Community Renewable Energy in Australia: Exploring its character & emergence in the context of climate change action

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KEYWORDS

Community renewable energy, new social movement theory, climate change

ABBREVIATIONS

CRE – Community Renewable Energy

RE – Renewable Energy

ABSTRACT

Throughout the world, community involvement in renewable energy across many scales and varieties of activity is increasingly common, driven by broader processes of technical, social, political and environmental change. Social movements play a fundamental role in this process of change, acting as dynamic sites of action and innovation in thinking and practice. The past 10 years have seen the emergence of a growing community movement in Australia around renewable energy. This has predominantly been motivated by a desire to take direct and empowering action on climate change at a local level, especially in the context of wavering Australian government policy and support for both carbon reduction and renewable energy over the same period of time. Community renewable energy (CRE) is a relatively new feature in the bouquet of climate change action and renewable energy deployment in Australia. CRE is a form of renewable energy deployment in which communities, of location and of interest, come together to initiate, develop, own and benefit from the asset (Seyfang et al 2013; Hicks & Ison 2012; Walker & Devine-Wright 2007). This article in an effort to understand the scope and character of CRE in Australia and theorise why it has emerged at this time. In doing this we draw on two national surveys of the nascent CRE movement, one conducted in 2011 and the other in 2014, and present an analysis of the key characteristics of CRE in Australia and how these have changed over this time period. We apply social movement theory to analyse its emergence at this time and to compare movement drivers in Australia with those in Germany and Denmark, where CRE is most well established.

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1. Introduction

Community Renewable Energy (CRE) is a diverse area of activity that can be loosely understood as a form of renewable energy deployment in which communities, of location and of interest, come together to initiate, develop, own and benefit from the asset (Hicks and Ison, 2011; Seyfang, 2010; Seyfang et al., 2013; Walker and Devine-Wright, 2008). Its fundamental drivers have been categorized as a desire to decarbonize, decentralize and democratize electricity supplies and to demonstrate the effectiveness of renewable energy (Ison, 2009). In their study of community energy projects in the UK, Walker and Devine-Wright (2008) identify two defining features that characterise CRE initiatives: that they are focused around both the process and the outcomes of the endeavor. The process element refers to the ways in which CRE projects are developed and if they provide opportunities for people to be engaged in discussion, decision-making and development. The outcomes element refers to the more tangible outputs of MWs of renewable energy or energy savings and the financial benefits flowing from the initiative, and where these go and who they benefit.

In Denmark and Germany CRE projects have greatly contributed to the countries' success in renewable energy, mainly through increasing acceptance of and participation in renewable energy deployment (Bolinger, 2001; Meyer, 2004; Musall and Kuik, 2011; Schweizer-Ries et al., 2010; Yildiz et al., 2015; Zoellner et al., 2008). For example there are more than 800 energy cooperatives with more than 200,000 people engaged that have invested 1.35 billion Euro in renewable energy over the last decade (Debor, 2014; DGRV, 2014; Holstenkamp and Müller, 2013; Yildiz et al., 2015).

CRE has gained increasing attention from the public, academia and industry in the last ten years. While a substantial body of literature and studies are building up around the world (Avelino et al., 2014; Haggett et al., 2013; Harnmeijer et al., 2013; Hoffman et al., 2012; Seyfang and Haxeltine, 2012; Seyfang et al., 2014; Walker and Devine-Wright, 2008; Walker, 2008; Walker et al., 2009, 2007), there is a paucity of academic research on the subject in Australia (Hicks and Ison, 2011; Ison et al., 2012). This article is an effort to understand the characteristics of CRE in Australia and theorise why it has emerged as it has, when it has. Our fundamental research questions are: what is the status and character of CRE in Australia? How can we understand its emergence at this time? In this study we draw on two national surveys of the nascent CRE movement (conducted in 2011 and 2014) and present an analysis of the key characteristics of CRE in Australia and how these are changing over time.

The paper is structured into three main sections: the first section sets the scene and places the CRE development in Australia in the context of climate change policy and social movements, as well as introducing our methodology and theoretical framework. The second part of the paper presents empirical data from the two national surveys of CRE. The third section apply a social movement theory lens to understand the emergence of a CRE movement at this time and compare movement drivers in Australia with those in Germany and Denmark, where CRE is most well-established.

2. Context

Climate Change in Australia

The impacts of a changing climate are already being witnessed in Australia. Seven of Australia's ten hottest years on record have occurred during the last decade, with 2013 having the most frequently recorded extreme temperatures above the 1961-1990 average (Bureau of Meterology, 2015) . Additionally, the increased frequency of severe weather events such as heat waves, cyclones, bushfires, droughts and floods manifest the impacts of global climate change locally. As with other nations, Australia has to face the social and economic implications of climate change, including issues arising for human health, agriculture, water supply, infrastructure and the environment (Climate Council, 2013; Garnaut, 2011; Hennessy et al., 2007; Stern, 2007). Mitigating the impacts of climate change requires the significant reduction of CO2 emissions particularly in countries such as Australia, which is one of the worlds' largest per capita CO2 emitters (OECD, 2013).

Australia's climate mitigation policies

Despite increasing scientific consensus and poignant climate experiences, taking action on climate change has struggled to gain consistent attention in Australian policy. While some carbon emissions reduction, carbon trading and renewable energy policies have been introduced at state and federal levels, this has been in a context of fluctuating levels of political support. For some policies the effect has been terminal, leading to occurrences such as Australia being the first country in the world to remove a carbon pricing mechanism, just two years after its introduction in July 2012 (Australian Government, 2015a; Twomey, 2014; Vorrath, 2014)[1]. The Direct Action Plan, introduced as a replacement, to reach the national target of a 5% reduction in CO2 below 2000 levels by 2020 has been highly questioned for its ability to deliver the target effectively (Editorial, 2015a, 2015b; Miller, 2014). This is part of a longer list of measures introduced by the Abbott Government to weaken action on climate change since it entered office in September 2013, including large cuts to the Australian Renewable Energy Agency[2], high uncertainty about the future of the Clean Energy Finance Corporation[3] and the abolition of the Climate Commission[4] (REF).

Diesendorf's (2010) analysis indicates that successive Australian governments continue to be strongly influenced by the fossil fuel lobby and are increasingly criticized by the international community for their weak and wavering stance on climate change. The political class in Australia largely identifies with the wealth of the country's fossil energy resources, which is considered to provide major benefits and a growing stature as a global energy superpower

[1] The Australian Government introduced a Carbon Pricing Scheme in July 2012 that required emissions-intensive industries to report on and pay a price for carbon pollution. Entities that met or exceeded the threshold of 25,000 tonnes carbon dioxide (CO2-e) per financial year became liable under the carbon pricing mechanism.
[2] The Australian Renewable Energy Agency was established by the Australian Government in July 2012 to support commercialization and uptake of new renewable energy technologies.
[3] The Clean Energy Finance Corporation was established in July 2012 to provide competitive finance renewable energy projects.
[4] The Australian Government established the Climate Commission as an independent science body to inform about facts on climate change. After the newly elected Government abolished it in September 2013, a campaign raised funds from the public to enable it to continue to operate as the Climate Council (Climate Council, 2015).

(Australian Government, 2015b). Diesendorf's analysis also indicates that the willingness of successive governments to avoid or delay actions to cut CO2 emission in Australia has consequently driven the growth of the climate action movement (ibid).

Australia's renewable energy policies

The Renewable Energy Target (RET) was established by the Australian Government to ensure 20% of Australia's electricity comes from renewable sources by 2020 and has enjoyed bi-partisan support since its introduction in 2001 (Australian Government, 2014; Buckman and Diesendorf, 2010; Byrnes et al., 2013; Kent and Mercer, 2006). The RET is Australia's major policy to incentivize renewable energy deployment and operates through the creation of tradable certificates issued to large-scale (over 100kW) and small-scale (up to 100KW) generators (Australian Government, 2014; Buckman and Diesendorf, 2010). Spurred by a Prime Minister who declares that "coal is good for humanity"[5], the RET has been under threat recently from climate skeptics and fossil fuel supporters within the government, industry and general population. Reviews of the RET have caused the renewable energy industry to standstill for the past two years, causing the loss of almost 2500 jobs and a 90% drop in investment over 2013-2014 (Australian Bureau of Statistics, 2015; Parkinson, 2015). The Government's strategy for the country's energy future presented in the Energy White Paper in April 2015 continues to promote the dominance of fossil fuel (Australian Government, 2015b; Whitmore and Hopkin, 2015).

Rise of the climate action movement

Since the 1990s, environmental NGOs in Australia have undertaken climate change focused campaigns, contributing to increasing public awareness and political action. Hall and Taplin (2008) highlighted that by 2006 NGO campaigns had significantly increased public interest in and media coverage of climate change and public polls indicated that 68% of Australian considered climate to be a "critical threat" (Lowy Institute, 2014). A range of climate action groups and networks emerged at this time as part of the direct campaign to address climate change (Burgmann and Baer, 2012; Hall and Taplin, 2008). By the late 2000s, however, the importance of climate change in public opinion had decreased. A poll by Australia's peak scientific body in 2014 indicated that climate change ranks among the last of people's general concerns (14th of 16) and environmental concerns (7th of 8) (Lowy Institute, 2014). Despite this, many community groups and NGOs remain engaged on issues related to climate change.

At the time of writing, the movement for action on climate change encompasses many branches that refer more and less overtly to climate change itself. Some lament the demise of a movement solely focused on climate change in Australia since the late 2000s and feel that, as a result, climate change discourse and debate has diminished in the public arena (REF). Others posit that the climate movement, rather than having disappeared, has morphed into a more diverse movement targeting direct causes and solutions to climate

[5] While opening a coalmine, PM Abbott declared that "coal is good for humanity" and that it "will be the world's main energy source for years to come" (ABC 2014).

change (REF). Some of these branches include anti-coal and gas, divestment and renewable energy focused activity. It also encompasses many actors and types of activity, including NGOs, alliances and more and less formalised community groups involved in lobbying, education, mass protest, direct action, divestment, cyber action, behavior change, retro-fitting for energy efficiency and devising and demonstrating alternatives. For example, Australia now has over 2 million households with solar PV and/or solar hot water (Clean Energy Regulator, 2014) and over 60 communities pursuing CRE projects (C4CE, 2015a).

3. Methods

This article analyses the results of the first two nation-wide surveys of the nascent CRE movement in Australia and applies a social movement theory framework to understand its emergence at this time.

Surveys

The surveys were created and conducted by members of the Coalition for Community Energy (C4CE) in 2011 and 2014. Each survey was designed with particular purposes in mind: the first was an effort to capture the "challenges and opportunities" of community energy in Australia (Ison et al., 2012); the second informed the development of a National Strategy for Community Energy (C4CE, 2015a). The initial purpose of the surveys was to help the newly formed Coalition for Community Energy to understand the emergent community energy movement, its strengths, opportunities, challenges and weaknesses. Since, we have identified the need to for cross-survey analysis and to bring this data to wider audience. In particular, there is a need to compare the two data sets to track trends over time and to position this research in a broader context in order to reflect on the development of the CRE movement in Australia.

The first survey was sent to 30 CRE groups of which 28 (93%) were returned. The second survey was sent to 40 CRE groups and 35 (87%) were returned. Seven questions were common to both surveys, three questions were similar and the remainder are different. Progressive analysis of the sector's characteristics is possible on the basis of the overlapping questions. Questions were mostly multiple choice or scaled (rating - five-point scale - not-important to important), some were open ended. One author was involved in designing the first survey in 2011 and both authors were involved in designing the second in 2014. The authors received permission from the Coalition for Community Energy to use the results from both surveys to produce this article.

Data analysis involved a dataset comparison using the statistical IBM SPSS software as well as custom made Microsoft excel sheets. The 2011 and 2014 samples were entered into the software and analysed in relation to the research questions. Open-end questions were coded using standard qualitative data analysis techniques around emergent themes and ultimately quantified. We specifically focused on answers that provided insights into the characteristics and changes in CRE over the time frame, as well as those that gave insights into the normative foundations of the groups.

Theoretical framework: New Social Movement Theory

We apply New Social Movement Theory (NSMT) to analyse the relationship between the climate movement and CRE in Australia, particularly to understand the emergence of CRE initiatives when they did and to better understand the role they might play in the transition towards the low carbon society necessitated by climate change.

Since the 1960s social movement studies has grown into an established field of research, including a large body of literature on the definitions and characteristics of social movements (Diani, 1992; Eyerman and Jamison, 1991; McCarthy and Zald, 1977; Melucci, 1985, 1980; North, 2011; Porta and Diani, 2006; Saunders, 2013). This article draws on two definitions. The first, Eyerman and Jamison (1991) who perceived social movements "as temporary public spaces . . . movements of collective creation that provide societies with ideas, identities and even ideals". The second, Diani's view of movements as networks "of informal interactions, between a plurality of individuals, groups or associations, engaged in a political or cultural conflict, on the basis of a shared collective identity" (Diani, 1992). Thus, social movements can be seen to rally a range of actors around a contested societal issue in a process that fundamentally involves the creation of new identities and cultures.

Considered as agents of social change, social movements have influenced and transformed society in a number of different areas such as environmental protection, civil rights and women's rights (Porta and Diani, 2006; Zald et al., 2005). In analysing these phenomena, social movement theory (SMT) developed quickly and several schools of thought emerged, which can be categorised into two main streams focused on either structural or cultural drivers of change (Corte 2010). The most significant of the structural school of SMT is Resource Mobilisation Theory, which emphasizes "rational action and structural opportunities for movement emergence" and focuses on the use of resources to produce of tangible outcomes or changes in (Bate et al., 2004; Porta and Diani, 2006). The cultural school of SMT is the foundation of NSMT, which is seen as a critical response to the resource mobility approach that emerged in the early 1990s (Seyfang et al. 2010).

NSMT emphasises the importance of collective identity, values, lifestyle and awareness of global issues as both drivers and desired outcomes of social movements (Melucci, 1985, 1980). By taking a macro-societal perspective, proponents of NSMT such as Melucci (1980), Touraine (1981) and Habermas (1981) are more concerned with 'why' rather than 'how' social movements emerge. NSMT places importance on the cultural characteristics of a social movement, such as identity and solidarity, (Melucci, 1980) as well as placing the actors (rather than resources) at the center of analysis (Porta and Diani, 2006). In particular, a collective identity created through interactive social processes (e.g. debates, building relationships) is seen as vital for the rise, perseverance and success of a movement (Mario Diani and Doug McAdam, 2003, Bate et al, 2005). Furthermore, Seyfang et al (2010) recognize the strength of NSMT in relation to CRE in its ability to draw attention to long-term transformations that alter people's identities and the political and social conditions and give rise to new social movements.

Given our interest in community involvement in renewable energy transitions through CRE, the NSMT perspective allows us to investigate the phenomenon by looking at its cultural and social dimensions and to understand the impetus for its emergence against a wider socio-

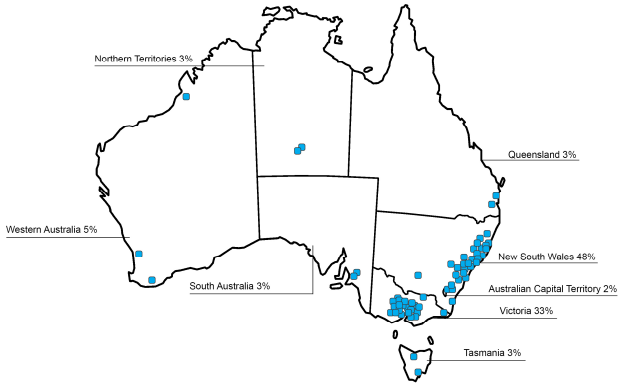
political context. It encourages an analysis of the drivers of the CRE movement in Australia, with particular attention to group's motivations, and to compare this with the emergence of CRE in other countries.

4. Characteristics of CRE development in Australia

In this section we analyse the characteristics of the CRE movement and its development over the last four years by drawing on the results of the 2011 and 2014 surveys and link the results to the Australian policy context.

Status & development of CRE

At the time writing the Coalition for Community Energy (C4CE, 2015a) reports that there are 60 CRE groups across all states and territories of Australia, as shown in Figure 1 below. Nineteen of these are fully established and account for more than 9 MW of installed wind or solar technology (Kirsch et al., 2015). Together they produce 50,000 MWh of electricity per year, avoiding 43,000 tons of carbon dioxide emissions (ibid).



According to our survey data almost 500 community members are actively engaged in the development and operation of the 35 projects surveyed. They are supported by a much bigger network of members and associates that accounts for roughly 17,000 people across Australia. The number of people involved in CRE has increased significantly since 2011, as seen in Table 1.

The latest figures reported by C4CE in early 2015 have soared up to more than 4,000 active and 21,000 associated members (Kirsch et al., 2015).

Year	People actively involved	Members & Associates
2011	255	2,721
2014	482	16,618

Table 1: Number of people involved in CRE in 2011 and 2014

Although the first CRE activities in Australia started in 2004, the majority of groups surveyed are not older than 2 years, indicating the rapid growth in the movement in the recent past, as seen in Figure 2. The majority of community projects are still in the early stages of project development assessing the technology, financial and legal options, and seeking planning approval. The second largest group of projects is conducting fundraising activities for capital works. However, in comparison to 2011, CRE groups are progressing, having moved from the first three stages on to the middle three stages (see Figure 3).

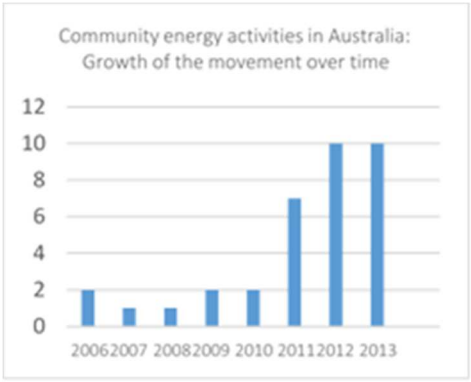


Figure 2: Number of CRE groups established per year.

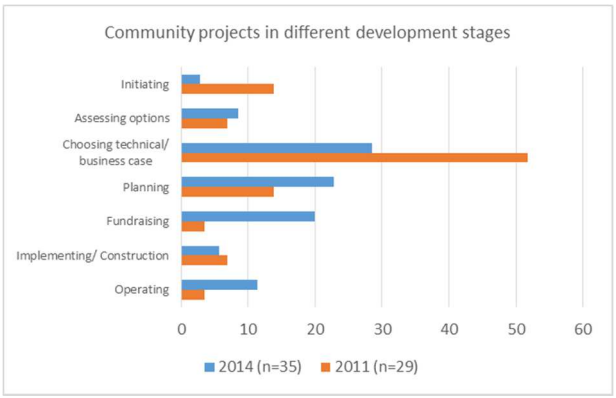


Figure 3: Community energy activities in different project stages in 2011 and 2014 (in %)

2011 was a significant year in the development of CRE in Australia, with seven or more groups initiated that year and each year after. This is likely due to the introduction of a supportive government program in New South Wales (NSW)[6] as well as the inspiration garnered from Hepburn Wind, Australia's first community wind farm located in Victoria (VIC), beginning operation in June of that year.

Figure 4 shows the distribution of CRE groups in 2011 and 2014 by states. While in 2011 VIC had the most CRE projects, by 2014 NSW had taken the lead, also likely a result of the state's support program. The majority of CRE activity is located in regional areas (19 of 35 groups) of these two states.

[6] The NSW Government Office of Environment and Heritage's Regional Clean Energy Program was introduced in 2011 to support the uptake of renewable energy in the state. They support CRE through regionally based renewable advocates, grant funding, information services and resource development.

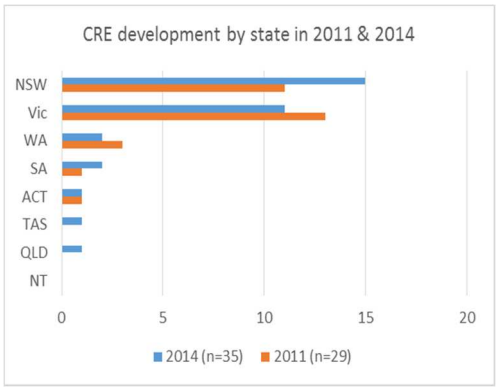


Figure 4: Distribution of CRE by state in 2011 and 2014

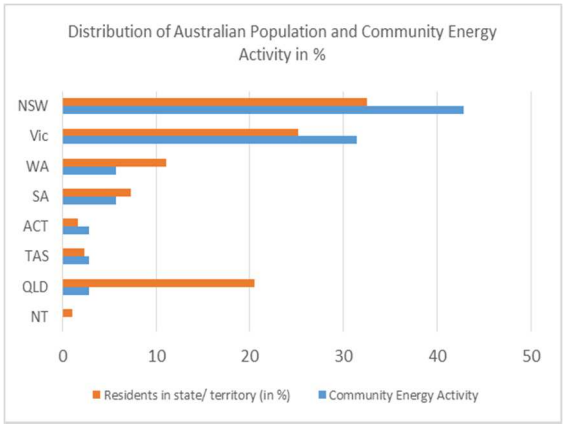


Figure 5: Distribution of Australian community energy activity (2014) and Australian population (Australian Bureau of Statistics, 2015)

As can be seen in Figure 5, the distribution of CRE groups loosely matches population density in South Australia (SA), the Australian Capital Territory (ACT), Tasmania (TAS) and the Northern Territory (NT). NSW and VIC have more than 'their share', and Queensland (QLD) has significantly less CRE activity by population.

Technology choices

The favored technology option (chosen by 30% of groups) is solar PV and this ranges from household scale (eg. through an organised bulk-buy scheme) to medium scale installations of up to 250kw. The first community owned solar farm, with a capacity of 99kW, was launched in October 2014. Nevertheless, the two operating community wind farms, Denmark Community Wind (1.6 MW) and Hepburn Wind (4.1 MW), contribute the most in terms of MW of CRE capacity. A number of the groups (10 of 35 groups) are also pursuing energy efficiency programs.

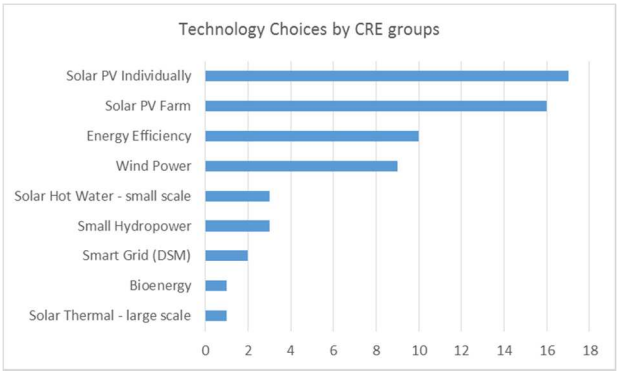


Figure 6: Technology choices of CRE groups by % in 2014

Since 2011 the technology choices have diversified and technologies such as small hydropower, solar thermal and peak demand management systems and smart grids are also being considered. The technology choice is influenced not only by the environmental conditions but also by availability of suitable host sites, particularly for solar PV. The most often cited option (54% or 19 respondents) for the location of the CRE projects is a large energy using building that requires a large enough on-site electricity demand to directly purchase and utilise electricity as it is generated from solar PV and who can offer a reasonable electricity price to enable the project to be economically viable in what is called a 'behind the meter' arrangement.

Legal models

Ensuring a high degree of local ownership and control of community energy projects has been demonstrated to facilitate local community benefits across social, economic and environmental outcomes (Hicks and Ison, 2011; Hielscher, 2011; Seyfang and Smith, 2007; Walker and Devine-Wright, 2008). CRE groups surveyed attribute great importance to the criterion of community ownership, with a significant majority (80% or 28 of 35 respondents) indicating plans for assets to be owned by the local community. However, they plan deliver this in different ways and to varying extents through the use of different legal arrangements. Legal structures being used or planning to be used are: Cooperative (13), Private Company (limited by shares (Pty Ltd.)) (9), Incorporated Association (9), Public Company (limited by shares (Co. Ltd.)) (7) and Trust (1). While most are based on a shareholder model in which people invest in the project by making a monetary contribution (ie. those using cooperative and company structures), some are based on membership, where entry is open and accessible to anyone in the community (ie. those using incorporated associations). Cooperatives uphold the democratic principle of one-member-one-vote, and are often favored for this reason. The majority of groups (16) chose to employ company structures that are easier to adopt due to more widespread application than cooperatives. However, three groups are still in favor of cooperative style democratic attribution of voting rights and have altered their constitutions to incorporate this. Some groups place restrictions on shareholdings, requiring people to be local and/or putting limits on maximum investments, in line with motivations for broad local participation. Through the combination of the elements of a legal model groups are fashioning structures that meet their legal needs as well as delivering on their desired level of community ownership and control (Hicks and Ison, n.d.).

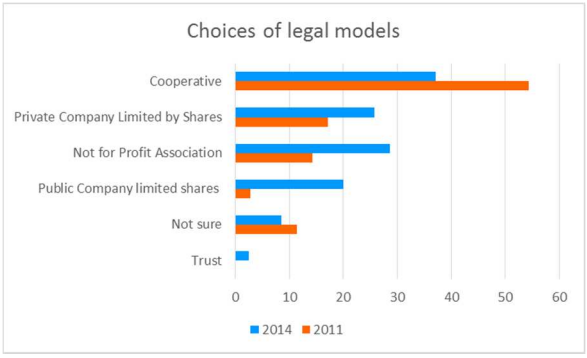


Figure 7: Choices of legal model in 2011 and 2014 (in %)

Although the cooperative model is still favored in 2014, its popularity has decreased since 2011 as preferences shifted towards other legal structures (as seen in table 7). In 2014, groups were considering a wider variety of legal structures, with trusts, incorporated associations and public companies becoming much more popular. This is likely to be in part the diversification of the movement as it matures and new actors engage with CRE, bringing different exposure and experience. It also reflects innovation emerging to deal with experienced regulatory and resources challenges (explored in more detail below). Also, the dominance of Hepburn Wind, a cooperative, as the leading influence has been diluted as other CRE projects have successfully established using different legal models.

Financial features

Of the 35 CRE groups surveyed in 2014, a quarter (9 of 35) are for-profit and the rest are not-for-profit. The for-profit projects expect to offer, or are already offering, community investors a return on their investment. In addition, 5 groups are considering or already contributing to a community fund, to ensure the financial benefits of the project are also distributed to the broader community. However, this is only an option currently afforded by

the two established MW scale wind farms, rather than the much smaller community solar installations. For example, Hepburn Wind contributes approximately $30,000 per year ($7.5k/MW/year) and Denmark Community Windfarm contributes $10,000 per year ($7.1k/MW/year) to a purpose-built community fund. Of the not-for-profit groups, five are using the surplus generated to establish a revolving fund to go towards future solar projects. Others use the money saved to go into supporting their core activities (e.g. childcare).

Furthermore, without an enormous amount of volunteer work and time the projects surveyed would not be realized. C4CE estimated that 31 volunteer weeks goes into the development of community energy projects, with some groups having spent 6 years on the development phase alone (Kirsch et al., 2015). The bulk of the volunteer work is contributed in the early development of the projects. Once projects reach implementation and operation phases, larger projects such as community wind farms can create up to seven full time jobs during construction and up to four ongoing positions (Kirsch et al., 2015)

In financing CRE projects the development and operation phases are very distinct. In the development phases, funding is crucial to securing legal and technical advice, among other things. Once a project is operational income is generated through its outputs (electricity sold). In 2014, the most common sources of secured funding during the development phase was state governments, membership dues, small donations and philanthropic grants. This reflects the fact that most groups are still in under development and have not yet gotten to the point of being able to seek investment or crowdfunding. The groups were not asked to specify whether they were planning to use crowfunding to seek investment or donations, but interest in investigating this from of funding increased significantly from 2011. This most likely reflects the establishment of several web-based crowdfunding platforms in Australia from 2011-14 and the success of the first donation-based and crowdfunded project by CORENA in 2013 in South Australia.

Interest and reliance on both membership dues and small donations as a means of funding the development phases increased between 2011 and 2014 as a source of funds being investigated and secured. This is likely to be a reflection of difficulties securing funds from other sources, such as federal government and state government, both of which decreased as a source of funds being investigated or secured over the same time period. As a result, groups are increasingly relying on multiple sources of income to fund the feasibility stages of CRE projects, and this includes an increase in locally sourced, piecemeal funding through membership dues and small grants. Grants from philanthropic organisations also increased as a source of funding from 2011 to 2014, indicating an increase in the number of programs and philanthropists with an interest in and understanding of CRE.

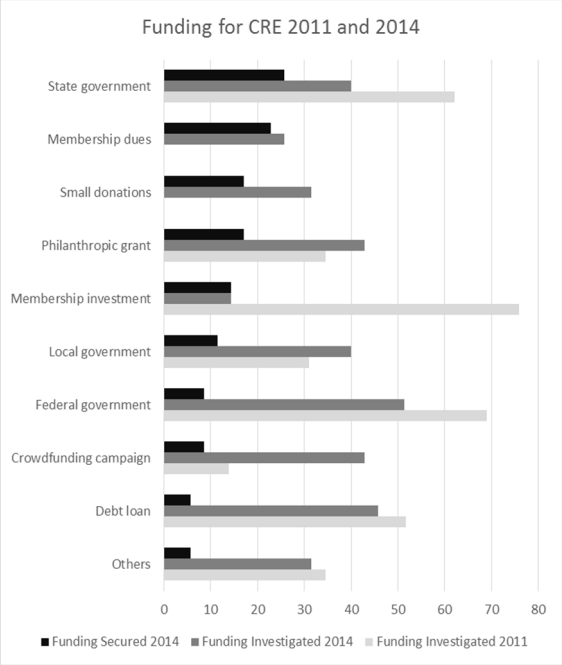


Figure 8: Funding sources that are investigated in 2011 and 2014, plus funding sources finally secured in 2014 (in %)

State government grants remained an important identified source of funding for CRE development and this would largely reflect the New South Wales (NSW) Government's Regional Clean Energy Program. This program has conducted two grant rounds for feasibility studies, one of $411,000 across 9 CRE projects in 2013 and one of $846,000 across 19 projects 2015 (Parkinson, 2014).[7] Victorian Government under Labor leadership has made funds available to CRE, most notably a Victorian government grant of $975,000 received by Hepburn Wind. Twenty five percent (9) of the groups surveyed have secured state government funds.

The Renewable Energy Target remains an important source of funds for CRE projects that are generating electricity and are, thereby, eligible for Generation Certificates, which they sell to boost income. However, policy uncertainly has caused a dramatic decrease in Certificate values recently, undermining this as a source of projected income. Further, the removal of the Carbon Pricing mechanism in 2014 reduced the price competitiveness of renewable energy in the Australian energy market (Macgill et al., 2014; O'Gorman and Jotzo, 2014).

Motivations & vision

CRE in Australia is informed by strong normative commitments to sustainability, especially carbon reduction, and to people's role in actively contributing to a transition to renewable energy. The 2014 survey asked groups to select which motivations from a list were the key drivers for their project (see Table 3). Environmental, and more specifically concerns around climate change, are of greatest importance to CRE groups, with 89% of respondents listing it as a driving motivation for their group. The next most cited motivations are more social aspects of 'community self-sufficiency and resilience' (80%) and 'engagement and

[7] The second round of funding from the Regional Clean Energy Program was announced after the survey was conducted and thus is not reflected in the survey data.

empowerment' (74%). Interestingly, while engagement and empowerment ranks highly, this is conceived of as being distinct from increasing political power, which was only ranked as a motivator by 60% of survey respondents. Also of note is that income generation (71%) and contributing to energy affordability (3%), motivations that have driven CRE development in other countries, such as Scotland, are lower on the list. Predominant motivations of CRE groups can be associated with their origins. More than one third of the initiatives stem from former or active climate action or sustainability groups, where the CRE project is either the main activity or the focus of a sub group.

Motivation	# of CRE groups	from 100%
CO2 reduction/ climate change	31	89 %
Self Sufficiency and Resilience	28	80 %
Engagement and Empowerment	26	74 %
Income generation	25	71 %
RE industry development	25	71 %
Energy literacy	24	69 %
Behaviour change	21	60 %
Social capital	21	60 %
Political power	21	60 %
Show alternative	3	9 %
Affordable energy source	1	3 %
Contribute to a social movement	1	3 %

Table 3: Motivations of CRE project members and leaders for their engagement with CRE in Australia. Data taken from the CRE survey in 2014. (n=-35)

The C4CE (2015) reports on a shared visioning process conducted with 250 people from across Australia involved with CRE, as evoking:

> *A vibrant community energy sector, where communities across and throughout Australia are hubs of sustainable innovation and collaborative action between residents, business, industry, and all tiers of government. Their shared vision of achieving 100% renewable energy fits within their broader purpose of transitioning to an environmentally sustainable way of life, also encompassing food, housing, transport and more.*

Here, again, both social and environmental motivations are evident as normative drivers for participants in CRE. Community collaboration and community cohesion were particularly emphasized through this process, as demonstrated in a representative quote from a Congress delegate: *"Energy (is) being generated and managed by the community in a socially equitable fashion. Community management and engagement helps to bring social and community cohesion in our society" (*C4CE 2015, p. 15*).*

Barriers and Hurdles

The CRE groups surveyed face significant challenges largely stemming from operating in a complex regulatory environment that is unfamiliar with medium scale renewable energy projects led by community organisations (Ison et al., 2012). CRE groups have to date found it difficult, as small and unknown actors, to interact and negotiate beneficial arrangements

with energy retailers, debt providers and grid operators. Fifty percent of groups quoted "lack of understanding within political, financial and community circles about potential for CRE" as a key barrier. Where policies have targeted CRE, these have tended to be small programs offering inconsistent or once-off support at a state level (eg. small grant funds (NSW); feed-in-tariff grant (ACT)), which have not addressed broader systemic barriers over the longer term.

In particular, groups face financial hurdles associated with financing the development phases of CRE projects before planning approval is secured; raising capital to fund construction; and securing a buyer for the energy who can offer a price that will render the project financially viable (wholesale electricity prices being low and private sale generally not possible within the regulatory environment unless it is 'behind the meter'). Other regulatory barriers include difficulties gaining grid connection (Ison et al., 2012) and the lack of stable incentives for renewable energy (e.g. renewable energy target, feed-in-tariffs), in particular for mid-scale installations (Ison & Hicks 2011).

In 2014 groups are seeking options for coping with the difficult operating environment by focusing on business model innovation. CRE business models encompass organizational-legal, financial, technological and community engagement aspects (Hicks et al., 2014). The National Community Energy Strategy (2015) emphasizes that only few models are viable in the Australian context and much effort is needed to identify successful schemes that can be replicated by groups. For example, one challenge that impacts business models are the restrictions posed by the Corporations Act that limits the number of investors to 20 (Australian Government, 2015c). If a project exceeds the number of 20 investors, which is highly likely for community projects, there are high compliance obligations (e.g. regarding public offerings and advertising), greater legal complexity (e.g. needing an Australian Financial Service License), as well as uncertainty and liability risks for issuers (Australian Government, 2015d; C4CE, 2015a). These restrictions have been implemented as an investor protection mechanism but negatively impact the financial viability of CRE projects.

Regulatory limitations also affect the size of the CRE project. A comparison between the 2014 and 2011 survey data reveals that planned system sizes have decreased from the multi-megawatt range to being below 100kW. With few exceptions, groups that aim to install solar PV are planning 10-99kW projects with behind-the-meter arrangements. This can be explained by the fact that for larger, grid connected systems groups have to deal with challenges associated with accessing the energy market (e.g. grid connection, negotiating a power purchase agreement) and a trade-off between skills, capacities and economic viability of the project (e.g. lack of skills and resources to develop larger scale installations and constrains to make the business case stack up with Large-Scale-Certificates from the RET scheme). Closely linked to the system size is the challenge of finding an adequate host site for community wind and solar projects.

Although such challenges remain an issue, some support for CRE has been provided by state governments, such as the aforementioned NSW program and the ACT Government's reverse auction feed-in tariff (FiT) for 1MW of community-owned solar PV (ACT Government, 2015, 2011).

Support Networks in the Sector

The challenging policy and regulatory context has not only spurred the development of innovative CRE models in Australia, it has also catalysed a collaborative approach among groups to deal with shared challenges. The C4CE was established in 2014 as a collaboration between nine organisations engaged in supporting CRE, in recognition that "collaboration enables greater impact than the simple sum of individual member efforts" (C4CE, 2015b). Guided by the overarching goal of helping remove the barriers to and maximize the opportunities for community involvement in renewable energy, C4CE coordinates advocacy and lobbying targeted at changing state and federal policy, facilitates alignment of effort, shares knowledge and enables the movement's activities and resources to grow. It can be considered a strength of the emerging movement that such collaborative arrangements pool resources and help to avoid duplications, while facilitating greater political impact (C4CE, 2015b).

The governance approach of C4CE is based on Collective Impact model, which encompasses a framework for facilitating and achieving large-scale social change based on cross-sector engagement and highly participatory governance processes (Kania and Kramer, 2011). The network has grown to 51 members including CRE projects, sustainability groups, climate action groups, local and state governments (e.g. Bass Coast Shire Council and NSW Office of Environment & Heritage), research institutions (Institute for Sustainable Futures), industry suppliers and larger environmental and energy not for profit organisations (GetUp and Moreland Energy Foundation Ltd). Of the 60 CRE groups in Australia, 31 are currently official members of C4CE.

5. Discussion

In the section that follows we outline the ways in which CRE can be seen as part of the broader climate movement in Australia, but also how it demonstrates key aspects of being a social movement in its own right. Drawing on New Social Movement Theory (NSMT) we present how CRE meets what Della Porta and Diani (1992, 2006), and Eyerman and Jamison (1991) summarise as being key aspects of social movements: that they arise in response to ongoing political conflicts or policy failures; they are underpinned by a common sense of identity; and, that they contribute to social change.

Links with the climate movement

The first CRE activities in Australia were overtly motivated to enable positive and empowering community-led action on climate change in a context of disillusioning and unsatisfactory national and international governance (Cameron and Hicks, 2013; Denmark Community Wind, 2015; Hepburn Wind, 2015). The uptake of CRE as a growing movement in Australia can also be linked with the climate movement, having emerged concurrently with increased public awareness of climate issues and, particularly, in the years since government action on climate change and support for renewable energy has waned. As introduced above, 89% of groups engaging in CRE list carbon emissions reduction and action on climate change a fundamental motivation and at least one third of CRE projects have stemmed from

pre-existing climate action, sustainability and transition town groups operating in communities.

Similarities can also be drawn between the emergence of C4CE and the efforts that connect groups on climate change action such as the Climate Emergency Network (CEN), Climate Emergency Action Network (CLEAN), Climate Action Network Australia (CANA) and the Australian Youth Climate Coalition (AYCC) (Burgmann and Baer, 2012).

Responding to political conflict

The emergence of social movements is generally correlated to the context of the times and, particularly, contentious politics that mobilize people to promote or oppose a social or environmental issue (North, 2011). Della Porta and Diani (2006) suggests that a social movement's dynamics are associated with the presence of conflict and often emerge in a space of 'contradictions' over contentious issues in contemporary Western societies. The political conflicts that have fueled the CRE movement's emergence and growth can be attributed to at least three main factors: the inaction by the national government on climate change; the struggle between coal, gas and renewable energy deployment; and, the competition between centralized monopolies and decentralized community and household owned systems for electricity supply.

Della Porta and Diani (2006) argue that organisations in social movements are prone to engage in confrontational challenges or countercultural practices. However, it can be assumed that not all CRE groups see themselves engage in confrontational action (North, 2011) but rather, are seeking proactive, creative solutions through grass-root action (Seyfang et al., 2010). Although groups are certainly concerned with contentious issues, this does not ultimately result in direct confrontation or conceptualizing an "enemy" as is often considered the case with social movements (Tarrow and Tarrow, 1998; Touraine, 1981). However, there is the potential for highly decentralized and democratized systems of energy deployment, such as CRE, to be disruptive to the current energy and policy context, thereby confronting the status quo albeit through less directly confrontational means. North's (2011) analysis of transition towns and carbon rationing action groups provides indications for a better understanding of the diversity of CRE groups' position in contentious politics. Similar to transition initiatives(Hopkins, 2008), CRE groups act locally in participatory ways to construct better alternatives to the dominant, fossil fuel dependent society. According to North elite's support would be appreciated but, if absent, such initiatives take charge of the transition themselves. Yet, in Australia the constrained environment requires public support and policy change similar to other countries such as Germany and Denmark where CRE activities have prospered. Therefore CRE movement has to make publicly visible demands for change to grow and reach scale. This demand is channeled through the C4CE advocating, coordinating and engaging its member organisations and the broader network.

Building collective identity

Beyond the conflict analysis, New Social Movement Theory (NSMT) emphasizes a cultural perspective that looks at collective identities, shared commitments and organizational

coherence to explain the emergence and rise of social movements. Since the 1970s climate and environmental movements have been studied under the lens of NSMT which focuses on the cultural and identity aspects of social movements, including identifying who joins the movement to understand why has it emerge at this point in time (Anugwom, 2007; North, 2011; Oliver and Myers, 2003; Porta and Diani, 2006).

In social movement processes, NSMT theorists highlight the importance of shared collective identity among actors, which is associated with a sense of common purpose and shared commitment to a cause (Porta and Diani, 2006). The growth of the CRE movement can be attributed to the promotion of the idea that a democratized, decentralized and decarbonized energy supply can be realized through the creation of CRE installations (Ison, 2009). While the connection to the climate movement and its goals of carbon reduction and green lifestyle has been a common driving force, it is clear that the particular social arrangements and community benefits of CRE initiatives (Walker and Devine-Wright, 2008; Walker et al., 2007) are equally attractive. Delegates at the Community Energy Congress in 2014 expressed their shared vision whereby considering CRE as one stepping stone for a stronger community empowerment and community cohesion which will help to achieve sustainable outcomes that involves the community decision making and benefits all community members (C4CE, 2015a). Hence, the importance of a cultural orientation to participation, democratic decision-making processes and community empowerment forms part of the cultural aspect of the CRE movement in Australia, in line with Walker and Devine-Wright's discussion of the importance of the 'process' element of CRE introduced above.

An awareness of the significant successes of CRE movements in Germany, Denmark and other countries is a source of inspiration for Austrian CRE groups, instilling a promise of similar achievements in Australia. Alongside this is a cultural practice of CRE groups laying claim to a right to participate in decisions about the future of energy supply in their communities, according to their values around climate change and community participation.

The biggest demonstration of public interest in CRE, apart from a small number of articles in renowned media platforms (e.g. Herald Sun,The Conversation 2013, Sydney Morning Herald, Reneweconomy)[8], was witnesses at the Community Energy Congress in Canberra in June

[8] Sydney Morning Herald Website Links: http://www.smh.com.au/national/renewable-energy-power-to-the-people-20141103-11fymi.html (accessed 24/05/2015); http://www.smh.com.au/national/the-winds-of-change-20140915-10exir.html (accessed 24/05/2015); http://www.smh.com.au/comment/the-liberal-party-should-be-community-energys-number-one-fan-20140617-zsaft.html (accessed 24/05/2015);
Herald Sun Website Link: http://www.heraldsun.com.au/leader/north/darebin-council-push-for-rooftop-solar-power-farm-at-preston-tram-workshops/story-fnglenug-1226977636875 (accessed 24/05/2015);
The Conversation Website Link: https://theconversation.com/what-australia-could-learn-from-a-us-energy-uprising-19637
Reneweconomy Website Links: http://reneweconomy.com.au/2013/community-energy-fund-seeks-50m-commitment-from-major-parties-50434 (accessed 24/05/2015);
http://reneweconomy.com.au/2014/shoalhaven-seeks-120000-for-99kw-community-owned-solar-project-23959 (accessed 24/05/2015);
http://reneweconomy.com.au/2014/communities-and-wind-power-whats-the-deal-98785 (accessed 24/05/2015);
http://reneweconomy.com.au/2012/embark-lend-lease-unveil-plans-for-400kw-community-solar-park-in-sydney-55682 (accessed 24/05/2015);

2014. As suggested by Burgmann and Baer (2012), conferences and summits are significant strategies that have been applied in Australia to consolidate the climate movement, raise attention of the politicians, formulate key policy demands and kick off climate action networks. With an attendance of more than 340 people from across Australia, the Community Energy Congress was able to gather a similar number of attendees as some of the important gatherings of the climate movement (e.g. Climate Movement Convergence in 2008, 250 people; Climate Action Summit in 2010 and 2011, 300 people). Participants learnt, engaged and shared knowledge about the concept of community energy and successful national and international projects. The Coalition for Community Energy was launched at the Congress and a first draft of the National Community Energy Strategy[9] presented for discussion.

The shared commitment of CRE actors is not only demonstrated by their participation and membership in their local CRE groups but also in their engagement in the C4CE and exchanges with other CRE groups across the country. The network coordinates and initiates regional and national meetings and conferences (e.g. Community Energy Congress, Webinars etc.), reaches out via email campaigns (Fund Community Energy Campaign, Renewable Energy Target campaign) and engages CRE groups in meetings with their local electorate. It can be argued that the strong collaboration within the movement helps to produce and encourage a shared identity and reinforces feelings of belonging and solidarity (Melucci, 1985; Porta and Diani, 2006). This ultimately supports the CRE activities in a rather difficult policy and regulatory environment and potentially contributes to greater political impact of the movement.

Contributing to social change

Social movements are seen as indicators for the rejection or dissatisfaction of civil society with social order and, as they often seek significant changes to the status quo, have different degrees of success with their interventions. Still, they are often described as 'agents of social change' (Zald et al, 2002, Bate et al, 2004, Porta and Diani, 2006), which can initiate and influence the emergence of new socio-political orders. This has been demonstrated and proven in different examples in the past, for example Martin Luther King's speech would not have been as powerful as a turning point in the US civil rights movement if there wasn't the mass march to Washington leading up to this event (Baer and Burgmann, 2012, p263). However their achievements can vary greatly (Porta and Diani, 2006) and their reach has been contested and challenged (Burgmann and Baer, 2012; North, 2011)

While studying success and failure of social movements is considered an integral part of SMT discipline, evaluating the outcomes can be challenging and different variables and factors have to be acknowledged (e.g. time frames, plurality of actors and strategies of different actors in and outside of the movement engaged with a particular issue) that make it difficult to assess the effectiveness of a particular movements (Porta and Diani, 2006). Further,

[9] The National Community Energy Strategy was funded by the Australian Renewable Energy Agency and provides an overview of the status of community renewable energy in Australia, highlighting the challenges and barriers but also proposing policy changes and support in the field.

outcomes such as shifting identity and culture can be very difficult to decipher and trace back to specific causes, often being the outcomes of a confluence of factors over an extended period of time. Different authors posit that the successes of movements comprise changes in policy, policy process and social values (Giugni et al., 1999; Rochon and Mazmanian, 1993) but have recognized at the same time that effects are often indirect, unintended and sometimes even in contradiction to their goals (Giugni et al., 1999). However, it is clear that with a social movement comes increased attention from the broader public and, with that, more opportunity for awareness and change (North, 2011)

The CRE movement in Australia is still in its infancy. The members of this movement are driven by a socio-ecological vision of change that is embedded in the broader goal of the climate movement to significantly reduce carbon emission. The prime concerns for the movement are policy and social value changes that could lead to a high share of renewable energy and community co-ownership. Without question, the core of the CRE movement's agenda is socio-technical, involving a transformation in who owns energy and the sources it comes from.

Some indications for the movement's potential contribution to social change can be provided by a brief look at the developments of the CRE sectors in Germany and Denmark. In both countries the emergence of a CRE sector was closely associated with the presence of a broader social movement that created public awareness and mobilised for policy change. In Denmark the anti-nuclear movement is considered as one of the crucial drivers for the success of renewable energy in the country (Jørgensen and Karnøe, 1995). In the 1970s context of the global oil crisis and the country's move towards nuclear power, a debate was launched that mobilized masses against the governments' suggestions of nuclear power as a "clean" and advanced option. A grassroots movement strengthened by the Organisation against Nuclear Power (OOA, established in 1974) and the Organisation for Renewable Energy (OVE, established in 1975) was able to initiate bottom-up practical strategies that involved a broad range of different actors such as entrepreneurs, researchers, engineers and highly skilled workers, as well as contributing to mass mobilizations and policy interventions.

The movement was not only able to succeed with their ultimate goal to get nuclear power off the agenda in Denmark but also demonstrate a working alternative that was embraced by the public (Sørensen, 2012). Events such as the purchase of the first 100 demonstration wind turbines by idealistic community buyers, were considered as a significant step for the creation of the initial wind energy market (Jørgensen and Karnøe, 1995) and the first CRE sector in the world. The public engagement in wind energy deployment helped to decrease entry barriers for wind power and led both to a supportive institutional framework for renewable energy and an innovative local market of wind turbine manufacturing. In 2000 80% of all wind turbines in Denmark were either owned on individual basis or through "cooperatives" (Wassink (2000) in Bolinger, 2001; Meyer, 2004). In 2009 a legislation was introduced to stimulate local involvement and ownership in new wind-energy projects. The Danish act on renewable energy imposes an obligation on all new wind-energy projects to offer a minimum of 20% ownership to local inhabitants, e.g. cooperatives (Danish Energy Agency, 2009). In 2014 the country deploys almost 40% of its energy demand from wind

power, and has set goals for 50% wind energy in the Danish electricity consumption by 2020 (Danish Wind Industry Assocation, 2015). The Danish example demonstrates that a combination of a vibrant bottom-up and a progressive top-down approach plus a diversified set of public ownership arrangements has contributed to the success of the wind energy sector (Cumbers, 2012) and helped to drive the technical as well as the social integration of the usage of this form of energy.

In Germany a social movement has also played an important role in the development of the CRE sector. Similar to the Danish example, the oil crisis and the conflicts around the establishment of nuclear power plants in Germany in the 1970s gave birth to an anti-nuclear movement that promoted the establishment structures of energy generation guided by principles of decentralisation, collective ownership and direct democracy as well as ecology (Mautz et al, 2006). In the mid-80s the efforts of the movement were catalysed by the disaster of Chernobyl that created broad public opposition towards nuclear power and the first 'citizen wind plants' (Bürgerwindanlage) - two to three turbines owned, financed and operated by a group of people - were established (Byzio et al., 2002). These 'citizen wind plants' helped establish the wind industry in the country but also provided the basis for participatory financing schemes and set the scene for favorable political framework conditions for RE in general (Byzio et al., 2002; Mautz et al., 2008; Toke et al., 2008). Since its beginnings more than 30 years ago, the CRE sector in Germany has grown into a very diverse field of projects of different forms, sizes, legal arrangements and social impacts and contributed greatly to the German success story in renewable energy with 47% of its capacities owned and operated by citizens and communities (Agentur fuer Erneuerbare Energien, 2014). While total numbers of CRE projects in Germany have not yet be collected and analysed, in 2015 more than 200,000 people were engage in more than 800 energy cooperatives (DGRV, 2014).

Although motivated by different issues - resentments over nuclear power (GER and DEN) in contrast to concerns over climate change (AUS) – and placed in different contexts (1970s/ 1980s versus 2015) - the examples suggest that social movements on broader environmental and energy issues had a significant role to play in the emergence of CRE emergence, and that CRE in turn, can contribute significantly to changing energy provision at a country scale. The comparison offers insight into the different dynamics that have driven the social movements to engage in RE. In Germany and Denmark the period of protest and mass mobilisation against nuclear power was the precursor to an alternative energy discussion in which community energy solutions were promoted (Mautz et al., 2008). The mobilisation against a mutual opponent (nuclear industry and the state) gave rise to fundamental questions about energy generation and has led to a critical mass of people interested not only in opposing the incumbent system but also in seeking new forms of energy generation. Decentralised wind power projects offered an innovative socio-technical alternative which was embraced by activists and open-minded farmers. In contrast, Australia's CRE movement is embedded in a more general context of social support for renewable energy accompanied by climate change concerns. It is yet to be closely linked with the anti-coal and anti-coal seam gas protests and its ability to present itself as a viable alternative to these is stymied by the fact that much of the extract feeds export rather than domestic energy needs.

Further research is needed to deepen the knowledge to be able to compare and draw links between the emergence of CRE and social movements.

6. Conclusion

We have argued that CRE is a nascent movement in Australia that can be seen to be a social movement in its own right, as well as contributing to broader a broader social movement for action on climate change. What remains to be seen is the extent to which CRE in Australia is able to affect social change and contribute significantly to a shift away from fossil fuels and towards a low-carbon future. Based on experience in other countries, it is possible to foresee that the CRE movement could play a significant role in both the deployment of MW's of renewable energy generation as well as fostering the social and political conditions to support more rapid uptake of renewable energy more generally. Increasing the number of people mobilized around positive and tangible solutions to climate change involving renewable energy has a role to play in increasing the level of awareness, education, engagement and political power of those grassroots actors in the broader climate movement. Future research needed to understand how much of the success in Germany and Denmark can be attributed to cultural aspects, such as past experience and inclination to cooperative based solutions and active civil society.

While at present the CRE movement in Australia is being driven by grassroots actors, there is an identified role for increased support from both civil society and government if barriers are to be removed and projects enabled to succeed in a more timely manner. Some government programs, such as the NSW Regional Clean Energy Program, are actively and successfully supporting CRE, although this is still occurring within a broader policy and regulatory context that is constraining. In order to support CRE and other medium scale renewable energy installations, a number of policy support programs are recommended to address issues associated with difficulties accessing grid connection, securing a fair price in the national electricity market and accessing low-cost finance for project establishment. Further, such policies need to be implemented, or at least coordinated, at a national level and be secure over the longer term in order to attract confidence within this new sector. They also must recognize the appetite for new actors in energy provision and provide space for community groups, with their different business models and values, to participate as eligible actors. Successful policies in other countries have combined stable grid connection, feed-in-tariffs, loan funds and advisory and training services as an effective means of supporting CRE (Hicks and Mey, 2014).

BIBLIOGRAPHY

ABC (2014) http://www.abc.net.au/news/2014-10-13/coal-is-good-for-humanity-pm-tony-abbott-says/5810244

ACT Government, 2011. Electricity Feed-in (Large-scale Renewable Energy Generation) Act 2011. Australian Capital Territory (ACT) Government, Canberra.

ACT Government, 2015. Community solar [WWW Document]. Website. URL http://www.environment.act.gov.au/energy/community_solar (accessed 5.20.15).

Agentur fuer Erneuerbare Energien, 2014. Wachstumstrend der Energiegenossenschaften ungebrochen [WWW Document]. URL http://www.unendlich-viel-energie.de/wachstumstrend-der-energiegenossenschaften-ungebroche

Anugwom, E., 2007. Social Movements, Sociology Of, in: Anderson, G., Herr, K. (Eds.), Encyclopedia of Activism and Social Justice. Thousand Oaks, pp. 1306–1315. doi:http://dx.doi.org/10.4135/9781412956215.n881

Australian Bureau of Statistics, 2015. Employment in Renewable Energy Activities, Australia, 2013-14 [WWW Document]. Website. URL http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4631.0Main+Features12013-14?OpenDocument (accessed 4.17.15).

Australian Government, 2014. Renewable Energy Target Scheme - Report of the Expert Panel. Canberra.

Australian Government, 2015a. Repealing the Carbon Tax [WWW Document]. Website. URL http://www.environment.gov.au/climate-change/repealing-carbon-tax (accessed 4.20.15).

Australian Government, 2015b. Energy White Paper.

Australian Government, 2015c. CORPORATIONS ACT 2001 - SECT 708.

Australian Government, 2015d. CORPORATIONS ACT 2001 - SECT 734.

Avelino, F., Bosman, R., Frantzeskaki, N., Akerboom, S., Boontje, P., Hoffman, J., Paradies, G., Pel, B., Scholten, D., Wittmayer, J., 2014. The (self-)governance of community energy.

Bate, P., Bevan, H., Robert, G., 2004. Towards a million change agents. A review of the social movements literature: implications for large scale change in the NHS. London.

Bolinger, M., 2001. Community Wind Power Ownership Schemes in Europe and their Relevance to the United States, Power.

Buckman, G., Diesendorf, M., 2010. Design limitations in Australian renewable electricity policies. Energy Policy 38, 3365–3376. doi:10.1016/j.enpol.2010.02.009

Bureau of Meterology, 2015. Annual climate statement 2014 [WWW Document]. Website. URL http://www.bom.gov.au/climate/current/annual/aus/ (accessed 4.15.15).

Burgmann, V., Baer, H.A., 2012. Climate Politics and the Climate Movement in Australia. Carlton, Vic : Melbourne University Press, Carlton, Vic.

Byrnes, L., Brown, C., Foster, J., Wagner, L.D., 2013. Australian renewable energy policy: Barriers and challenges, Renewable Energy. St Lucia. doi:10.1016/j.renene.2013.06.024

Byzio, A., Heine, H., Mautz, R., Rosenbaum, W., 2002. Zwischen Solidarhandeln und Marktorientierung. Ökologische Innovation in selbstorganisierten Projekten – autofreies Wohnen, Car Sharing und Windenergienutzung. Göttingen.

C4CE, 2015a. National Community Energy Strategy. Sydney.

C4CE, 2015b. C4CE Governance [WWW Document]. Website. URL http://c4ce.net.au/about-c4ce/governance/ (accessed 5.18.15).

Cameron, J., Hicks, J., 2013. Performative Research for a Climate Politics of Hope: Rethinking Geographic Scale, "Impact" Scale, and Markets. Antipode 00, 19. doi:10.1111/anti.12035

Clean Energy Regulator, 2014. REC Registry - small-scale installations - December 2014. Canberra.

Climate Council, 2013. Unpacking the IPCC Fifth Assessment Report.

Cumbers, A., 2012. Reclaiming Public Ownership: Making Space for Economic Democracy. Zed Books, London and New York.

Danish Energy Agency, 2009. Wind turbines in Denmark. Copenhagen. doi:978-87-7844-821-7

Danish Wind Industry Assocation, 2015. Statistics on the development of wind power in Denmark 2005-2014 [WWW Document]. Website. URL http://www.windpower.org/en/knowledge/statistics/the_danish_market.html (accessed 5.25.15).

Debor, S., 2014. The socio-economic power of renewable energy production cooperatives in Germany: Results of an empirical assessment (No. 187), Wuppertal Papers.

Denmark Community Wind, 2015. Denmark Community Windfarm Ltd - Western Australia [WWW Document]. Website. URL www.dcw.org.au/ (accessed 5.20.15).

DGRV, 2014. Umfrage Energiegenossenschaften 2014. Berlin.

Diani, M., 1992. The concept of social movement. Sociol. Rev. 40, 1–25. doi:10.1111/j.1467-954X.1992.tb02943.x

Editorial, 2015a. Direct Action to run out of cash ' by 2016 ' [WWW Document]. Bus. Spect. URL http://www.businessspectator.com.au/news/2015/5/6/policy-politics/direct-action-run-out-cash-2016 (accessed 5.15.15).

Editorial, 2015b. Direct Action is holding policy at best [WWW Document]. Aust. Financ. Rev. Website.

Eyerman, R., Jamison, A., 1991. Social movements: a cognitive approach. University Park, Pa.: Pennsylvania State University Press.

Garnaut, R., 2011. The Garnaut Review 2011, Australia in the global response to climate change. Melbourne. doi:10.1017/CBO9781139107280

Giugni, M., Mcadam, D., Tilly, C., 1999. How Social Movements Matter, Volume 10. ed. University of Minnesota Press, Minneapolis.

Haggett, C., Creamer, E., Harnmeijer, J., Parsons, M., Bomberg, E., 2013. Community Energy in Scotland : the Social Factors for Success. Cxc 1–25.

Hall, N.L., Taplin, R., 2008. Room for climate advocates in a coal-focused economy? NGO influence on Australian climate policy. Aust. J. Soc. Issues 43, 359–379.

Harnmeijer, J., Parsons, M., Julian, C., 2013. The Community Renewables Economy. ResPublica.

Hennessy, K., Fitzharris, B., Bates, B.C., Harvey, N., Howden, S.M., Hughes, L., Salinger, J., Warrick, R., 2007. Australia and New Zealand. Climate Change 2007: Impacts, Adaptation and Vulnerability., in: Parry, M.L., Canziani, O.F., Palutikof, J.P., Linden, P.J. van der, Hanson, C.E. (Eds.), Contribution of Working

Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK, Cambridge, UK, pp. 507–540.

Hepburn Wind, 2015. Hepburn Wind Website [WWW Document]. Website. URL http://hepburnwind.com.au/ (accessed 5.20.15).

Hicks, J., Ison, N., 2011. Community-owned renewable energy (CRE): Opportunities for rural Australia. Rural Soc. 20, 244–255.

Hicks, J., Ison, N., n.d. Making Sense of the Diversity of Community Owned Renewable Energy: Theory and practice.

Hicks, J., Ison, N., Gilding, J., Mey, F., 2014. Community-owned renewable energy: a how to guide. Sydney.

Hicks, J., Mey, F., 2014. Government Support Options For Community Energy: Best Practice International Policy. Sydney.

Hielscher, S., 2011. Grassroots Innovation Community Energy in the UK. Brighton.

Hoffman, S.M., High-Pippert, A., Fudge, S., Peters, M., 2012. Decentralizing the electricty system. Public values and community energy.

Holstenkamp, L., Müller, J.R., 2013. On the State of Energy Cooperatives in Germany (No. 14), Arbeitspapierreihe Wirtschaft & Recht. Lüneburg.

Hopkins, R., 2008. The transition handbook: from oil dependency to local resilience. White River Junction, Vt. : Chelsea Green Pub., White River Junction, Vt.

Ison, N., 2009. Overcoming Technical Knowledge Barriers to Community Energy Projects in Australia. UNSW.

Ison, N., Hicks, J., Gilding, J., Ross, K., 2012. The Australian Community Renewable Energy Sector - Challenges and Opportunities. Sydney.

Jørgensen, U., Karnøe, P., 1995. The Danish Wind-Turbine Story: Technical Solutions to Political Visions?, in: Rip, A., Misa, T.J., Schot, J. (Eds.), Managing Technology in Society. Pinter, London, pp. 57–82.

Kania, J., Kramer, M., 2011. Collective Impact. Standford Soc. Innov. Rev.

Kent, A., Mercer, D., 2006. Australia's mandatory renewable energy target (MRET): an assessment. Energy Policy 34, 1046–1062. doi:10.1016/j.enpol.2004.10.009

Kirsch, C., Jackson, M., Langham, E., Ison, N., 2015. Community Energy Collective Impact Assessment (An Appendix of the National Community Energy Strategy). Sydney.

Lowy Institute, 2014. The Low Institute Poll [WWW Document]. Low Inst. Website. URL http://www.lowyinstitute.org/lowyinstitutepollinteractive/climatechange.php (accessed 5.15.15).

Macgill, I., Riesz, J., Vithayasrichareon, P., 2014. Submission on the RET Review Issues Paper. Sydney.

Mautz, R., Byzio, A., Rosenbaum, W., 2008. Auf dem Weg zur Energiewende Die Entwicklung der Stromproduktion aus erneuerbaren Energien in Deutschland. Universitätsverlag Göttingen, Göttingen.

McCarthy, J.D., Zald, M.N., 1977. Resource Mobilization and Social Movements: A Partial Theory. Am. J. Sociol. 82, 1212. doi:10.1086/226464

Melucci, A., 1980. The new social movements: A theoretical approach. Soc. Sci. Inf. 19, 199–226.

Melucci, A., 1985. The Symbolic Challenge of Contemporary Movements. Soc. Res. (New. York). 52, 789–816 CR – Copyright © 1985 The New School. doi:10.2307/40970398

Meyer, N.I., 2004. Renewable energy policy in Denmark. Energy Sustain. Dev. 8, 25–35. doi:10.1016/S0973-0826(08)60388-9

Miller, D., 2014. What is the Coalition's direct action climate change policy? [WWW Document]. ABC News Website. URL http://www.abc.net.au/news/2013-12-20/coalition-climate-change-direc... (accessed 4.15.15).

Musall, F.D., Kuik, O., 2011. Local acceptance of renewable energy—A case study from southeast Germany. Energy Policy 39, 3252–3260. doi:10.1016/j.enpol.2011.03.017

North, P., 2011. The politics of climate activism in the UK: A social movement analysis. Environ. Plan. A 43, 1581–1598. doi:10.1068/a43534

O'Gorman, M., Jotzo, F., 2014. Impact of the carbon price on Australia ' s electricity demand, supply and emissions (No. 1411), CCEP Working Pape.

OECD, 2013. Environment at a Glance 2013: OECD Indicators. doi:http://dx.doi.org/10.1787/9789264185715-en

Oliver, P.E., Myers, D.J., 2003. Social Movements and Networks. Soc. Movements Networks Relational Approaches to Collect. Action 173–203. doi:10.1093/0199251789.001.0001

Parkinson, G., 2014. NSW injects extra $ 700,000 into community renewable projects [WWW Document]. Reneweconomy.com.au. URL http://reneweconomy.com.au/2014/nsw-injects-extra-700000-community-renewable-projects-55084 (accessed 1.15.15).

Parkinson, G., 2015. Australian renewable investment plunges to near zero , but rooftop solar grows. RenewEconomy Website.

Porta, D. della, Diani, M., 2006. Social Movements, 2nd ed. Blackwell Publishing, Malden, Oxford, Carlton.

Rochon, T.R., Mazmanian, D.A., 1993. Social Movements and the Policy Process. Ann. Am. Acad. Pol. Soc. Sci. 528, 75–87. doi:10.2307/1047792

Saunders, C., 2013. Environmental networks and social movement theory. London, London.

Schweizer-Ries, P., Rau, I., Zoellner, J., 2010. Aktivität und Teilhabe – Akzeptanz Erneuerbarer Energien durch Beteiligung steigern.

Seyfang, G., 2010. Community action for sustainable housing: Building a low-carbon future. Energy Policy 38, 7624–7633. doi:10.1016/j.enpol.2009.10.027

Seyfang, G., Haxeltine, A., 2012. Growing grassroots innovations: Exploring the role of community-based initiatives in governing sustainable energy transitions. Environ. Plan. C Gov. Policy 30, 381–400. doi:10.1068/c10222

Seyfang, G., Haxeltine, A., Hargreaves, T., Longhurst, N., 2010. Energy and communities in transition - Towards a new research agenda on agency and civil society in sustainability transitions, Working Paper - Centre for Social and Economic Research on the Global Environment.

Seyfang, G., Hielscher, S., Hargreaves, T., Martiskainen, M., Smith, A., 2014. A grassroots sustainable energy niche? Reflections on community energy in the UK. Environ. Innov. Soc. Transitions 13, 21–44. doi:10.1016/j.eist.2014.04.004

Seyfang, G., Park, J.J., Smith, A., 2013. A thousand flowers blooming? An examination of community energy in the UK. Energy Policy 61, 977–989. doi:10.1016/j.enpol.2013.06.030

Seyfang, G., Smith, A., 2007. Grassroots innovations for sustainable development: Towards a new research and policy agenda. Env. Polit. 16, 584–603. doi:10.1080/09644010701419121

Sørensen, B., 2012. A history of energy : Northern Europe from Stone Age to the present day. Milton Park, Abingdon, Oxon, Milton Park, Abingdon, Oxon.

Stern, N.H., 2007. The economics of climate change: the Stern review. doi:10.1257/aer.98.2.1

Tarrow, S., Tarrow, S., 1998. Power in movement : social movements and contentious politics, 2nd ed. ed. Cambridge , Cambridge .

Toke, D., Breukers, S., Wolsink, M., 2008. Wind power deployment outcomes: How can we account for the differences? Renew. Sustain. Energy Rev. 12, 1129–1147. doi:10.1016/j.rser.2006.10.021

Touraine, A., 1981. The voice and the eye: an analysis of social movements. Cambridge Cambridgeshire, Cambridge [Cambridgeshire].

Twomey, P., 2014. Obituary: Australia's carbon price. Conversat. Website.

Vorrath, S., 2014. Australia dumps carbon price, as repeal passes Senate. RenewEconomy Website.

Walker, G., 2008. What are the barriers and incentives for community-owned means of energy production and use? Energy Policy 36, 4401–4405. doi:10.1016/j.enpol.2008.09.032

Walker, G., Devine-Wright, P., 2008. Community renewable energy: What should it mean? Energy Policy 36, 497–500. doi:10.1016/j.enpol.2007.10.019

Walker, G., Devine-Wright, P., Hunter, S., High, H., Evans, B., 2009. Trust and community: Exploring the meanings, contexts and dynamics of community renewable energy. Energy Policy 38, 2655–2663. doi:10.1016/j.enpol.2009.05.055

Walker, G., Hunter, S., Devine-Wright, P., Evans, B., 2007. Harnessing Community Energies: Explaining and Evaluating Community-Based Localism in Renewable Energy Policy in the UK. Glob. Environ. Polit. 7, 64–82.

Whitmore, J., Hopkin, M., 2015. Energy White Paper promises privatisation and lower prices: experts respond [WWW Document]. Conversat. Website. URL https://theconversation.com/energy-white-paper-promises-privatisation-and-lower-prices-experts-respond-39853 (accessed 5.15.15).

Yildiz, Ö., Rommel, J., Debor, S., Holstenkamp, L., Mey, F., Müller, J.R., Radtke, J., Rognli, J., 2015. Renewable energy cooperatives as gatekeepers or facilitators? Recent developments in Germany and a multidisciplinary research agenda. Energy Res. Soc. Sci. 6, 59–73. doi:10.1016/j.erss.2014.12.001

Zald, M.N., Morrill, C., Rao, H., 2005. The Impact of Social Movements on Organisations, in: Davis, G.F. et al (Ed.), Social Movements and Organization Theory. New York, N.Y. : Cambridge University Press, New York, N.Y., pp. 253–280.

Zoellner, J., Schweizer-Ries, P., Wemheuer, C., 2008. Public acceptance of renewable energies: Results from case studies in Germany. Energy Policy 36, 4136–4141. doi:10.1016/j.enpol.2008.06.026