



A New Epoch for Community Renewable Energy Co-operatives in Ireland? An Exploration of the Factors Influencing their Development

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This paper outlines the capacities required for community groups to successfully establish and maintain renewable energy co-operatives in Ireland. It finds that community groups that successfully establish renewable energy co-operatives must possess high levels of resilience, have access to technical expertise, and have appropriate finance. It also highlights how it is crucial that at least one member of each renewable energy co-operative engages with state agencies and the community. Pringle's (2015) theoretical framework applied in this paper focuses on the capacities required for the successful implementation of community renewable energy projects (which include community renewable energy co-operatives) in rural settings. Although this is a robust framework, when applied to Irish communities it may require some modification to detail the capacities required to successfully implement renewable energy co-operatives. Urban communities, particularly marginalised communities, may not possess the same level of expertise as rural communities. The theoretical framework could be broadened to acknowledge the critical importance of the amount of volunteer time that is required to ensure that a renewable energy co-operative becomes operational.

Introduction

Ireland is failing to meet its climate change obligations agreed with the European Union (EU) (Climate Action Network [CAN], 2018). Research highlights the poor performance of Ireland in addressing climate change (Climate Change Advisory Council, 2018) with Ireland ranked the second-worst performing state within the EU (CAN, 2018). Indeed, instead of achieving a reduction in carbon and nitrogen emissions, Ireland's emissions increased in 2017 (Climate Change Advisory Council, 2018). To counter this relatively poor performance in reducing emissions, the Irish Government needs to develop a policy pathway for implementing this transition which must be robustly implemented (Climate Change Advisory Council, 2018; Kirby & O'Mahony, 2018). To counter increases in carbon emissions, policy-makers have a number of policy tools at their disposal (Climate Change Advisory Council, 2018; McCabe, 2020), some of which are discussed below.

Huybrechts and Mertens (2014) assert that renewable energy co-operatives are relevant in the transition to an economy which is less reliant on fossil fuels because they are democratic and because their mission is concerned with making a contribution towards the realisation of a sustainable society. Co-operatives are also premised on equal voting rights between members and, typically, they do not present barriers to individuals becoming members (Bauwens et al., 2016). They allow citizens to collectively own renewable energy initiatives. Renewable energy co-operatives facilitate greater social acceptance of renewable energy initiatives than capitalist entities (van der Waal, 2020). Roby and Dibb (2019) provide evidence for community-owned renewable energy projects securing greater support for wind turbines than investor-owned ones. As a result of less resistance to renewable energy projects, they are more likely to secure planning permission (Savaresi, 2019).

Community energy covers aspects of collective action to reduce, purchase, manage, and generate energy. Community energy projects emphasise local engagement, local leadership and control, whereby the local community benefits collectively from the outcomes (Walker & Devine-Wright, 2008). Although international research indicates the positive impact that community-owned energy initiatives (including renewable energy co-operatives) have in

promoting transition to low-carbon societies (Nolden, 2013), few countries have implemented robust policies to support the growth of the community renewable energy sector (Savaresi, 2019). Indeed, state policy and investment are pivotal to the development of a vibrant community-owned renewable energy sector, including renewable energy co-operatives (Lalor, 2012; McMurtry, 2018; van der Schoor & Scholtens, 2015). Austria, Denmark, and Germany are considered to be implementing the most effective policies to support community renewable energy initiatives (Bauwens et al., 2016). Their policy interventions can be categorised into support measures and benign planning policies (Bauwens et al., 2016). In relation to support measures, the funding of third sector support agencies, the allocation of grant funding for feasibility studies, and financial packages to generate renewable power and heat have proven effective in facilitating the growth of community renewable energy sectors (Roberts & Gauthier, 2018).

Compared to Austria, Denmark, and Germany, the Irish State has not assisted the development of a community-owned renewable energy sector (Lalor, 2014). However, this may be about to change as the Department of Communications, Climate Change and Environment (DCCAE) is in the process of introducing measures to support communities to be in a position to own renewable energy initiatives (DCCAE, 2017). In the first quarter of 2020, the DCCAE undertook a consultation process with the public on the next renewable electricity support scheme (RESS). This scheme intends to support the generation of 3,330 gigawatt hours (GWhrs) of renewable electricity for the Irish market from a combination of onshore wind, solar, hydro, waste to energy, biomass combined heat and power (CHP), and biogas CHP. As part of this consultation process, senior civil servants hosted three workshops for the public to explain the new scheme and point out how and where people can take part in this transition to renewable energy; key points are outlined in Table 1 below.

Table 1: Key elements of the proposed RESS

The Citizen Investment Scheme	Government-backed investment scheme for every 'developer-led' renewable project. All citizens will have the opportunity to invest in 5% of all projects with a guaranteed return on their investment. Participation will extend to anyone who lives in the EU, although locals will always be prioritised. Minimum and maximum investment offers of €500-€20,000 by any one person (p. 31).
The Community Benefit Fund	A fund collected by all 'developer-led' renewable projects, at a rate of €2/MWh (p. 9). The fund consists of direct payments to 'near neighbours' within two kilometres of developments (25%), to social enterprises and community groups working on energy efficiency and climate action (50%), and local sports clubs and activities (25%). The purpose is to ensure that those within the immediate locality of any development will see a benefit from it. A set of guiding principles will be developed.
Auctions	Two main auctions will support 3,300 GWhrs of renewable electricity onto the Irish market. A separate category of up to 30 GWhrs is proposed for community-led projects in the recognition that such initiatives would likely not be able to compete against major developers with large portfolios of projects. Developers are allowed to partner with communities if 51% of the project is owned by the community group. A community is simply a group of members who choose to participate, and all members will likely have to demonstrate their support by investing or donating money to the project to ensure that it can raise sufficient capital to get off the ground.

Source: DCCAE, 2019

A number of EU countries have witnessed a significant increase in co-operatives generating renewable energy (Tahram, 2015). However, on the island of Ireland, only five renewable energy co-operatives generate renewable energy (Doyle, 2012). With Ireland struggling to reach its binding EU carbon emission targets, renewable energy co-operatives could make a greater contribution to Ireland meeting these obligations (Bauwens, 2013; Connolly & Mathiesen, 2014). This paper examines the capacities needed for the successful implementation and maintenance of renewable energy co-operatives in Ireland. A review of literature is provided including an

overview of the theoretical framework. The methods employed to gather and analyse the primary data are then outlined, followed by findings and conclusions.

Capacity in Renewable Energy Co-operatives

The concept of capacity refers to the ability of members of a community or indeed the community itself to make changes by harnessing the resources at their disposal either individually or collectively (Middlemiss & Parrish, 2010). The theoretical framework outlined in this paper is predicated on work completed in the areas of community change and sustainable consumption. According to the Community Capitals Framework (Emery & Flora, 2006, pp. 20-21), community change can be understood through analysing the following types of capital that exist within a community:

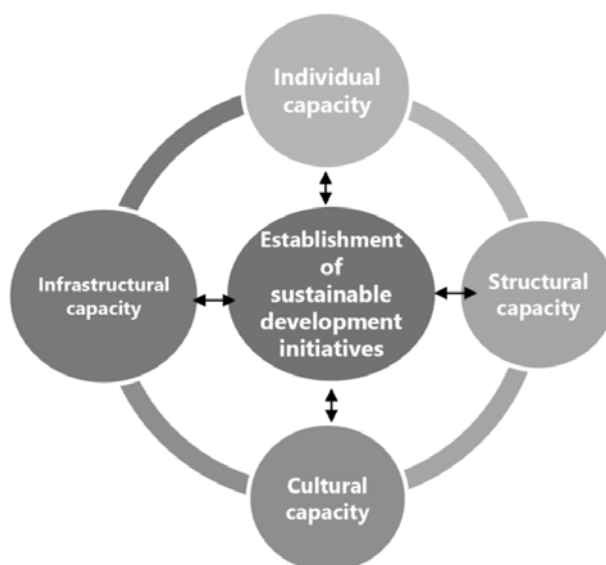
- Natural capital: assets associated with a particular area, including amenities, scenery, natural resources, and geographic isolation.
- Cultural capital: how the residents of a community comprehend society. It influences how and whether people are listened to within a community.
- Human capital: the level of skills and expertise that residents possess required to bring about change.
- Social capital: degree of inter-connectedness between residents and organisations in an area.
- Political capital: access to levels of power, and connections to resources and organisations. It also refers to the ability of people to articulate their perspectives.
- Financial capital: the level of financial resources which can be invested in a range of activities associated with community endeavour.
- Built capital: the infrastructure which is necessary for a community to organise and implement its plans.

Middlemiss and Parrish (2010, p. 7561) apply the above types to the context of sustainable consumption in communities. In doing so, the authors have developed a theoretical framework which is comprised of four interlinked capacities. First, personal capacity refers to the resources acquired by people who participate in the advancement of community sustainability. These resources can take the form of knowledge of sustainability issues, the skills that they can utilise, personal values and commitment to act. Second, the organisational capacity of a community is concerned with the culture and values pertaining to organisations within a community that have an influence over communities' efforts to promote sustainability. Third, the infrastructural capacity of the community relates to the stock of facilities that can enable sustainable living. These facilities can be granted or secured from the State, business or community groups. Some communities may already possess a stock of infrastructure which facilitates sustainable living. Finally, cultural capacity refers to the openness towards sustainability that exists within a community. This is influenced by a community's history and values.

Building on the work of Middlemiss and Parrish (2010), Pringle's (2015) theoretical framework narrows the focus from sustainable living to exploring community energy. There are four categories of capacity which constitute the theoretical framework. Individual capacity is defined as the level of skills, values, and finance that individuals within a community possess which can assist in the formation of community energy initiatives (including renewable energy co-operatives). Structural capacity of a community focuses on the culture and values pertaining to organisations within a community that have an influence over communities' efforts to establish community energy initiatives (Middlemiss & Parish, 2010; Pringle, 2015). Community

organisations, local development agencies, politicians and state agencies are included in this category. The presence of community organisations and supportive state and local development institutions can contribute to a range of barriers being addressed (Pringle, 2015). Infrastructural capacities refer to the stock of infrastructure that is present in communities which is conducive to the drive to establish community energy initiatives. Cultural capacity refers to the level of commitment and openness to sustainability that exists within a community (Pringle, 2015). The cultural capacity is influenced by the historical context and commitment within a community towards sustainability. These four capacities are interlinked and each can have an impact on another — see Figure 1.

Figure 1: Key capacities for the establishment of sustainable development initiatives



Adapted from: Middlemiss & Parrish, 2010; Pringle, 2015

Key Capacities for the Establishment of Renewable Energy Co-operatives

Communities encounter a number of barriers in striving to establish renewable energy co-operatives (Hillman et al., 2018). Chief amongst these is a lack of certainty in the policy environment in which they operate (Lockwood, 2016). Adequate capacities are required to overcome a range of barriers (Warbroek et al., 2019) and this section outlines the essential capacities required for the establishment of renewable energy co-operatives.

The level of community involvement, resources, expertise, and structural capacities are determining factors for the establishment of renewable energy co-operatives (Herbes et al., 2017). Regarding community involvement, the norm seems to be that a cadre of community activists develop community energy projects while utilising a hierarchical structure (Seyfang, 2007; van der Waal, 2020). Assuming that community renewable energy co-operatives recruit residents, there is a number of key skills that individuals need during the planning, mobilisation, and developmental phases (Seyfang et al., 2014). These can be categorised into interpersonal, technical, and organisational skills. Interpersonal skills such as confidence, emotional stamina, and communication are deemed crucial to the development of community energy initiatives including renewable energy co-operatives (Sperling, 2017). Technical skills include the capacity to design and interpret financial management reports, knowledge of renewable energy technology, and management expertise (Sperling, 2017). The organisational skills that key individuals require include the capacity to undertake meaningful consultations and to make effective decisions (Becker et al., 2017). The vision and styles of leadership of key members

are considered as being critical to the success of community renewable energy co-operatives (Sperling, 2017; van der Horst, 2008).

The existence of community leaders or project champions, who can navigate the political structures and the policy processes to gain essential resources is crucial to the establishment of renewable energy co-operatives (Hufen & Koppenjan, 2015; Kelsey & Meckling, 2018). In addition, in order to be effective, these project champions need to be able to secure funding and possess the time to volunteer (Becker et al., 2017). There can be groups of project champions associated with each renewable energy co-operative or a sole individual who performs this role (Warbroek et al., 2019).

With regards to structural capacities, the presence of community organisations and supportive state and local development institutions can contribute to overcoming a range of barriers (Mulugetta et al., 2010). Strong relationships with community organisations and state agencies can lead to them either directly performing the role of animator of community energy initiatives/renewable energy co-operatives or providing funding for communities to secure the necessary expertise (Hain et al., 2005; Meister et al., 2020). In particular, local authorities can perform a central role in directly enabling communities to develop renewable energy co-operatives through the provision of supports and as collaborative partners (Wirth, 2014), or indirectly through the establishment and resourcing of intermediaries; actors that create “new possibilities and dynamism within a system” (Howell, 2006, p. 104). The lack of intermediaries serves as a barrier to communities developing community renewable energy initiatives (Watson et al., 2020). Infrastructural capacities, such as access to appropriate tracts of land, are required for the deployment of renewable energy co-operatives’ installations (Hain et al., 2005).

Finally, cultural capacity refers to the level of commitment and openness to sustainability that exists within a community (Middlemiss & Parrish, 2010). As stated above, cultural capacity is influenced by the level of commitment to the values associated within the community, and the historical attitude, towards sustainability (Mundaca et al., 2018). A high level of trust of community projects and state institutions within communities contributes to them becoming more receptive to the development of community renewable energy initiatives (Walker et al., 2010).

Methods

The research employed a case study approach, which is an effective tool when asking ‘how’, and ‘what’ questions (Yin, 2018). These categories of questions form the basis of the interviews conducted. At the time the research was undertaken only five renewable energy co-operatives were operational in Ireland and all five were included in the study, see Table 2.

Four of the initiatives are structured as industrial and provident societies (IPS — see Companies Registration Office — www.cro.ie), while Templederry Community Wind Farm is incorporated as a company limited by guarantee (CLG) but adheres to the International Co-operative Alliance’s co-operative principles. Templederry Community Wind Farm is a subsidiary of a community co-operative. Residents in the village and areas surrounding Templederry were invited to become members of the co-operative. Each member initially invested €1,000. There are over 30 shareholders in the co-operative. A representative of Templederry Community Wind Farm stated it was structured as CLG as there was a perception that commercial banks were more familiar with lending to CLGs than to an IPS. For the purpose of this paper, Templederry Community Wind Farm is referred to as a co-operative.

As can be seen in Table 2, three of the renewable energy co-operatives are located in rural areas, while two are based in urban areas. Drumlin Wind Energy Co-operative and Templederry Community Wind Energy both generate power via wind turbines and sell their electricity into the national grid. Northern Ireland Community Energy produces solar energy. Aran Islands Renewable Energy has increased the energy efficiency of community buildings and homes on

the Aran Islands and plans to erect a wind turbine. Finally, Claremorris and Western District Energy Co-op has completed measures to increase awareness of the role that communities can play in generating renewable energy. It plans to develop a renewable energy district heating system that will generate heat for a number of public buildings in Claremorris.

Table 2: Overview of renewable energy co-operatives in the study

Renewable energy co-operative	Location	Renewable energy technology employed
Aran Islands Renewable Energy	Rural, West Coast of Ireland	Energy efficiency installations and wind turbine
Claremorris and Western District Energy Co-op	Urban, County Mayo	Renewable heat via district heating system
Drumlin Wind Energy Co-op	Rural, Northern Ireland	Renewable electricity from wind turbines
Northern Ireland Community Energy Co-op	Urban, Northern Ireland	Solar energy
Templederry Community Wind Farm	Rural, County Tipperary	Renewable electricity from wind turbines

To identify the capacities required for the implementation and maintenance of renewable energy co-operatives in Ireland, a combination of semi-structured interviews, focus groups, and documentary research was employed. Sixteen semi-structured interviews were held with key individuals who are associated with the five renewable energy co-operatives, individuals who worked with support agencies, and a policy maker. The interviews were held, in the main, at the interviewees' respective places of work or close to where they lived, and lasted between 40 minutes and one hour (13 hours of data). The background and expertise of each of the interviewees is detailed in Appendix 1.

Focus groups were held with the management committee of Aran Islands Renewable Energy, Templederry Community Wind Farm, and Claremorris and Western District Energy Co-op (two hours of data). Eighteen people participated in the focus groups. In total, 36 individuals participated in the research carried out in 2017.

A list of trigger questions was used to guide the semi-structured interviews and the focus groups, including:

- How did the idea for a renewable energy co-operative emerge?
- What is the primary focus of the renewable energy co-operative (economic, education regarding environment, ecological)?
- What were the essential skills/expertise required to transform the idea for a renewable energy co-operative from a concept to retrofitting dwellings/generating renewable energy?
- What were the resources required to establish the renewable energy co-operative?
- Did you require resources and supports from outside your community? If so, what were they? Where did you source them?
- What were the challenges encountered in establishing the co-operative? How were these overcome?

The questions posed to the civil servant, the SEAI official, and the regional development agency personnel focused on proposed policies that could facilitate communities to establish renewable energy co-operatives. All interviews were audio-recorded and transcribed verbatim. The process entailed reading each of the transcripts a number of times in order to become familiar with the

data. The text of each of the transcripts was then coded. Qualitative thematic analysis was employed to formulate themes from the transcripts (Braun & Clarke, 2006). A number of themes were identified which were placed under the headings of Middlemiss and Parrish's (2010) and Pringle's (2015) four capacities.

Findings

The research findings pertain to interviews and focus groups with individuals associated with renewable energy co-operatives, support agencies, and policy makers. The bulk of the data related to individual and structural capacities. The research generated less data pertaining to infrastructural and cultural capacities. These are looked at in turn.

Individual capacity

The findings indicate several dimensions related to individual capacity, including internal expertise, leadership, the key role of a champion, being developer-led, and attention to social processes.

Regarding internal expertise, leaders of renewable energy co-operatives and staff of support agencies acknowledged the importance of committee members possessing a wide range of expertise which enables the realisation of their co-operative's objectives. This included engineering expertise (one of the co-operative members is an engineer who has expertise in developing wind turbines); technical expertise (two co-operatives have committee members who were trades people); and financial expertise (several co-operatives have committee members who have business knowledge and financial management expertise). Additionally, support agency staff identified the lack of technical expertise as presenting a significant barrier to communities aiming to establish renewable energy co-operatives:

Some communities are very lucky that they have a retired engineer that has loads of time and loads of expertise on their hands and they become a very key part of the community but not all communities are lucky in that way. You're generally dealing with community members and wouldn't have an idea how to apply for planning permission, how to, what's involved in setting up a community turbine, the access to the grid, the grid restrictions you know, you're not allowed sell electricity to your neighbours (Employee of support agency).

Leadership

Several support agency staff acknowledged the difficulties committee members of renewable energy co-operatives can encounter in securing sufficient finance from a number of sources. Support agency staff spoke of the importance of leaders of renewable energy co-operatives having credibility from the perspective of the financial institution:

When you're going to get loan finance and equity finance, like it's very difficult unless you have a financial expert within your community group which not every community group has (Employee of support agency).

In summary, two support agency staff referred to the leadership of renewable energy co-operatives requiring particular skills. These included technical knowledge of renewable energy technology and procedures to gain access to the national grid; how to effectively communicate with and gain the trust of the community; the capacity to secure finance from a range of sources to cover the capital costs associated with establishing a renewable energy project and to ensure renewable energy projects are in line with local, regional, and national planning policy.

Task-orientated leadership

Several members of renewable energy co-operatives emphasised that having individuals with the relevant expertise is essential, but equally as important is that committee members undertook agreed tasks between meetings.

Once a month is not going to achieve anything, all of the stuff that gets done in between meetings, you know that people are willing and able and have the time and the energy to spend on it (Committee member of renewable energy co-operative).

The same group of members of renewable energy co-operatives asserted that when committee members spend time undertaking tasks, this then strengthened their commitment and fortified their sense of ownership of the co-operative.

Resilient leadership

Members of renewable energy co-operatives and staff of support agencies agreed that setbacks can be encountered which require resilience on the part of members of the co-operative governance structure. Interviewees recounted setbacks, emanating from within the community, such as proposed plans being rejected at community meetings. Members of renewable energy co-operatives and support agency staff identified access to planning permission, the process of securing a power-purchase agreement, and obtaining finance from commercial banks as being significant barriers facing communities in establishing renewable energy projects:

... And there is a whole pile of regulations, challenges, and regulations and lack of accountability in all that sort of stuff that makes renewable energy development very challenging for everyone (Committee member of renewable energy co-operative).

There's not many community groups that are going to stay together and stay motivated and stay financially feasible for 12 years when they can't get access to the grid (Employee of support agency).

I think it's sheer persistence that has resulted in some renewable energy co-operatives producing power and selling it into the grid (Employee of support agency).

A number of support agency staff cited the regulatory environment in Denmark and Germany as being more conducive to the establishment of renewable energy projects:

In Germany, the policy-makers have forced the distribution operators and the planning authorities to do their job efficiently and effectively. The aim is to make it easy to develop renewable energy projects (Employee of support agency).

One support agency staff member said that making the regulatory environment more accessible to renewable energy projects was more important than providing animation supports to communities.

Champion

A large number of renewable energy co-operative members and support agency staff emphasised the importance of renewable energy co-operatives having an individual who is willing and has the time to commit to performing a number of crucial roles. One interviewee referred to this person as being a champion:

I would say you need one person who is prepared to take it ... and do whatever it takes. I would say a champion is essential (Committee member of renewable energy co-operative).

Two interviewees spoke of the champion identifying the idea for developing a renewable energy co-operative and persuading people to form a co-operative. Members of renewable energy co-operatives and support agency staff acknowledged champions as building relationships with key individuals in state agencies, third level institutions, and with private businesses. Two members of renewable energy co-operatives identified that champions play a pivotal role in negotiations associated with securing finance. Individuals who are champions were seen to play a crucial role in ensuring that residents are consulted, and an opportunity is provided for communities to influence the establishment of renewable energy co-operatives:

They make sure the community is kept informed, and that the views of the community regarding the establishment of renewable energy initiatives are as far as possible taken on board. They make sure that steps are taken to promote community buy-in (Committee member of renewable energy co-operative).

Interviewees pointed out that champions must be accountable to the renewable energy co-operative governance structure. Both renewable energy co-operatives and support agencies mentioned the relevance of the governance structure associated with a co-operative emphasising the importance of deciding upon a vision, aims, and objectives in a collective manner as opposed to one person framing them:

We spent a lot of time agreeing our vision and objectives as a committee. We regularly review the progress that we are making in achieving our objective (Committee member of renewable energy co-operative).

The point was made that this collective approach provides the committee with direction and aids cohesion: “having a vision and mission keeps us going in the right direction”.

Developer-led

One member of a renewable energy co-operative used the term ‘developer-led’ to describe the role he performed prior to the formation of the co-operative. During the developer-led phase, this individual bore the risks associated with any setbacks associated with the erection of a wind turbine and the costs incurred:

Yeah, so I guess you know I put in my time and cash, you know, because there was expenditure required in the planning permission, putting up wind speed masts and, you know, all of those. I bore those costs initially and any failures that were along the way, not every site that I approached turned out that it was suitable, or I could get planning permission for, so I bore those costs (Committee member of renewable energy co-operative).

Social processes

Social processes were deemed another important factor in the establishment of renewable energy co-operatives. Some renewable energy co-operative members spoke about their committees making decisions through consensus. Several individuals mentioned that their committees regularly dedicated some committee meetings to planning and reviewing performance. They attributed this practice as being a key factor in their respective co-operatives attaining their goals and promptly addressing issues in the community:

How to give and take, how to listen to each other, and how to form a consensus, yeah, to talk through it and talk through a situation, we’re good at that here (Committee member of renewable energy co-operative).

According to a number of members of renewable energy co-operatives, their committee members invested time in engaging with residents with a view to inviting them to become members of their respective co-operatives. One interviewee referred to how community participation increased when residents saw the benefits of community energy ownership.

Structural capacity

The findings of this research also point to five key dimensions of structural capacity: relationship building, external expertise, community engagement, regional focus, and state supports.

Relationship building

The capacity of renewable energy co-operatives to develop and sustain effective partnerships was valued by those interviewed. Renewable energy co-operative members highlighted the amount of time required to cultivate relationships with key individuals associated with external organisations:

Cultivating relationships ... you have to go to meetings, you have to have time to go to meetings, and then you have to explore with them what we could do together (Committee member of renewable energy co-operative).

One interviewee referred to the importance of engendering enthusiasm towards the co-operative amongst representatives of organisations. This required renewable energy co-operative members to tell a compelling story of the work being undertaken.

Several interviewees mentioned the importance of identifying what the prospective partner could gain from forming a partnership with a renewable energy co-operative. Several renewable energy co-operative members identified that beneficial relationships were formed with third level institutions, private sector companies, and other co-operatives. A number of interviewees mentioned the partnership between their co-operatives and Templederry CRES as overcoming a number of obstacles which renewable energy co-operatives currently encounter. Community Power (formerly CRES) is Ireland's first fully community-owned electricity supply company. It is a sister company to Templederry Community Wind Farm:

CRES is trying to follow that model, you know where that if there are surpluses coming into CRES, that that surplus can be used to guide and to help other communities around Ireland develop their own community energy solution locally (Employee of support agency).

Some renewable energy co-operative members stated that forging relationships with privately-owned energy businesses can mitigate the challenge of securing the necessary funding.

External expertise

One renewable energy co-operative member and a number of support agency staff noted that there is a tendency for renewable energy co-operative governance structures not to possess individuals with all of the necessary expertise to successfully establish a financially sustainable renewable energy project. Therefore, they asserted that committees must identify gaps in their expertise. To compensate for this lack of expertise, several interviewees spoke of securing external expertise from organisations with whom they work well. One interviewee stated that gaining expertise from another co-operative was a positive experience, as it was committed to increasing the number of renewable energy co-operatives in the country. However, with only a handful of renewable energy co-operatives in Ireland, support agency staff and policy-makers identified the need for intermediary organisations that have the expertise to provide technical assistance to renewable energy co-operatives at various stages of development.

Support agency staff, renewable energy co-operative members, and a policy-maker identified a dearth of independent technical assistance available to renewable energy co-operatives throughout the country. Interviewees pointed to there being only three energy agencies that were proactively providing support to renewable energy co-operatives and community energy initiatives. The point was made that there needs to be an energy agency covering every part of the country:

It is not fair that if your community is not located in the South East or Dublin then it is more difficult to access technical assistance from energy agencies (Committee member of renewable energy co-operative).

A network of proper energy agencies is vital (Employee of support agency).

Support agency personnel attributed the success of the three energy agencies to a combination of pursuing a social enterprise approach, the structure of the entity, and the calibre of the managers hired by them. Renewable energy co-operative members acknowledged the key role that SEAI Sustainable Energy Communities was in assisting communities to set up renewable energy initiatives. (see www.seai.ie for information). While some support agency personnel advocated that intermediary organisations have a regional focus and others asserted that they should have a county focus, all agreed that any intermediary organisations should have a clear remit, a strategic plan, and be reviewed on an annual basis.

Community engagement

A small number of members of renewable energy co-operatives spoke of their committees prioritising consultation with their communities. Methods of consultation included community

meetings and individual discussions with residents. Members of renewable energy co-operatives spoke of implementing protocols to ensure committee members were accountable for their actions:

There has to be procedures put in place that make us accountable and, like, keep an eye on every aspect of ... the activity of the committee, you know, not just the money, the money is obvious, but all the other aspects as well. So, for example, I've initiated that whenever I write an email in relation to the co-operative, there's two people on the committee that I send a copy to so there's no private email for me to send ... it's a committee, it's a committee email, I write it but two other people on the committee get to read it (Committee member of renewable energy co-operative).

A number of renewable energy co-operative members noted that their committees were devising a code of governance. According to the members of one committee, they compiled a set of criteria which would determine the location of the site for their wind turbine. The same cohort of interviewees believed that committing to these criteria strengthened the level of trust between the committee and the community:

Once people saw that we were going to commit to those four criteria and then we came up with a site that fulfilled those four criteria, people were happy, that's why we got a unanimous 'yes' (Committee member of renewable energy co-operative).

Several members of renewable energy co-operatives emphasised the importance of holding awareness-raising events about plans for the establishment of renewable energy installations. A number of members of renewable energy co-operatives referred to such events as reducing local opposition to the establishment of renewable energy projects:

You deal with nimbyism [not in my back yard] straight on, right in its face, you deal with it, you educate, demonstrate, you don't give up, you know, you empower (Committee member of renewable energy co-operative).

According to one interviewee, renewable energy co-operatives needed to establish the reasons why people were opposing the installation of renewable energy technology in their communities, and the committees strived to address the reasons underpinning the resistance. However, the same interviewee spoke of a small minority who may never be convinced and that this cohort should not be afforded the right to block progress.

Among a minority of interviewees, co-operative renewable energy governance structures used different criteria to decide whether or not to erect or install renewable energy technology. Co-operative members spoke about seeking planning permission to erect a wind turbine only if there was unanimous community support for the location of the development:

In this community and in such a small place, I don't think you could do anything, it would be impossible to do anything without backing from the community. If the majority of the community were against us, it just would be a no-go and it would be a waste of time to try and cut it, it just wouldn't happen (Committee member of renewable energy co-operative).

Regional focus

One co-operative member suggested that communities should adopt a regional perspective to identifying sites to erect wind turbines. The same interviewee mentioned that a renewable energy co-operative could be formed involving a number of communities. This would facilitate the selection of the best sites for wind energy.

State supports

Six interviewees spoke about the importance of establishing an incentive scheme targeting small-scale energy generators. This would facilitate communities to establish renewable energy co-operatives. A support agency employee believed that the deployment of renewable energy needed to take place on a county-by-county basis, with a number of criteria being employed to determine the number of megawatts of electricity that would be deployed in each county:

X county needs to have, because it's a big, rural county that's depopulated, you know that isn't very populated, we can accept up to 900 megawatts in x, once over that, the CRU isn't allowed except any further applications, and the planning authorities aren't allowed accept any applications (Employee of support agency).

Two support staff employees advocated that the DCCAE should reserve an amount of megawatts of power to be delivered by community-owned renewable energy projects:

They need to be given a ... mandate ... to deliver a certain number of megawatts of community-owned renewable energy projects by a certain time (Employee of support agency).

Two interviewees state that the DCCAE should be held accountable to attaining this target. The recommendations contained in the independent report (DCCAE, 2019) commissioned by the DCCAE included preferential treatment for community projects in relation to the connection process to the grid; providing financial support, at pre-start-up stage, including the provision of grant funding to undertake a feasibility study; providing grant funding during the development phase; and the creation of a number of 'trusted intermediaries' and 'trusted advisers'. The trusted adviser role will be created primarily to signpost communities to where they can source the expertise to overcome the barriers encountered such as grid access. The Department is considering ring-fencing an amount of power under each Renewable Energy Feed in Tariff (REFIT) auction which would be delivered by community energy projects.

Infrastructural capacity

The findings indicate three main dimensions of infrastructural capacity: access to suitable sites and, as mentioned above, community support and resilience. With regard to access to suitable sites, committee members of two renewable energy co-operatives stated that it was imperative to secure suitable sites to install renewable energy technology, particularly wind turbines. One of the interviewees spoke of how communities had to compete against investor-owned businesses to acquire suitable sites. This required communities to have access to expertise to identify the most suitable sites.

Cultural capacity

Trust was identified as another important factor in the establishment of community renewable energy co-operatives. According to renewable energy co-operative members and support agency staff, co-operatives were positively viewed in light of the economic benefits that agricultural producer co-operatives have generated for farmers and this association benefited renewable energy co-operatives. Renewable energy co-operative members also acknowledged the importance of investing time in raising awareness of community renewable energy co-operatives through holding information meetings and consulting the community on key developments.

Renewable energy co-operative members and support agency staff said renewable energy co-operatives gain credibility through administering a state-funded residential retro-fitting programme. This initiative reduced the risk of households experiencing fuel poverty. According to renewable energy co-operative members, this displayed to the community that the co-operative intended to undertake activities which improved residents' quality of life. The point was made that the term co-operative was easy to understand compared to a CLG, as it was associated with being democratic.

Discussion and Conclusions

The research identifies several challenges that communities encounter when developing renewable energy co-operatives in Ireland. These include:

- An absence of individuals with relevant technical expertise on the committees of renewable energy co-operatives.

- Difficulty in accessing support from intermediary agencies.
- Having to secure finance from several sources to cover the capital costs associated with the development of a renewable energy project.
- Ensuring that the community is kept informed of progress.
- Engaging with the regulatory environment to secure planning permission for an installation and access to the national grid, which is more onerous than in either Denmark or Germany.

The research points to the need for high levels of resilience and access to technical expertise and appropriate finance and highlights successful renewable initiatives which have these competencies and resources. The research also highlights how it is crucial that at least one member of each renewable energy co-operative engages with state agencies and the community.

With the exception of the support provided by a small number of energy agencies, there is a dearth of support structures available to promoters of prospective renewable energy co-operatives. Recent research has highlighted the need for "a 'one-stop shop' to be established, where community energy groups can go for information, advice, and support, within an existing agency or a separate body' (Watson et al., 2020, p. 55). Indeed, in the main, the promoters of renewable energy co-operatives need to secure funding from external sources to access support from energy agencies. The new RESS, discussed earlier, should facilitate communities to develop renewable energy co-operatives (Watson et al., 2020). The RESS has indicated that a support structure will be resourced to support community renewable energy initiatives, including renewable energy co-operatives.

Pringle's (2015) theoretical framework focuses on the capacities required for the successful implementation of community renewable energy projects/renewable energy co-operatives in rural settings. Although this is a robust framework, it may require some modification when applied to Irish communities to detail the capacities required to successfully implement renewable energy co-operatives. With regards to individual capacity, urban communities, particularly marginalised communities, tend to have a smaller cohort of individuals with the skills, knowledge, and values to initiate community renewable energy co-operatives. This could have repercussions for the amount of time these individuals need to invest to ensure that the co-operatives become operational. Community leaders could become over-committed which could lead to negative personal repercussions, due to their enthusiasm levels (Seyfang, 2007). Therefore, the framework could be adjusted to specify the importance of empowering novice members. With regard to social capital, some communities, particularly socio-economically marginalised neighbourhoods, may not have the knowledge about how to engage with the local government system, in order to secure both land and other resources to establish a renewable energy co-operative.

With regards to infrastructural capacities, it was surprising that securing suitable sites was not considered a challenge by more of the cases. However, committee members from three of the renewable energy co-operatives cited the challenges encountered in gaining unanimous community support for the installation of wind turbines. Accordingly, the framework needs to take account of this challenge.

In relation to cultural capacity, the majority of communities would not have a history of developing renewable energy co-operatives, and therefore values associated with their establishment should be broadened. These values could include those that focus on self-sufficiency and collective economic development, as these values are identified as the key motives for the establishment of the majority of the renewable energy co-operatives in Ireland.

The research findings allude to renewable energy co-operatives encountering some challenges. Therefore, resilience within the governance structure of renewable energy co-operatives could be included as a component of the theoretical framework. The theoretical framework could be broadened to acknowledge the critical importance of the amount of volunteer time that is required to ensure that a renewable energy co-operative becomes operational. Furthermore, the style of collaboration between committee members contributes to the success of renewable energy co-operatives. In particular, a consensus approach to decision-making is considered as an important factor in the successful establishment of renewable energy co-operatives. The theoretical framework does not place much weight on the importance of community engagement. Nor does it place emphasis on the values that exist among residents, as opposed to those that pertain to individuals active among community organisations. This is an important factor when one considers the level of resident resistance in Ireland to the installation of renewable energy technology.

There is a wealth of research which outlines the societal benefits of renewable energy co-operatives (Tahram, 2015). Therefore, it is incumbent on the Irish State to develop policies to assist communities to establish community renewable energy co-operatives. These policy areas include procurement, legislative reform, finance, and access to the national grid.

Finally, the EU's directive on smart grids (2011) presents opportunities for renewable energy co-operatives. Therefore, research is required to identify the supports for renewable energy co-operatives to contribute to the operation of smart grids. Other research could focus on whether the category of ownership — investor versus co-ownership — of the renewable energy initiatives has a bearing on how receptive communities are to their installation.

The Author

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Appendix 1

Details of participants: organisation and experience

Organisation	Position/Experience
Aran Islands Renewable Energy	Committee member and founding member of the co-operative. The individual lives on Aran Mór.
Claremorris and Western District Energy Co-op	Committee member and founding member of the co-operative with experience of establishing and managing businesses.
Drumlin Wind Energy Co-op	Committee member and founding member of the co-operative, with technical expertise in the installation of renewable energy technology. Committee member with professional experience in establishing renewable energy co-operatives in Great Britain.
Northern Ireland Community Energy Co-op	Committee member and founding member of the co-operative.
Templederry Community Wind Farm	Committee member and founding member of the co-operative. Lives in the Templederry area. An employee of another subsidiary of the co-operative.
Energy agency	The CEO of an energy agency providing support to three of the above communities in establishing and sustaining renewable energy co-operatives.
Co-operative specialising in the provision of support to community energy co-operatives	Co-operative member that provided supports to two of the above communities in establishing renewable energy co-operatives. Another co-operative member that provided supports to two different communities in establishing renewable energy co-operatives.
Regional development agency	Senior policy analyst with expertise in local economic development. Staff member with expertise in assisting communities in establishing community renewable energy co-operatives and managing an EU renewable energy programme.
Local authority staff	Senior officer. Senior officer (Planning department providing planning permission to the renewable energy co-operative to install wind turbines).
Department of Communications, Climate Action and Environment	Senior civil servant involved in designing policy to support the transition for Ireland to become less reliant on renewable electricity generated from fossil fuel.
Sustainable Energy Authority of Ireland (SEAI)	A senior manager responsible for developing and managing programmes to support communities to develop community renewable energy initiatives.