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Economic, Education, Jobs and Skills Committee

Inquiry into community energy projects

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Economic, Education, Jobs and Skills Committee

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Committee functions

The Economic, Education, Jobs and Skills Committee is constituted under section 8 of the *Parliamentary Committees Act 2003* (Vic).

The Committee's functions are to inquire into, consider and report to the Parliament on any proposal, matter or thing concerned with:

a. economic development, industrial affairs or infrastructure

b. the provision of services to new urban regions

c. the development or expansion of new urban regions

d. education or training.

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This report is available on the Committee's website.

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Terms of reference

Inquiry into community energy projects

Received from the Legislative Assembly on 23 June 2016:

To the Economic, Education, Jobs and Skills Committee, for consideration and report no later than 1 July 2017, into supporting the role of communities in the Victorian energy economy and, in undertaking the inquiry, the Committee should:

a. look at the potential role of co-operatives, mutuals, social enterprises and community ownership in the energy sector;

b. investigate the benefits of community owned energy programs;

c. investigate the best ways to encourage the uptake of community energy projects;

d. investigate the ability to expand community energy projects outside of solar and wind power;

e. review the best practice models of other Australian and international jurisdictions for supporting community ownership options in the energy sector;

f. investigate the challenges to community energy projects in metropolitan areas; and

g. investigate ways to support communities to surmount challenges to community owned energy in metropolitan areas.

The reporting date was extended to 31 October 2017 by resolution of the Legislative Assembly on 20 June 2017.

Chair's foreword

I am pleased to present the Economic, Education, Jobs and Skills Committee's report on its Inquiry into community energy projects. The vibrancy of the community energy sector in Victoria is impressive and the enthusiasm and dedication shown by local energy groups in both metropolitan and regional areas is commendable.

Unlike in Europe and North America, community energy in Australia is still struggling to gain a foothold in the energy market. Some community energy groups have successfully developed projects, but others are finding difficulty negotiating the financial, technical and legal aspects of funding and constructing a renewable energy project. Policy uncertainty, regulatory restrictions and a lack of start-up funds and resources have hampered the efforts of some community energy groups.

The Victorian Government has implemented a range of measures and programs to encourage the development of the sector, but the Committee found community energy groups continue to face barriers when developing projects. By examining community energy projects running interstate and overseas, the Committee concluded that community participation in the energy sector is least risky and most likely to succeed if community energy groups collaborate with developers or local government. Renewable energy developers and local governments can offer community energy projects equity, expertise and better economies of scale. The Committee therefore recommends that the Victorian Government encourage such collaboration through financial mechanisms tied to its renewable energy targets.

The uptake of renewable energy in Victoria may affect energy security and affordability, which could disadvantage vulnerable consumers. While the Committee recognises the economic and social benefits of community energy, it also wants to ensure that consumer protections and energy security are maintained with expansion of the sector. The recommendations in this report aim to encourage the uptake of community energy projects and at the same time safeguard energy security and affordability.

On behalf of the Committee, I thank the many individuals, community energy groups and organisations who wrote submissions, attended public hearings or hosted site visits. The Committee appreciates the time and effort of all who contributed their views and experiences during the Inquiry.

I sincerely thank the Committee's Deputy Chair, Ms Dee Ryall MP, and my fellow Committee members, Mr Jeff Bourman MLC, Mr Peter Crisp MP, Ms Christine Fyffe MP, Hon Jane Garrett MP and Mr Cesar Melhem MLC for their hard work and contributions throughout the Inquiry. I also acknowledge the dedication of Mr Don Nardella MP during the first seven months of the Inquiry.

The Committee also wishes to extend its gratitude to the Committee's secretariat, Ms Kerryn Riseley, Dr Marianna Stylianou and Ms Janelle Spielvogel, for their commitment and assistance throughout the Inquiry.

Nazih Elasmar MLC
Chair

Executive summary

A community energy project is a renewable energy or energy efficiency project that a community develops, delivers and benefits from. Examples include a cooperative that raises funds to construct a small wind farm, or a community group that organises a bulk buy of solar panels for installation on multiple local households. Community energy is an emerging sector in Australia, unlike in Europe where the sector is established and strong, particularly in Denmark, Germany and Scotland. In 2015, over 2800 community energy projects were operating in Europe compared with fewer than 25 projects in Australia. In 2016, six community energy projects were operating in Victoria. The Victorian Government is encouraging the development of community energy projects as part of its roadmap to boost renewable energy generation in the state.

The Inquiry's terms of reference asked the Committee to investigate the benefits of community energy projects, how their uptake can be encouraged, whether they can be expanded beyond solar and wind power and how challenges specific to metropolitan projects can be overcome. The Committee spoke with community energy groups, supporting organisations, energy distributors and retailers, and government bodies to review best practice models of community participation in the energy sector in Victoria, interstate and overseas.

Community energy projects have obvious environmental benefits through the reduction of greenhouse gas emissions, but they also offer economic, social and technological benefits. Research in Australia and overseas indicates that community energy projects provide a greater economic benefit to the local community than commercial renewable energy projects. This benefit arises from new income streams, job creation and local procurement of goods and services. At the same time, the Committee found the growth of renewable energy may pose risks to energy security and affordability, and the community energy sector needs to be carefully managed to ensure that vulnerable consumers are not disadvantaged.

There is a range of business models that community energy groups can adopt to run their project. The Committee found that some of the most successful community energy projects involved the partnership of community groups with developers, local government or enterprises that offer platform solutions. Large renewable energy projects in particular benefit from the expertise, equity and economies of scale that developers can provide community energy groups. Therefore, the Committee recommends that the Victorian Government encourage collaboration between community energy groups and developers or local government through financial mechanisms tied to its renewable energy policies.

The most common challenges that community energy groups face when developing a project include policy uncertainty, regulatory restrictions, technical issues and a shortage of funding and resources. From its review of best practice in Australia and overseas, the Committee found that measures such as supportive

policy, financial assistance and the provision of resources and support help community energy to thrive. However, collaboration with industry or local government appears to be the best way to involve communities in the energy sector with the least risk and greatest chance of financial success.

Stakeholders informed the Committee that the capacity of community energy group volunteers to develop a project in terms of time and skills was a significant challenge, as were the start-up costs involved with getting a project investment ready. The Committee recommends the Victorian Government implement a loan fund for community energy projects and expand the pilot Community Power Hubs program if it proves to be of value to the community energy sector. In addition, the Committee believes the Victorian Government should work with the COAG Energy Council to reduce the regulatory and financial barriers that currently restrict the uptake of community energy projects.

Most community energy projects in Australia and overseas are located in regional areas. The Committee was asked to specifically inquire into the challenges of developing community energy projects in metropolitan areas and ways to overcome them. It found the barriers for metropolitan community energy projects are largely the same as those in regional areas, other than specific issues relating to higher housing density and a greater proportion of renters and apartment dwellers in urban areas. Strategies to address these barriers include developing projects that use financing models based on environmental upgrade agreements and enabling local energy trading. However, a number of regulatory restrictions exist at the national and state levels that prevent the implementation of new business models such as these in the energy sector.

The Australian energy market is undergoing rapid change and new technologies present community energy groups with project options other than wind and solar, such as bioenergy, pumped hydro, micro grids and battery storage. Community energy groups, energy distributors, universities and the Victorian Government are running a number of trials using these technologies, and the Committee recommends that other community energy groups note the lessons from these trials before undertaking projects using these technologies. A strong theme that emerged in the evidence was the importance of energy efficiency measures that reduce energy use and costs, and the Committee believes that energy efficiency measures should be incorporated into community energy projects wherever possible.

The Committee recognises the benefits that community energy projects offer local communities but is also mindful of ensuring that consumer protection and energy security and affordability are not compromised. The implementation of the Committee's recommendations will help to encourage the uptake of community energy projects in Victoria while also protecting consumers and the efficiency of the electricity market.

Glossary

20/12 investor rule	A rule in the *Corporations Act 2001* (Cth), which limits the number of investors in a project to 20, with no more than $2 million being raised over a 12-month period. If more capital or more investors are required, a disclosure document must be issued and annual reporting requirements complied with.
AEMC	Australian Energy Market Commission, the entity established by the Council of Australian Governments to make and amend the National Electricity Rules, conduct independent reviews and provide advice to governments on electricity markets.
AEMO	Australian Energy Market Operator, the entity responsible for operating the National Electricity Market in Australia's eastern and south-eastern seaboard and the Wholesale Electricity Market in Western Australia.
ARENA	Australian Renewable Energy Agency, an agency established by the Australian Government in 2012 to administer and develop an investment plan to fund renewable energy projects.
Australian Energy Regulator	The entity that monitors wholesale electricity and gas markets, sets network service charges and regulates the retail energy markets in Queensland, New South Wales, South Australia, Tasmania (electricity only) and the Australian Capital Territory.
Behind the meter	Where electricity generated from a solar power installation is used on site rather than exported to the electricity grid.
BSG	Bendigo Sustainability Group, a not-for-profit incorporated organisation that works towards sustaining the future natural environment of the Bendigo region. It has developed several community energy projects and created a model for financing the installation of solar PV systems on council-owned buildings.
CARES	Community and Renewable Energy Scheme, a Scottish Government scheme that offers a support package to community renewable energy developers that includes free advice and support in addition to start-up grants and loans.
CEC	Clean Energy Council, the peak body for the clean energy industry in Australia.
COAG Energy Council	Council of Australian Governments Energy Council, a ministerial forum to pursue national energy reforms made up of Energy and Resources Ministers from the Commonwealth, each Australian state and territory, and New Zealand.
Coalition for Community Energy	A network of 72 organisations that guides, supports and advocates for the community energy sector in Australia.
CORENA	Citizens Own Renewable Energy Network Australia, a not-for-profit organisation that delivers community energy projects through a donation model.
Darebin Solar $aver program	A program run by the City of Darebin that installs solar panels on the roofs of low-income and elderly households at no upfront cost and households repay the cost through council rates over a 10-year period.
DELWP	Department of Environment, Land, Water and Planning, the Victorian Government department that is concerned with energy and climate change issues.
Distribution network	The network that delivers electricity from substations to homes and businesses at a low voltage via powerlines.

Electricity grid	The transmission and distribution network that delivers electricity from generators to consumers.
Energy distributor	A company that owns and maintains the distribution networks, including electricity powerlines and power poles, and natural gas pipelines that carry electricity and natural gas to houses and businesses.
Energy retailer	A company that sells energy to consumers and bills them for the service.
Essential Services Commission	Victoria's independent economic regulator of the electricity, gas, water and sewerage, ports, taxis and rail freight industries. It is responsible for issuing energy distribution and retail licences in Victoria.
EUA	Environmental upgrade agreement, an agreement between a business, bank and local government that facilitates a building upgrade to improve energy, water or environmental efficiency.
Feed-in tariff	A rate paid for electricity fed back into the electricity grid from a renewable energy generator.
Finkel review	A 2017 review of the future security of the National Electricity Market conducted by an expert panel chaired by Dr Alan Finkel for the COAG Energy Council.
GW	Gigawatt, a measure of installed energy generation capacity equal to 1000 MW.
kW	Kilowatt, a measure of installed energy generation capacity equal to 1000 watts.
kWh	Kilowatt hours, a measure of energy generated over a period of time equal to 1000 watt hours.
Local energy trading	Where an electricity generator at one location sells or assigns its exported electricity to a consumer at another location. The electricity is transferred virtually rather than physically and the consumer receives billing credits for the amount of electricity exported. Also known as virtual net metering.
MEFL	Moreland Energy Foundation Limited, an independent not-for-profit organisation that works to reduce greenhouse gas emissions and improve energy efficiency through local action.
MRSG	Macedon Ranges Sustainability Group, a not-for-profit organisation that helps Macedon Ranges communities manage climate change and sustainability issues.
MW	Megawatt, a measure of installed energy generation capacity equal to 1000 kW.
MWh	Megawatt hours, a measure of energy generated over a period of time equal to 1000 kWh.
National Community Energy Strategy	A strategy developed in 2015 for ARENA by the founding organisations of the Coalition for Community Energy and the Institute for Sustainable Futures at the University of Technology Sydney that sets out a vision, objectives and priority initiatives for the community energy sector.
National Electricity Market	The wholesale electricity market for eastern and south-eastern Australia, that is, Queensland, New South Wales, the Australian Capital Territory, Victoria, South Australia and Tasmania.
National Electricity Objective	An objective that the AEMC is required by law to have regard to, which is to promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of electricity consumers with respect to price, quality, safety, reliability, and security of supply of electricity; and the reliability, safety and security of the national electricity system.

National Electricity Rules	Rules that govern the operation of the National Electricity Market, the economic regulation of services provided by transmission and distribution networks and the provision of services to retail consumers.
New Energy Jobs Fund	A fund set up by the Victorian Government in 2016 to support Victorian-based projects that create long-term sustainable jobs, increase the uptake of renewable energy generation, reduce greenhouse gas emissions and drive innovation in new energy technologies.
Off balance sheet	An accounting term for when an asset or liability is not shown on a company or organisation's balance sheet.
PiLoR	Payment in lieu of rates, a payment that energy generators elect to make to local government in lieu of rates. The generator and council must negotiate the amount, but if they cannot agree, the formula used is $40 000 upfront plus an additional $900 per megawatt capacity of the generation facility.
Platform solution	A system where services or infrastructure can be shared across or replicated for multiple projects.
Power purchase agreement	A long-term contract for the purchase of electricity output from an electricity generation project or facility.
PV	Photovoltaic, the production of electricity from sunlight.
Reverse auction scheme	A scheme where renewable energy developers bid for a long-term contract to provide electricity at the lowest cost.
Single-phase power	The distribution of alternating current electric power using a system in which voltages vary in the same pattern.
Split incentive	Where a landlord will not benefit from investing in renewable energy or energy efficiency measures because the energy and cost savings will accrue to the tenant.
Three-phase power	The distribution of alternating current electric power using a system in which voltages are offset in time by one-third of the period.
Transmission network	The network that delivers electricity from power stations to smaller distribution networks at high voltage via transmission lines.
Virtual net metering	See local energy trading.
VRET	Victorian Renewable Energy Target, a Victorian Government commitment to generate 25% of Victoria's electricity from renewable sources by 2020 and 40% by 2025.

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1 Introduction

On 23 June 2016, the Parliament of Victoria's Legislative Assembly gave the Economic, Education, Jobs and Skills Committee terms of reference to conduct an inquiry into community energy projects. The terms of reference directed the Committee to investigate the role of communities in the Victorian energy economy and in doing so, explore the benefits of community energy projects and ways to encourage their uptake.

Community energy is where a community develops, delivers and benefits from an energy project. The project could involve renewable energy, such as installing solar panels on a local building, or energy efficiency measures, such as retrofitting energy-efficient lighting at a community centre. Compared with commercial projects, the development, construction and operation phases of community energy projects are more likely to involve the procurement of local goods and services, which supports local jobs and the local economy.

Several community energy projects are operating in Victoria. Two of the most notable projects are Hepburn Wind, a wind farm in Daylesford built, owned and operated by a community cooperative, and the City of Darebin's Solar $aver program, which helps low-income and elderly households install solar panels at no upfront cost.

The strong level of public interest in this Inquiry indicates that there is a desire among the community to engage in energy issues and develop energy projects. The Committee met with many community groups who are at different stages of developing energy projects. While their needs varied, these groups shared the belief that community energy is the missing link between household and large-scale commercial energy projects that could strengthen public support for renewable energy and assist Victoria to transition to a lower carbon future.

Community energy projects are often not easy to develop and operate. They require technical, legal and financial skills and a significant level of commitment from community volunteers. During the course of the Inquiry, the Committee heard a number of suggestions of how community energy projects could be encouraged and supported. The recommendations in this report aim to foster the development of community energy projects while also ensuring their long-term viability and protecting Victorian energy consumers.

1.1 Background

1.1.1 What are community energy projects?

One commonly cited definition of community energy projects refers to projects where community members own or participate in the production or use of renewable energy.[1] However, this definition is limiting because it excludes community energy projects that do not involve the generation of renewable energy, such as energy efficiency programs. For this reason, this report uses the same definition as the National Community Energy Strategy, which was developed for the Australian Renewable Energy Agency (ARENA) and states that community energy projects have at least two of the following elements:

- local ownership and/or decision-making power
- local project development and design
- flow of benefits to local individuals or stakeholders
- energy production matched to local energy needs.[2]

The definition of community usually refers to people living in the same place, but it may also refer to a group of people with common interests, such as an environmental group.[3]

The Committee notes that in 2016, the Department of Environment, Land, Water and Planning (DELWP) released a discussion paper requesting community feedback on how community renewable energy projects should be defined.[4] A definition of community energy projects is important if the Victorian Government decides to provide specific support to community projects as opposed to other renewable energy projects.[5] The Government will decide whether community energy projects should be differentiated from other projects and if so, develop a definition based on the submissions it has received.

1.1.2 Existing community energy projects

The community energy sector in Australia has been active for over a decade. Currently, there are at least 59 community energy groups that are developing, delivering and/or operating energy projects in Australia.[6] Of these community energy projects, 22 are now operating and six of these are in Victoria. Victoria also has more than 20 other community energy projects that are at some stage of development.[7]

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1 Josh Roberts, Frances Bodman and Robert Rybski, *Community power: model legal frameworks for citizen-owned renewable energy* (2014), 4; REN21, *Renewables 2016 global status report* (2016), 135.

2 Institute for Sustainable Futures, et al., *National community energy strategy* (2015), 2.

3 Victorian Government, *Submission 98*, 5.

4 Department of Environment, Land, Water and Planning, *Community renewable energy projects: PiLoR and planning issues discussion paper* (2016), 12.

5 ibid, 13.

6 Institute for Sustainable Futures, et al., *National community energy strategy*, 6.

7 Victorian Government, *Submission 98*, 5.

By 2015, the community energy sector in Australia had:

- contributed over $23 million in community funding to energy infrastructure
- installed more than 9 megawatts (MW) of renewable energy
- produced more than 50 000 megawatt hours (MWh) of renewable energy (at the end of 2014)
- saved more than 43 000 tonnes of carbon emissions.[8]

Some of the key community energy projects operating in Victoria and Australia are described below along with a brief overview of overseas projects. Other Australian and overseas community energy projects will be presented as case studies or examples throughout the report.

Key Victorian projects

Hepburn Wind

Hepburn Wind is a cooperative of about 2000 members that owns and operates Australia's first community-owned wind farm. Located at Leonards Hill, south of Daylesford, the wind farm has two turbines that together can generate up to 4.1 MW of electricity, enough to power 2300 households. The project was financed through cooperative members ($9.8 million), Victorian Government grants ($1.725 million) and a Bendigo Bank loan ($3.1 million). The landowner has leased the site to Hepburn Wind for 25 years.[9] The project procures local goods and services, including $7 million of Australian content during construction, and employs three locals part-time.[10]

Hepburn Wind began generating electricity in June 2011. Profits from the sale of electricity are returned as dividends to investors and used to support the community through a fund that awards grants to local projects. Hepburn Wind has funded 45 local projects since 2011 totalling $89 000 worth of grants.[11]

Darebin Solar $aver program

Darebin Solar $aver is a program run by Darebin City Council in metropolitan Melbourne which helps low-income and elderly households install solar panels on their roof at no upfront cost. Households pay off the panels through their rates over a 10-year period. The repayments are structured to be less than the amount households save on their electricity bills each year.

In 2014, 545 kilowatts (kW) of solar panels were installed on 292 pensioner homes through the program. In 2016, solar panels were installed on a further 200 households, including 34 rental properties from a social housing cooperative.[12]

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8 Energy Innovation Co-operative, *Submission 52, Attachment 6*, iii.

9 Hepburn Wind, *Origins* (2016), <www.hepburnwind.com.au/hepburn-wind-origins> viewed 31 January 2017.

10 Hepburn Wind, *Submission 95*, 5.

11 Hepburn Wind, *Origins*.

12 Darebin City Council, *Submission 55*, 1.

Key Australian projects

Repower Shoalhaven

Repower Shoalhaven is a community-owned company that has helped facilitate the installation of solar systems on the roofs of businesses in the Shoalhaven and Southern Highlands areas of New South Wales. Its first project, the installation of a 99 kW system at Shoalhaven Heads Bowling and Recreation Club, was Australia's first community investor-owned solar power system.

The company, which started in 2013, finds a business that would benefit financially from solar installation but is unable to afford it. It then seeks community investors to pay for the installation. The business agrees to purchase the electricity for a fixed price over 10 years, after which time the panels belong to the business. Investors are repaid from the revenue generated through the sale of electricity to the business.[13] Repower Shoalhaven has installed three community energy projects so far and its fourth project was fully subscribed and funded within two days.[14]

Denmark Community Windfarm

Denmark Community Windfarm is a two-turbine wind farm located in the coastal town of Denmark, Western Australia. It began generating energy in 2013 and supplies about 30% of local electricity demand.[15] A public company, Denmark Community Windfarm Ltd, was set up to construct and operate the project, which was funded through the issue of shares to 115 investors, of whom 90% are locals.[16]

Denmark Community Windfarm has used local businesses in all phases of the project, from planning, surveying, roadworks and construction to executive management and financial oversight. The project also supports the local community through a grants fund. By 2014, the company had paid off more than $600 000 of debt and paid its first dividend to shareholders.[17]

ClearSky Solar Investments

ClearSky Solar Investments is a not-for-profit social enterprise established in Sydney in 2013 that links community and individual investors with solar projects in need of financing. Investors who sign up on ClearSky's website are informed of new projects and they can apply for units in the trust associated with the project they are interested in.

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13 Repower Shoalhaven, *Southern Highlands* (2016), <www.repower.net.au/southernhighlands.html> viewed 31 January 2017.

14 Repower Shoalhaven, *Projects* (2016), <www.repower.net.au/projects.html> viewed 31 January 2017.

15 Denmark Community Windfarm Ltd, *History*, <www.dcw.org.au/history.html> viewed 31 January 2017.

16 Craig Chappelle and Taryn Lane, *Denmark Community Windfarm–Denmark WA*, <www.embark.com.au/pages/releaseview.action?pageId=7700704> viewed 31 January 2017.

17 Denmark Community Windfarm Ltd, *The project*, <www.dcw.org.au/history.html> viewed 31 January 2017.

Investors receive payments quarterly after the project's system is turned on. The power generated by the project is sold to the end user and the revenue raised is used to pay back investors with interest. The payments are calculated by multiplying the amount of energy generated by the system with the price per kilowatt hour set out in the contract.[18]

Total investment was over $1.7 million by 2016 and this has funded the installation of 14 solar projects throughout Australia, mostly in New South Wales.[19]

Overseas projects

Community energy projects operate in Europe, North and South America and Asia. The sector is strongest in Europe where over 2800 community energy projects were operating in 2015.[20] Community energy was pioneered in Denmark where community-owned wind farms have operated since the late 1970s and government policies have promoted the development of community energy projects. Other European jurisdictions with strong community energy sectors are Germany and the United Kingdom.

The types of renewable energy technologies used in European community energy projects vary. Wind power is common in Denmark, Germany and Sweden, whereas solar and bioenergy projects are popular in Germany and Austria.[21] The technologies used in the United Kingdom include wind, bioenergy, solar and mini-hydro.[22]

1.1.3 Types of renewable energy

Renewable energy is energy obtained from natural resources that can be constantly replenished.[23] Most community energy projects in Australia use solar or wind power technologies, but renewable energy can be obtained from other sources. The different types of renewable energy technologies and their application in Victoria are described below.

Solar energy

Solar energy can be derived from sunlight or the sun's heat. Sunlight can be converted into electricity by photovoltaic (PV) cells in solar panels, and the sun's heat can be used to directly heat water for domestic use or create steam to generate electricity using steam turbines.

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18 ClearSky Solar Investments, *How it works*, <www.clearskysolar.com.au/howitworks.php> viewed 31 January 2017.

19 ClearSky Solar Investments, *Linking community investors with quality solar projects*, <www.clearskysolar.com.au> viewed 31 January 2017.

20 REN21, *Renewables 2016 global status report*, 136.

21 Jarra Hicks and Nicky Ison, *Community energy in Europe*, <www.embark.com.au/display/public/content/Community+energy+in+Europe> viewed 31 January 2017.

22 Community Energy Scotland, *Projects database*, <www.communityenergyscotland.org.uk/projects.asp> viewed 31 January 2017.

23 Australian Renewable Energy Agency, *What is renewable energy?*, <arena.gov.au/about-renewable-energy> viewed 31 January 2017.

Solar hot water systems or solar PV panels are installed on the rooftops of more than 2 million Australian households. According to the Australian Bureau of Statistics, 11% of Victorian households in 2014 reported using solar electricity.[24] A 2012 report for the former Department of Primary Industries found that the strongest solar resources in Victoria are in the state's northwest.[25]

Wind energy

Wind energy is derived from converting wind currents into electricity. The wind rotates turbine blades which turn a generator to produce electricity. Wind energy is the fastest growing renewable energy source in Australia and currently provides for 4% of Australia's primary energy consumption.[26]

The Victorian Wind Atlas prepared by Sustainability Victoria shows that the strongest wind resources are in the coastal, central and alpine regions of Victoria.[27] In January 2017, there were 17 major wind farms operating in Victoria generating up to 1249 MW of power.[28]

Bioenergy

Bioenergy is energy derived from organic matter (biomass), such as animal and plant waste and residential and industrial waste. The biomass is burned to heat water and create steam. The steam pushes a turbine that rotates a generator to produce electricity. In some cases, the steam is used to heat buildings.

Bioenergy accounts for 1% of Australia's energy production and is mainly sourced from sugarcane waste.[29] In Victoria, most bioenergy is produced from wood waste in the pulp and paper industry. For example, the Australian Paper Mill in Gippsland produces more than 50% of its energy needs from biomass waste. It is the largest generator of renewable base load (that is, consistent) energy in Victoria.[30]

Other examples of bioenergy generation in Victoria include Berrybank Farm near Ballarat, which produces electricity from its piggery waste, and Beaufort Hospital, which is heated by burning woodchips from the nearby Pyrenees Timber sawmill at Chute.

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24 Australian Bureau of Statistics, *Environmental issues: energy use and conservation*, cat. no. 4602.0.55.001 (2014), <www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4602.0.55.001Main+Features1Mar%202014?OpenDocument> viewed 31 January 2017.

25 Black & Veatch Australia Pty Ltd, *Solar technology suitability review,* report for Department of Primary Industries Victoria (2012).

26 Australian Renewable Energy Agency, *Wind energy*, <arena.gov.au/about-renewable-energy/wind-energy> viewed 31 January 2017.

27 Geoscience Australia, *Wind energy*, <www.ga.gov.au/scientific-topics/energy/resources/other-renewable-energy-resources/wind-energy> viewed 1 February 2017.

28 Department of Environment, Land, Water and Planning, *Wind projects* (2017), <www.energyandresources.vic.gov.au/energy/sustainable-energy/wind-energy/wind-projects> viewed 1 February 2017.

29 Australian Renewable Energy Agency, *Bioenergy*, <arena.gov.au/about-renewable-energy/bioenergy> viewed 31 January 2017.

30 Department of the Environment and Energy, *Carbon neutral stories: Australian Paper*, case study (2016).

Hydroelectricity

Hydroelectricity harnesses the force of running water to generate electricity. Water is stored in a dam until it is needed. When the dam gates are released, the force of falling water spins turbines that connect to an electricity generator. In Australia, most hydro power stations use dams situated in major river valleys. Victoria sources hydroelectricity from dams such as Lake Eildon, Hume and Dartmouth.[31] The Kiewa Hydroelectric Scheme in the Victorian Alps is Australia's second largest mainland hydroelectric scheme after the Snowy Mountains Scheme.

There are few opportunities left for major hydroelectricity development in Australia, but community energy projects can develop 'mini-hydro' schemes that do not require dam storage and instead use the natural run of a river.[32] Another option is pumped hydro, which pumps water from a lower reservoir to a higher storage basin and then the water can be released when needed to generate electricity.

Geothermal energy

Geothermal energy uses heat stored in the earth to create electricity. Underground hot water and steam is extracted to the surface where the hot steam generates electricity using steam turbines.[33] Alternatively, the extracted heat can be used to heat buildings directly.

Potential geothermal resources in Victoria can be found around Lorne and in the areas between Ballarat and Bendigo and Horsham and Mildura.[34] There is also potential offshore, and geothermal exploration has begun in the Otway Basin. One example of geothermal energy use in Victoria is the Deep Blue Hotel Resort in Warrnambool, which uses hot mineral water for its space heating, hot water and pool heating.[35]

Marine energy

Marine energy is energy derived from the sea. Electricity can be produced from the movement of water through waves, tides and ocean currents or thermal energy generated by converting the temperature difference between surface water and deep water. Marine energy technology is still in the early stages of development and a commercial market for it is yet to develop overseas.[36] One

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31 Department of Environment, Land, Water and Planning, *Hydroelectricity* (2017), <www.energy.vic.gov.au/renewable-energy/hydroelectricity> viewed 31 July 2017.

32 Australian Renewable Energy Agency, *Hydropower*, <arena.gov.au/about-renewable-energy/hydropower> viewed 31 January 2017.

33 Australian Renewable Energy Agency, *Geothermal energy*, <arena.gov.au/about-renewable-energy/geothermal-energy> viewed 31 January 2017.

34 Department of Economic Development, Jobs, Transport and Resources, *GeoVic* (2011), <earthresources.vic.gov.au/earth-resources/maps-reports-and-data/geovic> viewed 31 January 2017.

35 Department of Economic Development, Jobs, Transport and Resources, *Geothermal* (2011), <www.energy.vic.gov.au/renewable-energy/geothermal> viewed 31 July 2017.

36 REN21, *Renewables 2016 global status report*, 57.

exception is tidal power derived from in-stream turbines in tidal barrages. Two such large-scale tidal power stations exist, one in France (completed in 1966) and one in South Korea (completed in 2011).[37]

There are four wave and tidal power demonstration projects in Australia including two in Victoria off the coast of Portland and Phillip Island. Marine energy is not commercially viable at present and is therefore unlikely to be a major contributor of renewable energy in Victoria's short- to medium-term future.[38]

1.1.4 Community energy policy context

Several community energy policies have emerged in Australia over the past decade reflecting growing government interest in the sector. Recent policies in some Australian jurisdictions have encouraged the uptake of community energy projects. The policies of these governments are outlined below.

Victorian Government

In August 2015, the Victorian Government released its Renewable Energy Roadmap. The roadmap sets out actions that the Government will take to boost renewable energy generation. One of these actions is to 'encourage household and community development of renewable generation, products and services.'[39] Later that year, the Government released a *Guide to community-owned renewable energy for Victorians* to assist local groups to navigate the commercial, technical, governance and regulatory aspects of developing and operating a community energy project.[40]

The Renewable Energy Roadmap was also designed to promote sustainable jobs in Victoria. In March 2016, the Department of Economic Development, Jobs, Transport and Resources released a new energy technologies sector strategy to grow the sector and create new jobs, business models, and markets for products and services. Part of the strategy included a $20 million New Energy Jobs Fund to fund new energy technology projects under four categories: community, manufacturing, technology and energy storage.[41]

The first round of the New Energy Jobs Fund awarded $5.8 million to 24 projects, 18 of which were community energy projects. The second round will have separate streams for community and industry, and the community stream will provide two categories of support: project development and project implementation.[42]

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37 ibid.

38 Department of Environment, Land, Water and Planning, *Marine* (2017), <www.energy.vic.gov.au/renewable-energy/marine> viewed 31 July 2017.

39 Department of Economic Development, Jobs, Transport and Resources, *Victoria's renewable energy roadmap: delivering jobs and a clean energy future* (2015), 6.

40 Department of Economic Development, Jobs, Transport and Resources, *Guide to community-owned renewable energy for Victorians* (2015), 5.

41 Department of Economic Development, Jobs, Transport and Resources, *New energy technologies sector strategy: Victoria's future industries* (2016), 9.

42 Victorian Government, *Submission 98*, 9.

In June 2016, the Victorian Government committed to renewable energy targets of at least 25% of the state's electricity derived from renewable energy by 2020 and 40% by 2025. The Government also committed to a target of net zero greenhouse gas emissions by 2050.[43]

New South Wales Government

The New South Wales (NSW) Government is supporting community energy projects through grants and the provision of information and advice. In 2013, the Government released its Renewable Energy Action Plan to achieve 20% renewable energy by 2020. One of the plan's objectives was to encourage community energy projects by providing communities with planning tools, standard contracts and project facilitation support.[44]

The NSW Government has provided start-up funding to 19 community energy groups through its Growing Community Energy grants program.[45] The aim of the program is to support the development of viable community energy projects whose business models can be replicated elsewhere in NSW.

Australian Capital Territory Government

In 2016, the Australian Capital Territory (ACT) Government set a renewable energy target of 100% to be achieved by 2020 (lifted from its 90% by 2020 target set in 2012). To achieve this target, the ACT Government has implemented several renewable energy programs involving solar, wind and bioenergy, in addition to a program encouraging innovation and investment in energy storage.

The ACT Government's key mechanism to achieve its renewable energy target is the use of a reverse auction scheme. In a reverse auction, renewable energy developers bid for a long-term electricity purchase contract and compete with each other to provide renewable energy at the lowest cost to the ACT. Developers set the bid price at a point that makes the renewable energy project viable and the Government awards the contract to the developer that offers the best value to the ACT.[46] Four reverse auctions were held between 2012 and 2016 for large-scale solar and wind projects. The successful projects are located in the ACT, NSW, Victoria and South Australia.

A community solar program that allows individuals renting or living in apartments to access the benefits of solar installation is another ACT policy initiative. The Government has entered into a long-term electricity purchase contract for a 1 MW solar farm to be built in Canberra. The facility will be funded by community members who will invest between $1000 and $10 000 each. The

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43 Department of Economic Development, Jobs, Transport and Resources, *New energy. New jobs*, fact sheet (2016) 1.

44 New South Wales Government, *NSW renewable energy action plan* (2013), 18.

45 NSW Office of Environment and Heritage, *Community energy grants* (2016), <www.environment.nsw.gov.au/communities/community-energy-grants.htm> viewed 1 February 2017.

46 ACT Government, *Canberra 100% renewable: leading innovation with 100% renewable energy by 2020*, brochure (2016) ACT Government, 2.

solar farm is expected to earn more than $360 000 annually and profits will be returned to community investors.[47] The round one offer document was released in September 2016 and was over-subscribed by 50%.[48]

Australian Government

The Australian Government has a renewable energy target of 33 000 gigawatt hours (GWh) (roughly equivalent to 23% renewable energy) by 2020. There are no components of the Government's current climate policy that specifically relate to community energy.[49]

Previous efforts relating to community energy include the Community Energy Efficiency Program, which the Australian Government introduced in 2011 to provide matched funding to non-profit community organisations and local governing bodies wanting to implement energy efficiency projects. A total of $106.2 million was granted to 160 recipients over two funding rounds; however, the program has since closed.[50]

The Australian Government also established ARENA in 2012 to administer and develop an investment plan to fund renewable energy projects. ARENA's objectives are to reduce the cost and increase the use of renewable energy in Australia.[51] In 2013, ARENA funded the Institute for Sustainable Futures at the University of Technology Sydney to hold the first community energy congress in June 2014 and develop a national community energy strategy. To complete this project, the Institute partnered with the founding organisations of the Coalition for Community Energy, a network of 72 organisations that supports and advocates for the community energy sector. The National Community Energy Strategy was released in 2015 and sets out a vision for community energy, set of objectives and priority initiatives to grow the sector.[52]

1.2 Scope of the Inquiry

1.2.1 Terms of reference

The terms of reference for this Inquiry required the Committee to investigate ways to support the role of communities in the Victorian energy economy. The Committee was asked to give consideration to:

- the role of cooperatives, mutuals, social enterprises and other forms of community ownership in the energy sector

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47 SolarShare Canberra, *1MW flagship project* (2017), <solarshare.com.au/solar-farm-project/greenfield-project> viewed 1 February 2017.

48 SolarShare Canberra, *Australia's largest community owned solar farm nears reality!* (Media release, 17 November 2016).

49 Ernst & Young and Climate Council of Australia, *Renewable energy jobs: future growth in Australia* (2016), 47.

50 Department of Industry, Innovation and Science, *Community energy efficiency program*, <www.industry.gov.au/Energy/Programmes/CommunityEnergyEfficiency/Pages/default.aspx> viewed 7 July 2016.

51 Australian Renewable Energy Agency, *About ARENA*, <arena.gov.au/about-arena> viewed 1 February 2017.

52 Institute for Sustainable Futures, et al., *National community energy strategy*, 1.

- the benefits of community energy projects
- the best ways to encourage the uptake of community energy projects
- whether community energy projects can be expanded beyond solar and wind power
- best practice models interstate and overseas for supporting community ownership in the energy sector
- the challenges to community energy projects in metropolitan areas and ways to overcome them.

1.2.2 What did the Committee examine?

The Committee decided not to limit its definition of community energy projects to only consider community-owned renewable energy projects. To do so would have overlooked successful community projects involving energy efficiency and those funded through a community donation model. The definition of community energy projects used in this report is stated in Section 1.1.1.

In September 2016, DELWP sought community feedback on its discussion paper on community renewable energy projects. The requested feedback relates to the following three issues that arose during consultation for the Victorian Government's Renewable Energy Roadmap:

- the definition of community renewable energy projects
- the payment-in-lieu-of-rates methodology for community renewable energy projects
- planning issues for wind farms.[53]

These issues were also raised in the evidence presented to the Committee. However, the Committee considers these technical issues are more correctly dealt with by DELWP and therefore they were not comprehensively examined as part of this Inquiry.

1.3 Inquiry process

The Committee called for public submissions to this Inquiry in August 2016. Advertisements appeared in *The Age*, *The Herald Sun* and *The Weekly Times*, as well as on Facebook. The Committee also arranged for notice of the subsequent public hearings to be included in the Parliament of Victoria's Twitter feed and Facebook news feed.

53 Department of Environment, Land, Water and Planning, *Community renewable energy projects: PiLoR and planning issues discussion paper*, 6.

The Committee Chair wrote directly to over 290 key stakeholders inviting submissions to the Inquiry. These stakeholders included community energy groups nationwide, Victorian energy retailers and distributors, renewable energy developers, industry associations, universities, and government departments and bodies at the federal, state and local levels.

The Committee received 99 submissions. A list of stakeholders who made a submission can be found in Appendix 1. The Committee also received 136 proforma submissions from supporters of Yes2Renewables, the Friends of the Earth's (Melbourne) campaign for 100% renewable energy. Friends of the Earth (Melbourne) invited supporters of Yes2Renewables to make a submission to the Inquiry using a proforma email it had prepared. These submissions were not counted individually but collectively as one submission (submission 6). However, in cases where extra content was added to the proforma email, these submissions were counted individually (a total of 19 submissions in addition to the 136 proforma submissions).

The Committee held nine days of public hearings between October 2016 and May 2017. Four days of public hearings were held in Melbourne, four in regional Victoria (Geelong, Traralgon, Daylesford and Shepparton) and one in Sydney. Appendix 2 lists the witnesses who gave evidence to the Committee at the public hearings.

The Inquiry's terms of reference asked the Committee to examine best practice models that support community ownership in the energy sector in Australia and overseas. In order to gather evidence of best practice, the Committee undertook site visits to Daylesford and Woodend in Victoria and the Northern Rivers region of New South Wales. A number of community energy projects have been or are being developed in these regions and the Committee was able to ask questions of the community energy groups coordinating these projects. Appendix 3 lists who the Committee met with on these site visits.

The Committee also travelled to the United Kingdom, Denmark and Germany to visit operating community energy projects, talk to community energy groups about their experiences and meet with government representatives to discuss the effectiveness of relevant policies. Appendix 3 lists the organisations the Committee met with during the international study tour. The insights gained on the tour are discussed throughout the report.

The secretariat also conducted a literature review on community energy projects and this research is reflected throughout the report.

1.4 Outline of the report

This report is divided into seven chapters:

- This chapter, Chapter 1, provides an introduction to the Inquiry, including the Inquiry's context, scope and conduct.

- Chapter 2 outlines the benefits of community energy projects and discusses issues that might be faced as the community energy sector grows.
- Chapter 3 presents an overview of community ownership and participation models in the energy sector.
- Chapter 4 provides a summary of common barriers faced by community energy groups and measures that could be implemented to encourage the uptake of community energy projects.
- Chapter 5 considers the challenges to developing metropolitan community energy projects and how to overcome them.
- Chapter 6 discusses ways of expanding community energy beyond wind and solar power.
- Chapter 7 contains a brief conclusion to the report.

Evidence of best practice in community energy overseas and interstate is interspersed throughout the report.

2 Benefits of community energy projects

The evidence presented to the Committee cited multiple benefits of community energy projects including economic, social and environmental benefits. This chapter outlines these benefits among others that participants, researchers and governments have associated with community energy projects. It concludes by discussing issues of concern for consumer protection if community energy projects are not carefully integrated into Victoria's energy system.

2.1 Economic benefits

Community energy projects can provide communities with income through the sale of electricity and cost savings through reduced energy demand. In addition to these financial benefits, the development of a community energy project can also boost the local economy through job creation and local procurement. Research conducted internationally has shown that community energy projects provide a greater economic benefit to the local community than commercial renewable energy projects. The evidence for these benefits is presented under the headings below.

2.1.1 Additional income stream and income diversification for communities

The income from community energy projects benefits the local community because the money is retained there rather than directed to energy retailers and distributors.[54] Community energy projects can provide communities with an income stream through the sale of electricity back to the grid or the lease of land where the renewable energy infrastructure is situated.

Daylesford's community wind farm, Hepburn Wind, is an example of a community energy project that earns income from each of these sources. Hepburn Wind is a cooperative with over 2000 members who contributed $9.8 million through the purchase of shares to construct the wind farm. The wind farm earns income by selling the electricity it generates at the market price set by the National Electricity Market and selling Renewable Energy Certificates. The wind farm generated 9873 megawatt hours (MWh) in the 2015–16 financial year and its average combined income was $117.27 per MWh that year.[55] The owner of

54 WestWind Energy, *Submission 61*, 1.

55 Hepburn Wind, *Hepburn Wind annual report 2015–16: generating results* (2016), 9.

the site where the turbines were erected agreed to a 25-year lease and Hepburn Wind has provided 65 households in the immediate vicinity a gift of equity in the project as well as a contribution to their energy bills.[56]

Community energy projects also keep revenue from energy generation within the community. In its submission, Bendigo Sustainability Group, a charity that works on environmental sustainability in the Bendigo region, highlighted this issue:

> Currently $80M to $100M leaves the Bendigo region annually in payment of electricity bills to retailers and energy companies located outside of our region, many with overseas head offices. A principal role of having community ownership of local energy systems is to retain revenue within the local area. The flow on effects will potentially lead to revenue redistribution 7 or 8 times locally before leaving the region as opposed to 1 or 2 times for electricity bills paid directly to a distant retailer.[57]

Community energy projects in rural areas can also provide a new source of income for regions that may be experiencing agricultural, population or economic decline.[58] In addition, farmers who host project infrastructure can use the additional income to support their operations.[59] Ms Alicia Webb, Policy Officer at the Clean Energy Council (CEC), the peak body for the clean energy industry in Australia, explained:

> Generally the landholders, who are private landholders, site bits of renewable energy project infrastructure, whether that be a substation, a transmission line or the actual solar panels or wind turbines. They are paid. When they are paid they can reinvest into their land, they can hire more people to work the farm, they can do whatever they want—it is their money.[60]

2.1.2 Reduced energy costs

A direct benefit of communities generating and using their own electricity is that they can reduce the amount of electricity they need to purchase.[61] For example, the Abbotsford Convent, through The People's Solar crowdfunding platform, crowdfunded $120 000 to install a 99 kilowatt (kW) onsite solar photovoltaic (PV) system. The installation has reduced the site's combined annual electricity bill of $130 000 by about $15 000 and the savings will be used to maintain and protect the Convent's gardens and grounds.[62] A study of the role of local government in community energy also found that 82% of local governments surveyed were motivated to engage in renewable energy development to reduce their electricity bills.[63]

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56 Ms Taryn Lane, Chairperson, Coalition for Community Energy, *Transcript of evidence,* Melbourne, 24 October 2016, 3.

57 Bendigo Sustainability Group, *Submission 76*, 6.

58 Gordon Walker, et al., 'Harnessing community energies: explaining and evaluating community-based localism in renewable energy policy in the UK' (2007) 7(2) *Global Environmental Politics*, 64–82, 73.

59 Macedon Ranges Sustainability Group, *Submission 64*, 3.

60 Ms Alicia Webb, Policy Manager, Clean Energy Council, *Transcript of evidence,* Melbourne, 7 November 2016, 4.

61 Australian Energy Council, *Submission 80*, 2.

62 Northern Alliance for Greenhouse Action, *Submission 36*, 2–3.

63 Franziska Mey, Mark Diesendorf and Iain MacGill, 'Can local government play a greater role for community renewable energy? A case study from Australia' (2016) 21(November 2016) *Energy Research & Social Science*, 33–43, 37.

Community members also consider community energy projects as a way to control their energy costs in the current Victorian market where electricity retailers engage in short-term discounting which is tied to on-time bill payments. According to Energy Locals, an Australian owned and operated social enterprise energy retailer:

> None of these tactics build consumer trust, and with almost every retailer in Victoria adopting varying forms of the fundamentally same approach, we must question whether high churn is representative of better outcomes for those in need of the service, or whether it is symptomatic of the desperate chase for increasingly disenchanted consumers. No wonder, therefore, that consumers are starting to self-organise and establish their own community energy groups. This gives many a way to regain control of their energy bills by garnering local support for increased renewable energy and offers an organised voice when lobbying for change.[64]

The Energy Innovation Co-operative, an energy cooperative for communities across Bass Coast, South Gippsland and Cardinia Shires, also believes that the competition that community energy projects create with electricity distributors provides 'a significant incentive for the distributers to lift their service levels to avoid a "death spiral" of decreasing numbers of customers on their network.'[65]

2.1.3 Job creation and skills training

The development and operation of community energy projects can create local jobs and provide training opportunities.[66] Community energy projects that source local goods and services also help to create jobs and develop the local economy.

Job creation

Community energy projects generate employment directly, such as construction, administration and maintenance jobs, and indirectly through jobs along the supply chain. For example, the Darebin Solar $aver program, which installs solar panels on the rooftops of low-income and elderly households in the City of Darebin at no upfront cost, uses a number of solar panel contractors which employ several installers each. The Acting Director of Operations and Environment at Darebin City Council, Ms Libby Hynes, explained:

> Throughout our area at the moment we are installing around about 400 kilowatts of solar, through the last tranche of Solar $aver we did 545 kilowatts. That has employed at least four sets of contractors and it has put around about $1.6 million into the solar industry. That is one council. Over many councils that would make a lot more of an impact … Usually there are two or three people working for a contractor.[67]

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64 Energy Locals, *Submission 68*, 2.

65 Energy Innovation Co-operative, *Submission 52*, 4.

66 Institute for Sustainable Futures, et al., *National community energy strategy* (2015), 4.

67 Ms Libby Hynes, Acting Director, Operations and Environment, Darebin City Council, *Transcript of evidence,* Melbourne, 21 November 2016, 3.

A collective impact assessment report on community energy measured the contribution of community energy projects to local job creation in terms of the number of employee hours created during the development, planning, installation and ongoing operation phases. On average, Australian community energy projects created 16 weeks of work during the development phase, four weeks during planning, 25 weeks during installation and 37 weeks on an ongoing basis.[68]

Community energy projects have also been shown to create more jobs than comparable commercial renewable energy projects. A literature review of the economic development impact of community wind projects found that the employment impact of community-owned projects is 1.5 to 3.4 times higher than for absentee-owned projects.[69]

The extent of job creation depends on the type of renewable energy technology used in the project, with solar energy creating the most jobs. According to the Australian Bureau of Statistics, there were 1900 full-time equivalent employees in renewable energy activities in Victoria in the 2015–16 financial year. Most of these employees (1340 or 71%) worked in solar energy, compared with 320 in wind energy, 100 in hydropower and geothermal energy combined and 40 in biomass energy.[70]

Local procurement

Evidence also shows that community energy projects source the majority of their services from local providers. The collective impact assessment report on community energy found that while only 12% of renewable energy technology components for Australian community energy projects were sourced locally, 92% of services such as installation, construction, electrical work and administration were sourced locally.[71]

A Victorian example of a community energy project that sources services locally is Hepburn Wind. Ms Taryn Lane, Community Manager at Hepburn Wind, emphasised the importance of local procurement stating 'we have had a local purchasing policy throughout the whole life cycle of the project to date. So this occurred throughout construction and it still occurs today when we look at employing or securing services.'[72]

Senvion Australia, a wind farm developer, operator and maintenance service provider, added that wind energy projects can boost the manufacturing and transport sectors in Australia:

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68 Energy Innovation Co-operative, *Submission 52, Attachment 6*, 16.

69 E. Lantz and S. Tegen, 'Economic development impacts of community wind projects: a review and empirical evaluation' (Paper presented at WINDPOWER 2009 Conference and Exhibition, Chicago, 4–7 May 2009), 10.

70 Australian Bureau of Statistics, *Employment in renewable energy activities, Australia 2015–16*, cat. no. 4631.0 (2017), <www.abs.gov.au/ausstats/abs@.nsf/mf/4631.0> viewed 19 May 2017.

71 Energy Innovation Co-operative, *Submission 52, Attachment 6*, 16.

72 Ms Taryn Lane, *Transcript of evidence*, 3.

> We have also seen spin-off benefits to the Australian supply chain, including expanded manufacturing capability of key components, such as towers, cables and transformers as well as increased haulage and cranage capability, and the expanded capacity of key transport hubs, such as the Ports of Portland and Hastings.[73]

Skills training

Community energy projects can provide opportunities for technicians to upskill and learn about renewable energy technology and for technology students to gain hands-on experience.[74] Skills training can also be included as part of a community energy project. For example, Repowering London, a not-for-profit organisation that develops community renewable energy projects in London, United Kingdom, incorporates training opportunities for local people in its projects. A typical project developed by Repowering London delivers 10 paid internships for local young people and 10 to 15 paid work experience placements for local youth and adults.[75] The internship program runs over 30 weeks and covers the financial, technical, legal, community engagement, information technology and media aspects of community energy projects. At the end of the internship, the interns can undertake paid work experience installing solar panels.[76]

The development of wind energy projects in South Australia has also created the opportunity for local young people to gain qualifications in renewable energy, as observed by the CEC:

> Wind farms provide the opportunity to bring training and skills development opportunities to local communities. For example, Senvion Australia is working with the TafeSA indigenous access unit to set up a pre-vocational program for the Narrunga indigenous community to assist young people from the community to get qualifications and jobs on the Ceres renewable energy project. In addition, as a result of the development of the wind industry in South Australia, and the demand for skilled personnel, a renewable energy training centre has been established at Mt Gambier TAFE.[77]

2.1.4 Local economic development

A study of community wind energy in the United States found that community energy projects support local economic development through three primary mechanisms: use of local labour, businesses and materials; returns paid to local investors; and servicing of local bank loans.[78] The Coalition for Community Energy, a network of 72 organisations that advocates for the community energy sector, also highlighted evidence showing that community wind projects in

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73 Senvion Australia, *Submission 78*, 2.

74 Mr Ron Ipsen, Vice President, Voices of the Valley, *Transcript of evidence,* Traralgon, 6 March 2017, 3.

75 Afsheen Kabir Rashid, Co-founder, Director and Chief Operating Officer, Repowering London, *Repowering London*, supplementary evidence received 30 March 2017, 2.

76 Afsheen Kabir Rashid, Co-founder, Director and Chief Operating Officer, Repowering London, *Banister House solar report*, supplementary evidence received 30 March 2017, 2.

77 Clean Energy Council, *Submission 5, Attachment 1*, 7.

78 E. Lantz and S. Tegen, 'Economic development impacts of community wind projects', 1–2.

Germany, the United Kingdom, the United States of America and Australia have derived one and a half to seven times the local economic benefit than that provided by absentee-owned wind projects.[79]

A report for the United Kingdom Department of Energy and Climate Change found that community-owned energy projects offer between 12 and 13 times as much economic value for the local community as commercial renewable energy projects. This analysis did not include the value of social and environmental returns that community energy projects also offer, so the full return on investment value was estimated to be higher.[80]

Individual investors in community energy projects also receive returns that keep revenue from energy generation in the local community helping the local economy. For example, investors in ClearSky Solar Investments, which is a not-for-profit social enterprise that has funded the installation of 14 solar projects on community buildings throughout Australia, receive a 7% return on their investment every quarter after they make their initial investment. The return consists of a capital repayment component and an interest component.[81] The collective impact assessment report on community energy found that community energy projects had earned over $3.5 million for community investors by 2015.[82]

2.2 Social benefits

Although community energy projects can generate financial benefits, this is often not the key motivation for communities to get involved.[83] The social benefits of an energy project that brings a local community together are also valuable. These benefits include giving the community a sense of ownership and control over their energy source and costs and creating community confidence and resilience. On a more practical level, community energy projects can also have in-built benefit sharing schemes or community funds that support local projects or initiatives. In addition, community energy can enable more people to access or participate in renewable energy generation. These benefits of community energy projects are explored further under the headings below.

2.2.1 Local ownership and decision making

The ability to own part or all of a local energy project and make decisions about how the project is developed and operated gives local communities control over their energy use and costs and how benefits from the project are shared. Voices of the Valley, a community advocacy group for the Latrobe Valley whose members experienced the impact of the privatisation of the Valley's coal-fired power

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79 Coalition for Community Energy, *Submission 92*, 5.

80 Peter Capener, *Community renewable electricity generation: potential sector growth to 2020,* report for UK Department of Energy and Climate Change (2014), 2.

81 Emeritus Professor Warren Yates, Board Member, ClearSky Solar Investments, *Transcript of evidence,* Sydney, 15 February 2017, 3–4.

82 Energy Innovation Co-operative, *Submission 52, Attachment 6*, 15.

83 Victorian Government, *Submission 98*, 11.

stations in the 1990s, considers local ownership very important for being able to control the community's future direction. President of Voices of the Valley, Ms Wendy Farmer, stated:

> bringing companies [in] makes companies in charge of what happens in the community. Where if you've got community energy and you've got community ownership you've got that social impact. You've got money going back into communities, you know going back to sporting clubs or whoever is involved and … we're not begging corporations to actually control our future.[84]

Mr Dan Musil, who is also a resident of the Latrobe Valley and Secretary of Earthworker Cooperative, which has established a worker-owned factory in Morwell to manufacture renewable energy appliances and components, agrees that community energy is a way for communities to proactively react to manufacturing decline and unemployment in the region. He argued:

> community energy is not just a response to the challenges that we're seeing now, I think it poses and presents and is already demonstrating real opportunities for communities to start taking power back, to start benefitting from the industries that exist within them and providing ways for communities to foster more civic engagement and participation which I think is really important for a healthy society.[85]

He added that community buy-in for renewable energy is essential and community energy projects give local communities a say in the process and how the project benefits are shared.[86]

2.2.2 Community empowerment, resilience and pride

The successful development of a community energy project requires the navigation of hurdles in the energy system and commercial law as well as the collaboration of volunteers to raise funds and engage the local community. When a community achieves this, it creates a sense of empowerment, pride and social connection, which increases community resilience.[87] As stated by the Goulburn Broken Greenhouse Alliance, a partnership between the Goulburn Broken Catchment Management Authority and eleven regional councils to promote climate change action:

> Additional to direct renewable energy benefits, establishing and governing community renewable energy projects supports stronger communities, through relationship building, communication and cooperation. Ultimately these skills are transferable across a range of community activities and pursuits and contribute to increased community resilience.[88]

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84 Ms Wendy Farmer, President, Voices of the Valley, *Transcript of evidence,* Traralgon, 6 March 2017, 13.

85 Mr Dan Musil, Secretary, Earthworker Cooperative, *Transcript of evidence,* Traralgon, 6 March 2017, 3.

86 ibid.

87 Coalition for Community Energy, *Submission 92*, 7.

88 Goulburn Broken Greenhouse Alliance, *Submission 44*, 2.

Communities in regional areas that are experiencing economic downturns can benefit from the economic resilience that community energy projects offer through the creation of local jobs and new income streams. However, the resilience developed through community energy is not only economic, but also includes the ability to adapt to social, technical, environmental and political challenges that communities may face.[89] It increases a community's capacity to realise collective initiatives or projects in the future.[90]

2.2.3 Benefit sharing with the local community

Many community energy projects share benefits with the local community through a community enhancement fund that can be spent on local facilities, programs or initiatives. The community energy groups tailor these funds to meet the needs of the local community. For example, in its first five years of operation, the Hepburn Wind Community Fund has contributed over $90 000 to 43 local community projects and delivered an electric vehicle charging station on the main street of Daylesford.[91] Another example of a community energy project that shares benefits with the local community is The People's Solar and Geelong Sustainability's crowdfunded solar system at South Geelong Primary School, which has used savings on the school's energy bills to fund new bike shelters, a kitchen garden program and a new green wall at the school.[92]

Some community energy groups specifically design community funds to finance environmental initiatives such as energy efficiency. For example, Repowering London uses its Community Energy Efficiency Fund to improve the energy efficiency of local households through energy surveys and audits. After deducting project costs, 80% of each project's revenue is paid to investors as returns and the remaining 20% is allocated to the Community Energy Efficiency Fund.[93]

The Sydney Renewable Power Company is also considering the development of an annual community impact project to give back to the local community. In June 2016, the unlisted public company installed a 520 kW solar PV array on the roof of the redeveloped International Convention Centre in Darling Harbour financed through community shares. The company's Founding Director, Mr Andy Cavanagh-Downs, explained:

> one of the things that we've talked about, which we will see if shareholders want to do or not, is we were thinking of having an impact project every year whereby people can donate either some of their return or capital to an outcome within the local community every year. So it would be a democratic process. People can opt in if they want to. If they want to receive their investment return they can and take it but, you know, we might try to put solar panels on a local school or a wheelchair in a nursing

89 Jarra Hicks and Nicky Ison, 'Community-owned renewable energy (CRE): opportunities for rural Australia' (2011) 20(3) *Rural Society*, 244–255, 253.

90 TREC Renewable Energy Co-op, *Accelerating renewable energy for co-operatives in Canada: a review of experiences and lessons*, report prepared by Judith Lipp, Alice Dixon and Mumtaz Derya Tarhan (2016), 6.

91 Hepburn Wind, *Submission 95*, 5.

92 City of Greater Geelong, *Submission 37*, 2.

93 Afsheen Kabir Rashid, *Repowering London*, 4.

> home. We'll open it up to shareholders and say, 'What would you like to see come about?' So we'd like to stay relevant and have some sort of community impact, we think, in that way but it's up to the shareholders at the time.[94]

In general, community benefit sharing schemes have become common for renewable energy projects because they help to establish a relationship between the developer and the community. This relationship acknowledges the amenity impacts of a project on the local community and helps to gain the support of locals.[95] Ms Alicia Webb from the CEC stated:

> I think the renewable energy industry as a whole is moving towards more sophisticated benefit sharing. Like I said, some of the CEC's members are doing neighbour remuneration schemes. I would say nearly most projects have a community enhancement fund. They vary in size, but there has been a lot of work done in enhancing benefit sharing. Like I said, local contracts, making sure they hire local trucking companies, stay in local hotels—all that sort of stuff. It just means money going into the community. I think there was announcement recently about a big wind farm in Queensland that actually made some sort of economic analysis of the local economic benefit. I think something like 60 per cent of the total project investment was going to land in Queensland, which is pretty massive. These are hundreds of millions of dollars' worth of projects.[96]

2.2.4 Broader access to renewable energy

Another benefit of community energy projects presented to the Committee was that they give people who want to invest in renewable energy but are unable to do so access to renewable energy generation. People may be unable to invest in renewable energy for a range of reasons including aesthetics, location, tenure type or income. For example, Mr Geoff Drucker, Director of Countrywide Energy, a Victorian renewable energy developer that offers community members shares in projects, explained that:

> there are a number of people who do not want to put solar panels on their roof, either because they think they might destroy or impact the look of their house, their house points in the wrong direction or they do not want to have the maintenance and the upkeep of them but they would like to invest in solar energy in some way.[97]

Apartment dwellers and renters also lack the opportunity to install solar panels on their rooftops. Mr Rob Law, Project Manager at the Northern Alliance for Greenhouse Action, a network of nine metropolitan councils in Melbourne's north that are working towards a low-carbon future, added that:

> a lot of people—renters, apartment dwellers—do not own their own property and do not have suitable roof space, so community energy models that are emerging very much have that social focus on access to clean energy. A number of them might do it in a way that sort of allows for low-income people to access a project at a lower cost

94 Mr Andy Cavanagh-Downs, Founding Director, Sydney Renewable Power Company, *Transcript of evidence,* Sydney, 15 February 2017, 8.

95 Clean Energy Council, *Submission 5, Attachment 1*, 3–4.

96 Ms Alicia Webb, *Transcript of evidence*, 7.

97 Mr Geoff Drucker, Director, Countrywide Energy, *Transcript of evidence,* Melbourne, 20 March 2017, 2.

> than someone that has the capacity, so there are a number of different models. Being from local government, I guess that is one of our key concerns as well, the social equity aspect.[98]

For example, the Darebin Solar $aver program is a community energy project specifically designed to assist low-income households in the City of Darebin to install solar panels to reduce their energy bills.

Ms Susan Davies, Secretary/Director of the Energy Innovation Co-operative, also identified that community energy projects can indirectly support people on low incomes:

> So you are asking for donations from people who can afford it, and the benefits of that particular project would go to people whether they can afford to participate directly themselves or not. So if we have, say, a neighbourhood house, it does not have a lot of capital, and it helps a lot of people on very low incomes. If we were able to give a no-interest loan and potentially some donation to help that neighbourhood house put solar panels on its roof, then that particular neighbourhood house would have money that they previously gave to a multinational electricity retailer; they would have additional money to be able to use to assist the people that they assist who are low-income people. So those very low-income people, who may have no money to invest at all, would feel an economic benefit from what we had been able to do by putting a community-owned energy generator on their roof.[99]

Therefore, community energy projects not only allow investment in renewable energy for people who cannot install solar panels on their own rooftops, but can also give low-income households an opportunity to install renewable energy or at least benefit indirectly from energy savings.

2.3 Environmental benefits

Community energy projects not only reduce greenhouse gas emissions, but can also help protect the environment through increasing community awareness about environmental and energy issues and encouraging behaviour change. In addition, participation or awareness of community energy projects can build public acceptance of renewable energy generation and unlock new sources of funding through community investors. These benefits are discussed further under the headings below.

2.3.1 Reduction in greenhouse gas emissions

While the economic and social benefits of community energy are common drivers for the development of projects, the Victorian Government recognises that '[i]ndividuals and communities are also, almost invariably, looking for ways to make a positive impact on the environment and reduce their greenhouse

98 Mr Rob Law, Project Manager, Northern Alliance for Greenhouse Action, *Transcript of evidence,* Melbourne, 24 October 2016, 4.

99 Ms Susan Davies, Secretary/Director, Energy Innovation Co-operative, *Transcript of evidence,* Melbourne, 21 November 2016, 7.

gas emissions.'[100] By increasing the volume of renewable energy generation or decreasing energy demand through community energy projects, the amount of energy required from greenhouse gas emitting energy sources is reduced. Renewable energy generation also reduces air and water pollution and supports the transition to an ecologically sustainable energy sector.[101]

2.3.2 Greater community awareness of energy and environmental issues

The community engagement required as part of a community energy project helps to raise awareness of energy and environmental issues among locals. Greater awareness of these issues may lead to behaviour changes relating to energy use and choice of energy supply.[102] The Moreland Energy Foundation, an independent not-for-profit organisation established by Moreland City Council in 2000 to tackle climate change, adds:

> A further benefit of community energy is that it leads to the improvement of energy literacy more generally. Until recently the energy network and market were unseen by all but a limited number of technical and policy professionals. The growth of the community energy sector has increased understanding which has already shown to improve community resilience through collective action and in time as the energy market transforms further democratisation of the energy market in the interests of all consumers.[103]

Greater awareness of energy issues was an outcome that the Copenhagen Environment and Energy Office and the Middelgrunden Wind Turbine Cooperative found through offering Copenhagen residents an opportunity to own part of the Middelgrunden 20-turbine offshore wind farm. The wind farm supplies 4% of Copenhagen's electricity and, with 8650 members, it is the world's largest cooperatively owned wind farm. During the community engagement phase of the project, 'more than 50,000 people received information directly and more than 50,000 people visited the Middelgrunden homepage. For many people electricity suddenly was something that did not just come out of the socket.'[104]

2.3.3 Greater acceptance and support for renewable energy

Community ownership and participation can also help to create a social licence to develop and run renewable energy projects. Compared with commercial projects, community energy projects tend to experience more support and less opposition from the local community and planning authorities.[105]

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100 Victorian Government, *Submission 98*, 11.

101 TREC Renewable Energy Co-op, *Accelerating renewable energy for co-operatives in Canada*, 6.

102 Coalition for Community Energy, *Submission 92*, 4–5; Jarra Hicks and Nicky Ison, 'Community-owned renewable energy (CRE)', 250.

103 Moreland Energy Foundation Limited, *Submission 51*, 2.

104 Copenhagen Environment and Energy Office, *The Middelgrunden offshore wind farm: a popular initiative* (2003), 6.

105 Indigo Shire Council, *Submission 93*, 2.

For example, the Australian Wind Alliance found that community acceptance of wind farms increases when there is a sense of local ownership and obvious benefits for the community.[106] The Business Council of Co-operatives and Mutuals also noted that the higher level of wind farm ownership among citizens of Denmark and Germany has contributed to the relatively high acceptance of wind energy in these nations.[107]

The experience in the United Kingdom has been similar, according to the Department of Energy and Climate Change:

> In some cases, increased community ownership could lead to reduced barriers to deployment of some renewable electricity technologies. For large projects, offering communities the chance for a share in ownership can often strengthen local support for new energy infrastructure, which in turn can help unlock additional investment and lead to more renewable electricity developments being built.[108]

Community energy's success in securing new sources of funding for renewable energy has also occurred in Australia. By 2014, Australian community investors had contributed over $23 million in funding for energy infrastructure.[109] In the same year, the community energy sector leveraged $3 of community energy funding for every $1 of government investment, and in the case of one community energy group, ClearSky Solar Investments, which has developed 14 community solar projects, $10 of community investment was leveraged for every $1 of government funding received from a NSW Government start-up grant.[110]

By the nature of their size, community energy projects can also enable the expansion of renewable energy by opening up avenues for development that otherwise might remain untapped. According to the Moreland Energy Foundation:

> Community solar programs act to fill the current gap between small scale household solar installations, and large scale commercial installations. This will allow community investment to drive the roll out of renewable energy and utilise opportunities (and roof areas) that might otherwise have been missed.[111]

In addition, community energy projects can help to influence renewable energy policy by creating citizens and stakeholders who actively advocate for government action on climate change.[112]

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106 Australian Wind Alliance, *Submission 89*, 2.

107 Business Council of Co-operatives and Mutuals, *Submission 74*, 15.

108 Department of Energy & Climate Change, *Community energy strategy: full report* (2014), 15.

109 Energy Innovation Co-operative, *Submission 52, Attachment 6*, iii.

110 Coalition for Community Energy, *Submission 92*, 7.

111 Moreland Energy Foundation Limited, *Submission 51*, 2.

112 Jarra Hicks and Nicky Ison, 'Community-owned renewable energy (CRE)', 253.

2.4 Technological benefits

Further deployment of renewable energy through community energy projects also has technological benefits for the community and the renewable energy industry. Communities can benefit from the added security that local electricity generation provides and the industry benefits from the demonstration of successful renewable energy projects.

2.4.1 Improved energy security

Developing new points of electricity generation throughout Victoria could improve energy security because multiple electricity inputs in the system reduce the risks when a major transmission line is compromised.[113] In its submission, Deakin University noted that increasing energy generation capacity through community energy 'will be an important strategy for maintaining sufficient supply to cater for the growing energy demands associated with the significant population growth occurring and predicted for Victoria.'[114]

Regional areas in particular often face electricity supply issues, especially if they have only single-phase rather than three-phase power or are situated towards the end of the grid.[115] One of the benefits of the community wind farm built in the town of Denmark, Western Australia is the improvement in the quality and reliability of the local electricity grid. Prior to the wind farm development, Denmark received its electricity from power stations more than 400 kilometres away and, being at the end the transmission line, it often experienced unreliable supply and occasional extended blackouts. The community wind farm now supports the grid and improves its reliability.[116]

Another issue experienced in regional tourist areas is the increase in demand during high season. Community energy projects in the region could alleviate this problem as described by the Mornington Peninsula Shire in its submission:

> The economic, population and particularly tourism-related growth has led to significant increases in the demand for energy, particularly the demand for electricity on very hot days in summer when the number of people on the Mornington Peninsula grows exponentially and they turn on air-conditioners. This leads to electricity supply brown-outs (supply failures) particularly in the southern peninsula area between Rosebud and Portsea. It is anticipated that a $30 million investment in additional very high voltage power distribution infrastructure may be required by approximately 2020 to minimise or prevent brown-outs if this peak demand for electricity on the southern peninsula is not managed in the short term. An integrated approach is required to manage peak-use electricity demand whilst simultaneously generating renewable energy, which could include community power generation and distribution.[117]

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113 Mr Gavin Ashley, Principal, Sustainable Energy and Urban Development, Moreland Energy Foundation Limited, *Transcript of evidence,* Melbourne, 24 October 2016, 4.

114 Deakin University, *Submission 34*, 3.

115 Glenelg Shire Council, *Submission 39*, 1.

116 Jarra Hicks and Nicky Ison, 'Community-owned renewable energy (CRE)', 250.

117 Mornington Peninsula Shire, *Submission 38*, 1.

The integration of community energy projects into the grid can also create less of a problem for electricity networks due to their typical smaller scale.[118] In addition to providing grid security, community energy projects are a more predictable proposition for the electricity network than household solar installations. Mr David Meiklejohn, Executive Officer of the Northern Alliance for Greenhouse Action, explained:

> community energy projects, a little in the same way as large-scale renewable energy projects, are probably a slightly easier proposition for distributors to know about. They know that, for example, a community energy project will take a few years to get up off the ground, they know what the scale of it is going to be, and they can plan better for that to be integrated into the grid to make sure it does not cause any disruption or any fluctuations. By contrast, Australia has by far the highest proportion of individual household rooftop solar in the world … That causes much more disruption for energy distributors at the moment, because they simply do not know or cannot anticipate where that growth is going to take place. They do not know if suddenly one week a new suburb is going to put on 3000, 2-megawatt solar systems and therefore what that is going to do for the local grid, in the same way that a planned community energy project over a number of years gives them a greater ability to be able to plan for the future success of the network.[119]

Ms Taryn Lane from Hepburn Wind also noted that network distributors value how mid-scale generators can strengthen the grid and they compensate the wind farm in return. She stated:

> The network distributors at the moment are definitely looking at ways in which these mid-scale generators can help strengthen the existing grid and maybe save them some money in regard to augmentation and future enhancement of the grid network. Certainly for Hepburn Wind we spent $1.6 million reinforcing our local grid. We were the first mid-scale generator to plug into the network in Australia in that way, and we spent a lot of money enhancing the local grid, which has made it more resilient in our local area. We also receive a sort of annual payment that is called TUOS [Transmission Use of System]. It is essentially for us being a generator within the network, so we get an annual payment for savings on that transmission use.[120]

The University of Melbourne added that the greater distribution and diversification of energy generation through community energy projects can reduce the vulnerability of the grid during extreme weather events, such as storms and bushfires.[121]

2.4.2 Demonstration of renewable energy projects

The development of successful community energy projects can be used to demonstrate how renewable energy projects can be incorporated into the grid. The National Community Energy Strategy, developed by the Coalition for Community Energy for the Australian Renewable Energy Agency, notes

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118 Gordon Walker, 'What are the barriers and incentives for community-owned means of energy production and use?' (2008) 36(12) *Energy Policy*, 4401–4405, 4402.

119 Mr David Meiklejohn, Executive Officer, Northern Alliance for Greenhouse Action, *Transcript of evidence,* Melbourne, 24 October 2016, 6.

120 Ms Taryn Lane, *Transcript of evidence*, 7.

121 The University of Melbourne, *Submission 70*, 4.

that community energy projects demonstrate to community members and the broader public 'that clean energy technologies work and that a clean, low carbon energy future is possible.'[122] As a result, renewable energy capacity could increase throughout Australia, especially when community energy groups can scale and replicate community energy projects and models that have proven successful elsewhere.[123] The renewable energy industry and its associated technology and service supply chains will also benefit from having a steady pipeline of projects.[124]

2.5 Issues of concern regarding the growth of community energy

While community energy projects offer benefits to local communities, the renewable energy industry and the environment, the growth of community energy may affect the security and affordability of electricity supply, especially as the energy market deals with the transition to cleaner energy sources. The integration of renewable energy projects into Victoria's energy system needs to be carefully managed to ensure that consumers are protected. However, in most cases these protections need to be applied at the national level rather than at the state level. These issues are discussed in further detail below.

2.5.1 Energy security

The majority of community energy projects involve renewable energy, and the intermittent nature of renewable energy generation can potentially compromise the safety and reliability of electricity supply and increase supply costs.[125] The World Energy Council refers to the challenges created by the transition to renewable energy as the energy trilemma.[126] The energy trilemma has three dimensions: energy security, energy affordability and energy sustainability, and it reflects the difficulty of finding energy sources that are secure, affordable and at the same time, environmentally friendly.

One of the challenges in Australia is that the electricity grid was built to be unidirectional, where electricity is produced at a central location and distributed to consumers. Renewable energy generation that is distributed across the network requires the grid to be bidirectional where generators throughout the grid can draw electricity and export the excess energy they generate. This reverse flow can make the energy system more difficult to operate. At the same time, the

122 Institute for Sustainable Futures, et al., *National community energy strategy*, 2.

123 Australian Wind Alliance, *Submission 89*, 2.

124 Department of Economic Development, Jobs, Transport and Resources, *Victoria's renewable energy roadmap: delivering jobs and a clean energy future* (2015), 7.

125 Alan Finkel, et al., *Independent review into the future security of the National Electricity Market: preliminary report* (2016), 14; Binod Prasad Koirala, et al., 'Energetic communities for community energy: a review of key issues and trends shaping integrated community energy systems' (2016) 56(C16) *Renewable and Sustainable Energy Reviews*, 722–744, 726.

126 World Energy Council, *World energy trilemma* (2017), <www.worldenergy.org/work-programme/strategic-insight/assessment-of-energy-climate-change-policy> viewed 13 April 2017.

future electricity demand of consumers becomes less certain as the number of households, organisations and businesses that can generate their own energy from rooftop solar panels increases.[127]

Witnesses at the public hearings for the Inquiry stressed the need for regulatory change and a transition plan to protect supply as the electricity market transitions to cleaner energy. For example, Mr Adrian Merrick of Energy Locals stated:

> What is the greatest risk to energy security if we were to proceed apace with distributed generation? The greatest risk is that asset owners start switching them off at an increasingly fast rate. We have seen a couple in South Australia, we have seen one in Victoria recently and there are probably others that are being debated in various boardrooms around the country. So some sort of regulatory change to provide an incentive to keep capacity available when it is needed would be sensible.[128]

He recommended that a type of capacity payment to give generators the impetus to stay online should be considered.[129] Emeritus Professor Warren Yates, Board Member of ClearSky Solar Investments, recommended a transition plan which:

> would involve strategically located storage, either battery or pumped hydro, and, as you're rolling out your distributed generation, you'd also be rolling out your distributed storage. You also need to look at the connections on the grid, on the entire national grid, so that, when things aren't working in Victoria, you can import power from places where it is.[130]

In recognition of the challenges posed by the integration of new energy technologies in the energy market, the Council of Australian Governments (COAG) Energy Council appointed an expert panel chaired by Dr Alan Finkel to review the future security of the National Electricity Market and develop a reform blueprint to maintain energy security and reliability during the electricity market's transition.

A preliminary report of the Finkel review in 2016 found that the efficient uptake and integration of renewable energy and energy storage technologies 'could significantly reduce the incidence and level of peak demand, improve reliability and reduce expenditure on network augmentation', but if 'not well managed, they could have a detrimental impact on security.'[131] The final report recommended that all electricity generators be required to meet strict technical standards in order to increase energy security.[132]

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127 Alan Finkel, et al., *Independent review into the future security of the National Electricity Market: preliminary report*, 14.

128 Mr Adrian Merrick, Founder and Chief Executive Officer, Energy Locals, *Transcript of evidence,* Melbourne, 7 November 2016, 6.

129 ibid.

130 Emeritus Professor Warren Yates, *Transcript of evidence*, 6.

131 Alan Finkel, et al., *Independent review into the future security of the National Electricity Market: preliminary report*, 14.

132 Alan Finkel, et al., *Independent review into the future security of the National Electricity Market: blueprint for the future* (2017), 49.

The Finkel review also recommended that new generators be required to ensure there is adequate dispatchable capacity in regions where reliability may be at risk.[133] Dispatchable capacity refers to energy that can be dispatched quickly when required and common sources are natural gas, hydroelectricity and large-scale batteries. While this requirement addresses the impact of intermittent solar and wind resources on system reliability, it may increase the cost of developing new projects and compromise investment in renewable energy.[134]

In relation to the increase in distributed renewable energy generation, the Finkel review recommended that the COAG Energy Council direct the Australian Energy Market Commission to review the regulatory framework for system security and propose draft rule changes that will incentivise distributed energy generators to provide frequency and voltage control services.[135]

2.5.2 Energy affordability

As the uptake of renewable energy, energy storage and energy efficiency measures increases, electricity consumption and demand will decrease. There is also a chance that individuals or communities may choose to disconnect from the grid. These outcomes could improve energy reliability for businesses and households and lessen the need for network maintenance, but there is a risk that the extra cost of ensuring the security of a highly distributed energy system may fall on low-income or vulnerable consumers who are still connected to the grid but are least able to afford it. An added disadvantage for vulnerable consumers is that they are less able to modify their energy use or install renewable energy because they lack funds or are renting their premises.[136]

As Ms Nicky Ison, Secretariat Coordinator of the Coalition for Community Energy, pointed out:

> if you do the demographic analysis and split the population into income quintiles, the second-lowest income quintile is the section of the population that has the highest uptake in solar. The lowest uptake is in that lowest income quintile, so there are very definitely real barriers that low-income and vulnerable households face when trying to access the benefits of renewable energy.[137]

Professor Yates added:

> you're going to get terrible distortions if you don't reform the grid and don't reform the pricing of the grid, because what's going to happen is the rich people are going to put solar panels on their roofs, they're going to put batteries in their houses, and the rest of the community will be left to pay for the grid. And so we need reform. We

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133 ibid, 75.

134 Matt Chambers, 'Finkel report could lift solar, wind costs', *The Australian,* 12 June 2017, <www.theaustralian.com.au/business/mining-energy/finkel-report-could-lift-solar-wind-costs/news-story/5ee318515ca72de5c060e84ea9839eac> viewed 19 June 2017.

135 Alan Finkel, et al., *Independent review into the future security of the National Electricity Market: blueprint for the future*, 63.

136 Alan Finkel, et al., *Independent review into the future security of the National Electricity Market: preliminary report*, 18.

137 Ms Nicky Ison, Secretariat Coordinator, Coalition for Community Energy, *Transcript of evidence,* Melbourne, 24 October 2016, 3.

> desperately need reform to the Australian energy market operators and we need to do it so that it's possible to transfer power from solar panels to other users in a more efficient way.[138]

When the Committee asked how to avoid low-income households subsidising network charges for higher-income households that can afford to install solar panels, Mr Adrian Merrick of Energy Locals responded:

> We have absolutely got to avoid disadvantaged consumers in particular losing out in this, but I would also argue that some of those consumers now have access to a different market. Some of those consumers today, I would argue that a reasonable proportion of them are not on the best deal that they could be on in the market. As they have access to other local sources of energy that they could choose to buy from and an aggregator of that local power that says, 'Well we are grouping together the various kilowatt hours that are being exported from roofs in the local area, and we will offer it to you cheaper than your retailer is offering it to you', I would argue that gives that consumer more choice.[139]

He agreed with Professor Yates that network tariff reform through local generation credits and local network credits could avoid this subsidisation, 'open up the market and give consumers access to greater choice than they have today.'[140] He also said he:

> would like to see that networks increasingly support the ability of consumers to connect new local generation to the grid, potentially opening up the ability for micro grids to operate in the future, which could solve some of the future network constraints that are on the horizon if nothing else changes. And clearly we should encourage the [Australian Energy Regulator] to maintain a strict control over the ongoing review process they have for network tariffs and … how those network tariffs are best structured to make sure that we do not see too violent a swing in one direction or another, which could leave some consumers in a worse-off position.[141]

Mr Tosh Szatow, Director and Co-founder of Energy for the People, a social enterprise that develops and delivers clean energy projects, pointed out that community energy projects in regional areas could also produce savings for industrial and city consumers. With the current grid, these consumers cross-subsidise the infrastructure costs to transmit electricity to regional communities at the end of long distribution lines. He reasoned:

> if those sorts of communities become more sufficient and even leave the grid as communities or as individuals, that should actually reduce the cost of supply to cities and to industrial customers, because the network companies are not having to cross-subsidise those long lines out to the regions. I think in an ideal world if that transition of the network is well managed, you will see savings to industrial and city customers.[142]

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138 Emeritus Professor Warren Yates, *Transcript of evidence*, 4.

139 Mr Adrian Merrick, *Transcript of evidence*, 4.

140 ibid.

141 ibid, 6.

142 Mr Tosh Szatow, Director and Co-founder, Energy for the People, *Transcript of evidence,* Melbourne, 24 October 2016, 5.

In relation to energy affordability, the final report of the Finkel review suggested that consumers be rewarded for better managing their electricity demand, and generating and storing their own energy through household solar and batteries. Consumers could also reduce their electricity bills by improving their household's energy efficiency.[143]

FINDING 1: The National Energy Market's transition to cleaner energy may have an impact on energy security and affordability due to the intermittent nature of renewable energy generation and the uncertainty of future electricity demand.

RECOMMENDATION 1: The Victorian Government support the recommendations of the Finkel review that aim to enhance system security and reduce consumers' electricity bills, while being mindful of the cost impact on renewable energy development.

2.5.3 Protecting consumers and investors

Any renewable energy generator including a community energy project that is connected to the electricity grid needs to be registered. In Victoria, the Essential Services Commission provides retail licences and exemptions for entities that sell electricity in the National Electricity Market, whereas the Australian Energy Regulator provides these licences for the rest of the market. The Australian Energy Council, which represents electricity and downstream natural gas wholesalers and retailers, highlighted that community energy projects that create their own micro grid and disconnect from the grid, do not fall under the National Electricity Rules or regulations and consumers are not protected by the associated customer protection framework.[144]

AusNet Services, which owns and operates Victoria's electricity transmission network and the electricity distribution network for north-east Melbourne and eastern Victoria, also indicated that it was unclear who would hold public liability in the case of a micro grid. AusNet is trialling a micro grid in the suburb of Mooroolbark that consists of 14 homes with residential solar PV and batteries that can generate, store and share electricity with one another via local powerlines. As part of the trial, AusNet is undertaking research with Deakin University into consumers' sharing behaviour and the type of governance framework that would be required for a micro grid to operate successfully.[145]

However, micro grids make up a small proportion of community energy projects that this Inquiry is considering. The majority of Victorian community energy projects involve the installation of solar panels or wind turbines, and the community energy groups running them do not consider or want disconnection from the grid. Even so, poorly managed community energy projects may pose a risk for consumers and investors. WINconnect, an embedded network management business and electricity retailer, noted that community energy

143 Alan Finkel, et al., *Independent review into the future security of the National Electricity Market: blueprint for the future*, 6.

144 Australian Energy Council, *Submission 80*, 2.

145 Mr Mark Judd, Energy Solutions Innovation Manager, AusNet Services, *Transcript of evidence,* Melbourne, 24 October 2016, 9–10.

projects should offer consumers the same protections as commercial generators do, such as hardship policies, payment plans, disconnection procedures, payment options and dispute resolution mechanisms.[146]

WINconnect also cautioned that community energy projects run by volunteers may not have a consistent leadership team, which could create financial risks:

> These schemes will be established by virtue of the goodwill and common aspirations of the participants within them. It should not be assumed that the good intentions of all at the beginning of the set up will last forever. Significant financial transactions in energy trading are going to occur within this community and therefore it is essential that a strong and robust regulatory framework governance be established to limit and curtail any unscrupulous behaviour.[147]

Geelong Sustainability, a not-for-profit community group that advocates for the environment, also noted that community energy projects can be limited by the skills and availability of volunteers. As the project moves further along development and tasks become more time-consuming and complex for volunteers, project viability may be challenged. It suggested that at this point, 'the volunteer task group needs to become an advisory group and the project requires paid staff or contractors to take the project forward.'[148] The limitations of volunteer capacity was a strong theme in the evidence the Committee received from community energy groups. Chapter 4 discusses this limitation further.

The Essential Services Commission has protections in place for consumers and investors of community energy projects. For larger renewable energy generation projects, the Commission applies three tests to any potential licensee. First, a licensee must demonstrate financial capacity to manage the service, including managing the risk from the intermittency of energy generation. Second, the licensee must demonstrate the technical capacity to operate the service based on the skills profile of the board and management team, and third, the licensee must pass a fit and proper person test to deliver the service.[149] A General Exemption Order exists that specifies categories of exemptions where entities are not required to hold a licence.

Smaller community energy projects may be eligible for exemption from holding a licence if the electricity is provided as a community service or to a defined group of customers at one site.[150] In its 2016 position paper on the General Exemption Order, the Victorian Government recognised the growth of community energy projects and proposed to refer to the Essential Services Commission the task of specifying the core consumer protections required of all exempt licensees and additional protections required of particular classes of licensees.[151]

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146 WINconnect, *Submission 26*, 3.

147 ibid, 2–3.

148 Geelong Sustainability, *Submission 60*, 4.

149 Dr Ron Ben-David, Chairperson, Essential Services Commission, *Transcript of evidence,* Melbourne, 20 March 2017, 4.

150 Department of Environment, Land, Water and Planning, *General exemption order: draft position paper* (2016), 5.

151 ibid, 15.

The Victorian Renewable Energy Advocate, Mr Simon Corbell, also cited ways to mitigate the risks to consumers and investors by increasing the capacity of community energy groups to make effective decisions. For example, he suggested that the Victorian Government could provide community energy groups with financial or technical expertise either directly or through a financial grant that allows for the procurement of expertise. Alternatively, he suggested that community energy projects could be developed as part of a larger commercial project to ameliorate the risks.[152]

To ensure the protection of consumers and investors, the Victorian Government must be mindful of the risks posed by community energy projects that are managed poorly or operated inefficiently.

FINDING 2: Consumers may be at risk if community energy projects are not required to offer the same customer protections or be subject to the same financial reporting requirements as commercial generators.

152 Mr Simon Corbell, Victorian Renewable Energy Advocate, *Transcript of evidence,* Melbourne, 20 March 2017, 4–5.

3 Models of community ownership and participation

There are various models for community ownership or participation in the energy sector. These can range from projects with full community ownership to projects funded from donations with no direct community ownership. This chapter explores the range of business models that community energy groups can adopt when participating in the energy sector. Case studies of each model are presented throughout the chapter.

3.1 Community investment projects

Community investment projects usually involve community investors funding a renewable energy project with the expectation of a return on their investment. Usually a community organisation initiates and leads the project operating as a cooperative or company. The organisation may return part of the profits to the wider community through a community fund. In some cases, the companies are social enterprises where the business has a social objective and all profits are invested to achieve that objective.

Cooperatives and social enterprise companies are publically accountable in a similar way to corporations and commercial companies, but they have added accountability to the community they represent. According to the Victorian Community Solar Alliance, a network of 14 organisations that develop community solar projects, cooperatives and social enterprises are:

> subject to regulatory oversight, financial auditing, management rules and standards ... There is also community oversight and direct accountability to the local community, which can be even more powerful.[153]

The tax implications, costs of operating and fundraising capabilities of cooperatives and companies differ and community energy groups will consider these aspects when determining a business structure. Community energy groups may also choose their structure based on how they want to be perceived. For example, 'choosing a co-operative sends a message that [the] enterprise is about more than just making money, while a company structure may be more familiar and therefore reassuring to larger individual and institutional investors.'[154]

The cooperative and social enterprise models are discussed further under the headings below.

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153 Victorian Community Solar Alliance, *Submission 49*, 2.

154 Jarra Hicks, et al., *Community-owned renewable energy: a how to guide,* report for Community Power Agency (2014), 33.

3.1.1 Cooperatives

Cooperatives are the most common model for community renewable energy projects internationally, and several community energy projects in Victoria and Australia are run by cooperatives.[155] Cooperatives are businesses or organisations that are owned and operated by members who share the profits. Membership is voluntary and cooperative members contribute equity capital and have equal voting rights regardless of the amount they invested. Cooperatives are managed by an elected board. They can have an unlimited number of members (and therefore investors), and they can distribute profits before tax.[156]

Bendigo Sustainability Group believes that the unlimited membership and equal representation offered by cooperatives are the model's strengths 'as it encourages small scale, local investors to make a small financial commitment and also have a say in the operations of the Co-op.'[157] The Business Council of Co-operatives and Mutuals, the national peak body representing these enterprises, also cited research by Ernst & Young that found for every dollar spent at a cooperative, an additional 76 cents of value is created for the local economy.[158] A community energy project run by a cooperative has the added protection of keeping control of the project with the community.[159] The Co-operatives National Law, applied in Victoria by the *Co-operatives National Law Application Act 2013*, mandates that shares in cooperatives can only be traded with another active member with consent of the board.

Renewable energy cooperatives are common in Europe, where 2397 cooperatives have installed renewable energy projects. REScoop.eu is the European federation for community energy groups and cooperatives and it has more than 1200 renewable energy cooperatives in its network. Its members have collectively invested €2 billion (AUD $3 billion) in renewable energy installations, which have a combined production capacity of 1 gigawatt.[160]

An example of a community energy cooperative operating in Victoria is Hepburn Wind, which operates the community wind farm in Daylesford. Another is Energy Innovation Co-operative, a community energy group based in the Bass Coast and South Gippsland region that facilitates solar photovoltaic (PV) installation, energy efficiency measures and is working on a project to install a solar PV system at the State Coal Mine in Wonthaggi. Case studies 3.1 and 3.2 explore community energy projects run by cooperatives elsewhere in Australia and overseas.

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155 REN21, *Renewables 2016 global status report* (2016), 137.

156 Frontier Impact Group, *Behind the meter solar PV: funding guidebook* (2017), 49.

157 Bendigo Sustainability Group, *Submission 76*, 7.

158 Business Council of Co-operatives and Mutuals, *Submission 74*, 9.

159 ibid, 8.

160 REScoop.eu, *Facts & figures* (2017), <rescoop.eu/facts-figures-0> viewed 4 May 2017.

CASE STUDY 3.1: Pingala (Sydney, New South Wales)

Pingala is an incorporated association in Sydney that helps communities to choose, build and operate a solar farm on the roof of a host site such as a hotel or school. Pingala has installed 29.9 kilowatts (kW) of solar panels on the roof of Young Henry's Brewery in Sydney and is working with three Aboriginal communities in remote New South Wales on an energy efficiency program and community solar investigation.

Pingala's investment vehicle is Pingala Co-operative, which is supported by Pingala Association. The Association also operates the finances and functions of the Co-operative. The Co-operative raises the capital for Pingala's projects and organises payments to members/investors. As explained by Mr Tom Nockolds, Secretary of Pingala:

> that same cooperative will handle all of our future projects and we can have an unlimited number of investors on each project and an unlimited number of investors across all the projects. So within that cooperative we have in the disclosure statement that we have submitted with the regulator in New South Wales, the Department of Fair Trading, a target range of return of between 5% to 8%, so that's what we're aiming to give our investors.[161]

At its launch, Pingala Co-operative issued 17 500 shares at $1 per share that could be purchased in bundles of 250, up to 1000. All the shares sold within nine minutes.[162] The Co-operative aims to reinvest the capital raised from its projects into similar solar projects on the roofs of businesses and other organisations across Sydney as well for communities in need.

CASE STUDY 3.2: Brixton Energy (London, United Kingdom)

Brixton Energy is a cooperative in South London that has coordinated three community energy projects. Each project has installed solar PV arrays on the roof of a housing estate in Brixton (located in the borough of Lambeth, South London). The first project started generating energy in March 2012 and was the first inner-city community-owned solar power station in Britain.

The installation of each project was funded through the sale of shares in the cooperative. For example, 103 investors purchased shares valued from £250 (AUD $430) to fund the first project. Almost half of these investors were Brixton locals and they raised £60 000 (AUD $105 000) in three weeks.

The Brixton Energy cooperative is structured so that a portion of the projects' revenue is allocated to the Community Energy Efficiency Fund (CEEF). The CEEF has funded home energy surveys and audits for the residents of the housing estates and installed energy-saving light bulbs and power-down plugs. It has also run energy advice sessions and community workshops, as well as financed renewable energy work experience and internship placements for young residents of the estates.[163]

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161 Mr Tom Nockolds, Secretary, Pingala, *Transcript of evidence*, Sydney, 15 February 2017, 4.

162 ibid, 3.

163 Brixton Energy, *Community Energy Efficiency Fund*, <brixtonenergy.co.uk/projects/ceef> viewed 28 April 2017.

3.1.2 Social enterprises

Social enterprises are revenue-generating businesses that have a specific social purpose, which they achieve by reinvesting their profits in the business or local community. While social enterprises can take a range of business structures, many in the community energy sector are companies that provide economic, social and environmental benefits to local communities. The aim of social enterprises is to be commercially self-sustaining while also supporting the community. Mr Tosh Szatow, Director and Co-founder of Energy for the People, prefers a social enterprise model for community energy projects. He stated:

> you need to strike a balance between the kind of efficiency and discipline that comes with being commercial but the kind of community and social sensibility that comes with being a community organisation … a social enterprise that strikes the right balance between those two things.[164]

Energy for the People is a social enterprise that develops and delivers clean energy projects. Since it was established in 2012, Energy for the People has worked on over $15 million of energy retrofit projects, crowdfunded $250 000 of solar community projects and is assisting the towns of Newstead and Tyalgum with their transition to 100% renewable energy.[165] As a certified social enterprise, it has capped the wages of its staff on a pro rata basis and invests as much of its profits as possible to support its core mission of addressing the causes and symptoms of youth homelessness. It argued that due to the rigour around certification, certified social enterprises are able to 'build trust with communities, financiers and corporations, and are thus able to facilitate a wide range of financing options.'[166]

The business structure adopted by social enterprises involved in the community energy sector includes companies and trusts. Table 3.1 lists the business structures and features of companies and trusts used for community energy projects in Australia.

Several community energy projects in Australia have a company business structure. For example, Repower Shoalhaven uses a private company structure to attract investors to develop community solar energy projects in southeast New South Wales. It has completed three projects and financed a fourth. The first project installed a 99 kW system on the Shoalhaven Heads Bowling and Recreation Club for $119 800. The system has been operating since August 2014 and was Australia's first community investor-owned solar power system.[167]

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164 Mr Tosh Szatow, Director and Co-founder, Energy for the People, *Transcript of evidence,* Melbourne, 24 October 2016, 3.

165 Energy for the People, *Submission 4*, 1.

166 ibid, 3.

167 Repower Shoalhaven, *Projects* (2016), <www.repower.net.au/projects.html> viewed 31 January 2017.

Table 3.1 Examples of company and trust business structures used in the Australian community energy sector

Business structure	Features	Examples
Private company limited by shares	• not allowed to publically seek investors (therefore cannot issue a public share offer document); can only raise equity from existing shareholders, employees or certain classes of investors • cannot have more than 50 shareholders • shareholder liability limited to the value of their shares • relatively easy to set up	Repower Shoalhaven (NSW)
Public company limited by shares	• unlimited number of shareholders • shareholders can be sought publically • shareholder liability limited to the value of their shares • requires offer information statement (if raising funds up to $10 million) or prospectus (over $10 million) • compliance and establishment costs are expensive • structure commonly used for community renewable energy projects	Denmark Community Windfarm (WA); Sydney Renewable Power Company (NSW)
Public company limited by guarantee	• no share capital; each shareholder is liable for the amount they agree to contribute if the company is wound up • low cost to establish and operate; often used by not-for-profits	Moreland Energy Foundation (Vic)
Unit or discretionary trust	• 20/12 investment rule applies, that is a maximum of 20 investors over a 12-month period; total investment cannot surpass $2 million • established to own and operate a community renewable energy project and distribute profits to beneficiaries	ClearSky Solar Investments (NSW)

Sources: Jarra Hicks, et al., *Community-owned renewable energy*, 30–33; Frontier Impact Group, *Behind the meter solar PV*, 49–50.

Other prominent community energy projects in Australia have been structured as public companies limited by shares. For example, Denmark Community Windfarm in Western Australia operates as a company. Its 1.8 million shares were taken up in under a month.[168] The two-turbine wind farm began generating energy in February 2013 and 90% of investors are locals.[169] Another example is Sydney Renewable Power Company, which financed the installation of a 520 kW solar PV system on the roof of the redeveloped International Convention Centre in Darling Harbour by offering community and retail investors 519 unlisted shares at $2750 each.[170]

Case studies 3.3 and 3.4 present examples of social enterprises that operate in the Australian community energy sector.

168 Denmark Community Windfarm Ltd, *History*, <www.dcw.org.au/history.html> viewed 31 January 2017.

169 Kayla Inglis, Emily Mitchell and Robert Passey, 'Recommendations for implementing virtual net metering into community-owned renewable energy projects in Australia' (Paper presented at Asia-Pacific Solar Research Conference, Brisbane, 8–10 December 2015), 2.

170 Sydney Renewable Power Company, *Sydney Renewable share offer*, <www.sydneyrenewable.com/share-offer> viewed 1 May 2017.

CASE STUDY 3.3: ClearSky Solar Investments (Sydney, New South Wales)

ClearSky Solar Investments is a not-for-profit social enterprise established in 2013 that links community and individual investors with solar projects in need of financing. The power generated by the projects is sold to the end user and the revenue raised is used to pay back investors with a return of between 7% and 9%. By February 2016, ClearSky had raised almost $2 million and financed the installation of 1.1 megawatts (MW) of solar power on 14 sites throughout Australia, mostly in New South Wales.[171]

ClearSky's business structure is based on a unit trust. It chose this structure to avoid the cost of obtaining a financial services licence or producing a prospectus. Capital is raised by inviting members of the ClearSky community (who have registered on its website) to express an interest in a project. To comply with the 20/12 investment rule, the minimum investment amount is set so that fewer than 20 investors are needed to finance the project. Units are allocated to investors following written applications and unit holders then receive quarterly payments, which include capital repayment and interest components, from the revenue raised by the sale of electricity to the end user. In its first three years of operation, ClearSky distributed over $200 000 to investors.[172]

CASE STUDY 3.4: Enova Energy (Byron Bay, New South Wales)

Enova Energy, Australia's first community-owned renewable energy retailer, began selling electricity to customers in New South Wales in June 2016. It is a social enterprise and its business structure consists of a trading arm, Enova Energy Pty Ltd, and a not-for-profit arm, Enova Community Ltd, which is a registered charitable organisation. When the trading arm is profitable, 50% of profits will be invested in Enova Community to fund social benefit projects that improve access to renewable energy for all people.[173]

In addition to retail sales, Enova Energy purchases excess energy from community renewable energy projects that larger energy retailers are not interested in buying, and it aims to help communities develop their own renewable energy projects. It hopes to act as a model that can be replicated by other communities.[174]

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171 Emeritus Professor Warren Yates, Board Member, ClearSky Solar Investments, *Briefing notes on ClearSky Solar Investments*, supplementary evidence received 15 February 2017, 1.

172 ibid, 4–5.

173 Enova Energy, *Enova community* (2016), <enovaenergy.com.au/not-for-profit> viewed 1 May 2017.

174 Clarence Valley Conservation Coalition, *Submission 77*, 2.

3.2 Partnerships

Another option for community energy groups is to partner with either a renewable energy developer or local government to realise their project. Some community energy projects, especially larger ones, benefit from the expertise and reputation that a corporate or government partner can bring to the project. For example, investors and lenders are usually more willing to finance a project that has corporate or government backing and communities gain easier access to legal and technical expertise needed for project development and operation. This section discusses partnerships between communities and developers or local government and gives examples of each.

At this point, a distinction should be made between community ownership or participation in a renewable energy project and community benefit from a project. Some renewable energy developers provide benefits to the community such as compensation payments, savings on energy bills or employment (as discussed in Chapter 2), but community members are not actively involved in the project. On the other hand, community ownership or participation in a renewable energy project requires community members to make decisions about the project and take responsibility for aspects of the project.[175] A renewable energy project that does not require some degree of active involvement from the community should not be considered a community energy project.

3.2.1 Community–developer partnerships

In community–developer partnerships, either the community or the developer initiates the project and both parties agree to develop and operate the energy project together.[176] The community usually undertakes community consultation and engagement activities and the developer conducts the technical feasibility studies and organises the finance. These partnerships are often used for large renewable energy projects such as solar farms and wind farms, and the community owns part of the project and earns revenue from its share. The commercial developer benefits by gaining community support and a social licence to operate.[177]

WestWind Energy, a renewable energy developer working on several Victorian wind farms, notes that community energy groups may struggle to develop large renewable energy projects because they lack the specialist knowledge and capital to move projects beyond the concept stage.[178] It argues that community wind energy projects have a better chance of success when community groups partner with a developer who would manage the technical aspects of planning and raise most of the equity and debt to develop, finance and build the project.[179]

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175 Josh Roberts, Frances Bodman and Robert Rybski, *Community power: model legal frameworks for citizen-owned renewable energy* (2014), 29.

176 Department of Economic Development, Jobs, Transport and Resources, *Guide to community-owned renewable energy for Victorians* (2015), 35.

177 Institute for Sustainable Futures, et al., *National community energy strategy* (2015), 18.

178 WestWind Energy, *Submission 61*, 2.

179 Mr Tobias Geiger, Managing Director, WestWind Energy, *Transcript of evidence,* Melbourne, 21 November 2016, 7; WestWind Energy, *Submission 61*, 5.

Conversely, the developer benefits from partnership by securing community support, which can expedite the planning approval process.[180] The community would contribute by raising some of the required equity, engaging with the local community, identifying a site, liaising with the landholder, obtaining government grants and securing agreements with the landholder.

In the case of community–developer partnerships, a special purpose vehicle is usually established to manage the project's share allocation and commercial aspects as well as interact with financiers, government authorities, landholders and other stakeholders.[181] Mr Tobias Geiger, Managing Director of WestWind Energy, informed the Committee that the company is partnering with community energy groups in Geelong and the Macedon Ranges to develop wind energy projects, and by doing so it will aid the project's profitability. He stated:

> By doing it with a commercial developer in the background, we are making sure that there is going to be a return on investment, because otherwise we would not get involved either, because I could not say that out of the goodness of my heart I would spend $2 million of my shareholders' money and they would not see anything for it—I do not think I would be in this job for much longer. But we see that there is a return on investment potential there, and that is for the community to take.[182]

Mr Geiger added that community–developer partnerships enable community members who want to invest in renewable energy to do so using a reliable vehicle:

> A lot of people actually believe renewable energy is the right thing to do. They actually want to invest in it as well, rather than in a super fund structure where they do not know where their money is going … What we find with [this] model is, because the developer effectively takes on the cost and the risk of developing, many people in the community would like to make an investment, even like to make an impact investment, by saying, 'I'll put my money here because I think that is the right thing to do'. They typically do not have the time or the capability to do that, so I think coming to a partnership arrangement in some way with a developer who knows how to do that is quite beneficial for those investors as well.[183]

Wind energy projects are particularly difficult and risky to develop. A suitable site that has good wind resources and grid connection capability needs to be identified, the site's feasibility evaluated and the required permits, agreements, contracts and financing obtained. The project may fall through at any of these stages. According to Windlab, an international wind energy developer headquartered in Canberra, there is 'anecdotal evidence that as few as one in ten development sites result in constructed wind farms.'[184] For this reason, Windlab's Chief Executive Officer, Mr Roger Price, recommended that communities partner with developers to realise a wind energy project:

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180 Clean Energy Council, *Submission 5, Attachment 1*, 4.

181 WestWind Energy, *Submission 61*, 5.

182 Mr Tobias Geiger, *Transcript of evidence*, 8.

183 ibid, 4.

184 Windlab, *Submission 28*, 1.

> Developing a successful wind farm from a greenfield environment is an expensive process. It takes a long time. There is significant financial and operational risk, and to manage all of those things you need a high degree of expertise. So in our experience I think it is very, very difficult for a community to develop a wind energy facility on its own, and really we believe that the best mechanism is one that involves some sort of partnering between the community and the ultimate developer of the wind farm, which has been our experience. We are pleased to say that it has worked very successfully.[185]

Case study 3.5 presents Coonooer Bridge Wind Farm, a project Windlab developed with part local community ownership.

CASE STUDY 3.5: Coonooer Bridge Wind Farm (Buloke Shire, Victoria)

Coonooer Bridge Wind Farm is located in Buloke Shire, 90 kilometres (km) northwest of Bendigo. It is jointly owned by Windlab Limited, Eurus Energy and neighbouring landholders. The six-turbine wind farm began commercial operations in February 2016 and can generate up to 19.4 MW of energy.

When Windlab first identified the site, it spent time in the community meeting with the landholders, neighbours within 4 km of the project and other local groups. In these meetings, Windlab invited community members to participate in the project's development, provide feedback and be involved with decisions such as how many turbines should be constructed. Every household that lived within 3.5 km of the wind farm was given a small equity share ownership in the project, and they were also given the opportunity to invest in the wind farm (up to a maximum of 10% of the project in order to meet corporate regulations).[186] As explained by Mr Price of Windlab:

> So when the project reached the point of construction and we arranged finance for the project, those 33-odd neighbours ended up with an ownership in the project of about 3.7 per cent. Noting that this is a project that is worth more than $50 million … they will benefit from that ownership stake now over the next 20 to 25 years of operation of the project, making the same return on every percentage owned that Windlab and the other owners of the project make.[187]

Windlab established a special purpose vehicle to manage the wind farm's ownership and ensured that community members were represented on the board of directors. The community appointed an observer to the board of directors so it has access to the same information as other equity owners of the project. 'So as a result of that [community members] know what is happening with the project, they are involved in major decisions and they are treated like any other equity owner of the project,' said Mr Price.[188]

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185 Mr Roger Price, Chief Executive Officer, Windlab, *Transcript of evidence,* Melbourne, 21 November 2016, 2.

186 ibid, 4.

187 ibid, 2.

188 ibid, 3.

3.2.2 Community–local government partnerships

Another example of a partnership that has led to successful community energy projects is that between communities and local government. Partnerships between a community energy group and the local council often involve the community group installing a renewable energy system on council premises or land and the council purchasing the electricity generated.[189] Usually the community energy group approaches the council about the project, funds the project and receives income from the sale of electricity. Local governments may wish to engage in such partnerships to meet their sustainability objectives and support their local communities to participate in renewable energy.[190]

Case studies 3.6 and 3.7 highlight the work of community groups that have partnered with their local council to develop renewable energy projects.

CASE STUDY 3.6: Farming the Sun Lismore and Lismore City Council (New South Wales)

In 2013, Farming the Sun Lismore and Lismore City Council established Lismore Community Solar to develop Australia's first council-operated and community-funded solar farms. The two 100 kW solar farms will include a floating system located at the East Lismore Sewage Treatment Plant and a system on the roof of the Goonellabah Sports and Aquatic Centre. These projects will save the council about $41 000 in energy costs annually and help Lismore City Council achieve its aim to obtain all electricity from renewable sources.[191]

Farming the Sun is a collaboration of community groups, a solar energy company, TAFE New England and Regional Development Australia – Northern Inland NSW. It develops community solar farms in New South Wales and facilitates community bulk-buys of solar power. Farming the Sun raised funds from community members to construct the Lismore Community Solar projects. The funds were raised through a private investment offer where investors were asked to purchase shares priced between $8000 and $9000 with a target investment return of 4% per annum and a seven-year payback period.[192]

The Lismore Community Solar investment structure is based on two community companies, one for each solar farm. Each company has 20 shareholders and each will lend $180 000 to Lismore City Council to construct and operate the solar farms.[193] Construction began in late 2016.

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189 Department of Economic Development, Jobs, Transport and Resources, *Guide to community-owned renewable energy for Victorians*, 35.

190 International Council for Local Environmental Initiatives (ICLEI) USA, *Community shared solar: expansions underway in Solar America Communities* (2014), 13; Franziska Mey, Mark Diesendorf and Iain MacGill, 'Can local government play a greater role for community renewable energy? A case study from Australia' (2016) 21(November 2016) *Energy Research & Social Science*, 33–43, 34.

191 Farming the Sun, *Community Solarfarm loan model* (2016), <farmingthesun.net/lismore/business-model> viewed 20 June 2017.

192 Lismore City Council, *Community solar farm* (2017), <www.lismore.nsw.gov.au/cp_themes/default/page.asp?p=DOC-FQZ-40-34-15> viewed 3 May 2017.

193 Farming the Sun, *Community Solarfarm loan model*.

CASE STUDY 3.7: Bendigo Sustainability Group and City of Greater Bendigo (Victoria)

A Victorian example of a community–local government partnership is Bendigo Sustainability Group's work with the City of Greater Bendigo. Bendigo Sustainability Group (BSG) is a charity that works towards sustaining the future natural environment of the Bendigo region. It has a number of action groups including two that work on community solar projects.

BSG has developed a model for financing the installation of solar PV systems on council-owned buildings in Bendigo and selling the electricity behind the meter for use on site. BSG entered into a 20-year power purchase agreement with the council where the council pays a comparable tariff to purchase electricity from the solar installation as it would when purchasing electricity from the grid.

In 2015, BSG crowdfunded $25 000 to install a 20 kW solar PV system on the Bendigo Public Library. A recent council audit found that several other council buildings are suitable sites for a similar installation as the library. As a result, BSG and the council are planning to install solar PV systems on these buildings. Work has begun on the first of these projects, which will install a 30 kW system on the Bendigo Archive Centre.[194]

3.3 Donation projects

Donation projects raise funds for community energy projects through donations from community members. The projects are generally small and often involve the installation of solar energy on a building occupied by a not-for-profit organisation such as a school, sporting club or fire station. In other cases, the project may involve energy efficiency measures such as the installation of energy-saving light globes. Donations can be made through traditional fundraising methods or a crowdfunding platform. Any money generated or saved from the project goes back to the organisation to use as they wish.[195]

Crowdfunding is a relatively new form of raising funds from many people through a web-based platform. People can pledge support at a range of levels and these pledges only become donations when the fundraising target for the project is reached.[196] Examples of crowdfunding platforms include The People's Solar and Citizens Own Renewable Energy Network Australia (CORENA) who have partnered with community energy groups or not-for-profit organisations to install solar PV systems or implement energy efficiency measures (see case studies 3.8 and 3.9).

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194 Bendigo Sustainability Group, *Submission 76*, 1–3.

195 Department of Economic Development, Jobs, Transport and Resources, *Guide to community-owned renewable energy for Victorians*, 35.

196 ibid, 31.

While generally donations are made purely as a philanthropic gift, in some cases people making donations might receive a reward, which helps drive fundraising.[197] For example, The People's Solar recently crowdfunded over $60 000 to install a solar PV system at the Abbotsford Convent. People who donated were rewarded for their support with artworks, workshops, tickets to events, and other special offers offered by artists, resident makers and small businesses located at the Abbotsford Convent.[198]

CASE STUDY 3.8: The People's Solar (Melbourne, Victoria)

The People's Solar is a crowdfunding platform for solar energy projects that was established in mid-2014 by Energy for the People, a social enterprise that develops and delivers clean energy projects. Since then, The People's Solar has financed $250 000 of community solar projects, including solar installations at the Abbotsford Convent, Footscray Community Arts Centre, South Geelong Primary School and St Kilda Community Housing.

Mr Tosh Szatow, Director and Co-founder of Energy for the People, explained how The People's Solar works:

> Basically if someone wants to raise money to install solar panels, they can raise that money online through our website system, and they can also raise money through events and face-to-face activities in sort of traditional fundraising. I guess the way it works is that we get those projects to commit to spending the energy savings back into the community in some way, and that is their pitch, I guess, to the community in order to raise funds. We have raised about $250 000 to date using that system over two years, and that has doubled every six months.
>
> Recent projects were with the Abbotsford Convent. They raised about $60 000 online and got $60 000 match funding from a corporate partner. They were able to fund a 100-kilowatt solar system. We also did a project at Footscray Community Arts, where they raised about $20 000 online. They got match funded with $30 000 from a corporate partner, and then I think they got additional match funding from one philanthropic partner and also I think a federal government grant to build a $100 000 budget for a solar storage and lighting system.[199]

The People's Solar also worked with Geelong Sustainability, a not-for-profit incorporated community association, to raise $12 000 for a 9.25 kW solar PV system for South Geelong Primary School that was installed in May 2016. Most of the funds were raised through The People's Solar and the rest from a Geelong Connected Communities grant and fundraising drives and events. The money saved from electricity bills by the school is invested in sustainability education and programs for the students.[200]

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197 Mr Tosh Szatow, *Transcript of evidence*, 2.

198 The People's Solar, *Abbotsford Convent solar project*, <thepeoplessolar.pozible.com/project/abbotsford-convent-solar-project-2> viewed 4 May 2017.

199 Mr Tosh Szatow, *Transcript of evidence*, 2.

200 Geelong Sustainability, *Submission 60*, 8.

CASE STUDY 3.9: CORENA (Adelaide, South Australia)

Citizens Own Renewable Energy Network Australia (CORENA) is a not-for-profit organisation that delivers community energy projects through a donation model. It has delivered 15 community energy projects throughout Australia since it formed in 2013. It has 78 members throughout Australia who assist community groups with project development, technical expertise and quality control on the proposed installation and financial calculations.

CORENA has a Quick Win Fund that uses donations pledged on its website to provide not-for-profit community groups with interest-free loans to install solar PV systems. The community group repays the loan through savings on its power bills. Loan repayments and donations to CORENA projects go into a revolving fund pool and are funnelled into the next project. This revolving mechanism will enable the Quick Win Fund to eventually become self-funding. CORENA's administration and promotion costs are covered by membership fees allowing 100% of donations to go to project delivery.

Ms Heather Smith, a member of CORENA's Management Committee, explains the benefits of the model:

> The revolving-fund-based-on-donations model has advantages. It makes funding of projects easy, and we can offer no-interest finance. We have the flexibility to support projects without being constrained by returns or dividend payments. We outstrip crowdfunding approaches in raising funds and maintain project momentum … CORENA provides technical and project management support for community organisations to develop projects. This adds due diligence to projects and is a significant part of the overhead of getting any project through the development pipeline. CORENA targets projects for not-for-profit community groups that deliver benefits to their communities. This creates access to community energy for community organisations that may not normally consider community energy thus raising awareness in diverse communities of the benefits of energy efficiency and renewable energy.[201]

CORENA's latest project raised $11 000 to install a solar hot water system and a 4.2 kW rooftop solar PV system on the Brimbank Bicycle Education Centre in Keilor Downs, Melbourne. The centre provides road safety education and learn-to-ride programs for schools and community groups as well as riding programs for people with disability. The Brimbank Board will repay the $11 000 loan over 5 years with quarterly repayments of $550. CORENA estimates that the centre will save $1565 each year in electricity costs.[202]

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201 Heather Smith, Citizens Own Renewable Energy Network Australia, *Key points for Economic, Education, Jobs and Skills Committee*, supplementary evidence received 7 November 2016.

202 Citizens Own Renewable Energy Network Australia, *Quick Win project no. 15: Brimbank Bicycle Education Centre, Vic* (2017), <corenafund.org.au/quick-win-projects/15-brimbank-bicycle-vic> viewed 4 May 2017.

3.4 Multi-household projects

Multi-household projects involve a community group or local government aggregating households to bulk-buy and install renewable energy, most commonly solar PV systems. Aggregating households creates economies of scale for the purchase and installation of technology. Householders may also feel more comfortable about installing renewable energy if a community group or council is overseeing the process and providing them with advice. Some of these projects are designed to assist low-income households to install solar panels by providing favourable repayment options.

A Victorian example of a multi-household solar scheme is Bendigo Sustainability Group's Goldfields Solar Hub program. The bulk-buy program enabled over 700 households in Bendigo to install solar PV systems with a total capacity of over 2 MW.[203] Nearby in Castlemaine, MASH (or More Australian Solar Homes) is another community solar bulk-buy program that has enabled over 650 households and businesses to install solar PV systems as of February 2017.[204]

The Darebin Solar $aver program, which enables low-income households to install solar PV systems at no upfront cost and repay the cost through their council rates, is an example of a multi-household project that targets vulnerable consumers (see case study 3.10 for further information).

CASE STUDY 3.10: Darebin Solar $aver (Melbourne, Victoria)

Darebin Solar $aver is a program run by Darebin City Council that helps low-income households in the City of Darebin install solar panels on their roof at no upfront cost. Eligibility is restricted to pensioners who own their own home and are eligible for existing rates discounts. Households pay off the panels over 10 years through a special charge on their rates. The size of the solar PV systems is individually scaled to ensure that households save on their electricity bills and repayments are structured to be less than the amount saved each year.

Darebin City Council used its capital reserves to finance the project at a 0% interest rate due to the program's climate and social justice objectives. The program installed solar PV systems on 292 houses in 2014, and a further 200 households, including 34 rental properties from a social housing cooperative, in 2016. Other Victorian councils are planning to replicate the program, as are cities including Adelaide and Canberra.[207]

Professor Michael Brear, Director of the Melbourne Energy Institute at The University of Melbourne, believes there are several benefits from this program. These benefits include removing the financial barrier for households that cannot afford to pay for a system up front, gaining greater purchasing power and securing cheaper finance through greater economies of scale and providing stewardship so that individual households install a system that suits their energy

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203 Bendigo Sustainability Group, *Submission 76*, 2.

204 More Australian Solar Homes, *MASH community solar bulk-buy* (2017), <mash.org.au> viewed 5 May 2017.

205 Ms Libby Hynes, Acting Director, Operations and Environment, Darebin City Council, *Transcript of evidence*, Melbourne, 21 November 2016, 2–3.

use to maximise the return on investment.[206] He added, 'why could we not do that for many more low-income households, and why would you restrict that kind of thinking to low-income households?'[207]

3.5 100% renewable energy towns

Several community energy groups in Victoria and Australia are adopting a 100% renewable energy town model. This model develops pathways for communities to achieve their goal of obtaining all their energy needs from renewable sources. It often uses feasibility studies and other methods to determine the most suitable energy projects for the town to achieve this goal. Examples of towns that have announced their intention to transition to 100% renewable energy are Newstead and Yackandandah in Victoria and Tyalgum in New South Wales (see case studies 3.11 and 3.12).

CASE STUDY 3.11: Newstead (Victoria)

Renewable Newstead is a project that aims to supply the town of Newstead in central Victoria with 100% renewable energy. It plans to achieve this by generating electricity from solar panels distributed throughout the town that will be embedded within a community-scale electricity network. The network will be situated behind the meter, so the town will be billed as a single customer.

Newstead is located 110 km northwest of Melbourne and has a population of 800 people. The Renewable Newstead project is run by volunteers from Newstead 2021, a community group formed in 2008 to support the sustainability of Newstead and its surrounds. In 2015, Newstead 2021 received a $200 000 Victorian Government grant to develop a plan for the project that incorporates community ownership and balances commercial viability with social equity so that Newstead residents pay fair prices for electricity and there are price protections for vulnerable residents. The Renewable Newstead model will keep the town connected to the grid and make participation optional for Newstead households and businesses.[208]

Newstead 2021 has undertaken household energy assessments and retrofits, conducted feasibility studies into the most suitable renewable energy sources for the town and prepared a technical paper on the development of a self-sufficient micro grid.[209] In early 2016, Newstead 2021 signed a 2-year memorandum with electricity distributor Powercor to work towards Newstead's transition to 100% renewable energy. The agreement requires documentation of the process so that it can be replicated in comparable Victorian communities. The next steps for Renewable Newstead include running a long-term electricity distribution tariff trial and a net metering trial.[210]

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206 Professor Michael Brear, Director, Melbourne Energy Institute, The University of Melbourne, *Transcript of evidence,* Melbourne, 20 March 2017, 3.

207 ibid.

208 Renewable Newstead, *About RN* (2017), <www.renewablenewstead.com.au/about-rn> viewed 5 May 2017.

209 Minister for Energy and Resources (Victoria) Hon Lily D'Ambrosio MP, *Newstead to become our first fully renewable town* (Media release, 19 February 2015).

210 Renewable Newstead, *Submission 41*, 3.

CASE STUDY 3.12: Tyalgum (New South Wales)

Tyalgum is a village of 300 people in the Northern Rivers region of New South Wales that wants to generate 100% of its energy needs from renewable sources and possibly disconnect from the grid. A feasibility study found that Tyalgum could transition to 100% renewable energy by installing 1.5 hectares of solar PV and 30 square meters of battery storage. The community is now working towards achieving its ambitions within the next five years.

Tyalgum is situated at the end of the grid, which makes it vulnerable to blackouts but also well located to disconnect from the grid without disrupting energy supply to neighbouring communities. The town has about 120 households and five businesses that use a large amount of electricity. It has strong solar resources and its residents support action on environmental and sustainability issues.

The Tyalgum Energy Project became active in September 2014. Mr Andrew Price, who purchased the Tyalgum Buttery and plans to turn it into a renewable energy centre, came up with the idea of taking Tyalgum off the grid. The local community supported the concept and Mr Price hired a project manager to realise the idea. In 2015, Tyalgum Energy Project received a $15 000 grant from the NSW Office of Environment and Heritage, which funded a feasibility study for the project. The feasibility study, led by Energy for the People, recommended the installation of up to 2.7 MW of solar power and 2.7 MWh of battery storage, along with a backup generator. This will cost Tyalgum between $6.5 and $7.2 million based on the price of current technology, but the cost could fall to about $4.7 million by 2020.[211]

Disconnection from the grid requires full consensus from the community. It will also depend on negotiations with the state-owned electricity distributor, Essential Energy, about network access, tariffs and potentially transferring ownership of that part of the network. The price Tyalgum Energy Project can secure for electricity will determine whether the solar and storage assets are installed centrally or behind the meter.

3.6 Considering the merits of different models

This chapter has presented a range of models that enable communities to own and participate in the energy sector. Each ownership model has its merits and community energy groups will choose a model that suits their project. For example, Countrywide Energy, a Victorian renewable energy developer, preferred not to use a cooperative model because it believed the lack of proportional voting rights would make it harder to attract a large investor.[212] Conversely, Energy Forever, a community-owned solar power and sustainability grants program, decided to use a donation model because it did not think there would be enough profit from a community investment model to support their grants program.[213]

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211 Energy for the People, *Transition Tyalgum: a plan for energy self sufficiency* (2015), 4–5.

212 Countrywide Energy, *Submission 2*, 2.

213 Energy Forever, *Submission 67*, 2.

The Committee found that some of the most successful community energy projects involved the partnership of community groups with developers, local government or enterprises that offer platform solutions. Particularly for larger projects, community energy groups will find it beneficial to partner with renewable energy developers who can assume the financial risk and conduct technical feasibility studies.

Mr Szatow from Energy for the People believed that the best models are those that can be replicated by comparable community energy groups and are financially and socially sustainable.[214] Regardless of the model chosen, the best outcome for a community depends on how efficiently the project is managed and how effectively it benefits the community. As explained in Energy for the People's submission:

> An efficient, for-profit entity, which re-invests in its community can provide equal, if not more, benefit to a community than an inefficiently run cooperative or social enterprise, which relies on external support. Naturally, the converse is also true. We believe the label we attach to an entity has limited, tangible meaning or value when it comes to determining the merit of individual projects … In order to support community energy projects, we believe the emphasis should be on supporting and rewarding projects which can transparently, efficiently, and demonstrably create community benefit—regardless of the type of entity, delivering that project.[215]

Community energy groups need clear information about the different models of community ownership in order to make educated decisions about the most appropriate business structure for their project. The Victorian Government's *Guide to community-owned renewable energy for Victorians* provides this information. However, without relevant expertise, community energy groups may need assistance to set up these business structures. This assistance is covered in more detail in Chapter 4.

214 Mr Tosh Szatow, *Transcript of evidence*, 3.

215 Energy for the People, *Submission 4*, 2.

4 Encouraging the uptake of community energy projects

Throughout the course of the Inquiry, the Committee heard that community energy groups face a number of challenges when developing an energy project. These challenges include policy uncertainty, regulatory restrictions, technical issues and a shortage of funding and resources. The first part of this chapter outlines the barriers community energy groups experience, and the second part discusses ways to address these barriers and encourage the uptake of community energy projects.

4.1 Common barriers faced by community energy groups

Community energy in Australia is a young sector, and consequently communities along with the finance and energy sectors do not have a lot of experience developing these kinds of projects. Respondents to a 2012 survey of 28 Australian community energy groups and nine supporting organisations stated the three main challenges to developing community renewable energy projects were:

- financing the development stage of the project
- getting a fair price for the electricity generated
- connecting to the grid.[216]

The other common challenges identified in the survey were volunteers' lack of skills and knowledge, securing community support, finding project partners, lack of understanding of the sector and political uncertainty.[217]

Similar challenges were found for communities developing a renewable energy project overseas. A survey of 22 community energy groups in North America, Europe, Australia and New Zealand conducted in 2010 identified that:

- 95% of communities faced economic challenges (such as costs, financing and delayed investment returns)
- 91% faced technical challenges (such as lack of infrastructure and technology limitations)
- 86% faced political challenges (such as unfavourable policy and regulations)
- 73% faced social challenges (such as securing community acceptance).[218]

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216 Jarra Hicks, et al., *Community-owned renewable energy: a how to guide,* report for Community Power Agency (2014), 16.

217 Nicky Ison, et al., *The Australian community renewable energy sector: challenges and opportunities* (2012), 35.

218 Leigh Greenius, Elsa Jagniecki and Kati Thompson, 'Moving towards sustainable community renewable energy: a strategic approach for communities', Master of Strategic Leadership towards Sustainability thesis (2010), 44.

While the sector has matured since these surveys were conducted, many of these challenges remain. The sections below discuss the current barriers to community energy that stakeholders identified during this Inquiry. The Committee was also asked to specifically inquire into the challenges of developing community energy projects in metropolitan areas and ways to overcome them. Barriers unique to metropolitan community energy projects are covered in Chapter 5.

4.1.1 Policy barriers

Numerous stakeholders informed the Committee that political uncertainty and inconsistent state and Australian government policies have threatened the viability of community energy projects.[219] The main issue is how changes to feed-in tariffs, renewable energy targets and carbon pricing policies create uncertainty around the price paid for electricity. Policy changes that occur mid-project can have a significant impact on the project's financial modelling and business planning.[220]

For example, Hepburn Wind, Australia's first community-owned wind farm, has been affected by fluctuations in electricity pricing. The project is fully market exposed and at the start of the project, financial projections and investments were made based on assurances that there was bipartisan support for a carbon pricing mechanism and the renewable energy target.[221] The wind farm began generating electricity in 2011 when Hepburn Wind was projecting energy prices of over $130 per megawatt hour (MWh), but during the 2014 Australian Government review of the Renewable Energy Target, the price fell to $65/MWh.[222] As explained by Dr David Perry, Chair of Hepburn Wind:

> Now it is back up to in the order of $150 to $200 a megawatt hour. This is just in a couple of years … You can imagine the challenges of running any business in the context of that uncertainty around the revenue that you are going to have just a few months from now, let alone five or 10 years from now.[223]

Uncertainty around energy policy not only threatens the financial viability of community energy projects, but can also generate confusion and create a disincentive for community members to invest in a project.[224]

4.1.2 Regulatory barriers

Community energy groups seeking to develop a renewable energy project must deal with regulations relating to the energy market, fundraising and planning. Stakeholders noted that these regulations were designed for the

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219 For example, Totally Renewable Yackandandah, *Submission 25*, 3; Friends of the Earth (Melbourne), *Submission 83*, 4; SkyFarming, *Submission 84*, 2; Hepburn Wind, *Submission 95*, 2–3; Mr Simon Holmes à Court, *Transcript of evidence,* Daylesford, 30 May 2017, 4.

220 Nicky Ison, et al., *The Australian community renewable energy sector*, 46.

221 Hepburn Wind, submission to the Australian Government Climate Change Authority, Renewable Energy Target Review (2014), 1.

222 Dr David Perry, Chair, Hepburn Wind, *Transcript of evidence,* Daylesford, 30 May 2017, 2.

223 ibid.

224 Peter Hodgson, Ian Kett and Samatha Hepburn, Deakin University, *Inquiry into community energy projects*, supplementary evidence received 5 December 2016, 13.

traditional electricity network and some restrict the development and operation of distributed renewable energy generation. These regulations were also not designed for the small and local nature of community energy projects. This section covers the regulatory barriers that restrict community energy groups' ability to fundraise, install renewable energy technology and trade electricity.

Fundraising restrictions

Several community energy groups mentioned that they struggled to raise funds for projects due to regulatory restrictions relating to fundraising. These restrictions include the 20/12 investor rule in the *Corporations Act 2001* (Cth), which limits the number of investors in a project to 20 with no more than $2 million being raised over a 12-month period. If the group wants to raise more capital or have more than 20 investors, it must issue a disclosure document and comply with annual reporting requirements, which adds to the upfront and ongoing costs of the project. To work with this restriction, groups can either limit their project to 20 investors who can invest larger amounts of money, or develop a project with more than 20 investors that is large enough to cover the added costs.[225] However, finding a viable host site for a large project is often difficult (see Section 4.1.5).

Current investment rules therefore limit community energy to either small or large projects, creating a gap for mid-scale projects that make more economic sense for communities.[226] One way that community energy groups have worked around the 20/12 investor rule is splitting their project and forming two companies that can have 20 investors each. For example, Lismore Community Solar is developing Australia's first council-operated and community-funded solar farms. The two 100 kilowatt (kW) solar farms will be located at the East Lismore Sewage Treatment Plant and the Goonellabah Sports and Aquatic Centre, and a separate company has been set up for each solar farm, both with 20 shareholders.[227] Repower Shoalhaven, which develops community solar projects in the southeast region of New South Wales, has also separated one of its projects into two companies and then raised capital in two lots over two different years in order to comply with the 20/12 rule. This allowed 80 community members to invest, but also created greater administration costs for Repower Shoalhaven.[228]

Macedon Ranges Sustainability Group, a not-for-profit organisation focused on climate change and sustainability issues, suggested another way to work around the 20/12 investor rule. Vice President Mr Ralf Thesing proposed that one of the 20 investors could be a cooperative, which can have an unlimited number of community investors who could each invest a small amount. However, a limitation of this option is that the community members may have less control of

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225 Coalition for Community Energy, *Submission 92*, 8.

226 Chris Cooper and Tom Nockolds, *How equity crowd funding could transform the community energy sector* <www.embark.com.au/display/public/content/How+equity+crowd+funding+could+transform+the+community+energy+sector> viewed 23 June 2017.

227 Farming the Sun, *Community Solarfarm loan model* (2016), <farmingthesun.net/lismore/business-model> viewed 20 June 2017.

228 Chris Cooper and Tom Nockolds, *How equity crowd funding could transform the community energy sector*.

the project. As Mr Thesing explained, 'if someone puts in half a million dollars, they would probably want to have a larger say than someone who is putting in $500.'[229]

In March 2017, the Parliament of Australia passed new equity crowdfunding legislation that may alleviate some of these issues for community energy groups. The *Corporations Amendment (Crowd-sourced Funding) Act 2017* (Cth) will allow start-ups and small businesses with less than $25 million in assets and annual revenue to raise funds from a large number of investors who invest small amounts of money. The Act will take effect from 29 September 2017, but will only apply to public companies meaning that community energy groups will need to register as a public company and comply with reporting regulations once a five-year concession period ends. Eligible companies will be able to raise up to $5 million in any 12-month period.[230]

Licensing regulations

If a community energy group generates and wishes to sell electricity to tenants or third parties it must have a retail licence. In Victoria, the Essential Services Commission is responsible for issuing retail licences. Obtaining a licence is complex and expensive and can act as a deterrent for community energy groups to develop a renewable energy project.[231]

Victorian licensing arrangements require community energy groups to have a licence to generate, distribute and sell electricity. However, the Minister for Energy, Environment and Climate Change through the Governor in Council issued an order in December 2015 that exempts generators from the need to obtain a licence when developing small solar projects (less than 5 MW) with power purchase agreements between the generator and the site occupier.[232]

At the moment, a General Exemption Order exists that specifies categories of exemptions where entities are not required to hold a retail licence. The Victorian Government is currently reviewing the General Exemption Order and in its draft position paper, it examined how single-premises, community-owned renewable energy projects could be given an exemption from obtaining a licence to operate to reduce the regulatory burden on community energy groups.[233]

The Essential Services Commission is also currently conducting a separate review of the energy licensing framework in Victoria, which it realises is outdated and does not adequately deal with new business models such as community energy

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229 Mr Ralf Thesing, Vice-President, Macedon Ranges Sustainability Group, *Transcript of evidence,* Daylesford, 30 May 2017, 7.

230 Australian Securities and Investment Commission, *Crowd-sourced funding* (2017), <www.asic.gov.au/regulatory-resources/financial-services/crowd-sourced-funding> viewed 23 June 2017.

231 Franziska Mey, Mark Diesendorf and Iain MacGill, 'Can local government play a greater role for community renewable energy? A case study from Australia' (2016) 21(November 2016) *Energy Research & Social Science*, 33–43, 38; Department of Economic Development, Jobs, Transport and Resources, *Victoria's renewable energy roadmap: delivering jobs and a clean energy future* (2015), 16.

232 Victorian Government, *Victoria Government Gazette*, No. S 393, 8 December 2015, 1–2.

233 ibid, 7.

projects.[234] In its discussion paper, it proposed the introduction of a small-scale licence for small operations to promote their entry into the energy market. However, some stakeholders were opposed to this proposal because they felt that all generators should have the same level of regulatory obligation regardless of size. Other stakeholders were against the proposal because they believed that the small-scale licence still imposed too much regulatory burden on smaller generators. In response, the Essential Services Commission has placed the matter on hold until the Government's General Exemption Order review is completed.[235]

Restrictions to local energy trading

Local energy trading is where an electricity generator at one location sells or assigns its exported electricity to a consumer at another location. The electricity is not physically transferred to the consumer, instead the consumer receives billing credits for the amount of electricity exported. Because the electricity transfer is virtual, rather than physical, local energy trading is also known as virtual net metering. An example is a solar garden, where community members purchase a share in a solar farm located at a remote location. The community members then receive credits on their electricity bill for the electricity generated by their share of the farm.

Local energy trading allows people to invest in renewable energy without having to install solar panels on their house. Councils would also benefit from local energy trading because they could install solar panels on one of their buildings that has adequate roof space but low energy use, and assign the electricity generated to their other buildings that have higher usage profiles.

Several stakeholders noted that current regulations that restrict the implementation of local energy trading also limit the types of community energy projects that could be developed. While there are no legislative barriers to the implementation of local energy trading, it is not financially viable at present.[236] Currently, electricity bills charge consumers for using the entire distribution network. However, proponents of local energy trading argue that only a portion of the network is used in this arrangement and that network charges should reflect this. Mr Thomas Brown, Executive Officer of the Goulburn Broken Greenhouse Alliance, an alliance of 11 councils in Victoria's Hume region and the Goulburn Broken Catchment Management Authority, used the analogy of a toll road to explain:

> the way the Australian energy market is set up today and the prices we pay for using and maintaining the grid are comparable to paying a fixed rate fee for driving on a toll road irrespective of the distance that you drive.[237]

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234 Dr Ron Ben-David, Chairperson, Essential Services Commission, *Transcript of evidence,* Melbourne, 20 March 2017, 2.

235 ibid, 3.

236 Kayla Inglis, Emily Mitchell and Robert Passey, 'Recommendations for implementing virtual net metering into community-owned renewable energy projects in Australia' (Paper presented at Asia-Pacific Solar Research Conference, Brisbane, 8–10 December 2015), 1; Mr Thomas Brown, Environmental Sustainability Officer, Moira Shire Council, *Transcript of evidence,* Shepparton, 31 May 2017, 5.

237 Mr Thomas Brown, Executive Officer, Goulburn Broken Greenhouse Alliance, *Transcript of evidence*, Shepparton, 31 May 2017, 5.

In 2016, a rule change proposal was submitted to the Australian Energy Market Commission (AEMC) to enable local generation network credits, where electricity distributors would pay local energy trading generators a credit for using less of the network and therefore reducing operating costs. The AEMC ruled against the proposal because it believed that local generation network credits would increase average electricity prices for other consumers.[238]

Until a mechanism is developed to adjust network changes for local energy trading projects, the economics of this model remain a barrier. As Victoria's Renewable Energy Advocate, Mr Simon Corbell, explained:

> At the moment there are significant regulatory obstacles to [local energy trading] which really are simply a function of the way we have designed our electricity networks historically, and we are now having to think about a new way of viewing our electricity networks to allow those types of exchanges to occur. I think in respect of that and in respect of the technical and financial issues, the Government is certainly familiar with those barriers, and I would encourage them to continue to address them.[239]

The potential of local energy trading to encourage the development of community energy projects is further explored in Section 4.2.2.

Planning and local government restrictions

Some stakeholders also mentioned that planning restrictions were hindering efforts to develop community energy projects, especially wind projects. For example, Macedon Ranges Sustainability Group (MRSG), which is developing a wind project south of Woodend, noted that Amendment VC82 of the *Victoria Planning Provisions* prohibits the installation of wind turbines in certain locations in Victoria. In addition, the *Victorian Plantations Corporation Act 1993* (Vic) restricts the use of leased Crown Land exclusively for pine planation, and MRSG notes that this prevents community energy groups to develop wind farms on this land.[240]

The Victorian Government has reduced the current restrictions on the location of wind turbines from two kilometres to one kilometre from a dwelling and returned responsibility for wind farm planning approvals to the Minister for Planning from local councils. However, MRSG and Hepburn Wind have requested the complete revocation of no-go zones to encourage the development of community wind projects.[241]

Other stakeholders mentioned that current payments made by local generators to local government also place a great financial burden on community energy projects. The payment-in-lieu-of-rates (PiLoR) methodology requires generators to pay $40 000 upfront plus an additional $900 per megawatt capacity of the

238 Australian Energy Market Commission, *Local generation network credits: final determination* (2016), 2.

239 Mr Simon Corbell, Victorian Renewable Energy Advocate, *Transcript of evidence,* Melbourne, 20 March 2017, 6.

240 Macedon Ranges Sustainability Group, *Submission 64*, 3–4.

241 ibid, 3; Hepburn Wind, *Submission 95*, 2–3.

project. Stakeholders argued that this formula is financially prohibitive for the development of community energy projects, and requested that the $40 000 component be waived for community energy groups.[242]

The Victorian Department of Environment, Land, Water and Planning (DELWP) has sought community feedback on these issues through a discussion paper on community renewable energy projects.[243] The Committee considers these technical issues are more correctly dealt with as part of that process and therefore has not examined them as part of this Inquiry.

4.1.3 Financial restraints

A common theme that emerged during the Inquiry was the financial challenges faced by community energy groups when developing a project. These included a lack of start-up funds to get the project investment ready and the difficulty of getting a fair price for the electricity generated by the project. These barriers are discussed below.

Start-up costs

Many community energy groups struggle to obtain funds to set up a project so that it has a solid business case to present to investors.[244] Groups need funding to take their project from an idea through to the prefeasibility, feasibility and planning approval stages, which can be the most risky stages for a renewable energy project.[245] The Victorian Community Solar Alliance, a network of 14 organisations that develop community solar projects, stated that community energy groups 'begin with little or no initial capital and we use volunteers as our source of labour.'[246] Mr Simon Holmes à Court, the Founding Chair of Hepburn Wind and Chairman of Embark, a non-profit organisation that supports the community renewable energy sector, added:

> community groups have no capital to start with. They have no balance sheet. They do not have a portfolio of other wind projects or other solar projects that they have built. They start with nothing. So at Hepburn I think we all put in $10 on the first night and there were 19 people who signed up, so $190 was our balance sheet when we started. Three years later it was $13 million. So we can get there, but it is a non-traditional path to building a balance sheet.[247]

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242 Macedon Ranges Sustainability Group, *Submission 64*, 5; Coalition for Community Energy, *Submission 92*, 8; Hepburn Wind, *Submission 95*, 5.

243 Department of Environment, Land, Water and Planning, *Community renewable energy projects: PiLoR and planning issues discussion paper* (2016), 8.

244 BEAM Mitchell Environment Group, *Submission 29*, 2; Macedon Ranges Sustainability Group, *Submission 64*, 5; Environment Victoria, *Submission 72*, 4.

245 Coalition for Community Energy, *Submission 92*, 10.

246 Victorian Community Solar Alliance, *Submission 49*, 9.

247 Mr Simon Holmes à Court, *Transcript of evidence*, 5.

Small government grants have helped community energy groups with project start-up costs, but the Committee heard that some of these grants are not available to cooperatives. Mr Dan Musil, Secretary of Earthworker Cooperative, which is setting up a worker-owned factory in Morwell to manufacture renewable energy appliances and components, stated:

> In some situations dealing with some organisations, like Regional Development Victoria, there has been some programs, support programs or grants that just have excluded cooperatives from applying which is a real problem … We've relied on community investment to this point. We haven't received any funding from government to provide capital for the project … Whilst we have a good close partnership with Bank Australia there is still a need for the initial capital support to set up what can become a self-sustaining and mutually supporting network. But there is not many mechanisms currently to support capital for new community initiatives like cooperatives and I think that is really vital.[248]

The Community Power Agency, a community energy support organisation, also warns community energy groups to consider how their business models affect access to support. In its guide to starting a community renewable energy project for the New South Wales Government, it reminds community energy groups that grants are often only available to not-for-profit entities.[249]

Getting a fair price for electricity

One of the top challenges for community renewable energy projects identified by surveying community energy groups and support organisations was the ability to get a fair price for electricity generated.[250] The absence of attractive feed-in tariffs, that is, the price paid for electricity, hinders the financial viability of community energy projects and can deter their development.[251] Electricity retailers are also reluctant to enter into long-term power purchase agreements with community energy projects.[252]

Other stakeholders noted that to develop a financially viable solar energy project, community energy groups are required to work behind the meter, that is, to develop projects where all the electricity generated is used on site and none is exported to the grid.[253] Working behind the meter is necessary because of low feed-in tariffs. In 2016, the Victorian feed-in tariff was five cents per kilowatt hour. From 1 July 2017, the Essential Services Commission increased the feed-in tariff to 11.3 cents in recognition of the social and health benefits of renewable energy.[254] Despite the increase, the most feasible option for community energy groups is

248 Mr Dan Musil, Secretary, Earthworker Cooperative, *Transcript of evidence,* Traralgon, 6 March 2017, 5.

249 Jarra Hicks, et al., *Community-owned renewable energy,* 33.

250 Nicky Ison, et al., *The Australian community renewable energy sector*, 31.

251 Deakin University, *Submission 34*, 6; Horsham Rural City Council, *Submission 58*, 2.

252 SkyFarming, *Submission 84*, 1.

253 City of Greater Geelong, *Submission 37*, 3; Coalition for Community Energy, *Submission 92*, 10.

254 Essential Services Commission, *Feed-in tariffs* (2017), <www.esc.vic.gov.au/project/energy/2134-minimum-feed-in-tariff> viewed 26 June 2017.

to find a host site where the project scale is less than the host's energy use and the host agrees to purchase the energy generated.[255] This restricts the number of available sites that can host a community energy project.[256]

An added factor is the ability of large energy-consuming businesses and industries to negotiate heavily discounted energy rates directly with electricity retailers. Businesses that are paying reduced rates for their electricity are less attracted to installing renewable energy or working with a community energy group to host a solar project.[257]

The economies of scale for renewable energy are best suited for small- or large-scale projects, creating a gap for community-scale projects, which are typically medium scale.[258] As explained by Mr Holmes à Court:

> Hepburn Wind is still the largest community energy project in the country, but it is two orders of magnitude smaller than a large project. People are building 400 megawatt wind farms; we are 100th the size of that. At the other end we are 1000 times bigger than the average domestic system. So we sit in a no-man's-land. There is a whole very, very healthy industry around servicing domestic demand, and there is a growing industry around servicing the needs of the large developers, but quite niche around that middle ground where communities are. There are now a lot more firms looking at it and interested in it than there were back 10 years ago, but the economies of scale mean that there are fewer suppliers that are willing to work in this space. That needs to be considered.[259]

The Coalition for Community Energy, a network of 72 organisations that advocates for community energy, argued that community energy should be thought of as an emerging sector, and that growth of the sector could be encouraged using policies that introduce an added value stream.[260] These policies could include renewable energy targets, community-specific feed-in tariffs and reverse auctions, which are explored in Sections 4.2.2 and 4.2.3.

4.1.4 Resource constraints

During the Inquiry, the Committee learned that the activities of community energy groups are limited by the capacity of their volunteers in terms of time and skills.[261] For example, Mr Matthew Grogan, Co-Chair of Totally Renewable Yackandandah, a volunteer-run community group that is transitioning the town to 100% renewable energy, stated:

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255 Taryn Lane, 'Community solar: energy from the ground up' (2014) 129 *ReNew*, 44–47, 45.

256 Kayla Inglis, Emily Mitchell and Robert Passey, 'Recommendations for implementing virtual net metering into community-owned renewable energy projects in Australia', 5; Energy Democracy, *Submission 53*, 3.

257 Bendigo Sustainability Group, *Submission 76*, 13.

258 Jarra Hicks and Nicky Ison, 'Community-owned renewable energy (CRE): opportunities for rural Australia' (2011) 20(3) *Rural Society*, 244–255, 253.

259 Mr Simon Holmes à Court, *Transcript of evidence*, 4.

260 Coalition for Community Energy, *Submission 92*, 9.

261 For example, Mr Ed McManus, Chief Executive Officer, Meridian Energy Australia, *Transcript of evidence,* Melbourne, 7 November 2016, 2; Mr Andy Cavanagh-Downs, Founding Director, Sydney Renewable Power Company, *Transcript of evidence,* Sydney, 15 February 2017, 7; Dr David Perry, *Transcript of evidence*, 3; Victorian Community Solar Alliance, *Submission 49*, 4.

> we have unfortunately realised that our 100 per cent voluntary group has turned into a bit of a bottleneck, because we just do not have the capacity to bring what we can and what we know that we can to the table because we are holding up families and full-time jobs in the daytime. So we are seeking to actually employ an executive officer or officers to step into that role.[262]

Most community energy groups are operated by volunteers and few have enough funds available to employ one or more staff members to manage their project or undertake community engagement work. Some community energy groups employ project officers or consultants, but admit that their employees work more hours than they are paid.[263]

Research on community energy groups has shown that they spend most of their time on operational, legal or funding activities to ensure their survival and only a small portion of time on their energy project.[264] The skills and knowledge of volunteers in these areas can also affect the successful development of projects.[265] Community energy groups require legal, financial, technical and administrative skills to implement and progress a project. In some cases, volunteers have these skills or local professionals provide them in kind; otherwise, a lack of these skills or funds to procure them can limit a project's progress.[266]

Some stakeholders also mentioned that community energy groups require access to legal and accounting expertise specifically relating to cooperatives. They submitted that few lawyers and accountants are familiar with cooperatives law, which can deter community energy groups from using this business model.[267]

4.1.5 Technical challenges

Another barrier to community energy is the technical limitations that can affect the financial viability of a project. These limitations include finding a suitable host site, connecting to the electricity grid and accessing data on network constraints, as discussed below.

Finding a host site

Community energy groups that develop solar projects often have difficulty finding a host site that will make the project viable.[268] As explained in Section 4.1.3, current prices for electricity limit solar projects to those that operate behind the meter. The site has to have a good orientation, enough unshaded roof space,

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262 Mr Matthew Grogan, Co-Chair, Totally Renewable Yackandandah, *Transcript of evidence,* Shepparton, 31 May 2017, 2.

263 Mr Mick Lewin, Deputy Chair, Mount Alexander Sustainability Group, *Transcript of evidence,* Daylesford, 30 May 2017, 4; Ms Genevieve Barlow, Communications and Engagement Director, Renewable Newstead, *Transcript of evidence,* Daylesford, 30 May 2017, 4.

264 Sabine Hielscher, Gill Seyfang and Adrian Smith, *Community innovation for sustainable energy*, Centre for Social and Economic Research on the Global Environment working paper 2011-03 (2011), 11.

265 WestWind Energy, *Submission 61*, 2; GV Community Energy, *Submission 85*, 4.

266 Victorian Government, *Submission 98*, 11; Geelong Sustainability, *Submission 60*, 4.

267 Coalition for Community Energy, *Submission 92*, 10; The University of Melbourne, *Submission 70*, 3.

268 Moira Shire Council, *Submission 59*, 2; Victorian Community Solar Alliance, *Submission 49*, 6.

a high daytime energy use profile and an owner-occupier who is paying standard retail rates for electricity and agrees to purchase the electricity generated.[269] Section 5.1.1 in Chapter 5 explains the reasons for these criteria.

Geelong Sustainability added that finding a viable host site is also a time-consuming and difficult task for community energy groups:

> The time and skills required to cold call potential host sites, build relationships, assess the feasibility of the site and attend meetings to develop a project are outside the scope of typical volunteers. A challenge for our team has been accessing funding to enable a paid person to undertake this time consuming work.[270]

Host sites also need to have adequate renewable energy resources, such as regular sunshine or good wind speeds. Community energy groups need guidance to assess the quality and quantity of the relevant resource in technical feasibility studies prior to investing too much time and energy in a project.[271]

Grid connection

Larger renewable energy projects, such as solar farms or wind farms, need to be connected to the grid in order to export electricity. Designing and implementing a grid connection can be costly if the host site is not located close to the grid and/or there is currently a small line to the network with a small capacity.[272] For example, Hepburn Wind had additional unforeseen costs of $300 000 relating to grid connection and lost $600 000 revenue due to being constrained in the first months of its operation.[273]

Community energy groups that want to connect their project to the grid need to engage with the local electricity distributor early in the project. The process can take a long time and require much effort and negotiation with the distributor who will assess the project's impact on the network and its business proposition.[274]

In addition to being costly and onerous, the grid connection approval process can be unclear, uncertain and difficult to appeal.[275] Deakin University also noted that there are no standardised financial or technical provisions to regulate grid connection, which can make it difficult for new generators to estimate the cost of grid connection.[276] There may also be grid constraints at the point of connection, especially in regional areas where connection to a new renewable energy generator could exceed the technical limits of the network.[277]

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269 Northern Alliance for Greenhouse Action, *Submission 36*, 3.

270 Geelong Sustainability, *Submission 60*, 4.

271 Ms Alicia Webb, Policy Manager, Clean Energy Council, *Transcript of evidence,* Melbourne, 7 November 2016, 5.

272 ibid.

273 Institute for Sustainable Futures, et al., *National community energy strategy* (2015), 38.

274 Department of Economic Development, Jobs, Transport and Resources, *Guide to community-owned renewable energy for Victorians* (2015), 27–28.

275 Institute for Sustainable Futures, et al., *National community energy strategy*, 38.

276 Deakin University, *Submission 34*, 6.

277 Department of Economic Development, Jobs, Transport and Resources, *Victoria's renewable energy roadmap*, 15.

Access to data

Some stakeholders noted that the development of community energy projects, and renewable energy projects in general, is hindered by a lack of available data on network constraints and technical measures. For example, Mr Geoff Drucker, Director of Countrywide Energy, a Victorian developer of clean energy farms, stated:

> There is very little information about the distribution network in Victoria, such that we cannot find where there are issues without doing detailed investigations by basically travelling around the state and asking businesses if they have got energy issues. The state should know where the energy issues are so that we can go in there and fix those energy issues.[278]

The Essential Services Commission added that its inquiries have also been hampered by a lack of reliable information in the public domain about network constraints and voltage variation. It stated that if this information were available, it would inform the energy market about technical issues and opportunities to address them.[279]

4.2 Measures to encourage community energy uptake

A number of factors can encourage the development of community energy projects, such as supportive policy measures, financial support, collaboration with industry or local government and the availability of resources and project development support. The Committee assessed ways to address the barriers to community energy presented in evidence gathered from submissions, public hearings, site visits and an examination of overseas best practice. Its findings are presented below.

4.2.1 Supportive policy environment

Consistent, supportive policies relating to renewable energy and community participation in the energy sector have increased the uptake of community energy projects overseas. The Danish Energy Agency, which is the government agency responsible for energy production, supply and consumption in Denmark, attributed its successful integration of renewable energy and high level of community ownership of wind turbines to long-term policies that had broad political support. These policies included market mechanisms such as subsidies and tax incentives and their bipartisan support provided the sector with stability and built confidence among businesses and investors.[280] Case study 4.1 provides a brief summary of the community energy sector in Denmark.

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278 Mr Geoff Drucker, Director, Countrywide Energy, *Transcript of evidence,* Melbourne, 20 March 2017, 3.

279 Mr David Young, Director, Energy, Essential Services Commission, *Transcript of evidence,* Melbourne, 20 March 2017, 5–6.

280 Morten Bæk, Danish Energy Agency, *Community energy, energy efficiency and energy security in Denmark*, supplementary evidence received 5 April 2017, 5.

CASE STUDY 4.1: Community energy in Denmark

Denmark pioneered wind energy in the 1970s as a way to ensure energy security following the oil crisis. In 2015, 42% of electricity consumed in Denmark was generated from wind power.[281] Community-owned wind farms have existed in Denmark since the late 1970s. By 2004, more than 150 000 households belonged to a wind turbine cooperative, covering 75% of all the wind turbines in Denmark.[282]

In Denmark, community ownership is achieved through partnerships, where individuals pool their funds to purchase shares in a wind project in partnership with a utility. Shares are usually sold in lots of 1000 kilowatt hours and individuals usually buy enough shares to offset their annual electricity consumption (usually five shares). The average investment is about $2920.[283]

The majority of community-owned renewable energy projects in Denmark source their power from wind. Of all the renewable energy generated in Denmark in 2014, 73% was sourced from wind, 21% from biomass, 3% from solar, 2.5% from biogas and 0.1% from hydro.[284]

Denmark has a renewable energy target of 100% by 2050 and a goal of 50% wind power by 2020. To achieve the wind target, a further 1000 MW of offshore wind and 500 MW of onshore wind will be installed in addition to replacing old onshore wind turbines with new high-capacity ones. The Danish Government aims to reduce public opposition to increased wind turbine installations by mandating:

- compensation to residents if their property loses value due to wind turbines
- a payment to the local community per megawatt hour of energy generated
- an offer of 20% of wind farm shares to local residents.[285]

Denmark ensures community involvement in renewable energy projects by mandating that wind energy developers offer 20% of overall ownership shares in any new project to local residents. The Danish Government also pays a slightly higher feed-in tariff if developers offer a further 10% of shares in the project to the community (total of 30% community ownership).[286] The 20% requirement was introduced in 2008, but in practice, there has not always been enough local residents interested in buying that proportion of shares.[287]

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281 Danish Wind Industry Association, *The Danish market* (2016), <www.windpower.org/en/knowledge/statistics/the_danish_market.html> viewed 27 June 2017.

282 Alicia Webb, 'Worldwide wind cooperatives' (2009) 106(January–March) *ReNew*, 68–71, 68.

283 Jarra Hicks and Nicky Ison, *Community energy in Europe*, <www.embark.com.au/display/public/content/Community+energy+in+Europe> viewed 31 January 2017.

284 Danish Energy Agency, *Energy statistics 2014* (2016), 12.

285 Sophie Vorrath, *Graph of the day: Danish wind nears 100% of demand over weekend* (2016), <reneweconomy.com.au/graph-of-the-day-danish-wind-nears-100-of-demand-over-weekend-94773> viewed 27 June 2017.

286 Josh Roberts, Frances Bodman and Robert Rybski, *Community power: model legal frameworks for citizen-owned renewable energy* (2014), 30.

287 ibid.

In other jurisdictions, governments have implemented community energy targets to encourage growth of the sector. For example, in 2011, the Scottish Government set a target of 500 megawatts (MW) of community and locally-owned renewable energy by 2020. This target was achieved in 2015 and, at the end of September 2015, a further 609 MW of community renewable energy capacity was in various stages of development.[288] Setting a community energy target helps to drive targeted support for community energy, provide certainty for investors and boost local economic development.[289]

Many stakeholders participating in this Inquiry recommended the introduction of a community energy target in Victoria.[290] The most common suggestion was for the Victorian Government to stipulate that 5–10% of the Victorian Renewable Energy Target (VRET) be met by community energy projects.[291] Another option was for the Victorian Government to mandate that all renewable energy projects offer 10% ownership to local community not-for-profit organisations.[292]

The VRET is a commitment to derive at least 25% of Victoria's electricity from renewable sources by 2020 and 40% by 2025. Up to 1500 MW of new large-scale renewable energy capacity is required by 2020 and up to 5400 MW by 2025 to achieve these targets. The Victorian Government will introduce a competitive reverse auction scheme to support the VRET.[293] In a reverse auction, renewable energy developers bid to be the lowest cost provider of electricity.

The Australian Capital Territory (ACT) has successfully run a reverse auction scheme for renewable energy generation providing successful bidders 20-year contracts. Auctions were held for large-scale solar in 2012 and 2013, for large-scale wind in 2014 and 2015 and for battery storage in 2016. The auctions have procured 700 MW of renewable energy generation for the ACT, including four solar projects within the ACT and seven wind farms located in New South Wales, Victoria and South Australia.[294]

Victoria's Renewable Energy Advocate, Mr Corbell, was previously the ACT's Minister for the Environment and Climate Change and oversaw the implementation of the ACT reverse auction program. He said the program:

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288 Fiona Young and Kalina Georgieva, *Community and locally owned renewable energy in Scotland at September 2015: a report by the Energy Saving Trust for the Scottish Government* (2015), 1, 3.

289 Josh Roberts, Frances Bodman and Robert Rybski, *Community power*, 10.

290 For example, BEAM Mitchell Environment Group, *Submission 29*, 2; Renewable Newstead, *Submission 41*, 6; South Gippsland Shire Council, *Submission 75*, 4; Bendigo Sustainability Group, *Submission 76*, 9.

291 Bass Coast Shire Council, *Submission 20*, 4; Euroa Environment Group, *Submission 31*, 2; Northern Alliance for Greenhouse Action, *Submission 36*, 5; Victorian Community Solar Alliance, *Submission 49*, 11; Moreland Energy Foundation Limited, *Submission 51*, 2; Moira Shire Council, *Submission 59*, 3; Geelong Sustainability, *Submission 60*, 6; Macedon Ranges Sustainability Group, *Submission 64*, 6; Environment Victoria, *Submission 72*, 5; Friends of the Earth (Melbourne), *Submission 83*, 4; GV Community Energy, *Submission 85*, 5; Australian Wind Alliance, *Submission 89*, 3; Coalition for Community Energy, *Submission 92*, 12.

292 Bendigo Sustainability Group, *Submission 76*, 9.

293 Department of Environment, Land, Water and Planning, *Victoria's renewable energy targets* (2017), <www.energy.vic.gov.au/renewable-energy/victorias-renewable-energy-targets> viewed 27 June 2017.

294 Mr Simon Corbell, *Transcript of evidence*, 3.

> delivers very cheap and competitive costs for renewable energy generation. The projects that were supported by the ACT program at the time were the cheapest prices ever achieved for wind and solar power generation that are known in the broader electricity market … The reverse auction program has helped to deliver a pipeline of projects that has brought down costs, and in particular the reverse auction mechanism has also allowed for other broader community benefits to be realised, in particular over half a billion dollars of investment in the ACT economy associated with research, development and operations associated with renewable energy projects, as well as significant improvements in community engagement.[295]

A reverse auction scheme can be set up to award contracts to developers who fulfil additional criteria such as community engagement. For example, in the ACT the evaluation criteria include risks to timely project completion (50% weighting), local community engagement (20%), local economic development benefits (20%) and a compensation cap in the event of a change in ACT law (10%).[296] These criteria are considered with the bid price to determine the best value for money. The Victorian Government has also highlighted that its reverse auction scheme will consider benefits to Victorian jobs, investment and communities in addition to cheapest prices.[297]

Germany recently introduced a reverse auction scheme for renewable energy generation after removing guaranteed feed-in tariffs (see Case study 4.2). However, this policy change has led to a decline in community energy projects because community groups are unable to compete with commercial projects in the auction process. Ms Taryn Lane, Chairperson of the Coalition for Community Energy, stated that Victoria can learn from the German experience:

> What they have seen over the past few years of implementing the auctions is that the community sector has really stopped again. After being the biggest frontrunner for years it has now stopped again, so their advocacy going back to government now is that they really need to implement strategies to have a diversity of players within the auction process—clear criteria that give a weighting for community ownership and community scale, local purchasing, local benefits and those sorts of things.[298]

Hepburn Wind requested that 5–10% of Victoria's reverse auction program be allocated to community energy projects, but that this part of the auction be 'fit-for-purpose and contractually simpler for CE [community energy] project proponents.'[299] This would reflect the volunteer resources required to apply and if successful, adhere to compliance activities over the life of the contract, which could be up to 25 years.

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295 ibid.

296 ACT Government Environment, Planning and Sustainable Development Directorate, *How do the ACT's renewable energy reverse auctions work?* (2016), <www.environment.act.gov.au/energy/cleaner-energy/how-do-the-acts-renewable-energy-reverse-auctions-work> viewed 27 June 2017.

297 Mr Scott Hamilton, Executive Director, Renewable Energy, Department of Environment, Land, Water and Planning, *Transcript of evidence,* Melbourne, 20 March 2017, 8.

298 Ms Taryn Lane, Chairperson, Coalition for Community Energy, *Transcript of evidence,* Melbourne, 24 October 2016, 10.

299 Hepburn Wind, *Submission 95*, 4.

CASE STUDY 4.2: Community energy in Germany

The German Government has worked towards *Energiewende* (energy transition) since 2010. The transition includes renewable energy targets, energy efficiency and greenhouse gas reductions and a phasing out of nuclear energy. In 2015, 33% of electricity produced in Germany was from renewable sources. Germany has a renewable energy target of 80% by 2050.[300]

Citizens and communities in Germany own 47% of installed renewable energy capacity.[301] In 2014, there were 772 cooperatives operating renewable energy projects in Germany and most of these used wind and solar technologies (35% and 20% respectively). The majority of community wind projects in Germany are co-developed with an electricity utility company or wind energy developer. Communities in Germany are also investing in bioenergy, with over 200 bioenergy villages operating or under development in the country. Of the 4946 MW of installed bioenergy capacity in 2012, 42% was owned by the community.[302]

Germany introduced feed-in tariffs in 2000. They guaranteed the set price for renewable energy that electricity distributors were contracted to pay generators over 20 years. The tariffs were initially set at a high level to make renewable energy projects profitable when their installation was still expensive. This policy led to a marked increase in renewable energy generation in Germany, from 6% of all electricity production in 1999 to 33% in 2015.[303]

In 2014, the German Government revised the *Renewable Energy Sources Act* to manage the expansion of renewable energy and better manage rising electricity prices. Further revisions to the Act in 2017 changed how renewable electricity would be funded. The German Government stopped paying feed-in tariffs in January 2017 relying on reverse auctions to purchase renewable energy at the lowest price offered. To stabilise the retail price of electricity, the German Government aims to keep renewable energy generation at less than 45% of Germany's total electricity production until 2025. It has also placed caps on additional onshore wind, solar and biogas installations.[304]

However, some Victorian community energy groups voiced concern that reverse auctions could disadvantage their projects. For example, Ms Linda Parlane, Board Member of Moreland Community Solar Co-operative, a community energy group that develops solar projects in the Moreland region, stated that reverse auction bids are complex and time consuming for community energy groups and they will discourage community participation in the energy sector.[305]

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300 Craig Morris, *Germany is 20 years away from 100 percent renewable power – not!* (2016), <reneweconomy.com.au/germany-20-years-away-100-percent-renewable-power-not-68277> viewed 27 June 2017.

301 Craig Morris, *Citizens own half of German renewable energy* (2013), <energytransition.org/2013/10/citizens-own-half-of-german-renewables> viewed 27 June 2017.

302 Community Power, *Germany*, <www.communitypower.eu/en/germany.html> viewed 27 June 2017.

303 David Heberling, *Germany's unique energy conundrum: what the future of energy policy needs to address* (2016), <greenenergyinstitute.blogspot.com.au/2016/06/germanys-unique-energy-conundrum-what.html> viewed 27 June 2017.

304 Richard Fuchs, *German cabinet puts brakes on clean energy transition* (2016), <www.dw.com/en/german-cabinet-puts-brakes-on-clean-energy-transition/a-19318942> viewed 27 June 2017.

305 Ms Linda Parlane, Board Member, Moreland Community Solar Co-operative, Victorian Community Solar Alliance, *Transcript of evidence,* Melbourne, 7 November 2016, 7.

Ms Michelle Wilkinson, Committee Member of Renewable Albury-Wodonga Energy, a community group that is developing renewable energy projects in the Albury-Wodonga area, added that as a volunteer group, there was confusion about how the reverse auctions would work and the group is 'struggling to understand how we could actually participate in that auction process.'[306]

FINDING 3: Community energy groups will find it difficult to compete with commercial developers in a reverse auction scheme for renewable energy generation. The reverse auction mechanism could discourage community participation in the energy sector.

While community energy groups are likely to struggle with the reverse auction scheme if they apply on their own, there may be opportunities for them to apply with a developer. When the Committee asked if allocating a portion of the VRET to community energy projects would be risky, Mr Corbell responded:

> the allocation of part of the VRET auction program to community energy projects would be very modest in the overall scheme of the program … The component that would potentially be made available for community-owned energy projects would be extremely modest—certainly less than 100 and probably even less than 50 or 20 megawatts. It could be a very small component of the overall VRET scheme, so I do not believe that it would have any real material effect on the achievement of the target or indeed the overall operation of the Victorian [National Electricity Market] region, but it could have a very beneficial effect for community-owned projects in terms of being able to secure cheap finance to allow their projects to be delivered and also to attract attention and assistance from renewable energy developers who have the necessary expertise to bring to bear to help groups realise their ambitions.[307]

Policy measures have worked to encourage the development of community energy projects overseas, such as in Denmark, Germany and Scotland. The Victorian Government could encourage community participation in the energy sector by ensuring that community engagement or part-ownership is a significant component of the evaluation criteria for its reverse auction energy scheme.

RECOMMENDATION 2: The Victorian Government include community engagement or part-ownership as one of the evaluation criteria for the VRET reverse auction scheme with a weighting of at least 20%.

4.2.2 Regulatory changes

Regulatory barriers to community energy exist at the federal, state and local government levels, as discussed in Section 4.1.2. Consequently, the Victorian Government cannot address all of these barriers directly. This section examines regulatory areas that stakeholders have highlighted for change, such as licensing and local energy trading. Regulatory changes that are more likely to benefit multi-household projects, such as changes to support rates-based financing models, are discussed in Chapter 5.

306 Ms Michelle Wilkinson, Committee Member, Renewable Albury-Wodonga Energy, *Transcript of evidence,* Shepparton, 31 May 2017, 2.

307 Mr Simon Corbell, *Transcript of evidence*, 4.

Licensing

Some stakeholders identified the difficulty that retailers in the community energy sector have experienced trying to obtain a licence to operate in Victoria.[308] According to Energy Locals, an Australian owned and operated social enterprise energy retailer, one issue with the licensing framework is:

> the lack of clear timeframe for the regulator to process applications, creating an additional risk for enterprising groups trying to provide better outcomes for customers and the Victorian Government's own targets. There is significant interest in Victoria, yet potential market participants are discouraged by the lead times and process uncertainty.[309]

Energy Locals also recommended the Essential Services Commission amend regulations to reflect the value delivered by distributed generation, otherwise it would risk the development of innovative business models. It added the 'Victorian Government risks a growing disconnect between its own progressive energy policy and the ability for disruptive organisations to be allowed to contribute to its delivery.'[310]

Licensing issues in Victoria can be addressed without requiring national input, because the Essential Services Commission has the capacity to evolve its rules as needed.[311] The Essential Services Commission informed the Committee that the legislative framework for the regulation of Victoria's energy supply is quite robust and flexible enough to allow for licensing changes to suit community energy projects. The Commission's Chairperson, Dr Ron Ben-David, stated:

> some things may not need any legislative change because the machinery is already in place. I would also say that there are many things that are not good about our licensing framework, but the legislation that sits above it is actually very flexible. It allows for regulation of energy supply end to end. It does not prescribe the form of organisation, the technology or any of those sorts of things, so it is actually quite a flexible piece of legislation.[312]

Both the Victorian Government and the Essential Services Commission are currently reviewing aspects of Victoria's licensing framework to better accommodate new business models.[313]

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308 Mr Adrian Merrick, Founder and Chief Executive Officer, Energy Locals, *Transcript of evidence,* Melbourne, 7 November 2016, 3; Ms Michelle Wilkinson, *Transcript of evidence*, 2.

309 Energy Locals, *Submission 68*, 5.

310 ibid.

311 Dr Ron Ben-David, *Transcript of evidence*, 6.

312 ibid.

313 Mr Scott Hamilton, *Transcript of evidence*, 3; Dr Ron Ben-David, *Transcript of evidence*, 2.

Local energy trading

Several stakeholders supported regulatory changes to make local energy trading financially viable.[314] As explained in Section 4.1.2, local energy trading, or virtual net metering, enables electricity generation at one site to be offset against the energy bills of another site. Local government stakeholders were strong proponents of this mechanism because they own and operate many buildings and it would allow them to install solar panels on the most viable rooftop and assign the energy generated to buildings that use the most electricity. For example:

> the City of Greater Geelong is investigating a large scale solar project on a disused landfill site. As the site is remote from the approximate 800 building Council owns and operates, the electricity generated can only be fed into the electricity grid at a low rate of return. Alternatively if the electricity was able to offset other building site and their electricity demand, economic viability of the large scale solar project would be improved significantly.[315]

Stakeholders mentioned that the benefits of local energy trading are it:

- enables people who are unable to install solar panels on their roof (such as renters, apartment dwellers and those with unsuitable roofs) to invest in renewable energy
- provides a cheaper alternative for low-income households that wish to invest in renewable energy
- enables councils and community groups to install more renewable energy and meet their emissions reduction targets in a cost effective manner
- reduces ratepayer costs for the provision of community services if councils can install more solar panels and save on energy bills
- enables local government to control how they spend operational electricity expenditure and as a consequence support local economic development.[316]

While there is no legislative barrier to local energy trading, it is currently too costly because participants are required to pay for use of the entire grid even though the energy is traded locally. As mentioned earlier, the AEMC rejected a proposed rule change that would credit local network generators for using less of the grid because it believed that it would increase costs for other consumers left to underwrite the grid.

However, Ms Nicky Ison, Secretariat Coordinator of the Coalition for Community Energy, explained that local generation network credits would encourage the use of the existing grid and the exported energy would strengthen the grid at that location, reducing the need for further grid upgrades. She stated:

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314 For example, Northern Alliance for Greenhouse Action, *Submission 36*, 6; Goulburn Broken Greenhouse Alliance, *Submission 44*, 5; Darebin City Council, *Submission 55*, 2; Moira Shire Council, *Submission 59*, 3; Energy Locals, *Submission 68*, 4; Bendigo Sustainability Group, *Submission 76*, 8; GV Community Energy, *Submission 85*, 5.

315 City of Greater Geelong, *Submission 37*, 3.

316 Darebin City Council, *Submission 55*, 2; Mr Thomas Brown, Moira Shire Council, *Transcript of evidence*, 2.

> we see the grid as essential infrastructure, and it is really part of the social safety net. We understand that there has been this non-location-specific pricing because of equity reasons. We are not suggesting a complete removal of that. We are not saying that we should have full location-based pricing. But we should recognise that there is a value to all energy consumers and to the network operators of having increased utilisation of the existing infrastructure that we have, and that can be done through a degree of a partial charge through this credit model. The economic modelling that we have done has shown that it will have an economic benefit to the whole consumer base.[317]

When asked whether local energy trading would risk the future stability of the grid because distributors would have reduced revenue from network charges, Mr Brown from the Goulburn Broken Greenhouse Alliance responded:

> I would raise the point of virtual net metering being critical to the future security of the national grid and in Victoria, principally because the way technology is moving in terms of renewable energy generation and energy storage there is soon approaching a very convenient point in time when people disconnect from the grid and not participate in the grid—they will be grid defectors. Virtual net metering provides an opportunity for the grid to maintain its relevance to modern electricity consumers moving forward by enabling people to participate in renewable energy generation that they own that is not necessarily attached to a single residence or a single point of business.[318]

One of the Goulburn Broken Greenhouse Alliance's members, Moira Shire Council, has recently undertaken a local energy trading trial in conjunction with the University of Technology Sydney's Institute for Sustainable Futures and Swan Hill Rural City Council. The trial used five standard customer profiles, three residential and two business, with different energy use profiles and solar energy investments. The modelling, which underwent independent peer review, found that local energy trading could save these residential and business investors a combined $35 000 annually, and about $42 000 annually if local generation network credits were available.[319] Moira Shire Council wants to carry out local energy trading and would like the Victorian Government to work with the Council of Australian Governments (COAG) Energy Council to develop national consensus on how proportional charging for network use could be implemented.[320]

Local energy trading is currently operating in the United States of America, where it is referred to as community shared solar, in cities such as Denver, Minneapolis–St. Paul, Orlando, Sacramento, San Diego, Seattle and Tucson among others. In 2008, there was about 784 kW of community shared solar capacity in the United States. By 2013, this capacity had increased to 39 327 kW (or 39.3 MW), equivalent to a 4916% increase in five years.[321]

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317 Ms Nicky Ison, Secretariat Coordinator, Coalition for Community Energy, *Transcript of evidence,* Melbourne, 24 October 2016, 6.

318 Mr Thomas Brown, Goulburn Broken Greenhouse Alliance, *Transcript of evidence*, 7.

319 Jay Rutovitz, et al., *Virtual trial of local electricity trading and local network credits: a community solar farm,* report for Moira Shire Council and Swan Hill Rural City Council (2016), 9.

320 Mr Thomas Brown, Moira Shire Council, *Transcript of evidence*, 3.

321 International Council for Local Environmental Initiatives (ICLEI) USA, *Community shared solar: expansions underway in Solar America Communities* (2014), 1–2.

To enable local energy trading, the Northern Alliance for Greenhouse Action, a network of nine metropolitan councils in Melbourne's north, suggested that the AEMC consider the social and environmental value of alternate business models when assessing rule change proposals.[322] Other stakeholders recommended a change in the National Electricity Objective to take into account the decarbonisation of the electricity market.[323] The AEMC is required by law to have regard to the National Electricity Objective, which is:

> to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to – price, quality, safety, reliability, and security of supply of electricity; and the reliability, safety and security of the national electricity system.[324]

If the National Electricity Objective was amended to consider social and environmental objectives, the AEMC's assessment of the value of rule change proposals would align more closely with state and federal government commitments to lower carbon emissions.[325]

FINDING 4: Local energy trading helps more people to participate in renewable energy generation and enables local government to reduce energy bills and support local economic development.

RECOMMENDATION 3: The Victorian Government work with the COAG Energy Council to support regulatory changes that make local energy trading viable while also protecting grid security and vulnerable consumers.

4.2.3 Supportive electricity pricing

The financial viability of a community renewable energy project rests on the price paid for the electricity generated (the feed-in tariff) or the value of savings accrued on energy bills. As discussed in Section 4.1.3, current low feed-in tariffs force community energy groups to develop smaller projects that sit behind the meter and do not rely on selling electricity to the grid.

Electricity pricing increases in importance when a community energy group wants to develop a larger solar project or a wind energy project. A lack of price certainty makes it difficult to undertake financial planning and business modelling and attract project investors.[326] Dr Perry from Hepburn Wind said that regardless of the other types of support available to community energy groups:

> what is fundamental is the certainty of price: if you have got the certainty of price, banks will write you contracts, they will give you loans and everything becomes a hell of a lot simpler.[327]

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322 Northern Alliance for Greenhouse Action, *Submission 36*, 4.

323 For example, Moreland Energy Foundation Limited, *Submission 51*, 3; Energy Democracy, *Submission 53*, 5.

324 Australian Energy Market Commission, *National Electricity Market* (2016), <www.aemc.gov.au/Australias-Energy-Market/Markets-Overview/National-electricity-market> viewed 17 October 2016.

325 Energy Democracy, *Submission 53*, 5.

326 Nicky Ison, et al., *The Australian community renewable energy sector*, 37.

327 Dr David Perry, *Transcript of evidence*, 7.

Community energy groups working on larger projects may try to secure a favourable power purchase agreement with an energy buyer or the occupier of a host site, who will agree on a set price over a long-term contract of 20 or 25 years. However, securing a power purchase agreement is not easy and community energy groups have found that energy buyers are reluctant to enter into an agreement before the project is operational.[328] For example, Hepburn Wind was unable to secure a sustainable power purchase agreement at the close of the project and the Board decided to sell the energy generated at market price, exposing itself to price and volume risks.[329]

Another option for community energy groups is public procurement where state or local governments purchase electricity from community energy groups. Local governments could support community energy projects by choosing to obtain all their energy needs from renewable energy sources and favouring generators that include an element of community participation.[330] Bendigo Sustainability Group (BSG) has successfully negotiated long-term power purchase agreements with the City of Greater Bendigo Council for energy generated by solar panels installed on council buildings. The first power purchase agreement with the council is a 20-year contract to purchase electricity generated from a 20 kW solar array installed on the Bendigo Library. It took BSG three years to set up the first agreement with the council, but subsequent agreements have taken a lot less time and Mr Chris Weir, BSG's President, stated that it could now set up a power purchase agreement every three months.[331]

Several stakeholders suggested that the Victorian Government set up a community-specific feed-in tariff to encourage the development of community energy projects.[332] The community-specific feed-in tariff would be set at a higher rate to make the projects more viable. As discussed in Section 4.1.3, the feed-in tariff from 1 July 2017 is 11.3 cents per kilowatt hour, which is more than double the previous rate but not enough to ensure project viability.[333] Feed-in tariffs also change regularly, which affects financial projections and threatens project viability. When the Committee asked DELWP of the benefits and drawbacks of a community-specific feed-in tariff, Mr Scott Hamilton, Executive Director of Renewable Energy, stated that the Victorian Government did not have a policy position on this, but:

> every time that we add a particular carve-out, if we may, potentially that could increase the costs. So we would need to be very sure that the benefits were going to outweigh the costs in that and get back to what is a fair price in those things.[334]

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328 Nicky Ison, et al., *The Australian community renewable energy sector*, 37.

329 Dr David Perry, *Transcript of evidence*, 2.

330 Josh Roberts, Frances Bodman and Robert Rybski, *Community power*, 11.

331 Mr Chris Weir, President, Bendigo Sustainability Group, *Transcript of evidence,* Daylesford, 30 May 2017, 5.

332 For example, Northern Alliance for Greenhouse Action, *Submission 36*, 5; Victorian Community Solar Alliance, *Submission 49*, 12; GV Community Energy, *Submission 85*, 5; Coalition for Community Energy, *Submission 92*, 13.

333 Ms Linda Parlane, *Transcript of evidence*, 5.

334 Mr Scott Hamilton, *Transcript of evidence*, 9.

Another way for community energy groups to secure a good price for the electricity they generate is working with an energy retailer that is willing to purchase their energy.[335] Several retailers operating in New South Wales, such as Enova Energy and Energy Locals, purchase electricity generated by community energy projects. Community energy retailers are explored further in Chapter 6.

4.2.4 Financial support

A common concern among community energy groups is a lack of funds to get their project to the stage where it is investment ready. Some stakeholders requested that the Victorian Government provide community energy groups start-up funding to assist with project development, whereas others believed that community energy projects should not rely on government support. In addition, stakeholders also suggested tax relief and favourable bank loans as measures to reduce the financial burden on community energy projects. These options are discussed below.

Start-up funding

Community energy groups considered government funding for feasibility studies and project implementation as a valuable way to encourage the development of community energy projects.[336] Volunteer groups could use government seed funding to recruit staff on a temporary basis to fast-track project implementation and to engage lawyers and accountants.[337]

The awarding of a government grant can also provide credibility to a community energy group and enable it to attract more investors. The Coalition for Community Energy offered ClearSky Solar Investments as an example of a community energy group that has been able to leverage $10 in community investment for every $1 of government funding it received.[338] ClearSky has developed 14 community-funded solar energy projects since it received a $60 000 grant from the New South Wales Government. The grant was used to set up a model for the project that has since been replicated for other projects.[339]

The Victorian Government is already providing financial support to community energy groups to fund business cases, feasibility studies and project implementation. In 2016, it set up a $20 million New Energy Jobs Fund to help finance new energy technology projects under four categories: community, manufacturing, technology and energy storage.[340] The first round of the

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335 Nicky Ison, et al., *The Australian community renewable energy sector*, 37.

336 For example, BEAM Mitchell Environment Group, *Submission 29*, 2; Yarra Community Solar, *Submission 30*, 3; City of Ballarat, *Submission 42*, 1; Victorian Community Solar Alliance, *Submission 49*, 5; Horsham Rural City Council, *Submission 58*, 2.

337 Yarra Community Solar, *Submission 30*, 3; Horsham Rural City Council, *Submission 58*, 2; Victorian Community Solar Alliance, *Submission 49*, 5; Mr Mick Lewin, *Transcript of evidence*, 4.

338 Coalition for Community Energy, *Submission 92*, 7.

339 Emeritus Professor Warren Yates, Board Member, ClearSky Solar Investments, *Transcript of evidence,* Sydney, 15 February 2017, 2.

340 Department of Economic Development, Jobs, Transport and Resources, *New energy technologies sector strategy: Victoria's future industries* (2016), 9.

New Energy Jobs Fund awarded $5.8 million to 24 projects, 18 of which were community energy projects. The second round will have separate streams for community and industry, and the community stream will provide two categories of support: project development and project implementation.[341]

Some community energy groups found the application process for grants funding onerous and requested that the process be simplified. For example, Euroa Environment Group, a community environment group in the Strathbogie Ranges, requested 'that application processes are streamlined and not oppressive as community organisations are often run by volunteers whose time is limited.'[342] Mr Ron Ipsen, Vice President of Voices of the Valley, a community group developing a renewable energy project in the Latrobe Valley, also suggested:

> rolling grants instead of rounds. We have a lot of trouble with being prepared for a grant at a certain time … if we could have a rolling grant so that we could apply, you'd say that these grants will be open until such and such a time. That we could apply in the interim periods. Because very often we're not ready or things change.[343]

In contrast, some stakeholders did not recommend that community energy groups rely on government funding. They suggested that community energy projects be set up so that they can be self-funding. For example, Energy for the People, a social enterprise that develops and delivers clean energy projects, stated:

> We strongly recommend that government support be directed at initiatives and projects, which have a clearly defined plan for becoming a self-funded venture, over the long term. Too often, we see pilots and programs that achieve results while government support exists, only to cease when that funding ends. Self-funded models not only eliminate that ongoing need for government support, but also the significant transaction costs for both market participants, and communities.[344]

Mr Holmes à Court also did not agree with governments providing community energy groups with large grants without some kind of support and accountability measures:

> There are plenty of examples where government has thrown in $200 000 to a feasibility [project] and the group has gone and given it to a consultant, they have written a 3-inch report and it is been forgotten a year later. That does not work.[345]

He instead recommended that communities be 'drip-fed' small amounts of funding over time based on their performance, while also having access to a support person to contact if they encounter problems.[346] Similarly, Ms Jennifer Lauber Patterson, Managing Director of Frontier Impact Group, spoke of the importance of community energy groups not depending on grants:

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341 Victorian Government, *Submission 98*, 9.

342 Euroa Environment Group, *Submission 31*, 2.

343 Mr Ron Ipsen, Vice President, Voices of the Valley, *Transcript of evidence,* Traralgon, 6 March 2017, 5.

344 Energy for the People, *Submission 4*, 2–3.

345 Mr Simon Holmes à Court, *Transcript of evidence*, 5.

346 ibid, 6.

> Grants can come in and out of fashion, as we know. If you want a viable longer term commercial model, grants cannot be relied upon, but also there is a limited pool. If we are talking about mobilising a community's energy and being able to develop a lot of these systems, we have got to find ways where we do not have to rely on grant funding. Where grant funding is useful is demonstrating new models that have not been developed before and providing case studies and guidance. Once these tools are developed, then it should be able to then mobilise projects without needing that funding.[347]

Frontier Impact Group provides corporate advisory and capital raising services for technologies and projects that deliver high social and environmental benefits. In 2017, it released a financial toolkit for behind-the-meter-solar community energy projects that was funded by a grant from the Australian Renewable Energy Agency (ARENA). Ms Lauber Patterson stated that the granting of government funding would be less risky if a standard financial template was used in the application process. She said:

> If I had a fund, one thing I would require to make it easier is to use a financial template, because you know how the financial template works, there is consistency and it is very easy to review one project to another. If they meet certain criteria, then funding could be provided as part of that.[348]

The National Community Energy Strategy, developed by the Coalition for Community Energy for ARENA, also recognised that 'if the community energy sector is to grow and thrive it cannot rely on grants.'[349] One way of getting better value out of government grants is the use of a revolving loan fund. The fund would loan money to finance individual projects and reinvest loan repayments into new community energy projects.[350] Local government in Cornwall, United Kingdom has implemented a revolving loan fund model.[351]

A revolving and forgivable loan model for community energy has also been suggested in Canada. TREC Renewable Energy Co-operative, a Canadian non-profit organisation that advocates for and supports the transition to 100% renewable energy, supports a model where governments provide loans for a project's start-up costs that are repaid if the project comes to fruition or forgiven if not.[352]

Scotland has implemented forgivable loans. Local Energy Scotland is a consortium made up of five charities and social enterprises involved with energy efficiency and renewable energy. It administers and manages the Scottish Government's Community and Renewable Energy Scheme, which has been

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347 Ms Jennifer Lauber Patterson, Managing Director, Frontier Impact Group, *Transcript of evidence,* Melbourne, 20 March 2017, 5.

348 ibid.

349 Institute for Sustainable Futures, et al., *National community energy strategy*, 24.

350 ibid.

351 Cornwall Council, *Community energy remains at the heart of Cornwall Council's energy agenda* (2017), <www.cornwall.gov.uk/council-and-democracy/council-news-room/media-releases/news-from-2017/news-from-march-2017/community-energy-remains-at-the-heart-of-cornwall-council-s-energy-agenda> viewed 31 July 2017.

352 TREC Renewable Energy Co-op, *Accelerating renewable energy for co-operatives in Canada: a review of experiences and lessons*, report prepared by Judith Lipp, Alice Dixon and Mumtaz Derya Tarhan (2016), 20.

providing development and pre-planning loans for community energy projects since 2011. Local Energy Scotland offers early development loans of up to £150 000 at an interest rate of 10%. If a project does not proceed, for instance if it fails to obtain planning approval, the loan is written off as a grant. At present 40% of loans are written off, which Local Energy Scotland's representatives stated is largely due to the recent feed-in tariff reduction which has made projects focussed on generation less viable.[353]

Providing community energy groups loans to cover start-up costs rather than grants would encourage these groups to develop a solid business case before applying for financial support from government. Community energy groups seeking loans should be required to meet strict financial criteria that demonstrate their project's viability and capacity for self-funding over time.

FINDING 5: Government grants can assist community energy groups with their project's start-up costs, but might not encourage self-sufficiency. A loan fund model can be a more prudent financial support mechanism for community energy.

RECOMMENDATION 4: The Victorian Government replace grant funding for community energy projects with a loan fund.

RECOMMENDATION 5: Any financial support the Victorian Government gives to community energy groups has strict criteria to assess a project's financial viability and capacity to become self-funded.

Tax relief

Another measure suggested to financially reward community energy projects was tax relief.[354] In some European countries, community investment in renewable energy projects is encouraged through tax breaks. For example, in the United Kingdom, the Seed Enterprise Investment Scheme and the Enterprise Investment Scheme enable members of eligible social enterprises to offset 50% or 30% respectively of their investment against their personal tax liability.[355] Other tax incentives that have been implemented overseas include production tax credits and accelerated depreciation.[356]

Favourable bank loans

In Germany and Denmark, ethical banks offer investors in community energy projects favourable loan terms and rates. For example, the government-owned German Development Bank offers loans covering up to 100% of a project's capital costs with favourable terms. In addition, the Fælleskassen bank in Denmark has

353 Economic, Education, Jobs and Skills Committee, *Report on international study tour: Inquiry into community energy projects* (2017), 18.

354 Professor Samantha Hepburn, Director, Centre for Energy and Natural Resources Law, Deakin University, *Transcript of evidence,* Waurn Ponds, 5 December 2016, 5.

355 Josh Roberts, Frances Bodman and Robert Rybski, *Community power*, 50.

356 Community Power Agency, *Government support options for community energy: best practice international policy*, report prepared by Jarra Hicks and Franziska Mey (2014), 7.

offered community and individual investors share financing for wind turbines at below market rates, provided the investors held a savings account with the bank.[357] The government-run Danish Energy Agency also offers loan guarantees to community investors for conducting feasibility studies on potential wind energy projects.[358]

4.2.5 Encouraging collaboration

The evidence presented to the Committee highlighted that collaboration with renewable energy developers or local government is beneficial for community energy projects. Community energy groups are able to take advantage of the expertise, access to funding and economies of scale that developers or local councils can offer.

Collaborating with developers

Collaboration between community energy groups and renewable energy developers for large-scale projects is a way for communities to participate in the energy economy with less risk. The developer can raise most of the equity and manage the technical and legal aspects of the project, while community involvement can help secure the support of local residents. SkyFarming, a consultancy that has developed and project managed two community wind farms in Western Australia, recommended that community energy groups work with 'an experienced developer who will be able to supply the expertise and funding.'[359]

Community energy groups can also take advantage of the economies of scale offered by larger projects that they can develop with renewable energy developers. This is especially the case for wind projects, where the many expensive fixed costs, such as legal fees, permit applications, grid connection, construction of roads to access the site and crane hire, can be spread over many turbines.[360] Case study 4.3 presents the example of a wind farm in Scotland that is partially owned by a local community group.

Another example is the Coonooer Bridge Wind Farm in Victoria, which is jointly owned by wind energy developers Windlab Limited and Eurus Energy and neighbouring landholders. Every household situated within 3.5 kilometres of the wind farm was given a small equity share ownership in the project, and they were also given the opportunity to invest in the wind farm. The neighbours now own 3.7% of the project and earn a return proportionate to their investment.[361]

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357 Mark Bolinger, *Community wind power ownership schemes in Europe and their relevance to the United States* (2001), 14.

358 Morten Bæk, *Community energy, energy efficiency and energy security in Denmark*, 22.

359 SkyFarming, *Submission 84*, 2.

360 Mark Bolinger, *Community wind power ownership schemes in Europe and their relevance to the United States*, 6.

361 Mr Roger Price, Chief Executive Officer, Windlab, *Transcript of evidence,* Melbourne, 21 November 2016, 2.

CASE STUDY 4.3: Fintry Development Trust and the Earlsburn Windfarm

The Fintry Development Trust was set up in 2007 by the community of Fintry, a small village 30 kilometres north of Glasgow. When a developer approached the community to build a wind farm nearby, the Trust negotiated to buy into the scheme so that the community now effectively owns one of the 15 turbines at the Earlsburn Windfarm and earns one fifteenth of the total income. The Trust is a company limited by guarantee and has charitable status. It has over 150 members and membership is restricted to Fintry residents.[362]

The wind farm project had its origins in 2003 when two residents of Fintry were investigating options to develop a community renewable energy project with support from the community council. At the same time, West Coast Energy approached the council about developing a 14-turbine wind farm southwest of Fintry. Instead of setting up a separate renewable energy project, the Fintry residents decided to work with West Coast Energy to develop a joint venture.

The local community preferred to invest in a 'community turbine' that benefited the whole community rather than a cooperative buy-in scheme, which would only benefit community members who could afford to invest. The Trust, West Coast Energy and the renewable energy developer, Falck Renewables, agreed to install a fifteenth turbine and Falck lent the Trust the money to construct the fifteenth turbine. The loan will be repaid over 15 years and the Trust receives income twice yearly.[363]

The wind farm began generating electricity in December 2007 and the Trust received its first tranche of income in April 2008. Since then the Trust has used the revenue from the wind farm to install 120 renewable energy projects around Fintry including 27 solar PV installations, 35 biomass projects, 27 air-source heat pumps and 18 ground-source heat pumps. The Trust also provides the community with energy advice and energy efficient transport such as car and bike sharing schemes.[364]

Dr Perry from Hepburn Wind noted the downside of collaboration with renewable energy developers is that there will be less community involvement and control. He stated:

> I think that is an important thing, and it is a risk for these large-scale projects—that those community interests will be kind of washed over. But it is really down to the developers to be sensitive to that and set up appropriate controls and governance structures so that the return and some aspect of control is also given to the local community.[365]

Community energy groups can also collaborate with commercial businesses for smaller renewable energy projects. For example, ClearSky Solar Investments is a not-for-profit social enterprise that links community and individual investors with solar projects in need of financing. It partners with a for-profit solar

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362 Fintry Development Trust, *About*, <www.fintrydt.org.uk/about> viewed 30 June 2017.

363 Friends of the Earth Scotland, *Shared ownership in Scotland: opening up citizen participation in renewable energy*, report prepared by Anne Schiffer (2017), 8–9.

364 Fintry Development Trust, *History of Fintry Development Trust*, <www.fintrydt.org.uk/history-of-fintry-development-trust> viewed 30 June 2017.

365 Dr David Perry, *Transcript of evidence*, 3.

installation company, Smart Commercial Solar, that conducts the feasibility studies, installs and maintains the solar panels, and bills the customer. As explained by Emeritus Professor Warren Yates, a Board Member of ClearSky:

> as a community not-for-profit group run entirely by volunteers, we had to be very careful how we used our resources and we figured that the best use of our resources was not in finding sites, not in doing analysis, not in putting solar on roofs, but simply in financing solar projects ... So all we have to do is raise the money from the community investors and send a bill to our commercial partner every quarter for the energy which has been generated and then distribute it to our investors, and that is something we can do with volunteer staff given we have a very efficient web based system to do it.[366]

ClearSky Solar Investments has funded the installation of 14 solar projects throughout Australia, mostly in New South Wales. It used a $60 000 grant from the New South Wales Office of Environment and Heritage to cover the legal costs of setting up the contracts and developing a website and administration system. The contracts are replicated for each new project, so there are no more legal costs.[367] When a new project is ready for investment, everyone who has registered their interest on ClearSky's website is sent details of the project and is able to apply for units in the trust associated with the project.

Collaboration with renewable energy developers enables community groups to participate in the energy economy without taking on too much financial risk. Community energy groups and commercial developers should be encouraged to work together to develop renewable energy projects because these projects have a greater chance of financial success and community support.

FINDING 6: Community energy groups can develop projects with less financial risk if they partner with renewable energy developers who can provide equity, expertise and better economies of scale.

The Victorian Government can encourage collaboration between community energy groups and developers by implementing Recommendation 2, which would assess the level of community ownership or engagement in a renewable energy project when evaluating bids for the reverse auction scheme.

Collaboration with government

There are various ways that community energy projects could collaborate with state and local governments to help develop community energy projects. For example, several stakeholders mentioned that state and local government buildings could be used as host sites for community solar projects.[368] Local government could also work with community energy groups to identify suitable host sites. Mr David Meiklejohn, Executive Officer of the Northern Alliance for Greenhouse Action, stated that this had already occurred in some councils:

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366 Emeritus Professor Warren Yates, *Transcript of evidence*, 2.

367 ibid, 7.

368 For example, Northern Alliance for Greenhouse Action, *Submission 36*, 5; Victorian Community Solar Alliance, *Submission 49*, 13.

> some of our councils and some of the councils in other alliances have looked at how to start to map those areas to make it easier for community groups in the future to be able to identify what are going to be those suitable properties. So whether they are commercial properties or existing council properties or even state government properties—for example, like schools, which often have fantastic roof space.[369]

Local governments can also collaborate with community energy groups by entering into power purchase agreements with them. Mr Brown from the Goulburn Broken Greenhouse Alliance stated:

> One area of interest that councils are potentially trying to work with their communities is seeing whether they can sponsor or be involved in community energy projects where they themselves could become a customer of the energy that is generated through these programs and cause some economic closed-loop circles with some of that operational expenditure, which to date has always left these municipal boundaries and gone elsewhere … That is one of the main current focuses of councils because it is an opportunity they can look to to add value to an existing spend without needing additional resources to do so.[370]

An example of collaboration between local government and a community energy group is Lismore Community Solar, which was established by community group Farming the Sun Lismore and Lismore City Council. Lismore Community Solar's project consists of two 100 kW solar farms located at council properties that were financed by the community energy group. The projects will save the council about $41 000 in energy costs annually and help Lismore City Council achieve its aim to obtain all electricity from renewable sources.[371]

Collaboration with other community energy groups

Another beneficial collaboration for community energy groups is that with other groups working in the same space. Stakeholders mentioned that opportunities for community energy groups to share experiences and information with one another are very helpful. For example, Mr Ipsen from Voices of the Valley stated:

> Last week a lot of us attended the energy congress, the Community Energy Congress in Melbourne … That allows people to get together, allows the exchange of information that otherwise just is too difficult. It provides encouragement. Very often your community groups are working on their own in isolation. When you can put them together with other community groups then they encourage each other.[372]

Examples of community energy networks that can support and mentor other groups are presented in Section 4.2.6 below.

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369 Mr David Meiklejohn, Executive Officer, Northern Alliance for Greenhouse Action, *Transcript of evidence,* Melbourne, 24 October 2016, 10.

370 Mr Thomas Brown, Goulburn Broken Greenhouse Alliance, *Transcript of evidence*, 2.

371 Farming the Sun, *Community Solarfarm loan model*.

372 Mr Ron Ipsen, *Transcript of evidence*, 3.

4.2.6 Providing project development resources and support

Community energy groups are often run by volunteers who may lack the legal, technical, accounting and project management skills required to develop and operate a successful community energy project. A common theme in the evidence presented to the Committee was the need to provide resources and support to community energy groups, such as toolkits, advice, support and coordination. For example, Locals into Victoria's Environment, a climate change action group based in the City of Port Phillip, stated:

> At this early stage of [community-owned renewable energy]'s development, there is a strong case for government grant funding to build cost-effective centralised resources, replicable processes, and accessible common tools and resources that can be used by numerous [community energy] groups. This will help bring down costs and reduce the burden on volunteers.[373]

This section discusses the different types of resources and support stakeholders identified as necessary to encourage the development of community energy projects.

Guides and toolkits

Various stakeholders requested the development of guides and toolkits for community energy groups that would provide examples of best practice, practical tools for developing business and governance models, and community engagement templates.[374] Several guides and toolkits have already been developed to address the shortage of skills and knowledge among community energy group volunteers. Examples include the Victorian Government's *Guide to community-owned renewable energy for Victorians*, which provides community energy groups information on the commercial, technical, governance and regulatory aspects of developing and operating a community energy project.[375]

Frontier Impact Group's *Behind the meter solar PV: funding guidebook* is a toolkit that comprehensively guides community energy groups through the steps required to develop a community solar energy project.[376] Development of the toolkit was funded by ARENA and its aim was to improve financial literacy in the community energy sector. Frontier Impact Group's Managing Director Ms Lauber Patterson explained:

> it would take two years sometimes for a community energy group to actually develop a financial model that made any sense—and still they were not sure whether it achieved the right outcomes. Sometimes it is just as important to know that a project does not work, because why spend two years on a project and then find it is not actually economically viable?[377]

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373 Locals into Victoria's Environment, *Submission 15*, 1.

374 For example, Mr Gregory Clark, *Submission 23*, 4; Victorian Community Solar Alliance, *Submission 49*, 4; Geelong Sustainability, *Submission 60*, 5; The University of Melbourne, *Submission 70*, 3.

375 Department of Economic Development, Jobs, Transport and Resources, *Guide to community-owned renewable energy for Victorians*.

376 Frontier Impact Group, *Behind the meter solar PV: funding guidebook* (2017).

377 Ms Jennifer Lauber Patterson, *Transcript of evidence*, 2.

In addition to producing the toolkit, Frontier Impact Group will also run training workshops to help community energy groups work through actual projects. Ms Lauber Patterson added:

> What we are proposing to do in the training workshops is to do actual projects—providing what information do you need to be able to put into the financial model, and get them prepared before they actually do the workshop—then we go in there and we fill in the numbers that need to be filled in with the information they have got. This would take 12 months for organisations to do in the past. You can imagine. They are there, we can work through how to use those numbers, what they need before they even need to go into that meeting, and they can do their prefeasibility as part of that. That is really fast-tracking the potential for this.[378]

Guides and toolkits provide valuable information but they are only a start. When asked whether the toolkit meets Geelong Sustainability's requirements, Mr Dan Cowdell, the group's renewable energy project coordinator stated:

> It satisfies some of our needs. I believe the way it's able to produce a profit and loss and cash flow and indicative feasibility of the project is good. However, from a community point of view, I'm not an accountant and it does seem overly complex so I think it would need to be delivered with workshops or some perhaps a simplified version for it to be really useful. It is a good start however, yes.[379]

Mr Holmes à Court agreed, stating:

> There have now been several guides written … I think they are very, very useful at the early stages for people to work out. At the early stages in a community there will be all sorts of ideas. Very quickly you work out do you have a local resource? Do you have some leaders in the community? Do you have a supportive council? They help you very quickly narrow down through those guides.[380]

However, he added that guidebooks 'would not have been anywhere near as useful as the support we got from Sustainability Victoria' to develop Hepburn Wind in terms of mentoring and hands-on support.[381] The Clean Energy Council, Australia's peak body for the clean energy industry, also argued that guidebooks are not enough to develop large renewable energy projects, which really need full-time staff working on them. Ms Alicia Webb, Policy Manager at the Clean Energy Council, stated:

> Even when the guides exist and even if the legal structures and the contracts exist … you need actual skilled professionals on the ground in the communities. Hepburn Wind was very fortunate in that it had people in the community with the time and the expertise to invest. Not all communities have that. People have jobs. I feel like you really need full-time staff on a project this expensive and complex.[382]

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378 ibid, 5.

379 Mr Dan Cowdell, Project Coordinator – CORE Geelong, Geelong Sustainability, *Transcript of evidence,* Waurn Ponds, 5 December 2016, 5.

380 Mr Simon Holmes à Court, *Transcript of evidence*, 5.

381 ibid.

382 Ms Alicia Webb, *Transcript of evidence*, 5.

She also added that for large projects, community energy groups should collaborate with renewable energy developers to take advantage of their access to expertise:

> Even if the guides exist the communities do not always have the time resources. That is why I think there is a really good opportunity for communities to work with established developers, who have on-the-ground professionals, lawyers, legal teams et cetera, building these complex projects that communities can take part in without actually trying to create them from scratch themselves.[383]

FINDING 7: Guides and toolkits are useful in the early stages of a community energy project's development, but community energy groups require further mentoring and practical training to implement a project fully.

Advice, support and coordination

Throughout the Inquiry, community energy groups acknowledged that they had time constraints and did not have all the necessary skills and knowledge in house. Since volunteers run most groups, they appreciated education and guidance on developing and running community energy projects. For example, Ms Wilkinson from Renewable Albury-Wodonga Energy noted the value of support sessions provided through the New Energy Jobs Fund with sustainability organisation, the Alternative Technology Association and climate change organisation, Moreland Energy Foundation.[384] She added:

> There was also a workshop prior to that about understanding community energy, and that is just incredibly valuable. I am just a businessperson off the street who thinks we should be putting in more renewable energy. I know nothing of VRETs and the energy market. It has been a very big learning curve for me, and I still feel incredibly unknowledgeable. So any sort of support like that regionally is just so fantastic, and we learned so much on those days.[385]

Overseas, intermediary organisations have helped community energy groups through the provision of technical, financial and legal information and advice, and on-the-ground mentoring.[386] For example, in Scotland, the Government's Community and Renewable Energy Scheme (CARES) offers a support package to community renewable energy developers that includes free advice and support in addition to start-up grants and loans. Case study 4.4 discusses the Scottish Government's community energy policies.

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383 ibid.

384 Ms Michelle Wilkinson, *Transcript of evidence*, 6.

385 ibid.

386 Community Power Agency, *Government support options for community energy*, 9–10.

CASE STUDY 4.4: Community energy in Scotland

Scotland has a well-developed community energy sector using technologies such as wind, bioenergy, solar and mini-hydro. In 2011, the Scottish Government set a target of 500 MW of community and locally-owned renewable energy by 2020, which was achieved in 2015.[387] To achieve this target, the Scottish Government implemented financial support mechanisms for community energy projects and developed good practice guides to set out expectations and provide guidance to community groups.

It also implemented the Community and Renewable Energy Scheme (CARES), which offers a support package to community renewable energy developers that includes:

- free advice and support
- free online toolkits
- start-up grants of up to £10 000
- pre-planning loans of up to £150 000
- support to access post-planning loans.[388]

Local Energy Scotland, a consortium of five charities and social enterprises involved with energy efficiency and renewable energy, administers and manages CARES. It has a network of development officers throughout Scotland who provide regional support and advice to community groups. The officers help to assess the viability of renewable energy projects, identify and overcome challenges encountered during development and direct groups to specialist legal, financial and project management services.[389]

The Scottish Government has set a new target that at least half of newly approved renewable energy projects will be partially owned by the community by 2020. To encourage shared ownership, the Government provides rates relief and considers the extent of community ownership when assessing planning applications.[390]

Many stakeholders requested that the Victorian Government establish an intermediary organisation to provide community energy groups with hands-on advice and support. Some suggested that Sustainability Victoria take on this role.[391] Another common suggestion was to establish Community Powerhouses in several regions throughout Victoria to build capacity among community energy groups to develop projects.[392] Community Powerhouses would be regional community hubs that provide expertise, advice, coordination and support

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387 Fiona Young and Kalina Georgieva, *Community and locally owned renewable energy in Scotland at September 2015*, 1.

388 Local Energy Scotland, *CARES: progress and impact* (2016), 6–8.

389 ibid, 6.

390 Scottish Government, *Onshore wind policy statement: shared ownership* (2017), <www.gov.scot/Publications/2017/01/7344/8> viewed 3 July 2017.

391 For example, BEAM Mitchell Environment Group, *Submission 29*, 2; Energy Innovation Co-operative, *Submission 52*, 8; Environment Victoria, *Submission 72*, 5; Australian Wind Alliance, *Submission 89*, 4; Coalition for Community Energy, *Submission 92*, 13.

392 For example, Northern Alliance for Greenhouse Action, *Submission 36*, 5–6; Victorian Community Solar Alliance, *Submission 49*, 5; Energy Innovation Co-operative, *Submission 52*, 7; Geelong Sustainability, *Submission 60*, 7; Macedon Ranges Sustainability Group, *Submission 64*, 7; Energy Locals, *Submission 68*, 5; Environment Victoria, *Submission 72*, 5–6; Friends of the Earth (Melbourne), *Submission 83*, 5; Coalition for Community Energy, *Submission 92*, 14.

for community energy groups in their region. They would operate similar to Scotland's CARES model by providing grant funding and an information-sharing network, in addition to providing advice, support and coordination.[393]

Mr Tom Nockolds, Secretary of Pingala, an incorporated association based in Sydney that develops community solar projects, provided the example of how Moreland Energy Foundation in Melbourne has assisted community energy groups to develop projects in a similar way:

> there's a really big challenge about expertise, knowledge and support for these groups and one of the great things that we can point to nationally in the community energy sector is the success in the Moreland area with Moreland Energy Foundation. They have been a local organisation that has built within itself knowledge of these challenges and they know that it's door 46 for that particular room. So when there's a local community group developing a project in their area, they can help them with that knowledge … So we believe there should be more organisations like that peppered all around the country. They should be well resourced. Moreland was founded with multimillions of dollars in the year 2000 and that's why they've been so successful.[394]

Moreland Energy Foundation Limited (MEFL) is an independent not-for-profit organisation that was established by Moreland City Council in 2000 following the privatisation of the Victorian electricity industry. Its aim is to reduce greenhouse gas emissions and improve energy efficiency through local action, and it has provided practical support to the Moreland community on how to take up renewable energy and improve energy efficiency.[395]

Mr Manny Pasqualini, Renewables Broker at MEFL, supported the development of Community Powerhouses to coordinate activities in the community energy sector that are occurring in a range of communities, using different technologies in an ever-changing energy market.[396] He stated:

> You are seeing groups from right across the country from diverse communities, diverse locations all working toward similar things from similar principles … So I see the Community Powerhouse model as just being a really effective way of helping to coordinate those … I think what would not be such an effective way to do it is to try and do it from a centralised position … Governments are doing a really good job in facilitating the process. But on their own from those positions it is quite a hard thing to do, and I think you need to try and utilise the knowledge and the networks that you have around the country through something like Community Powerhouses.[397]

Community energy groups that had previously received support from Sustainability Victoria, such as Hepburn Wind and Energy Innovation Co-operative, praised the organisation's knowledge of the sector. For example,

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393 Coalition for Community Energy, *Submission 92*, 14.

394 Mr Tom Nockolds, Secretary, Pingala, *Transcript of evidence,* Sydney, 15 February 2017, 7.

395 Moreland Energy Foundation Limited, *The MEFL story*, <www.mefl.com.au/about-us/the-mefl-story> viewed 3 July 2017.

396 Mr Manny Pasqualini, Renewables Broker, Moreland Energy Foundation Limited, *Transcript of evidence,* Melbourne, 24 October 2016, 6.

397 ibid.

Ms Susan Davies, Secretary/Director of Energy Innovation Co-operative, which assists communities across Bass Coast, South Gippsland and Cardinia Shires to access renewable energy and become more energy efficient, stated:

> One of the lessons was how good it was to have Sustainability Victoria as a very focused organisation that had a lot of people in it at the time who really understood renewable energy. That was brilliant. They knew what they were talking about, and we have learned a lot from them, so that was fabulous. It was probably the quickest application process I have ever done in my life because everybody understood what each other was talking about.[398]

When the Committee asked Victoria's Renewable Energy Advocate, Mr Corbell, whether Sustainability Victoria should be appointed to assist community energy groups, he responded:

> I do not have a strong view as to which vehicle it should be, but I would agree that there does need to be an outreach capability to provide that point of information and advice and referral that groups need, because often in communities what we are finding is there is one person who is really driving it and there are lots of other people who are around them who are supportive, but they are out in a rural or regional community somewhere. They are fairly isolated in terms of access. They are reliant on contact with people often in Melbourne or Sydney or elsewhere to get that information, and that can be quite challenging. So if there was an outreach capability, and certainly Sustainability Victoria do have an excellent network of regional centres and liaison officers, that I think would make a lot of sense.[399]

Mr Hamilton of the Department of Environment, Land, Water and Planning agreed that there is a role for Sustainability Victoria and that it is building its capacity in the community energy efficiency space.[400]

In April 2017, the Victorian Government announced that it will trial Community Power Hubs in three regional areas over a two-year period to help develop community-owned and operated renewable energy projects. The pilot Community Power Hubs will be located in Ballarat, Bendigo and the Latrobe Valley and will be hosted by a local not-for-profit or social enterprise organisation. The purpose of the hubs is to coordinate and facilitate the development and expansion of community energy in the region by building capacity and skills. Sustainability Victoria will be selecting the hosts, who will be able to apply for grants of up to $110 000 per year over a period of two years to run the hub. A Sustainability Victoria employee will also provide direct support to the host during the pilot.[401]

FINDING 8: Intermediary organisations that provide community energy groups with advice, support, expertise and coordination can provide much needed assistance and boost the development of the community energy sector.

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398 Ms Susan Davies, Secretary/Director, Energy Innovation Co-operative, *Transcript of evidence,* Melbourne, 21 November 2016, 3.

399 Mr Simon Corbell, *Transcript of evidence*, 6.

400 Mr Scott Hamilton, *Transcript of evidence*, 11.

401 Sustainability Victoria, *Pilot Community Power Hubs* (2017), <www.sustainability.vic.gov.au/services-and-advice/funding/pilot-community-power-hub> viewed 3 July 2017.

RECOMMENDATION 6: The Victorian Government continue funding and consider expanding Community Power Hubs to other Victorian regions if results from the pilot program show they are valuable to the development of the community energy sector.

Platform solutions

Community energy groups often work on small projects that lack the economies of scale to ensure financial viability. The development of shared service platforms can help community energy groups achieve economies of scale by centralising services such as financing and administration.[402] An example is Energy Locals, which provides a fixed-cost retail service platform for community energy groups in New South Wales (and has applied for a licence to operate in Victoria). Energy Locals undertakes the back-end functions for community energy groups such as metering and billing and takes on the investment risk and compliance requirements.[403]

Ms Wilkinson from Renewable Albury-Wodonga Energy added that community energy groups would find it very valuable to have a shared support person that could help with administrative tasks:

> we really support some action around some level of funding for a support person, whether that be shared amongst regional community energy groups, just to support those basic functions around administration and how we participate in energy markets. For example, regional community energy groups could share an administrative function, be that auspiced by, say, a greenhouse alliance structure or through local government—some sort of auspicing arrangement like that—just to support the work that all of these volunteer community energy groups are trying to participate in and just recognising the fact that there is a lot of work that is required to actually understand a lot of these complex energy markets, especially the VRET auction process at the moment.[404]

A platform solution can also be a system that works across multiple communities and is easily replicated for other projects. According to Energy for the People, platform solutions provide 'backbone infrastructure, which avoids duplication and wasted spending across multiple projects.'[405] It has a created an online crowdfunding platform for solar energy projects that can be used by multiple community groups to finance their projects. Another example is ClearSky Solar Investments, which has created a model that can be replicated across multiple projects, as discussed above in Section 4.2.6.

FINDING 9: Platform solutions can help community energy groups create economies of scale and replicate their projects.

RECOMMENDATION 7: The Victorian Government support the development of platform solutions for community energy projects through financial mechanisms tied to the Victorian Renewable Energy Target.

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402 Institute for Sustainable Futures, et al., *National community energy strategy*, 24.

403 Energy Locals, *Submission 68*, 3.

404 Ms Michelle Wilkinson, *Transcript of evidence*, 2.

405 Energy for the People, *Submission 4*, 2.

4.2.7 Community engagement

Community engagement is essential to the success of a community renewable energy project. Despite its environmental benefits, a renewable energy project will have some impact on the community, even if it is only visual, such as the presence of solar panels or wind turbines. Therefore, community energy groups must ensure that they engage with local residents to secure support for the project. Community engagement can also assist with attracting funding, from not only community members but also larger investors who will have more confidence if they know the local community is on board with the project.[406]

Mr Tosh Szatow, Director and Co-founder of Energy for the People, which has worked with the towns of Newstead and Tyalgum to help them transition to 100% renewable energy, believes that technical and economic challenges for community energy projects are solvable, but community engagement is not as easy. He stated:

> the biggest challenge is a social one, and that is building strong, broad support for these projects across these communities. One thing we find is that sometimes these projects are conceived purely in environmental terms, and obviously we are a diverse society in Australia and not everyone is primarily motivated by environmental concerns. So sometimes those projects struggle to develop because they are only attracting people that care about the environment first and foremost. One of the things that Tyalgum and Newstead have done very well is engage more broadly with their community and looked at the financial benefits of these projects to the community and the social benefits, and that has helped build broad support.[407]

Professor Samantha Hepburn is the Director of the Centre for Energy and Natural Resources Law at Deakin University and she is working on a project that is investigating community engagement with public energy resources. She notes that communities are more likely to engage with renewable energy projects if the ownership models are based on cooperative norm principles, such as voluntary membership, democratic control (one vote per member regardless of investment amount), limited profits (main goal is social or environmental) and distribution of surpluses proportionate to investment.[408]

In Europe, local residents tend to be more supportive of renewable energy projects run by social enterprises or cooperatives than commercial developers because they tend to be smaller and more local in nature.[409] Professor Hepburn added that Europe provides good examples of community engagement with renewable energy. For instance, in Demark, the Danish Energy Agency has implemented several measures to engage the community with local onshore wind energy projects. These measures include:

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406 Frontier Impact Group, *Behind the meter solar PV: funding guidebook*, 44.

407 Mr Tosh Szatow, Director and Co-founder, Energy for the People, *Transcript of evidence,* Melbourne, 24 October 2016, 4.

408 Professor Samantha Hepburn, *Transcript of evidence*, 4–5.

409 Dr Neil Simcock, Rebecca Willis and Peter Capener, *Cultures of community energy: international case studies* (2016), 24.

- loss-of-value scheme—where the wind project developer must pay for any property value loss if the loss is at least 1% of the property's value
- option-to-purchase scheme—where the wind project developer must offer at least 20% of the project to local residents for investment.[410]

Bendigo Sustainability Group recommended that the Victorian Government identify local community energy champions and resource them to lead a community awareness campaign to promote and engage the community with local energy initiatives.[411] South Gippsland Shire Council also recommended that local government and community energy networks be encouraged. South Gippsland Shire Council is a member of the Communities Making Energy Together (ComMET) roundtable, which is a group of local government, agencies, community groups and individuals that supports community energy. The Council stated that the involvement of local government in ComMET provides two benefits to the community energy sector; it shares the risk between community and government, and provides legitimacy in the eyes of the community to the group and future projects.[412]

4.2.8 Facilitating grid connection

As discussed in Section 4.1.5, the costs for a community energy group to connect their project to the grid can threaten the viability of the project. Grid connection is expensive because it requires consultation with engineering experts and electricity distributors who will charge upfront fees to cover their costs of assessing the connection application.[413] This does not occur in Germany, Denmark and Sweden, where electricity distributors must follow set rules to connect small wind energy projects to the grid. In these countries, the generator pays the cost of connecting to the nearest feasible point of the grid and the distributor must cover the costs of strengthening or upgrading the grid to enable connection to occur.[414]

Mr Tobias Geiger, Managing Director of WestWind Energy, a wind energy developer based in Victoria, informed the Committee that the obligation for electricity distributors in Germany to cover the cost of grid connection assessment meant that it was in their interest to keep grid connection costs low. He recommended that Australian electricity distributors need incentives to reduce the cost of grid connection for community-scale projects:

> if there was a clear compulsion on the network service providers that they do need to take on the technical complexity and the cost of those connections, that would help greatly. It would also provide an incentive for them to keep the cost low. At the moment there is little incentive for them to keep costs low, and that is where the term gold plating of those connection assets is coming from.[415]

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410 Morten Bæk, *Community energy, energy efficiency and energy security in Denmark*, 22.

411 Bendigo Sustainability Group, *Submission 76*, 10.

412 South Gippsland Shire Council, *Submission 75*, 4.

413 WestWind Energy, *Submission 61*, 3.

414 Mark Bolinger, *Community wind power ownership schemes in Europe and their relevance to the United States*, 49.

415 Mr Tobias Geiger, Managing Director, WestWind Energy, *Transcript of evidence,* Melbourne, 21 November 2016, 3.

FINDING 10: Electricity distributors charge significant upfront costs to assess grid connection applications for new renewable energy projects, which can affect the financial viability of community energy projects.

RECOMMENDATION 8: The Victorian Government work with the COAG Energy Council to develop incentives for electricity distributors to make grid connection less costly for community energy projects.

5 Metropolitan community energy projects

Most community energy projects in Australia and overseas are located in regional areas. Compared with urban areas, regional areas are more likely to have suitable land for renewable energy projects and they may also have distinct energy concerns such as being located at the edge of the electricity grid or in bushfire-prone areas. In recognition of there being fewer projects in urban areas, the Inquiry's terms of reference specifically asked the Committee to consider metropolitan community energy projects. This chapter outlines the challenges for community energy in metropolitan areas and how to overcome them.

5.1 Barriers to metropolitan community energy projects

The Committee heard evidence that the barriers to developing community energy projects in metropolitan areas are largely the same as those experienced in regional areas. In spite of this, there are some unique barriers faced by metropolitan community energy groups who wish to develop a renewable energy project. These barriers are mainly due to the higher housing density and higher proportion of renters and apartment dwellers in inner Melbourne compared with regional areas. This section outlines the barriers common to metropolitan community energy projects, which includes projects in metropolitan Melbourne as well as urban areas in regional towns.

5.1.1 Identifying a suitable site

For a renewable energy project to be financially viable, installation must occur at a site that is favourable in terms of location, property tenure and energy use profile. Community energy groups informed the Committee that it is often difficult to find a site for a renewable energy project in metropolitan areas that meets all these requirements. This evidence in presented below.

Suitable land

Space constraints in metropolitan areas limit the types of energy projects that can be installed. There is a shortage of public land in urban centres that can host a renewable energy project, especially larger scale operations.[416] In addition, the cost of land is higher in urban areas, which makes it harder to acquire suitable land.[417] Consequently, most urban community energy projects are limited to solar projects on rooftops.[418]

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416 Frankston City Council, *Submission 21*, 2.

417 Marieke Oteman, Mark Wiering and Jan-Kees Helderman, 'The institutional space of community initiatives for renewable energy: a comparative case study of the Netherlands, Germany and Denmark' (2014) 4(11) *Energy, Sustainability and Society*, 3.

418 Macedon Ranges Sustainability Group, *Submission 64*, 7.

Suitable buildings

Since most metropolitan renewable energy projects are limited to rooftop solar energy, another important element to the success of a project is the building on which the panels are installed. Usually in metropolitan areas, projects are installed on community buildings such as sports halls and local government buildings, or on private property such as factory buildings with large roof areas.[419] For these buildings to be structurally suitable, most of the roof should be north facing and not overshadowed.[420] Overshadowing is a greater problem in urban areas compared with regional settings, and can often impede the installation of solar panels.[421] High-density and high-rise areas also have the threat of new developments potentially overshadowing existing solar panels.[422]

Other factors affecting the suitability of the building relate to the occupier. Ideally, the occupier of the building should also own it to avoid the split incentive for tenants and landlords to install solar energy (see section 5.1.3 for further explanation). For the project to be in the financial interest of the occupier, the occupier should also be paying standard retail rates for electricity and be willing to purchase the energy generated by the solar installation.[423]

Suitable energy use profile

Due to the low feed-in tariffs paid to generators for the electricity they export to the grid, most community energy projects are only financially viable if the electricity generated is used on site, also known as 'behind the meter'. To achieve this, the size of the installation has to be matched to the building's energy use and ideally, the building should consume most of its electricity during daytime and preferably seven days per week.[424]

Geelong Sustainability, a not-for-profit community association, stated that metropolitan sites with available space for solar panels often do not have a suitable energy consumption profile to make a community energy project viable.[425] Mr Dan Cowdell, a Project Coordinator with Geelong Sustainability, added that even when sites with high energy consumption are found, the occupiers often have agreements with energy retailers where 'they pay very little for their power … so, yes, it can be difficult to find the site where it does financially stack up.'[426]

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419 Mr Gregory Clark, *Submission 23*, 8.

420 Victorian Government, *Submission 98*, 15.

421 City of Melbourne, *Submission 71*, 1.

422 Northern Alliance for Greenhouse Action, *Submission 36*, 7.

423 ibid, 3.

424 ibid.

425 Geelong Sustainability, *Submission 60*, 7.

426 Mr Dan Cowdell, Project Coordinator – CORE Geelong, Geelong Sustainability, *Transcript of evidence,* Waurn Ponds, 5 December 2016, 6.

5.1.2 Technology limitations

The types of renewable energy technologies that can be developed in metropolitan areas are also limited due to technical considerations and planning restrictions. For example, wind turbines are not feasible for urban areas because current planning regulations in Victoria do not allow a turbine to be constructed closer than one kilometre to a dwelling. In addition, high-rise buildings in urban areas can compromise wind resources by creating turbulence and affecting wind speeds.[427] Similarly, bioenergy is less suitable for metropolitan areas because it requires a biomass source nearby and appropriate storage facilities.[428]

5.1.3 Split incentives for tenants and landlords

Large commercial buildings are likely to have the adequate roof space and energy use profile to be suitable hosts for a financially viable community energy project. However, most of these buildings are tenanted and there is no incentive for the landlord to install renewable energy and host a community project.[429] In this instance, there is a split incentive where the landlord will not benefit from investing in renewable energy or energy efficiency measures because the energy and cost savings will accrue to the tenant.[430] While this issue also affects buildings in regional areas, the Committee received evidence that urban areas have a higher proportion of renters.[431]

5.1.4 Dealing with owners' corporation regulations

Nearly one third of all new dwellings approved in Victoria are apartments, which are more common in metropolitan areas than regional areas.[432] Residents of high and medium density apartment blocks use 25% more energy than those in detached houses, and up to half of this energy powers common areas such as hallways, lifts, car parks and swimming pools.[433] Some overseas community energy projects have installed solar projects on apartment buildings and while most of the energy generated is exported back to the grid, some of it powers common areas. For example, Brixton Energy, a cooperative in South London, has installed a solar project on a housing estate in Lambeth that will save the Tenant Management Organisation £4000 (AUD $6700) on energy bills over 20 years.[434]

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427 WestWind Energy, *Submission 61*, 4.

428 Frontier Impact Group, *Submission 86*, 2.

429 Geelong Sustainability, *Submission 60*, 7.

430 Coalition for Community Energy, *Submission 92*, 12.

431 Victorian Government, *Submission 98*, 14; Australian Fabians Vic Branch and LEAN (Labor Environment Action Network), *Submission 97*, 3.

432 Northern Alliance for Greenhouse Action, *Submission 36*, 6.

433 Smart Blocks, *About Smart Blocks*, <smartblocks.com.au/about> viewed 26 May 2017.

434 Repowering London, *Case study of renewable energy co-operatives: Brixton Energy Solar 1, Solar 2 & Solar 3*, <moderngov.lambeth.gov.uk/documents/s77483/LC%2015%2010%20Repowering%20London.pdf> viewed 15 June 2017.

Low and medium rise apartment buildings are particularly suited to solar photovoltaic (PV) installation because they often have a large unshaded roof space and a suitable energy use profile. However, restrictions on how owners' corporations in Australia can conduct business limit the ability of apartment owners to install solar panels on apartment buildings.[435]

Owners' corporations are not allowed to conduct an energy business, so they cannot bill individual apartment owners for energy use. Instead, owners' corporations must work with an energy retailer, create an embedded network and change over existing apartment meters. The cost of changing the metering infrastructure is expensive (up to tens of thousands of dollars), and the energy retailer may have to charge expensive electricity prices to recoup the cost. Another option is spreading the infrastructure costs over a 20-year contract, which can be impractical and unpopular for both parties.[436]

In addition, tax rules discourage owners' corporations from installing large solar PV systems because any income earned from exporting electricity to the grid is considered assessable income and has to be divided between individual apartment owners who must declare it on their individual tax returns. However, this is not an issue if the owners' corporation scales the solar PV system so that all the energy generated is used on site.[437]

5.1.5 Sense of community

Another reason offered for there being fewer community energy projects in metropolitan areas is that there is less of a sense of community, especially in suburban areas.[438] A 2008 review of community energy projects in the United Kingdom noted that this was because urban communities can be less clearly defined, collectively organised and cohesive than regional communities.[439] However, metropolitan communities may have a stronger network to draw from than regional areas in terms of accessing expertise, support and financing.[440] A report on community ownership of wind power for the United States Department of Energy also concluded that urban communities have the benefit of being able to raise investment capital from 'a larger and potentially wealthier investor pool.'[441]

In addition, communities involved in energy projects do not necessarily have to be communities based in a geographic location. As explained by Mr Tom Nockolds, Secretary of Pingala, a Sydney-based association that helps communities to install solar projects on host sites, they can be communities of interest, such as people who want to invest in renewable energy.[442]

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435 Northern Alliance for Greenhouse Action, *Submission 36*, 7.

436 ibid.

437 ibid.

438 SkyFarming, *Submission 84*, 2.

439 Gordon Walker, 'What are the barriers and incentives for community-owned means of energy production and use?' (2008) 36(12) *Energy Policy*, 4401–4405, 4404.

440 SkyFarming, *Submission 84*, 2.

441 Mark Bolinger, *Community wind power ownership schemes in Europe and their relevance to the United States* (2001), 64.

442 Mr Tom Nockolds, Secretary, Pingala, *Transcript of evidence,* Sydney, 15 February 2017, 2.

An example is Sydney Renewable Power Company (SRPC), which has installed solar panels on the roof of the redeveloped International Convention Centre in Sydney. It is a community-owned solar installation, where community investors purchased shares in the company valued at $2750 each to repay the loan used to finance the project. Founding Director of SRPC, Mr Andy Cavanagh-Downs, told the Committee about the range of community investors in the project:

> what we've found is we're inundated with support across society, across professions, to create this kind of outcome that we've seen. So I think what it shows is that people are passionate and do care about climate change and carbon abatement.[443]

He added that the project provided community members who had strong views on climate change with an opportunity to invest in renewable energy.[444]

5.2 Overcoming barriers faced by metropolitan community energy projects

The Committee heard a number of strategies that could be implemented to overcome the challenges to metropolitan community energy projects including ways to identify suitable host sites, environmental upgrade agreements and local energy trading. These suggestions are discussed in the sections below.

5.2.1 Finding suitable host sites

The evidence presented to the Committee suggested alternative host sites and changes to planning regulations that would increase the available options for hosting community energy projects.

Alternative host sites

Stakeholders suggested several alternative host sites for renewable energy projects that could broaden the available options for community energy in metropolitan areas. The University of Melbourne suggested that community energy groups consider buildings occupied by schools, churches, sporting clubs and voluntary groups as potential host sites because they have established social networks that could be leveraged to support the project.[445] Local government stakeholders such as Indigo Shire Council and the South East Councils Climate Change Alliance advocated for partnerships between the public transport sector and community energy groups to install solar panels on public shelters and train station carparks.[446]

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443 Mr Andy Cavanagh-Downs, Founding Director, Sydney Renewable Power Company, *Transcript of evidence,* Sydney, 15 February 2017, 4.

444 ibid, 8.

445 The University of Melbourne, *Submission 70*, 7.

446 Indigo Shire Council, *Submission 93*, 4; South East Councils Climate Change Alliance, *Submission 66*, 3.

Macedon Ranges Sustainability Group added that solar PV arrays could be ground-mounted on old metropolitan landfill sites or unwanted contaminated industrial land, which would be a cost-effective way to repurpose this land.[447] Mr Simon Cover, Manager, Statutory Policy for Planning, Building and Heritage at the Victorian Department of Environment, Land, Water and Planning, also stated that the Department has a team that is working with the Victorian Planning Authority to facilitate the integration of community energy projects within greenfield developments.[448]

Amending planning regulations

Other stakeholders recommended amendments to planning regulations to uncover new potential host sites and protect existing sites. For example, wind energy developer WestWind Energy recommended removing the one kilometre setback rule for wind turbines developed by community groups so long as the noise of the turbines does not exceed acceptable limits.[449]

To protect existing solar panel installations, local governments could consider the impact of overshadowing during the planning process for new developments. The Victorian Government and the Coalition for Community Energy noted that Moreland City Council has developed a planning advisory note that assesses the potential impact of new developments on existing solar panels as part of its planning approval process.[450]

5.2.2 Overcoming the split incentive issue

One of the options proposed to the Committee to overcome the split incentive for landlords to install renewable energy when tenants benefit from the energy savings, was using environmental upgrade agreements (EUAs). EUAs provide council-based financing to businesses for upgrading existing non-residential buildings to improve energy, water or environmental efficiency. EUAs have been available to businesses in the City of Melbourne since 2011 and in all Victorian councils since 2015 following an amendment to the *Local Government Act 1989* (Vic).[451]

EUAs enable building owners to take out a loan at competitive interest rates to pay for upgrades such as solar panel installation. Rather than repaying the lender directly, the local council collects the loan repayments through the existing council rates process and passes them on to the lender. Under commercial leases, tenants usually pay the rates making this a fairer outcome since the tenants benefit from the reduced energy costs. The terms of the EUA should be set to

447 Macedon Ranges Sustainability Group, *Submission 64*, 7.

448 Mr Simon Cover, Manager, Statutory Policy, Planning, Building and Heritage, Department of Environment, Land, Water and Planning, *Transcript of evidence,* Melbourne, 20 March 2017, 12.

449 WestWind Energy, *Submission 61*, 4.

450 Victorian Government, *Submission 98*, 15; Coalition for Community Energy, *Submission 92*, 11.

451 Victorian Government, *Submission 98*, 14.

benefit the tenant by ensuring that the energy savings are more than the increase in rates. The building owner also benefits as the upgrade increases the value of the property.

One of the initiatives of the National Community Energy Strategy, developed by the Coalition for Community Energy for the Australian Renewable Energy Agency, is to develop models of community energy based on EUA financing models.[452] The City of Melbourne and the Northern Alliance for Greenhouse Action, a network of nine metropolitan councils in Melbourne's north, recommended amending the Local Government Act to enable EUAs for residential properties.[453]

Mr Gavin Ashley, Principal of Sustainable Energy and Urban Development at Moreland Energy Foundation, also recommended that a similar financing model be used to fund multi-household solar energy projects.[454] Moreland Energy Foundation is an independent not-for-profit organisation established by Moreland City Council in 2000 to tackle climate change. Mr Ashley noted that when councils access finance to support a residential rates-based program for installing solar, the debt is on their balance sheet. An example is the Darebin Solar $aver program, which installs solar panels on low-income households in the City of Darebin and recovers the cost through council rates. To enable this, the City of Darebin uses the Special Charges Scheme of the Local Government Act (s163), but the liability remains on its balance sheet and this makes other councils reluctant to use this option.

Mr Ashley recommended that the Act be amended to keep debt accumulated through the use of s163 off balance sheet, similar to commercial EUAs. Mr Ashley added that this amendment would be relatively easy because the recently passed EUA legislation acts as a precedent, and Local Government Victoria, which provides policy advice and oversees legislation relating to local government services, is currently reviewing the Local Government Act.[455]

FINDING 11: Councils may be reluctant to use rates-based financing through s163 of the *Local Government Act 1989* to support multi-household community energy projects because it affects their debt ratio.

RECOMMENDATION 9: The Victorian Government amend the *Local Government Act 1989* to keep debt accumulated by councils for renewable energy installation using s163 off balance sheet.

452 Institute for Sustainable Futures, et al., *National community energy strategy* (2015), 19.

453 City of Melbourne, *Submission 71*, 2; Northern Alliance for Greenhouse Action, *Submission 36*, 6.

454 Email from Mr Gavin Ashley, Principal, Sustainable Energy and Urban Development, Moreland Energy Foundation Limited, to Executive Officer, Economic, Education, Jobs and Skills Committee, 2 November 2016.

455 ibid.

5.2.3 Working with owners' corporations

The regulations around the functions of owners' corporations restrict apartment dwellers' capacity to install solar panels and subsequently save on energy costs and reduce their carbon footprint. The Committee encountered several options for enabling apartment dwellers to participate in renewable energy including assistance programs, new technology that helps bypass regulations and local energy trading. These options are discussed below.

Assistance programs

The City of Melbourne and the City of Sydney have developed the Smart Blocks program, which assists apartment owners and managers throughout Australia to implement energy efficiency measures and install solar PV systems.[456] The program explains the process of navigating owners' corporation rules to implement measures that improve the energy efficiency of lighting, heating and cooling systems, hot water systems, pools, and ventilation. It also provides assistance for the installation of a commonly owned solar system.

Although the City of Melbourne has received an increasing number of enquiries from owners' corporations about solar panel installation through the Smart Blocks program, the metering infrastructure costs and billing complexity have so far been too prohibitive for the successful installation of any solar systems.[457]

New technology

New technology has been developed that may enable apartment dwellers to bypass owners' corporation regulations and benefit from the installation of solar panels. Allume Energy is a startup funded by the The University of Melbourne's Melbourne Accelerator Program. Allume has developed technology that enables apartment dwellers to share the output of a single solar PV system on their common roof. Allume is patenting the technology, which bypasses the need to create an embedded network for the apartment building.

Apartment owners can choose whether to connect to the technology and the installation is usually viable with as few as six customers. Residents are able to opt in or opt out and are not committed to long-term contracts.[458] The installed box costs $490 upfront for each connected apartment and Allume charges $4.99 per month for access to its billing application programming interface. The Australian Energy Regulator has granted Allume a retail exemption licence to allow it to sell energy to landlords, who can on-sell it to tenants.[459]

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456 Smart Blocks, *About Smart Blocks*.

457 City of Melbourne, *Submission 71*, 2.

458 Allume Energy Australia, *Making solar accessible for apartment block residents* (2016), <www.allumeenergy.com.au/apartment-blocks> viewed 26 May 2017.

459 Michael Bailey, 'Startup Allume lets solar panels be 'shared' by strata dwellers', *Australian Financial Review,* 28 February 2017, <www.afr.com/leadership/entrepreneur/startup-allume-lets-solar-panels-be-shared-by-strata-dwellers-20170228-gun689> viewed 26 May 2017.

The New South Wales Government awarded Allume a $50 000 grant to fund a pilot program for community housing in conjunction with the Narromine Local Aboriginal Land Council. In February 2017, more than 20 apartment blocks were on the waiting list to install the technology once the patent is lodged.[460] If the pilot program is successful and Allume has a Victorian licence exemption from the Essential Services Commission, its technology could encourage the uptake of community energy projects in apartment buildings.

Local energy trading

Stakeholders also recommended the one-to-many local energy trading model to enable apartment dwellers to participate in renewable energy.[461] This model allows energy generated at one site to be assigned to many community owners (or shareholders) who can offset it against their household energy use. Local energy trading, or virtual net metering, is not currently viable in Australia due to regulatory restrictions (see Chapter 4 for further information on local energy trading).

5.2.4 Partnerships with regional communities

Partnerships with regional communities was another option stakeholders suggested to enable metropolitan communities to participate in community energy projects.[462] For example, regional communities can host a community energy project that a metropolitan community can help fund. Mr Tobias Geiger, Managing Director of wind farm developer WestWind Energy, stated that both communities benefit from the partnership:

> Say you have got an urban renewable energy group of some description that does not have the opportunity to build a wind tower somewhere in an urban area and they are looking for where they could do that. They could partner with a rural community that can host the project but probably do not have enough people who are able to fund that, so both groups fund the project.[463]

Partnerships between metropolitan and regional communities can also create social and environmental benefits for both parties, such as community empowerment and pride, greater access to renewable energy and greater community awareness of energy and environmental issues.[464]

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460 ibid.

461 Goulburn Broken Greenhouse Alliance, *Submission 44*, 4; City of Melbourne, *Submission 71*, 2; Mr Tom Nockolds, *Transcript of evidence*, 8.

462 Victorian Government, *Submission 98*, 15; WestWind Energy, *Submission 61*, 4.

463 Mr Tobias Geiger, Managing Director, WestWind Energy, *Transcript of evidence,* Melbourne, 21 November 2016, 4.

464 Victorian Government, *Submission 98*, 15; WestWind Energy, *Submission 61*, 4.

6 Expanding community energy beyond wind and solar

Most community energy projects in Australia involve the generation of renewable energy from solar and wind resources. Projects using solar and wind technologies have proven business models at the community scale unlike other renewable energy technologies such as bioenergy and hydroelectricity. The Inquiry's terms of reference asked the Committee to investigate whether community energy projects could expand beyond wind and solar energy. This chapter considers the viability of other technologies or measures that community energy groups could base a project on, including bioenergy, hydroelectricity, micro grids and energy efficiency programs.

6.1 Bioenergy

Bioenergy is energy converted from organic matter (biomass) such as animal and plant waste. To generate heat and/or electricity, the biomass feedstock is either combusted or digested in oxygen-free conditions to produce methane, which is then combusted.[465] The steam produced from the combustion turns a generator turbine to create electricity. A successful bioenergy project requires a good source of feedstock and economically viable methods of transporting and storing the feedstock.

The Coalition for Community Energy, a network of 72 organisations that advocates for the community energy sector, stated that there are synergies between bioenergy and community energy. First, bioenergy has a natural economy of scale for a community energy project because projects have to be large enough to be economically viable but not too large requiring transport of the biomass feedstock over long distances. In addition, community energy groups are likely to ensure that the biomass is sourced responsibly, and local councils are already collecting waste at the community level.[466]

The Committee was provided with examples of feedstock that could be used for bioenergy projects, such as rotten or unmarketable stone fruit from production regions in northern Victoria and effluent from piggeries and chicken farms.[467] Moira Shire Council in northern Victoria added that there are opportunities to produce bioenergy using the large volumes of organic material from food processing facilities in the shire that are sent to landfill.[468]

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465 Jarra Hicks, et al., *Community-owned renewable energy: a how to guide,* report for Community Power Agency (2014), 37.

466 Coalition for Community Energy, *Submission 92*, 15–16.

467 Mr Tobias Geiger, Managing Director, WestWind Energy, *Transcript of evidence,* Melbourne, 21 November 2016, 6; Victorian Government, *Submission 98*, 12–13.

468 Moira Shire Council, *Submission 59*, 4.

Mount Alexander Sustainability Group, the peak sustainability organisation for the Mount Alexander Shire in central Victoria, is interested in developing a bioenergy project in the southern industrial precinct of Castlemaine. Case study 6.1 outlines the group's progress.

CASE STUDY 6.1: Mount Alexander Sustainability Group's Waste to Energy project

Mount Alexander Sustainability Group (MASG) develops projects to help the Mount Alexander Shire community achieve the goal of zero net emissions. One of these projects is Waste to Energy, which involves the development of a bioenergy project in Castlemaine's southern industrial precinct where the town's landfill station and sewerage treatment facility are located.

The project began in 2015 with a prefeasibility study that investigated local waste streams and energy use profiles, and identified three potential bioenergy projects: a bio-digester, gas from landfill and bio-char/heating. The study recommended conducting full feasibility studies on the bio-digester and gas from landfill options.

The 2017 feasibility study will explore the viability of a waste to energy facility, provide a conceptual design and develop a business case for investors, lenders and the community. The project will use waste streams from the following industry partners: Coliban Water (sewerage from the wastewater treatment plant), Don Smallgoods (fats, oils and greases from the manufacturing of ham, bacon and smallgoods) and Mount Alexander Shire Council (plant and wood waste from the landfill station). The project has also secured government and philanthropic funding. If the feasibility study demonstrates that a waste to energy facility is viable, MASG will oversee the construction and operation of the facility.[469]

Bioenergy projects are generally more complex than other community energy projects. They have more transaction costs and coordination requirements than wind and solar projects due to the supply and transport of feedstock.[470] Another limiting factor for community bioenergy projects is the cost of running the operation, especially the ability to secure regular feedstock at a viable cost.[471] Victoria's Renewable Energy Advocate, Mr Simon Corbell, added that even though bioenergy projects are feasible, they are currently riskier because the industry is not as familiar with the technology compared with wind and solar projects.[472]

Mr Simon Holmes à Court, the Founding Chair of Hepburn Wind and Chairman of Embark, a non-profit organisation that supports the community renewable energy sector, suggested that community energy groups proceed with caution regarding bioenergy projects:

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469 Mount Alexander Sustainability Group, *MASG Waste to Energy: bioenergy for the Mount Alexander Shire community*, supplementary evidence received 19 May 2017, 2–3.

470 Coalition for Community Energy, *Submission 92*, 16.

471 Deakin University, *Submission 34*, 5; Macedon Ranges Sustainability Group, *Submission 64*, 7.

472 Mr Simon Corbell, Victorian Renewable Energy Advocate, *Transcript of evidence,* Melbourne, 20 March 2017, 6.

> Bioenergy has very interesting potential, and the community aspect, where you have a cooperative of farmers who have feedstock for the bioenergy, is really interesting. But there are not a lot of successful models in Australia yet, so I would tread carefully there and only with a lot of support to make sure that the farmers themselves were not burnt in the process.[473]

Demonstration projects will encourage the use of bioenergy technology and enhance its potential for community energy projects. The Victorian Government is supporting the Waranga Green bioenergy project with a $1 million grant from the New Energy Jobs Fund. Located in Stanhope (42 kilometres west of Shepparton), the project involves the construction and operation of a bio-digester plant that has the capacity to digest 200 tonnes of agricultural waste per day. The energy and heat generated will power the adjacent piggery and heat co-located horticultural greenhouses.[474]

In 2013, the Pyrenees Shire Council and the Central Highlands Agribusiness Forum (now known as Cultivate Agribusiness) led another bioenergy demonstration project that installed a 100-kilowatt (kW) woodchip-fuelled boiler at the Beaufort Hospital to provide hot water and heat the hospital. The Pyrenees Timber sawmill at nearby Chute supplies feedstock for the boiler and the system has been operational since February 2014. The Pyrenees Shire Council published a document outlining the lessons learned from the project. It found a lack of boiler system suppliers and installers in Australia and a low level of understanding of the technology among stakeholders and the community, but that bioenergy is viable if the system is matched to energy needs.[475]

6.2 Hydroelectricity

Several community energy groups in Victoria are trying to develop a project using hydroelectricity. Some of the projects involve the development of a small hydro system to generate energy and others will use a pumped hydro system to store energy for use later. The potential and challenges for community hydroelectricity projects are discussed below.

6.2.1 Small hydro projects

Small hydro projects use the power of flowing water in rivers or streams to generate electricity. They can be run-of-river schemes that do not require water storage such as a dam or reservoir because the energy is produced through the water's flow rate rather than the water's fall over a long distance. Small hydro projects therefore require a river or stream with a substantial flow rate that is constant throughout the seasons.[476]

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473 Mr Simon Holmes à Court, *Transcript of evidence,* Daylesford, 30 May 2017, 6.

474 Victorian Government, *Submission 98*, 13.

475 Pyrenees Shire, *The regional bioenergy project: lessons learnt* (2014), 1.

476 Jarra Hicks, et al., *Community-owned renewable energy,* 38.

Community energy groups overseas, especially in the United Kingdom, have developed many small hydro projects. For example, Harlaw Hydro, a cooperative in the village of Balerno, southwest of Edinburgh, owns and operates a small hydroelectric generator using the outflow of the Harlaw reservoir. The scheme was set up through the Balerno Village Trust, which raised £400 000 (AUD $695 000) for the project through a share offering.[477] The hydro scheme started generating electricity in July 2015. Due to a wet winter in its first year of operation, Harlow Hydro earned its projected annual return in less than six months and made a payment to shareholders. It also paid £11 000 (AUD $19 000) to the Village Trust, which has set up a grant scheme for community projects.[478]

In Victoria, some community energy groups are developing projects involving the restoration of old hydro systems that were dismantled once their towns were connected to the grid in the 1930s. For example, Warburton Community Hydro in the Yarra Valley is seeking to restore the town's old mini hydro energy system that used the flow from Ythan Creek, which now runs through the Warburton Golf Club. The restored system will supply energy to the golf course and export the remaining electricity to the grid. Upper Yarra Community Enterprise Ltd, a community-owned company that owns and operates the Warburton and Yarra Junction branches of Bendigo Bank, estimates the project will require $1 million of investment, half of which will be raised from community shareholders.[479]

Hepburn Wind, which developed Australia's first community-owned wind farm, is also planning to restore an old mini hydro system located at Lake Daylesford. The system, which powered lights and buildings around the lake until 1935, had an original capacity of 13 kW, but Hepburn Wind is seeking to increase that to 30 kW and either use the energy to power local buildings or export the electricity to the grid.[480] Dr David Perry, Chair of Hepburn Wind, added that a major purpose of the project is to demonstrate the potential of small hydro systems and educate the public about renewable energy.[481]

6.2.2 Pumped hydro projects

Pumped hydro systems also generate electricity using the power of flowing water, but they have the benefit of being able to store the water at times of low demand and release the water to produce energy when required. The systems require two reservoirs that are located relatively close to each other and at a height difference of at least 120 metres. Water is pumped from the lower reservoir to the upper reservoir during periods of low demand and off-peak electricity prices. The water is stored in the upper reservoir and released to generate electricity at periods of high demand and peak prices.

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477 Economic, Education, Jobs and Skills Committee, *Report on international study tour: Inquiry into community energy projects* (2017), 13.

478 ibid, 14.

479 Kath Gannaway, 'Tapping into hydro power', *Mountain Views Mail,* 22 May 2017, <mountainviews.mailcommunity.com.au/mail/2017-05-22/tapping-into-hydro-power> viewed 5 June 2017.

480 Brendan Wrigley, 'Electric vehicle charging station installed at Daylesford Town Hall', *The Advocate,* 10 October 2016, <www.hepburnadvocate.com.au/story/4217382/leading-the-charge-with-electric-cars> viewed 5 June 2017.

481 Dr David Perry, Chair, Hepburn Wind, *Transcript of evidence,* Daylesford, 30 May 2017, 3.

Pumped hydro systems are used to store energy, balance supply and demand, and stabilise the grid. They support grid stability through providing spinning reserve and can respond to energy load changes within seconds. They are also economical because they take advantage of peak and off-peak price differentials.[482]

Pumped hydro projects are more complex for community energy groups to develop compared with solar and wind projects. Installation and development costs are higher and specialist expertise in hydro engineering is required.[483] Mr Holmes à Court cautioned community energy groups about the technology stating:

> There are some great examples at the big scale, but as a standalone business it is very new, and people do not understand enough about how the economics work.[484]

However, the ability of pumped hydro projects to cheaply store energy and the presence of suitably located reservoirs in regional Victoria have encouraged community energy groups to consider developing a project. Some community groups, such as Bendigo Sustainability Group and Gippsland Climate Change Network, are investigating the use of old mine shafts, which have the required height differential to act as reservoirs for a pumped hydro project.[485]

Other community energy groups, such as Euroa Environment Group and Totally Renewable Yackandandah, are seeking to develop pumped hydro projects using natural reservoirs along the Great Dividing Range.[486] Euroa Environment Group, along with other community groups in the Strathbogie Ranges region, The Seymour We Want and Broadford Environmental Action Movement, received a $50 000 grant from the New Energy Jobs Fund in 2016 to conduct a prefeasibility study into the development of a pumped hydro system using reservoirs near Euroa and Seymour. Dr Roger Dargaville, Deputy Director of the Melbourne Energy Institute at The University of Melbourne, is leading the study.

The three Strathbogie community groups are also working with water services provider Goulburn Valley Water and the electricity distributor AusNet Services to explore the viability of the project.[487] When approached by Ms Fiona Townsend, a member of Euroa Environment Group, about developing a pumped hydro project at the sites, Goulburn Valley Water responded that it was redeveloping that water supply and exploring the potential of hydroelectricity. Ms Townsend stated that Goulburn Valley Water:

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482 Energy Storage Association, *Pumped hydroelectric storage* (2017), <energystorage.org/energy-storage/technologies/pumped-hydroelectric-storage> viewed 6 June 2017.

483 Mr Gregory Clark, *Submission 23*, 7; Bendigo Sustainability Group, *Submission 76*, 12.

484 Mr Simon Holmes à Court, *Transcript of evidence*, 5.

485 Mr Chris Weir, President, Bendigo Sustainability Group, *Transcript of evidence,* Daylesford, 30 May 2017, 4; Mr Dan Musil, Secretary, Earthworker Cooperative, *Transcript of evidence,* Traralgon, 6 March 2017, 4.

486 Professor Kate Auty, Member, Euroa Environment Group, *Transcript of evidence,* Shepparton, 31 May 2017, 2; Mr Ben McGowan, Secretary, Totally Renewable Yackandandah, *Transcript of evidence,* Shepparton, 31 May 2017, 2.

487 Professor Kate Auty, *Transcript of evidence*, 2.

> were actually considering fitting a hydro system themselves to maintain the power supply to their pump shed and everything else, and that they were also very interested in maybe looking at expanding that idea to being able to supply power back into Euroa at a larger level.[488]

AusNet approached Euroa Environment Group about the project because it was interested in the potential for Euroa to produce electricity, particularly as it was situated at the edge of the grid and could increase the reliability of energy supply to the area.[489]

Totally Renewable Yackandandah is also conducting a feasibility study into a 5 MW pumped hydro project with an engineering company that is seeking to trial the technology. The local water services provider, North East Water, which has a mothballed storage dam outside of Yackandandah, is also interested in the project because it could go towards its goal to be carbon-neutral by 2050.[490]

6.3 Micro grids

Several stakeholders during the Inquiry raised the potential of micro grids as a community energy project. Community micro grids are a combination of household solar energy generation and energy storage in the form of household batteries. The number of households connected to the micro grid can range from ten to several hundred. The households are interconnected allowing energy to flow between them depending on their level of electricity generation and demand.[491]

Micro grids can be connected to the main electricity grid or set up as an off-grid system. Off-grid systems are most commonly found in very remote locations. Most of the community energy groups that spoke to the Committee about developing a micro grid planned to stay connected to the main grid as a back-up option.

For example, the town of Newstead in central Victoria wants to transition to 100% renewable energy by generating solar energy and setting up a micro grid for the town. The micro grid will be connected to the main grid and situated behind the meter, so the town will be billed as a single customer. Volunteer group Newstead 2021, which runs the Renewable Newstead project, received a $200 000 New Energy Jobs Fund grant to develop the transition plan. The plan must incorporate community ownership and balance commercial viability with social equity through low prices and price protections for vulnerable residents. Newstead 2021 has secured an agreement with electricity distributor Powercor to realise the transition.[492]

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488 Ms Fiona Townsend, Member, Euroa Environment Group, *Transcript of evidence,* Shepparton, 31 May 2017, 4.

489 Professor Kate Auty, *Transcript of evidence*, 2.

490 Mr Matthew Grogan, Co-Chair, Totally Renewable Yackandandah, *Transcript of evidence,* Shepparton, 31 May 2017, 4.

491 Community Power Agency and Coalition for Community Energy, *Briefing paper: mini grids* (2016), 2.

492 Renewable Newstead, *Submission 41*, 2.

The town of Yackandandah in northeast Victoria is also trialling a micro grid installation in 2017. Community group Totally Renewable Yackandandah and electricity distributor AusNet Services have collaborated to pilot a micro grid connecting 25 households in an estate within the town. Each household has purchased a subsidised solar, battery and microcomputer package that will be installed and serviced by AusNet. The microcomputer will monitor and manage energy consumption and the micro grid will remain connected to the grid to ensure reliability.[493]

Mr Matthew Grogan, Co-chair of Totally Renewable Yackandandah, stated that AusNet approached Yackandandah about a trial because it wanted to pilot its technology:

> my understanding is that they know that the way that electricity is moved around the grid will change as battery technology becomes more and more affordable for households, and they are going to have to adapt their business model to allow for those changes. One way to do that is to generate and share electricity locally around one transformer, and they needed a sympathetic community to work with as that technology is trialled.[494]

AusNet is also trialling a micro grid in the Melbourne suburb of Mooroolbark. The micro grid connects 14 households in one street that have each had solar systems and batteries installed. The trial will investigate the technical feasibility of managing the energy generation and consumption of households connected to the micro grid. As explained by Mr Mark Judd, Energy Solutions Innovation Manager at AusNet:

> if you put 100 per cent solar on community houses on one transformer or in a community, that would cause some significant issues to the distribution network, because the reality is that if it is a hot, sunny day, an uncontrolled large-scale renewable energy system will push the voltage so high that it will cause problems. So when we move to this renewable energy future, we are going to have to put control systems at the houses so that the distributor can say to the new generators, 'We need to turn you down a little bit, because if we do not turn you down, we are going to cause quality issues on the network, and that will cause problems'. That also creates then the opportunity for management and then managing that sharing power as a community.[495]

The Victorian Government is also trialling the deployment of micro grids because it recognises that it could reduce the need for expensive grid upgrades. Mr Scott Hamilton, Executive Director of Renewable Energy at the Department of Environment, Land, Water and Planning, stated:

> an example we are seeing in many parts of the state, particularly in Shepparton and that area, is that there are constraints in terms of the grid as it currently is there. So there is a barrier for new businesses to be setting up, and they are seeing

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493 Totally Renewable Yackandandah, *Supporting the role of communities in the Victorian energy economy*, supplementary evidence received 29 May 2017, 1.

494 Mr Matthew Grogan, *Transcript of evidence*, 3.

495 Mr Mark Judd, Energy Solutions Innovation Manager, AusNet Services, *Transcript of evidence,* Melbourne, 24 October 2016, 4–5.

> higher prices and all those challenges. Some of the terrific work that is going on … is looking at whether those businesses can get together and have a micro grid or a connected power source which then supplies that part of the state with more power … that means that they get better self-sufficiency in terms of their actual needs and it actually makes more efficient use of the system. So rather than everyone having to build infrastructure that is dealing with the very peak loads, which is where a lot of those costs come from, if we can design and use the technology to match the demands and the needs, we will get much better value.[496]

The Department is working with Monash University and the Clean Energy Finance Corporation to develop a micro grid for the university's Clayton campus, which will act as a working prototype to test the transition to micro grids. The Government is also interested in the potential for micro grids to break off from the main grid and generate their own energy during challenging conditions such as bushfires and power outages.[497]

Some of the issues the Victorian Government is considering regarding micro grids are the sharing behaviour of interconnected households, how much connected households should pay for maintenance of the main grid and how energy security and affordability for households are protected.[498] Ms Alex Badham, Acting Director of Energy Markets Policy and Regulation at the Department, stated that the Government is working with the Council of Australian Governments (COAG) Energy Council about consumer protection issues regarding energy safety and security and protecting households that are experiencing hardship or want to opt out of the micro grid.[499]

Mr Andrew Dillon, General Manager of Corporate Affairs at AusNet, noted that there was a role for the Victorian Government to provide regulatory guidance on the interaction between households and the distributor so that the micro grid works effectively. He stated there was a need for guidance on:

> how the distribution network—like AusNet, for example—interacts with the local mini-grid operator, at what stages are we asking for things, when is it appropriate to actually demand they turn off or turn on and, again, who pays for what as part of that arrangement. That is going to be critical to making sure that it is stable.[500]

While micro grids show promise for securing electricity supply and reducing the need for grid upgrades, the Committee believes that community groups should be cautious about developing a community micro grid until the technical, safety and regulatory aspects of their operation are fully explored in the various trials running throughout Victoria.

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496 Mr Scott Hamilton, Executive Director, Renewable Energy, Department of Environment, Land, Water and Planning, *Transcript of evidence,* Melbourne, 20 March 2017, 6.

497 Victorian Government, *Submission 98*, 7.

498 Mr Scott Hamilton, *Transcript of evidence*, 5.

499 Ms Alex Badham, Acting Director, Energy Markets Policy and Regulation, Department of Environment, Land, Water and Planning, *Transcript of evidence,* Melbourne, 20 March 2017, 6.

500 Mr Andrew Dillon, General Manager, Corporate Affairs, AusNet Services, *Transcript of evidence,* Melbourne, 24 October 2016, 5.

6.4 Battery storage

Batteries can store electricity as chemical energy and convert it to electrical energy when required. There are different battery types such as lead, lithium and flow batteries, which vary in terms of voltage, cycle life, discharge rates and efficiency. Batteries can be scaled for use from household to grid level, and they are becoming more popular as their prices fall.[501]

Battery storage is an essential component of a micro grid (see Section 6.3), but it can also be incorporated into other community energy projects. For example, Community-Owned Renewable Energy Mullumbimby (COREM) is a not-for-profit community group that organises the funding and installation of solar photovoltaic (PV) systems in the Mullumbimby area. Its latest bulk buy project commenced in April 2017 and enables residents and small businesses in the Northern Rivers region of New South Wales to install rooftop solar and batteries at a reduced price.[502]

Brixton Energy, a cooperative in South London that has developed solar projects on housing estates in Brixton, London, is also working on a project that will install battery storage technology on one of these housing estates. The batteries will increase the proportion of generated energy that is used on site, which will create bill savings for the local council and increase the income available for the project's community fund that delivers energy efficiency measures for residents.[503]

As the price of battery storage falls, community energy groups in Australia will be more likely to integrate the technology into their projects.[504] For example, Bendigo Sustainability Group, a charity that has installed several solar projects on council and community buildings in the Bendigo region, is considering a shared residential battery project now that the cost of batteries is rapidly falling. This project will involve the installation of Tesla batteries on residential houses with solar panels, so that households can use the energy on site at night or share it with the grid.[505]

6.5 Energy efficiency programs

Many community energy groups that install solar systems emphasised to the Committee the importance of energy efficiency for project viability. For example, Citizens Own Renewable Energy Network Australia (CORENA), which delivers solar energy projects for community groups using a donation model, explained that because the aims of their projects are environmental and financial:

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501 Alan Finkel, et al., *Independent review into the future security of the National Electricity Market: blueprint for the future* (2017), 191.

502 Community-Owned Renewable Energy Mullumbimby, *Community power for community action* (2017), <www.corem.org.au> viewed 16 June 2017.

503 Powervault, *Working with Brixton Energy & Repowering London to install Powervaults in Brixton* (2016), <www.powervault.co.uk/article/working-with-repowering-london-to-install-powervaults-in-brixton-london> viewed 16 June 2017.

504 Mr Chris Weir, *Transcript of evidence*, 7.

505 ibid, 4.

> Energy efficiency is therefore equally, if not more, important than renewable energy as an energy 'source'. In many CORENA projects, the energy efficiency component brings down the overall payback time and is therefore an essential component. CORENA recommends that the committee not lose sight of the importance of energy efficiency in its inquiry.[506]

Other community energy groups that have successfully developed solar energy projects, such as ClearSky Solar Investments, Geelong Sustainability and Pingala, noted that energy efficiency was an essential first step for their projects. Emeritus Professor Warren Yates, Board Member of ClearSky Solar Investments, which has delivered 14 community solar projects, stated that when working with potential host sites:

> the first call is to make sure that they're the most efficient they possibly could be because we don't want them to be reducing their power over the next years.[507]

Mr Dan Cowdell, Project Coordinator with Geelong Sustainability, which installed a solar PV system at South Geelong Primary School, added:

> the last thing we want to go and put a 100 kilowatt solar system on, think they're going to use all that power that's been generated but then they implement some energy efficiency a year down the track and all of a sudden we're exporting a whole lot of power. So a part of our process in conducting a solar feasibility is also to do an energy efficiency audit and identify the measures that that site could take to actually lower their consumption first of all.[508]

Pingala, an incorporated association based in Sydney that develops community solar projects, also ensures that energy efficiency is maximised at potential host sites before developing a project. As explained by Mr Tom Nockolds, Secretary of Pingala:

> The best way to save money on energy for the best return on investment … is to spend it on energy efficiency first, minimise the size of the renewable energy you need and you get a much better outcome for your investors and the customer.[509]

In addition to being an important component of ensuring the viability of solar energy projects, some stakeholders also raised the environmental and health benefits of incorporating energy efficiency measures in community energy projects. Deakin University noted that this was important because most Australian buildings were not built to be energy efficient and that retrofitting existing buildings could significantly reduce energy use.[510]

Environment Victoria, an independent, not-for-profit environment group, supported community energy projects that are based on, or incorporate, energy efficiency measures, particularly for disadvantaged households. It noted:

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506 Citizens Own Renewable Energy Network Australia, *Submission 94*, 4.

507 Emeritus Professor Warren Yates, Board Member, ClearSky Solar Investments, *Transcript of evidence,* Sydney, 15 February 2017, 4.

508 Mr Dan Cowdell, Project Coordinator – CORE Geelong, Geelong Sustainability, *Transcript of evidence,* Waurn Ponds, 5 December 2016, 7.

509 Mr Tom Nockolds, Secretary, Pingala, *Transcript of evidence,* Sydney, 15 February 2017, 6.

510 Deakin University, *Submission 34*, 5.

> people living in poor quality housing which is draughty and cold in winter and dangerously hot in summer—or else prohibitively expensive to keep comfortable—face serious health risks, particularly in extreme weather events such as heatwaves.[511]

It added that community energy projects that incorporate energy efficiency measures such as insulation and draught sealing would significantly improve health outcomes for Victorians with chronic health conditions living in inefficient housing.[512]

Dr Nicholas Aberle, Campaigns Manager at Environment Victoria, stated that energy efficiency is just as important as renewable energy for helping people save money and increasing their comfort at home. He said:

> What would be great to see would be greater incorporation of the two things so we are not just creating schemes to help people put solar panels on their roofs or solar panels on a warehouse that they then have a share in. If at the same time we can reduce the amount of electricity that people need through energy efficiency, then there is a sort of fantastic synergy between the two.[513]

In addition, helping low-income households use less electricity could save the Victorian Government money by reducing the cost of energy concessions.[514]

FINDING 12: Energy efficiency measures are vital for reducing energy use and costs and should be incorporated into community energy projects where possible.

RECOMMENDATION 10: That the Victorian Government encourage community energy projects that are based on, or incorporate, energy efficiency measures using financial mechanisms tied to the Victorian Renewable Energy Target.

6.6 Other community energy initiatives

The Committee also came across other ways that communities can participate in the energy economy such as retailing and manufacturing. Although not strictly community energy projects, these initiatives fit in with the sector's values and operation, and are discussed below.

6.6.1 Community energy retailing

Several stakeholders noted that the existence of community energy retailers would give communities more control over their energy use and generation. It could also help encourage the development of community energy projects because community retailers are generally more willing than commercial retailers to purchase the energy generated by smaller community projects.

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511 Environment Victoria, *Submission 72*, 3.

512 ibid, 4.

513 Dr Nicholas Aberle, Campaigns Manager, Environment Victoria, *Transcript of evidence,* Melbourne, 24 October 2016, 4.

514 ibid, 5.

For example, one of the aims of Enova Energy, Australia's first community energy retailer, is to support community renewable energy projects by purchasing power from them, thus making them more financially viable.[515] Based in Byron Bay, Enova operates throughout most of regional New South Wales, but is not yet licensed to operate in Victoria. Enova's customers can purchase the Renewable Development Initiative (RDI) energy plan, where 13% of their energy usage charge supports local renewable energy generation.

AusNet noted that the establishment of a community energy retailer would be necessary for the successful operation of a micro grid. Mr Judd from AusNet stated:

> to make that work you really need to create a single retailer for that community, if you like, or have a single retailer for that community … we can bring the system—the technology in terms of the solar and the battery and the control systems and all those sorts of things—but you need the retail part of it to allow all the sharing to happen.[516]

He added that while existing retailers would still have a role in terms of wholesaling, hedging, compliance and regulation, the community retailer's role would be to manage the micro grid by signing up and billing customers and helping customers experiencing hardship.[517] Mr Judd also believed that the Victorian Government had a role to play in coordinating the development of the community retail concept to work within the current regulatory framework.[518]

Energy Locals, a social enterprise with an energy retail licence from the Australian Energy Regulator, is offering a way for community groups to bypass the regulatory issues inherent in establishing an energy retail operation. It is currently operating in New South Wales and southeast Queensland and is waiting for permission from Victoria's Essential Services Commission to provide a fixed-cost retail service platform for Victorian community energy groups. As Mr Adrian Merrick, Founder and Chief Executive Officer of Energy Locals, explained, energy retailing:

> is a complex operation to run, and it is not cheap to set one up and run it. It requires scale in order for customers to get the best possible price. If we were to fragment that too far, then I am not sure consumers would win, so we have set up our business to provide a retail service for communities that want to be able to control, structure their own local retail offering, benefit from the profit from that but without having to set up a retailer from scratch.[519]

With this platform service, customers would pay a fixed daily charge and an energy consumption charge. The fixed charge would include Energy Locals' service fee, which covers the cost to serve and a small profit. The remaining net profit would go to the community energy group.[520]

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515 Enova Energy, *Enova's Renewable Development Initiative to kick-start local renewable energy generation* (2016), <enovaenergy.com.au/local-renewable-energy-generation> viewed 8 June 2017.

516 Mr Mark Judd, *Transcript of evidence*, 3.

517 ibid, 4.

518 ibid, 5.

519 Mr Adrian Merrick, Founder and Chief Executive Officer, Energy Locals, *Transcript of evidence,* Melbourne, 7 November 2016, 2.

520 ibid, 3.

6.6.2 Community renewable energy manufacturing

The Committee also heard from Earthworker Cooperative, which is setting up a worker-owned factory in Morwell that manufactures renewable energy appliances and components, specifically solar hot water systems. The cooperative's aim is to create local sustainable jobs that meet social and environmental needs. Earthworker considers its Morwell project to be a proactive response to manufacturing decline, unemployment and climate change in the Latrobe Valley.[521]

In addition to supporting the local manufacturing sector and providing local employment, Earthworker also aims to provide households with greater access to energy efficiency technology through this project. It has teamed with unions around Australia to allow employees to pay off the installation of a solar hot water system through their wage at no upfront cost. It is also working with Bank Australia to provide households with finance to access the technology.[522]

While the manufacture of solar hot water systems through a cooperative is not strictly a community energy project, it is another avenue for community involvement in energy efficiency. As explained by Mr Dan Musil, Secretary of Earthworker Cooperative:

> Earthworker Cooperative is not your typical community energy project, but it harnesses the same necessities for community buy-in and participation around principles of inclusivity, clean energy and self-help to provide a range of energy efficiency and energy saving benefits to households and communities everywhere we hope.[523]

Earthworker welcomes the Victorian Government's programs supporting energy efficiency upgrades in households in Gippsland and throughout Victoria, but wants there to be mandatory local content requirements to support local manufacturing and employment.[524]

6.7 Encouraging alternative community energy projects

While the evidence presented to the Committee strongly supported energy efficiency measures, it also highlighted that community energy projects using renewable energy technologies other than wind and solar may be currently risky. Stakeholders noted that technologies such as bioenergy and hydroelectricity do not have the same viable business models at the community scale as wind and solar energy.[525] Also, these technologies are currently not as cost effective.[526]

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521 Mr Dan Musil, *Transcript of evidence*, 2–3.

522 ibid, 4.

523 ibid.

524 ibid, 5.

525 Bass Coast Shire Council, *Submission 20*, 5; Northern Alliance for Greenhouse Action, *Submission 36*, 7; Horsham Rural City Council, *Submission 58*, 2; Moira Shire Council, *Submission 59*, 3.

526 Australian Energy Council, *Submission 80*, 1.

A lack of experience with alternative renewable energy technologies in the energy and finance sector is another limiting factor. The Victorian Community Solar Alliance, a network of 14 organisations that develop community solar projects, stated:

> It is hard enough to work out the organisational and financial viability of a project using known data from mature industries such as solar and wind technology. Finding investors when cost and [return on investment] of newer technologies is not known would be much harder.[527]

However, the Alliance added that as the community energy sector matures, the viability of projects using alternative renewable energy technologies could improve.[528] While technologies such as bioenergy, pumped hydro and micro grids appear to have potential for community energy, further feasibility studies and demonstration projects are required to provide proof.

FINDING 13: Further feasibility studies and demonstration projects using renewable energy technologies other than wind and solar are required before actively supporting community energy projects using these technologies.

527 Victorian Community Solar Alliance, *Submission 49*, 6.

528 ibid.

7 Conclusion

Community energy projects have the potential to reduce carbon emissions, boost local economic development, create local jobs and empower communities. During the course of this Inquiry, the Committee met with many community energy groups developing and/or operating energy projects and learned of the challenges they face and their suggestions for supporting the sector.

Community energy groups face a number of barriers when developing an energy project. These include the capacity and skill level of volunteers as well as policy uncertainty, technical issues and regulatory restrictions that can threaten the financial viability of a project. A lack of funds to undertake the necessary steps to get a project investment ready and the difficulty of securing a fair price for the electricity generated were also key challenges for community energy groups. The Committee recommends the Victorian Government implement a loan fund for community energy projects, work with the COAG Energy Council to enable regulatory changes favourable to community energy and finally, expand the pilot Community Power Hubs program if it proves to be of value to the community energy sector.

A strong theme that became apparent in the evidence gathered for the Inquiry was the benefit of community energy groups collaborating with renewable energy developers or local government to develop a project. Community energy projects were more likely to succeed if they took advantage of the expertise, equity and economies of scale offered by a developer or council. Therefore, the Committee recommends that the Victorian Government encourage collaboration between community energy groups and developers through financial mechanisms tied to the Victorian Renewable Energy Target. While the Committee acknowledges that collaboration may reduce the level of control a community has on a project, it believes that this is the best way to ensure the project's financial viability and protect community investors.

Another theme that ran through the Inquiry was how the rules of the National Electricity Market were developed to suit traditional electricity generation at a central site. It became evident that the rules are less able to deal with distributed renewable energy. Consequently, there are many regulatory barriers to the implementation of new business models in the energy sector and there is a risk that the market will not be as well-equipped to respond to changing technologies and energy demand. The Committee recommends that the Victorian Government support the recommendations of the Finkel review that aim to secure electricity supply and keep energy affordable, while at the same time not discouraging investment in renewable energy.

Community energy is a nascent sector in Australia and the Committee recognises the benefits it can offer local communities in addition to the effects it may have on energy affordability and consumer protection if its integration into the energy market is not well managed. The recommendations in this report aim to

encourage communities that wish to develop an energy project and have greater control of their energy use, while also protecting the security of the electricity grid and vulnerable consumers.

Adopted by the Economic, Education, Jobs and Skills Committee

7 August 2017

Appendix 1
List of submissions

Submission no.	Individual or organisation	Date received
1	Mr Mark Nicholson	22 August 2016
2	Countrywide Energy	1 September 2016
3	Mrs Phillippa Noble	1 September 2016
4	Energy for the People	1 September 2016
5	Clean Energy Council	5 September 2016
6	Friends of the Earth supporters – Proforma submissions	6 September 2016
7	Ms Margaret Young	6 September 2016
8	Ms Lyn Hovey	6 September 2016
9	Ms Sherrin Caird	7 September 2016
10	Mr Tom Chalko	7 September 2016
11	Mr Thami Croeser	7 September 2016
12	Ms Joy Carberry	7 September 2016
13	Ms Jane Brownrigg	8 September 2016
14	City of Whittlesea	9 September 2016
15	Locals into Victoria's Environment	12 September 2016
16	Mr Peter Graus	14 September 2016
17	Renewable Albury–Wodonga Energy	15 September 2016
18	Mr Ben McGowan	19 September 2016
19	City of Melton	20 September 2016
20	Bass Coast Shire Council	20 September 2016
21	Frankston City Council	21 September 2016
22	Meridian Energy Australia	21 September 2016
23	Mr Gregory Clark	23 September 2016
24	Renew Point Henry Consortium	23 September 2016
25	Totally Renewable Yackandandah	26 September 2016
26	WINconnect	26 September 2016
27	Nagambie Golf Club	26 September 2016
28	Windlab	26 September 2016
29	BEAM Mitchell Environment Group	26 September 2016
30	Yarra Community Solar	26 September 2016
31	Euroa Environment Group	27 September 2016
32	Dandenong Ranges Renewable Energy Association	27 September 2016
33	Mr Murray Dancey	28 September 2016
34	Deakin University	28 September 2016

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Submission no.	Individual or organisation	Date received
35	Confidential	28 September 2016
36	Northern Alliance for Greenhouse Action	28 September 2016
37	City of Greater Geelong	28 September 2016
38	Mornington Peninsula Shire	28 September 2016
39	Glenelg Shire Council	28 September 2016
40	Mr Peter Degorski	28 September 2016
41	Renewable Newstead	28 September 2016
42	City of Ballarat	28 September 2016
43	AusNet Services	28 September 2016
44	Goulburn Broken Greenhouse Alliance	28 September 2016
45	Mr Timothy Read	28 September 2016
46	Mr Glenn Michael	28 September 2016
47	Ms Judy Cameron	28 September 2016
48	Ms Julie Bryer	28 September 2016
49	Victorian Community Solar Alliance	28 September 2016
50	Mr Martin Pritchard	29 September 2016
51	Moreland Energy Foundation Limited	29 September 2016
52	Energy Innovation Co-operative	29 September 2016
53	Energy Democracy	29 September 2016
54	Mr Tony Davidson and Rode RAGE (Ride Against Greenhouse Emissions) Team	29 September 2016
55	Darebin City Council	29 September 2016
56	Ms Anne Young	29 September 2016
57	Mr Peter Richardson	29 September 2016
58	Horsham Rural City Council	29 September 2016
59	Moira Shire Council	29 September 2016
60	Geelong Sustainability	29 September 2016
61	WestWind Energy	29 September 2016
62	Ballarat Renewable Energy and Zero Emissions	29 September 2016
63	Moreland Community Solar	29 September 2016
64	Macedon Ranges Sustainability Group	29 September 2016
65	Voices of the Valley	29 September 2016
66	South East Councils Climate Change Alliance	29 September 2016
67	Energy Forever	29 September 2016
68	Energy Locals	29 September 2016
69	Maribyrnong City Council	29 September 2016
70	The University of Melbourne	29 September 2016
71	City of Melbourne	29 September 2016
72	Environment Victoria	29 September 2016
73	AGL Energy	29 September 2016

Submission no.	Individual or organisation	Date received
74	Business Council of Co-operatives and Mutuals	29 September 2016
75	South Gippsland Shire Council	29 September 2016
76	Bendigo Sustainability Group	29 September 2016
77	Clarence Valley Conservation Coalition	29 September 2016
78	Senvion Australia	29 September 2016
79	Generation Shared	29 September 2016
80	Australian Energy Council	29 September 2016
81	Mr Duncan Wallace	29 September 2016
82	Ms Patricia Phair	29 September 2016
83	Friends of the Earth (Melbourne)	3 October 2016
84	SkyFarming	3 October 2016
85	GV Community Energy	3 October 2016
86	Frontier Impact Group	3 October 2016
87	Mr Nick Pastalatzis	3 October 2016
88	Surf Coast Energy Group	4 October 2016
89	Australian Wind Alliance	6 October 2016
90	Greater Shepparton City Council officers	7 October 2016
91	Victorian Trades Hall Council, National Union of Workers and National Tertiary Education Union	7 October 2016
92	Coalition for Community Energy	10 October 2016
93	Indigo Shire Council	10 October 2016
94	Citizens Own Renewable Energy Network Australia	11 October 2016
95	Hepburn Wind	13 October 2016
96	Mr Roger Willsher	29 September 2016
97	Australian Fabians Vic Branch and LEAN (Labor Environment Action Network)	13 October 2016
98	Victorian Government	22 December 2016
99	Latrobe City Council	23 February 2017

List of Friends of the Earth proforma submissions – submission 6

Josie Alexandra	Philip Barton	Lachlan Breust
Hannah Alquier	Jenni Baxter	Marianne Breust
Isobel Sfetcopoulos Anderson	Maurice Beinat	Robert Brown
Kevin Audley	Marion Bell	Hannah Bucknall
Allison Baensch	Alphonse Benoit	Jayne Burton
Geraldine Bagwell	Michaela Benson	Katie Butcher
Alan Barlee	Joe Boin	Imogen Butler
Kathrin Bartha	Quentin Bowers	Dave Campbell

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Michaela Jeannaisse Carter	Ayat Imdad	Patrick Simons
Linda Dal Castello	Ziver Imren	Christine Slatter
Gavin Cerini	Mark Jones	Rod Stevens
Chrissi Charles	Kassie Junkeer	Petr Svoboda
Kristen Chisholm	Linda Keir	Wendy Swaine
Jean Christie	Hakan Braxton Kemal	Neale Terrill
Georgie Coram	Lisa de Kleyn	Marg Thomas
Sean Corrigan	Marie Lakey	Thomas Timpe
Natalie Cowdell	Colin Lambie	David Tomkins
Jacob Craven	Marianne Latham	Gillian Trahair
Nathaniel Currie	Michael Little	Gill Trebilcock
Caroline Danaher	John Lloyd	Nick Wadsley
Monique Decortis	Peter Logan	Alan Wilson
Graeme Drysdale	Patricia Lovell	Edith Wilson
Pamela Engelander	Anthony Lunken	Linda Wollers
Phil Evans	Rev Dr Richard Mallaby	Leticia Worley
Leigh Ewbank	Sarah Mawer	Valerie Yule
Eve Fisher	Andrew McArthur	Claire Ziegler
Patricia Fraser	Bernie McComb	Rosalind Zweifel
Judi Gayfer	Katherine McDonald	
Victoria Green	Ross McNeilage	
Rebecca Grimaud	Christine Morris	
Lisa Grundmann	Patricia de Moulpied	
Lolita Gunning	Veronique Murch	
Zoe Halabarec	Ingrid de Neve	
John Hall	John Neve	
Bill Hampel	Leanne Nichols	
Grace Hardy	Noreen Nicholson	
Tony Hardy	Solway Nutting	
Prani Harrison	Leila Huebner OAM	
Deborah Hart	Ashley Paskin	
Robert Hart	Susan Patton	
Sandra Hawkins	Sandra Pearce	
Vera Hemkes	A.R Polack	
Joanna Herbert	David Quinn	
Sylvie Heywood	Charles Rendigs	
Ingrid Hindell	Revelly Robinson	
Skye Hueneke	B Ryan	
Tess Humphries	Van Beethoven Santos	
Tabitha Hutchinson	Jeremy Schroder	
Robynne ilott	Marco Setiawan	

Appendix 2
List of witnesses

24 October 2016, Melbourne

Name	Position	Organisation
Ms Nicky Ison	Secretariat Coordinator	Coalition for Community Energy
Ms Taryn Lane	Chairperson	
Mr Gavin Ashley	Principal, Sustainable Energy and Urban Development	Moreland Energy Foundation Limited
Mr Manny Pasqualini	Renewables Broker	
Mr David Meiklejohn	Executive Officer	Northern Alliance for Greenhouse Action
Mr Rob Law	Project Manager	
Mr Andrew Dillon	General Manager, Corporate Affairs	AusNet Services
Mr Mark Judd	Energy Solutions Innovation Manager	
Dr Nicholas Aberle	Campaigns Manager	Environment Victoria
Mr Tosh Szatow	Director and Co-founder	Energy for the People
Ms Emily Gayfer	Community Energy Coordinator, Yes 2 Renewables	Friends of the Earth (Melbourne)
Mr Pat Simons	Cleantech Jobs Coordinator, Yes 2 Renewables	

7 November 2016, Melbourne

Name	Position	Organisation
Ms Linda Parlane	Board Member, Moreland Community Co-operative	Victorian Community Solar Alliance
Mr Les Pradd	Director, Yarra Community Solar	
Mr David Spree	Senior Manager, Government Affairs	AGL Energy
Mr Tony Chappel	Head, Government and Community Relations	
Mr Ed McManus	Chief Executive Officer	Meridian Energy Australia
Mr Kieran Donoghue	General Manager, Policy and Research	Australian Energy Council
Ms Emma Richardson	Policy Adviser	
Ms Alicia Webb	Policy Manager	Clean Energy Council
Ms Heather Smith (via videoconference)	Management Committee Member	Citizens Own Renewable Energy Network Australia
Mr Adrian Merrick	Founder and Chief Executive Officer	Energy Locals

21 November 2016, Melbourne

Name	Position	Organisation
Mr Chris Judd	Chief Executive Officer and Managing Director	Senvion Australia
Ms Megan Wheatley	Manager, Communications and External Affairs	
Ms Libby Hynes	Acting Director, Operations and Environment	Darebin City Council
Ms Dominique La Fontaine	Executive Officer	South East Councils Climate Change Alliance
Mr Brett Munckton	Committee Member	
Mr Tobias Geiger	Managing Director	WestWind Energy
Ms Susan Davies	Secretary/Director	Energy Innovation Co-operative
Mr Roger Price (via teleconference)	Chief Executive Officer	Windlab

5 December 2016, Waurn Ponds

Name	Position	Organisation
Professor Peter Hodgson	Deputy Vice-Chancellor (Research)	Deakin University
Mr Ian Kett	Director, Strategic Programs	
Professor Samantha Hepburn	Director, Centre for Energy and Natural Resources, Faculty of Business and Law	
Ms Vicky Grosser	Carbon Manager, Manage Carbon	Renew Point Henry Consortium
Mr Pat Simons	Cleantech Job Coordinator, Friends of the Earth (Melbourne)	
Mr Dan Cowdell	Project Coordinator – CORE Geelong	Geelong Sustainability
Mr Tim Adams	Geelong Sustainability Committee Member	

15 February 2017, Sydney

Name	Position	Organisation
Emeritus Professor Warren Yates	Board Member	ClearSky Solar Investments
Mr Tom Nockolds	Secretary	Pingala
Ms Allegra Spender	Chair	Sydney Renewable Power Company
Mr Andy Cavanagh-Downs	Founding Director	
Mr Charlie Prell	NSW Organiser	Australian Wind Alliance

6 March 2017, Traralgon

Name	Position	Organisation
Ms Wendy Farmer	President	Voices of the Valley
Mr Ron Ipsen	Vice President	
Mr Dan Musil	Secretary	Earthworker Cooperative
Mr Ian Southall	Investor	
Ms Deirdre Griepsma	Manager Sustainability	Bass Coast Shire Council
Councillor Michael Whelan		
Mr Phil Stone	General Manager, City Development	Latrobe City Council
Mr Bruce Graham	Coordinator Regional Strategy	
Ms Mary Aldred	Chief Executive Officer	Committee for Gippsland

20 March 2017, Melbourne

Name	Position	Organisation
Mr Scott Hamilton	Executive Director, Renewable Energy	Department of Environment, Land, Water and Planning
Ms Alex Badham	Acting Director, Energy Markets Policy and Regulation	
Mr Simon Cover	Manager Statutory Policy, Planning, Building and Heritage	
Professor Michael Brear	Director, Melbourne Energy Institute	The University of Melbourne
Dr Sara Bice	Director, Research Translation, Melbourne School of Government	
Mr Simon Corbell	Victorian Renewable Energy Advocate	
Mr Geoff Drucker	Director	Countrywide Energy
Dr Ron Ben-David	Chairperson	Essential Services Commission
Dr John Hamill	Chief Executive Officer	
Mr David Young	Director, Energy	
Ms Jennifer Lauber Patterson	Managing Director	Frontier Impact Group

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30 May 2017, Daylesford

Name	Position	Organisation
Mr Ralf Thesing	Vice-President	Macedon Ranges Sustainability Group
Mr Barry Mann	Committee Member, Renewable Energy Action Group	
Dr David Perry	Chair	Hepburn Wind
Mr Simon Holmes à Court		
Mr Chris Weir	President	Bendigo Sustainability Group
Mr Ian Rossiter	President	Ballarat Renewable Energy and Zero Emissions (BREAZE)
Ms Genevieve Barlow	Community and Engagement Director	Renewable Newstead
Ms Meg Norris	Group Participant	
Mr Simon Beckett	Group Participant	
Mr Andrew Skeoch	President	Newstead 2021
Mr Mick Lewin	Deputy Chair	Mount Alexander Sustainability Group
Ms Mandy Field	Communications and Community Engagement Officer	

31 May 2017, Shepparton

Name	Position	Organisation
Mr Greg McKenzie	Manager, Environment	Greater Shepparton City Council
Ms Michelle Wilkinson	Committee Member	Renewable Albury–Wodonga Energy
Mr Thomas Brown	Executive Officer	Goulburn Broken Greenhouse Alliance
Professor Kate Auty	Member	Euroa Environment Group
Ms Shirley Saywell	Member	
Ms Fiona Townsend	Member	
Mr Jeff Wilmot	Member	Sustainable Seymour
Ms Sally Rice	Manager, Safety, Amenity and Environment	Moira Shire Council
Mr Jackson Tennant	Environmental Services Technical Officer	
Mr Thomas Brown	Environment Sustainability Officer	
Mr Matthew Grogan	Co-Chair	Totally Renewable Yackandandah
Mr Ben McGowan	Secretary	

Appendix 3
List of site visits

Date	Site
12 September 2016	Hepburn Wind, Daylesford, Victoria
	Macedon Ranges Sustainability Group, Woodend, Victoria
5 December 2016	Deakin University, Waurn Ponds Campus, Waurn Ponds, Victoria
13 February 2017	Tyalgum Energy Project, Tyalgum, New South Wales
	Community-Owned Renewable Energy Mullumbimby, Mullumbimby, New South Wales
14 February 2017	Enova Energy, Byron Bay, New South Wales
	Farming the Sun Lismore and Lismore City Council, Goonellabah, New South Wales
29 March 2017	Repowering London and Brixton Energy, London, England, United Kingdom
	Department for Business, Energy and Industrial Strategy, London, England, United Kingdom
30 March 2017	Harlaw Hydro, Balerno, Scotland, United Kingdom
	Local Energy Scotland and Energy and Climate Change Directorate, Scottish Government, Edinburgh, Scotland, United Kingdom
31 March 2017	Neilston Development Trust, Neilston, Scotland, United Kingdom
	Fintry Development Trust, Fintry, Scotland, United Kingdom
3 April 2017	Federal Ministry for Economic Affairs and Energy, Berlin, Germany
4 April 2017	Feldheim Energy Self-sufficient Village, Feldheim, Germany
5 April 2017	Middlegrunden Wind Turbine Cooperative, Copenhagen, Denmark
	Danish Energy Agency, Copenhagen, Denmark
	Energinet.dk, Ballerup, Denmark

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