School of GeoSciences

Dissertation

For the degree of

MSc in Ecological Economics

Student name: David Smith

August 2014

COMMUNITY RENEWABLE ENERGY CO-OPERATIVES IN SCOTLAND: WHAT'S THE HOLDUP?

Credit: Dingwall Wind Co-operative.

A dissertation presented for the degree of Master of Science.
University of Edinburgh, 2014.

THE UNIVERSITY OF EDINBURGH

ABSTRACT OF THESIS

(Regulation 3.5.13)

Name of Candidate **Mr David Smith**

Address **4/8 Argyle Park Terrace, EH9 1JY, Edinburgh**

Degree **MSc Ecological Economics** *Date* **14/08/2014**

Title of Thesis **Community Renewable Energy Co-operatives in Scotland: what's the holdup?**

No. of words in the main text of Thesis **16,391**

The challenge of Climate Change, peak oil and energy security have introduced the need for a transition away from a fossil-fuel based energy supply in favour of renewable energy sources. In order to implement this low-carbon transition, energy policy in the UK has traditionally used market-based incentives for the private sector to deliver renewable energy projects, favouring the dominance of large-scale projects and a centralisation of energy supply. The role of civil society has been confined to small-scale projects led at the grassroots level through 'community' projects, which remains an alternative way of supplying society's energy needs in the UK. In contrast, mainland Europe has seen civil society play a more important role in delivering these projects by using the co-operative as a vehicle to collectively own RE schemes, which has become a mainstream strategy.

In the past two years, several community energy co-operatives have emerged in Scotland. This research aims to understand how and why community energy co-operatives have now started to emerge in Scotland. A literature review first aimed to identify key socio-cultural and policy mechanisms that characterise the community energy landscape in Europe, the UK and Scotland. A comparison between six case studies of the new co-operative projects based in Scotland which use the co-operative model was then undertaken. Interviews with key individuals in these projects aimed to discover enabling factors and these results were combined with findings from the literature. The wider implications of these findings are also discussed, and conclusions drawn regarding the future of the community energy sector in Scotland.

ACKNOWLEDGEMENTS

First of all, I would like to thank Jelte Harnmeijer for his guidance and allowing me the opportunity to assist at Scene, and for his patience and sense of humour that were much needed during the project. I would also like to thank our course director Corinne Baulcomb for her calm and composed advice.

I would like to thank all the participants of the research, who made themselves available despite their busy schedules to answer my questions, and were extremely polite and patient. My wholehearted gratitude to Paul Phare who was extremely helpful during my research and provided some crucial insider insights which were vital in helping me understand this complex industry. I would also like to thank the members of the Dingwall Co-operative who welcomed me to their first AGM and were very friendly and appreciated my questions.

On a personal level, I would like to thank my mother, my sister Valerie for being my rock, Nadia for always being there, Mairi who gave me extra support, and the library crew.

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

LIST OF ABBREVIATIONS

Bencom	Society for the Benefit of the Community
CARES	Community And Renewable Energy Scheme
CBF	Community Benefit Fund
CC	Climate Change
OMOV	One-Member-One-Vote
PP	Planning Permission
RE	Renewable Energy
REIF	Renewable Energy Investment Fund

1. INTRODUCTION

1.1. Background

The challenge of Climate Change, peak oil and energy security have introduced the need for a transition away from a fossil-fuel based energy supply in favour of renewable energy sources. The current rate of use of the planet's stock of energetic resources cannot be sustained on a finite planet (Jackson, 2009). The latency in global action on these issues are due to a 'lock-in' of the socio-technical regime (Unruh, 2000). This describes the interdependence between a set of technologies, markets, social norms and practices which form an energy regime (Lawhon and Murphy, 2012). The current regime is based predominantly on utilising the finite stocks of energy in a closed system, which is by definition unsustainable (Daly, 1987). The theory of peak oil, which describes the increasing rise in costs of extraction once extraction rates have reached a maximum and start to fall (Hall and Murphy, 2011), reflects this has provided a debate, not on whether the current regime is unsustainable, but on the speed needed for this transition to occur. The problem of dangerous CC is another landscape pressure, as the latest Intergovernmental Panel on Climate Change fifth assessment report insists on rapid and global action to decarbonise the energy supply in order to avoid catastrophic CC (IPCC, 2013). The role of governmental energy policy should therefore be to ensure a smooth transition away from the unsustainable resource use and prevent future generations paying an excessive cost from today's development.

Renewable energy is playing an increasingly important part in government energy policy across countries. In order to implement this transition towards low-carbon energy supply, the UK has a tradition of using market incentives for the private sector to deliver RE projects, favouring the dominance of large-scale projects (Thomas, 2006). In contrast, mainland Europe has seen civil society play a more important role in delivering these projects by using co-operative arrangements to collectively own RE developments (Schreuer and Weismeier-Sammer, 2010). Co-operatives are organizations which are owned and run jointly by their members towards a common purpose and who share the profits or benefits. Recent years have seen take-up of such schemes to develop RE projects across the UK, with the exception of Scotland, the country where co-operatives were invented, until very recently.

In the UK, the ownership of RE by citizens is commonly referred to as Community Energy (CE), and schemes are led by small community groups. However, Walker and Devine-Wright (2008a) remark various ways of defining the word 'community' in the context of these schemes: community of locality and community of interest. The former is the understanding of the

community as individuals who share the same geographical space such as a neighbourhood. The latter refers to a shared interest or idea, the pursuit of which is relevant to the undertaking of the CE scheme (Walker and Devine-Wright, 2008a).

This research aims to understand how and why CE co-operatives have now started to emerge in Scotland. A literature review aimed to identify key socio-cultural and policy mechanisms that characterise the CE landscape in the UK and Scotland. It will then use six case studies of recent co-operative projects based in Scotland which are the first handful of schemes to currently use the co-operative model. The enabling factors reported by key individuals in these projects will be drawn and combined with findings from the literature. The wider implications of these findings are also discussed, and conclusions drawn regarding the future of the CE sector in Scotland.

1.2. Research aims and objectives

1.2.1 Aim

The aim of this research is to explore the factors that have contributed to the recent emergence of the co-operative as an organisational structure for community energy schemes in Scotland.

1.2.2. Objectives

- Conduct a review of the relevant literature and identify key explanatory mechanisms.
- Compare case studies of nascent Scottish co-operative CE schemes to explore their enabling factors and challenges, focusing on the pre-planning stage of development.
- Discuss the significance of explanatory factors to ongoing and future projects.

2. LITERATURE REVIEW

This chapter is a traditional literature review which aims to construct the context within which the new co-operative CE schemes are operating. From the European context, focus will narrow onto the UK and, more precisely, Scottish policy landscape. It will then seek to review the co-operative as an organisational structure and present some of its key mechanisms. The field of transitions theory will then be outlined in order to gauge the wider implications of the appearance of co-operative CE schemes in Scotland.

2.1. European Community Energy landscape

European countries have commonly used the co-operative as a model to develop CE schemes. The main experiences discussed are those of Denmark, Germany and, to some degree, the Netherlands.

2.1.1. Denmark

As of 2013, wind energy in Denmark provided 33.2 per cent share of the electricity consumed, with 4772 MW of capacity – a majority of this onshore (DEA, 2013). In Denmark, community ownership through co-operatives has been the predominant model through which the expansion of RE has taken place. Jorgensen and Karnoe (1995) recount that Danish community-owned projects were popularised in the 1970's and took shape through small co-operatives – so called 'windmill guilds' (Danielson, 1995). This was facilitated by a broad actor base through grassroots entrepreneurship and a widespread anti-nuclear culture, as well as the oil crises caused by OPEC (Danielson, 1995). The 'cooperatives culture' was also a key factor (Mendonça et al, 2009). In the 1990's a shift towards commercial production of renewable energy tripled the capacity between 1990 and 2010 (DEA, 2013). Ownership has therefore been increasingly concentrated and private, although the utilities and grid operators have needed to adapt to a more decentralised system (Jorgensen and Karnoe, 1995). Mendonça (2009) reports that as of 2008, 20 per cent of installed capacity was cooperatively owned. The case of Copenhagen-based offshore windfarm Middelgrunden is the most successful co-operatively owned project described in the literature, and is 50 per cent owned by a co-operative and 50 per cent by the local utility. The co-operative is formed by over 8000 members, who bought 40,500, shares of 1kW at 573 euros each.

2.2.2. Germany

Flieger and Klemisch (2008) note the socially integrative aspect of co-operatively owned energy and the potential to use this trend in a political context, as suggested by their use of the term

‘citizen wind parks’. Enzensberger et al (2003) summarise the investor landscape in German CE schemes as having three main typologies: private solitary individuals (usually farmers), individuals holding a small sum in shares within a co-operative and private shareholders jointly owning a project with a professional developer. Widespread ownership is seen as favourable in that increased citizen support will increase political support. Other enabling factors are the acceptability of lower expected returns on investment and high levels of citizen interest in maintenance of windfarms. As in Denmark, FiTs are seen as a key enabler as they reduce risk to all investors, particularly in a stable policy environment. Bolinger (2001) notes that this has attracted larger investors who may be less concerned with benefits to the local communities than return on investment, creating a concentration effect. As it happens, Bolinger (2001) points out that the business structure of most CE ‘co-operatives’ are in fact limited partnerships, where the local communities comprise between 20 and 30 per cent of total ownership. Schreuer and Weismeier-Sammer (2010) note that co-operatives in Germany have used solar photovoltaics as a technology. The most successful of these are jointly owned with commercial interests such as a utility or a bank. In addition, Schreuer and Weismeier-Sammer (2010) note that the success of the German co-operatives is also down to a strong support network by municipalities and the preferential rates given from the state-run bank for such schemes. The most notable success to date has been the case of the town of Felheim. The 150 inhabitants own shares in a 43 turbine windfarm and jointly own the regional grid with a developer (Marsh, 2013).

2.2.3. The Netherlands

In the Netherlands, Agterbosh et al (2009) identify several organisational forms, including small private investors, power distributors, wind co-operatives and independent wind power producers. In contrast to other European countries, cooperatives have struggled to establish themselves in the Netherlands. The co-operative culture is characterised by a marked priority on building a sustainable society (Agterbosh et al, 2009). Owing to the fact that profit was not the primary motive of these initiatives and that most of the turbines were installed before disruptive legislation was introduced in 1994, the movement suffered from a lack of momentum (Agterbosh et al, 2004). The operation phase of the projects was the responsibility of volunteers whose time was limited. The main model for CE schemes towards the turn of the century was that of private ownership by farmers. Liberalisation of the market saw the switch of 1.4 million households to ‘green electricity’ which had to be supplied by imports due to the lack of domestic capacity (Agterbosh et al, 2004). The supply of green electricity was therefore overwhelmed by demand in this situation. One of the enabling factors for forming co-operatives is that planning regulation requiring clustering of turbines forced these farmers to collaborate (Agterbosh et al, 2004). Despite a promising potential,

due to the number of individual private investors in wind turbines shown in their study, co-operatives still remain a minor part of the RE supply in the Netherlands (Agterbosh et al, 2009).

2.2. The UK Renewable Energy landscape

Renewable energy represented 19 per cent of the total final energy consumption worldwide in 2012 and increased in 2013 (Martinot, 2014). Net electricity generation from renewable sources in the UK increased by 30 per cent between 2012 and 2013, reaching 53.7 TWh. The capacity increased by 27 per cent, reaching 19.7 GW over the same timeframe (DECC, 2014a).

Wind technology is the leading technology in the UK, within which onshore wind is the front-runner in terms of individual RE technologies, with 32 per cent of electricity coming from onshore wind projects in 2013, followed by 21 per cent for offshore wind and 8.8 per cent from hydro sources (DECC, 2014a). Globally, wind accounted for the largest increase in capacity among the RE technologies between 2008 and 2013 (Martinot, 2014). This growth can be seen in the UK, which saw an increase of 40 per cent for onshore wind generation between 2012 to 2013 and a 27 per cent increase in technological capacity in the same year (DECC, 2014a). Indeed, Hau (2013, p.668) remarks that wind turbines are increasingly produced in the megawatt range in order to fit into large interconnected grids, as well as provide economies of scale for private developers.

Government intervention through energy policy is vital in addressing the problems previously mentioned, by providing support and breaking the carbon lock-in of the fossil fuel infrastructure (Unruh, 2002). Government intervention can take several forms to increase the market penetration of RE and associated technologies: "grants, loans, guarantees, tax releases (…) market price intervention such as price or income support" Lund (2009, p.54).

The UK government has traditionally used a market-based approach and created incentives for RE generation through market instruments rather than direct regulation (Thomas, 2006). The 2003 Energy White Paper set about defining energy policy for the country, insisting on exploiting resources which were economically profitable and environmentally sound, as well as guaranteeing security of supply (DTI, 2003). National policy efforts undertaken in recent years have the potential to place Scotland as a renewable energy hub for the UK due to large amounts of untapped onshore and offshore wind (SDC, 2005). The Scottish parliament enacted the UK Climate Change Act in 2009 which sets a legally binding target reduction of 80 per cent by 2050 compared to the 1990 baseline, with an interim target of 42 per cent by 2020 (Scottish Government, 2009a). The act also

plans to meet 50 per cent of electricity demand through renewables by 2015 and a complete decarbonisation of the gross electricity demand by 2020.

2.3. Community ownership in the UK

As a result of the promoting economies of scale and centralisation of energy supply in energy policy, the private sector has been dominant in developing RE schemes (Thomas, 2006). The country's energy policy has focused on a centralised energy supply which has been successively privatised and nationalised (Thomas, 2006). At the turn of the century, the energy infrastructure in the UK was run by large energy companies, with little attention paid to the needs of local communities (Devine-Wright, 2005). In countries such as Denmark and Sweden, local communities are routinely involved in, and have the opportunity to own RE projects (Devine-Wright, 2005).

2.3.1. The origins of the Community Energy discourse in the UK

2.3.1.1 Local opposition

As outlined previously, in the UK, a large majority of projects have been fully led by commercial developers who seek to profit from renewable energy resources. This has been another reason for local opposition to renewable energy, as private developers are seen as invading local communities and dispossessing the residents of the benefits (Warren and McFyden, 2010). One of the problems treated in the early literature concerning opposition to renewable energy projects was the Not-In-My-Back-Yard (NIMBY) phenomenon whereby local inhabitants supported the development of windfarms in principle, but became opposed if these windfarms were sited in their neighbourhood (their 'backyard') (Hunter & Leyden, 1995). The NIMBY syndrome was particularly studied in the UK, with some authors pointing to the lack of land availability and certain cultural characteristics as main differences compared to other European countries. Many studies show this theory to be incomplete for explaining causality, and the last decade has seen a flurry of literature focused on explaining the multiple interacting causes of local opposition to renewable energy projects (Schively, 2007; Van der Horst, 2007; Wolsink, 2000). These studies further argue that the use of the term NIMBY creates a social stigma and further entrenches opponents in their antagonism, thereby delaying efforts to mitigate CC.

Opposition has been linked to some externalities relating to wind turbine siting. The most commonly cited reason for negative reactions to wind turbine installation has been visual impact

(Pasqualetti, et al, 2002). In certain cases, health problems linked to noise and vibration causing sleep disturbance, and depression (Nissenbaum et al., 2012) and bird fatalities (Saidur, 2011) have been studied, although the latter points to the overwhelming benefits of mitigating CC and reducing water overconsumption in the energy industry.

Some rejection of RE projects is documented in many cases to hinge on beliefs concerning CC. A ten year study in the United States by Dunlap and McCright (2008) found that Democrats were more likely to believe and be concerned about CC than republicans. Similarly, Fielding et al (2012) summarise the fact that worldviews play a role in acceptance of the science of CC. Education on the issue showed a strong positive correlation with beliefs about CC among those identified as 'liberal' and no correlation with 'Republicans' or 'Conservatives', reflecting the fact that conservatives may be more likely to resist the scientific evidence for CC, primarily because they perceive CC politics as requiring changes to social and economic systems (Dunlap and McCright, 2008).

2.3.1.2. Community benefits

In order to 'tackle' this opposition, it is now commonplace for commercial developers to submit community benefits provisions during the planning procedure (Cass et al, 2010), and a community benefit fund with a recommended £5,000/MW for use by the community (UK Government, 2013). The two types of benefits are direct, through monetary payments, and indirect through social benefits in the local community. Provision of direct financial benefits is often associated with the instrumental rationale of increasing public acceptability of onshore wind energy projects (Devine-Wright, 2012). Munday et al (2011) review the benefits incurred by CE schemes on rural localities and draw five main subcategories of benefit to the community: (1) conventional economic benefits, (2) financial benefits to the local communities, (3) contributions in kind to local assets and facilities, (4) provision of other local services, (5) involvement in the development process. These are referred to more broadly in the literature as 'local regeneration' which accounts for economic, social and environmental benefits from local revenue-generating activities (Walker et al, 2010). In addition, Sawin (2004, p.9) states "local investment also provides an opportunity to strengthen and diversify local economies, particularly in rural areas, and can lead to new projects through the sharing of information and relevant experience".

One of the main issues regarding community benefit funds relates to the lack of a clear definition of the said community for whom these benefits are used, which means a lack of clear outcomes to pursue when funding projects (Aitken, 2010). This in turn leads to the lack of engagement on behalf of the community and can lead to opposition to a development. In schemes developed by a

commercial entity, these community benefit funds have also been seen as an attempt to bribe local inhabitants into supporting CE projects (Bell et al, 2005), although Cass et al (2010) highlight different results when considering the timing of public consultation and cross-cultural differences with Spain where it is a more inherently acceptable practice.

2.3.2 Community Energy policy in the UK

2.3.2.1. History

As demonstrated previously, obtaining consent from the inhabitants living in the area of the proposed development is increasingly seen as of fundamental importance to renewable energy projects (Aitken, 2010). The concept of Community Energy (CE) in UK policy circles was a novel approach to solve the inadequacy of energy policy in the 1990's. In 1999, the Local Governments Association demanded that the United Nation's Local Agenda 21 be applied to the generation and provision of energy (DTI, 1999). This implied providing local solutions, through councils, to global environmental issues. A host of local, regional and national programmes and support bodies followed in order to support this novel approach to developing CE schemes (Walker and Devine-Wright, 2008b). Competition for these schemes was extremely high, given that sources of funding had to be combined due to high capital costs (Walker and Devine-Wright, 2008b). One of the most successful schemes, the Community Renewables Initiative, provided support for schemes in England but was shut down in 2007 at a time when the demand for its services was the heaviest (Walker and Devine-Wright, 2008b). The Scottish Community Renewables and Household Initiatives (SCHRI) in Scotland was initiated in 2008 (Walker and Devine-Wright, 2008b) and is jointly managed by Community Energy Scotland (CES) and Energy Savings Trust (EST) (EST, 2008). It provides support for various solar installations, micro-hydro and micro-wind installations (EST, 2008).

In Scotland, the government began supporting CE schemes through means of grant funding and soft loans (Warren and McFyden, 2010). Communities which have implemented RE schemes have used the Development Trust (DT) as an organisational structure as a means of developing the projects (Walker and Devine-Wright, 2008b). According to the Development Trust Association of Scotland (DTAS), a development trust is a community organisation that aims to engage in economic, social and environmental regeneration of an area (DTAS, 2014). They are generally developed to support the local community and provide social benefits to this community. Investments are made through a trust fund, which is commonly owned among members. An asset lock can be put in place to ensure that funds generated by energy generation are used for the intended purposes of the members of the community. In sum, the development trust's function is to:

"represent communities' interests in revenue generation enterprises, and in some cases this has been extended to include the variants of community ownership" (Walker and Devine-Wright, 2008b, p. 4402).

One of the most recognised schemes today is the Isle of Gigha community windfarm, initiated by the Gigha Heritage Trust. The £4.5 million scheme was funded by a patchwork of grants and loans and equity deals, for a total capital cost of £440,000 (Isle of Gigha Heritage Trust website, 2014). The turbines generate approximately £100,000 per year for the trust. The success of this initiative generated a lot of public attention and support (Warren and McFyden, 2010). Politicians equally supported the model used to deliver the project: the Development Trust's model of public and debt finance (P Phare, Personal Communication, 4 June 2014). However, within the first two years of the project, 1 million pounds had to be returned to the Scottish Land Fund, one of the grant funders who had given a record-breaking £3.5 million grant to the island through Highlands and Islands Enterprise (Scottish Government, 2009b). The islanders quickly sold assets and fundraised on the island in order to settle their debt (Scottish Government, 2009b). The turbines were installed in 2004, and had a remaining lifespan of approximately 8 years due to the fact that they were second-hand. A fourth turbine was therefore needed in order to make up for the diminishing supply from the three initial ones (Energyshare, 2013). Community Energy Scotland provided the scheme with a pre-planning loan through the CARES fund, as well as REIF and the Co-operative bank provided a loan for the capital (Scottish Enterprise, 2013).

2.3.2.2. Recent policy changes

One of the most important recent policy changes comes from the European Union. The state aid requirements came into force with the enactment of the Lisbon Treaty on the 1 December 2009 (Official Journal of the European Union, 2008). These are regulations intending to maintain fair competition for industry among member countries. DBIS (2013) defines state aid as: "state resources [which] are used to provide assistance that gives organisations an advantage over others". Some exceptions are provided for, one of such is called the 'de-minimis provision', which allows for no more than 200,000 euros to be provided to an organisation within a 3 fiscal year period (DBIS, 2014).

In response, the UK and Scottish energy policy has made a shift away from allocating grants, instead opting instead for promoting a combination of loans and revenue support for schemes (Scottish Government, 2013a). The use of incentives for small scale schemes such as through Feed-in-Tariffs, Renewable Obligation Certificates (ROCs) and the Renwable Heat Incentive (RHI) is

part of the government's attempt to "make it more attractive for private sector investment" (Scottish Government, 2013a).

This change has arguably had a limited effect on enabling CE schemes as these are revenue support schemes, which pay off after the scheme has started generating electricity and selling it to the national grid. Recent research has revealed the main reason behind CE schemes failure was presence of high risk before the project can even begin (Harnmeijer et al., 2013; Warren and McFyden, 2010). The cost of non-capital operations such as feasibility studies and Environmental Impact Assessments have a disproportionate negative impact on community projects as they are smaller in scale, therefore these fixed costs represent a higher share of the total expenses and revenue (Harnmeijer et al., 2013). These costs can be up to 17 per cent of total project costs, and is totally at risk of a refusal by the local authorities to give planning permission (PP) (Harnmeijer et al., 2013). The fixed costs of due diligence also disadvantages the small scale energy projects when seeking a bank loan for project costs (P Phare 2014, Personal communication, 4 June). This creates a frontloading effect of project risks in the timeline of the development of the project (see Appendix I for a description of the project development pipeline).

2.3.2.3. Sources of support

Before the transition from grants to loans was established, government-backed funding bodies typically provided capital grants, which favoured large-scale for-profit schemes, although small-scale not-for-profit schemes were largely supported (Hain et al., 2005). Since 2011, the Community And Renewable Energy Scheme (CARES) has been in operation, and was first managed by CES, until the 1 August 2013 (Scottish Government, 2013a). Since this date, Local Energy Scotland (LES) has carried out the contract for administering the CARES fund and providing support to communities wishing to undertake a project (LES, 2014a). The aim of LES is to help the government achieve a target of 500 MW of RE under 'community ownership' by 2020, outlined in the recent Community Energy Strategy (LES, 2014a; DECC, 2014b).

The CARES support is structured in a unique manner among the range of alternatives for supporting projects. Several stakeholder consultations in the CE sector revealed the disproportionately high costs incurred towards the beginning of projects (CRIG, 2010). The fund aims to address this imbalance by providing (1) a start-up loan to assist community groups in the initial design of their project and (2) a pre-planning loan with a 10 per cent interest rate (Scottish Government, 2013b). Some of the key features of the loans are: (1) Any sub-5MW project that requires financial outlay before planning consent is eligible, (2) cover up to 90 per cent of these costs, (3) up to £150,000 can be loaned, (4) security on the loan is not required, (5) local advice and

support is made available. In addition, a clause states that if the project is refused PP and fails to materialise, the loan becomes a grant and is written off with no further liability for the recipient (Scottish Government, 2013b).

Another important fund, the Renewable Energy Investment Fund (REIF) is delivered by the Scottish Investment Bank through Scottish Enterprise (Scottish Enterprise, 2014). It aims to deliver loans, guarantees or equity investments to help projects at an advanced stage of development. The criteria for projects include generating energy from a renewable source, reducing the cost of renewable energy delivery, and there must be a demonstrable funding gap. Importantly, the fund collaborates heavily with the agency responsible for delivering CARES (Scottish Enterprise, 2014).

In addition to these funds, the government has recently launched the Community Energy Strategy in January 2014 (DECC, 2014b). In this strategy, the UK government has pledged a £15 million fund for developing community renewables.

2.3.2.4. Feed-in Tariffs

So far, especially in European countries such as Germany, the most important financial support mechanism for RE schemes has been Feed-in Tariffs (FiTs) (Butler and Neuhoff, 2008). The FiTs in the UK were a part of the Energy Act of 2008, attempting to "incentivise small scale, low carbon electricity generation by providing clean energy cashback" (DECC, 2010, p.1). The mechanism provides financial support for every kilowatt hour of electricity generated by a small scale generator of a capacity under 5MW. A subsidy is also given to the scheme when it exports electricity to the grid. These fixed generation tariffs vary by technology and are paid to schemes which supply the national grid or are off-grid, as these contribute to decreasing the net demand on the electricity grid (DECC, 2010). These are paid by large electricity generators in the area of concern and the cost of the FiT payments are levelised based on their respective market share.

An important stipulation in the distribution of FiTs, is that they are only eligible for installations of whose costs have not been partially or entirely covered by government grants, as these would constitute 'state aid' as defined by the EU (Ofgem, 2013). Ofgem's definition of "installation costs" does however not include the feasibility studies linked to a development or the grid connection upgrade associated with schemes.

The level of the FiTs were originally subject to a fixed rate degression to better support the diffusion of renewable energy technologies without providing distortionary subsidies in their favour. However, the pace of cost-reductions in the sector, particularly for solar photovoltaics (PV) has seen the introduction of a more flexible degression regime which would allow a sharper or

slower decrease in the rate given (Fittariffs website, 2014). Degression rates for large and small scale wind have been raised up to 20 per cent from 1 April 2014, due to high increases in installed capacity in the 2013 calendar year (Fittarrifs website, 2014). Degression for Hydro sources is set at 5 per cent for schemes at or under 2MW and 0 per cent above 2MW.

Table 1. Recent changes in Feed-in Tariffs for Hydropower and Windpower (Non-PV) (data from Fittariffs, 2014).

		FiT before April 2014 (p/kWh)	FiT after April 2014 (p/kWh)
Windfarm capacity	≤100kW	22.23	17.32
	>100 - 500kW	18.53	14.43
	>500kW - 1.5MW	10.05	7.83
	>1.5MW - 5MW	4.26	3.32
Hydro capacity	≤15 kW	22.23	20.57
	>15 - 100kW	20.76	19.2
	>100kW - 500kW	16.41	15.18
	>500kW - 2MW	12.82	11.86
	>2MW - 5MW	3.32	3.23

These changes will have implications for the choice of technology, where several alternate technologies could be applied, as the Net Present Value would decrease on the 20 year time horizon. Industry experts in the community energy sector denounce the measures to apply such a sharp degression in the FiTs as these will result in promoting large scale, privately owned schemes (REA, 2014). In addition, there is large uncertainty created in the fact that revisions are made at short notice: further degression to be applied after the 1 October 2014 will be decided on 31 July by the government (Ofgem, 2014).

2.4. How do we define 'community' energy, anyway?

The word 'community' in the literature has referred to two main conceptual understandings of this word in the energy context: community of locality and community of interest (Walker, 2008a). The former is the understanding of the community as individuals who share the same geographical space such as a neighbourhood. The latter refers to a shared interest or idea, the pursuit of which is relevant to the undertaking of the CE scheme (Walker and Devine-Wright, 2008a). Inhabitants of a village (community of locality) may decide to pool together in order to exploit the wind resource in the vicinity. Environmentally conscious investors (community of interest) may decide to invest in a

similar project. Hargreaves (2013, p. 13) reveals a survey of different common rationales behind the said community initiatives:

"carbon reduction featured in 55 per cent of all case studies; community development (22 per cent), sustainability in general (15 per cent), reducing fuel poverty (6 per cent) and improving local energy security (5 per cent)".

Often, the two communities join together to initiate a project, although the community of locality is seen as necessarily involved as they have a major role to play in the PP process. Walker (2008a) adds that some interviewees did not consider a precise definition to be appropriate for their projects, preferring an iterative, learning-by-doing approach instead.

2.5. The co-operative as an organisational structure

2.5.1. Co-operatives and their origin

Co-operatives originated in the late 18th century, during the industrial revolution, and the movement began in Scotland (Bailey, 1955). Some initial co-op-like schemes were initiated by the weavers association in Fenwick in 1769 and Govan in 1777 (Bailey, 1955). However, historians point to the Rochdale pioneers, who prompted a co-operative 'movement' as it is known today, as early as 1844 (Bailey, 1955). In 1995, the International Co-operative Association (ICA) attempted to standardise the definition of a co-operative as:

"an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise" (ILO, 2002). The values defended by this movement are "self-help, self-responsibility, democracy, equality, equity and solidarity" (Cooperatives^{UK}, 2011a; see Table 2).

Table 2. The defining values of co-operatives (data from: ICA, 2011).

Values	Meaning
Self-help	People help each other whilst helping themselves by working together for mutual benefit.
Self-responsibility	Individuals within co-operatives act responsibly and play a full part in the organisation
Democracy	Structured so that members have control over the organisation
Equality	Each member will have equal rights and benefits (according to their contribution)
Equity	Members will be treated justly and fairly
Solidarity	Members will support each other and other co-operatives

These values are carried out in practice by applying the co-operative principles (see Table 3). The co-operative organisational structure is distinguished from that of a limited company or corporation in law (Cooperatives[UK], 2011a). In essence, a co-operative differs from a traditional corporation whose main aim is to generate profit for the shareholders. Instead, the profits, when made, are intended for the distribution to its members (see Table 3, principle number 3). Sommerville (2007) views the main distinguishing feature of a co-operative as the principle of One-Member-One-Vote (OMOV), which differs from the corporation directed by shareholders (see Table 3, principle number 2). In addition, due to the inherent requirement for community engagement in the co-operative structure (see table 3, principle 7), co-operatives have been found in some cases to strengthen the capacity for organising and maintaining economic activity in a local area (Oorschot, 2013). Some also see co-operatives as being more compatible with the principles of sustainable development due to the fact that they are not listed on the stock market, and their primary duties lie in producing social benefit, based on long-term objectives and not quarterly, short-term objectives (Oorschot, 2013). Indeed, in a co-operative, because the shares distributed cannot be sold unless they are being sold back to the co-operative, members are focused on its ability to provide future long-term benefits (Mintzberg, 1996). The fact that the nominal value of the shares remain exactly the same throughout the period of investment means that the profile of the investor will not be the same as those investing in companies limited by shares, rather they will be seeking social impact (Spear, 2004).

Table 3. The co-operative principles and associated meanings (data from: ICA, 2011)

Principles	Meaning
1. Voluntary and Open Membership	Co-operatives are voluntary organisations, open to all persons able to use their services and willing to accept the responsibilities of membership, without gender, social, racial, political or religious discrimination.
2. Democratic Member Control	Co-operatives are democratic organisations controlled by their members, who actively participate in setting their policies and making decisions. Men and women serving as elected representatives are accountable to the membership. In primary co-operatives members have equal voting rights (one member, one vote) and co-operatives at other levels are also organised in a democratic manner.
3. Member economic participation	Members contribute equitably to, and democratically control, the capital of their co-operative. At least part of that capital is usually the common property of the co-operative. Members usually receive limited compensation, if any, on capital subscribed as a condition of membership. Members allocate surpluses for any or all of the following purposes: developing their co-operative, possibly by setting up reserves, part of which at least would be indivisible; benefiting members in proportion to their transactions with the co-operative; and supporting other activities approved by the membership.
4. Autonomy and independence	Co-operatives are autonomous, self-help organisations controlled by their members. If they enter into agreements with other organisations, including governments, or raise capital from external sources, they do so on terms that ensure democratic control by their members and maintain their co-operative autonomy.
5. Education, training and information	Co-operatives provide education and training for their members, elected representatives, managers, and employees so they can contribute effectively to the development of their co-operatives. They inform the general public - particularly young people and opinion leaders - about the nature and benefits of co-operation.
6. Co-operation among co-operatives	Co-operatives serve their members most effectively and strengthen the co-operative movement by working together through local, national, regional and international structures.
7. Concern for community	Co-operatives work for the sustainable development of their communities through policies approved by their members.

2.5.2. Criticisms and limitations of co-operatives

Even if the ICA has attempted to provide definitions of common values and principles a stable definition, there is not one clear manifestation of a said co-operative because the aim and direction of these enterprises follow a multiplicity of objectives (Jensen and Meckling, 1976). For this reason, they are subject to the scepticism of 'business realists', for whom the principle of efficiency is through optimising private profits (Bailey, 1955). The counterargument is that co-operatives are in fact more efficient than the current system can demonstrate because the environment within which they operate is characterised by a competitive drive motivated by profit, rather than co-operation and the pursuit of value-based objectives (Chevalier, 2011). Indeed, a challenge noted by Sommerville (2007) is the erosion of this social responsibility experienced by co-operatives, blurring the distinctions between a private firm and a co-operative. When a co-operative's activities resembles those of a private company, it is said that the co-operative 'degenerates' (Cornforth, 1995).

The points of similarity between co-operatives and traditional corporations are what Sommerville (2007) views as the main threat to the co-operative identity, which can be lost through two mechanisms: abandoning member ownership and control and a weakening of internal democracy. In the former case, the role of generating profits is central. Tuominen et al (2013, p.125) summarise the three main arguments for generating profits in co-operatives:

"1) Profit is a safe way to accumulate capital and one that promotes independence, 2) Financial resources are required for competition and regional development, and 3) Competition and regional development are an essential part of executing the co-operative purpose in the consumer market and regional economy.".

In addition, Mills (2001) points to the fact that enterprises require resources to face the pressures of the market and competition, and accumulating profit should enhance the survival prospects of co-operatives. Profits are often too low for co-operatives to sufficiently expand in the marketplace, which creates a need for investment from external sources (Sommerville, 2007). Opening up to other investors then blurs the borders between a co-operative and a corporation because distant investors are less able to participate in the democratic process and the co-operative identity is lost (Sommerville, 2007).

The principle of proportionality can also threaten the identity of a co-operative in practice. It describes that equity ownership should be in proportion to the level of input from the member, or 'patronage' (Barton, 1989). In this sense, ownership can be divided unequally - as in a limited company - whereby certain members own a higher proportion of the enterprise and its revenues. Even if the principle of OMOV applies, some have viewed this as problematic due to the creation of dynamics of inequality (Birchall and Simmons, 2007).

2.5.3. Co-operatives and the UK

2.5.3.1. Legal structure

In the UK, co-operatives are regulated under the Industrial and Provident Societies Act of 1965, which distinguishes these enterprises from private companies. Many different social enterprises' legal structures are covered by this act, and there is no specific legislation covering co-operatives themselves.

Table 4. Legal structures for incorporating an enterprise (data from: Wrexham Borough Council, n.d.)

Social enterprises - legal structures						
Private company		**Industrial and Provident Society (IPS)**		**Community Interest Company**		**Limited liability partnership**
Limited by guarantee	Limited by shares	Bona-fide co-operative	Society for the benefit of the Community (Bencom)	CIC Limited by guarantee	CIC Limited by shares	Flexibility and tax advantages

The main difference relevant in this context is between private companies and Industrial and Provident Societies (IPS). The main aim of businesses is the pursuit of financial profit for shareholders, whereas the aim of IPS must be to provide benefits to members of a said community (Cousins, 1994). Within those registering as an IPS, the main distinction to be drawn is to whom the benefits are directed: for bona-fide co-operatives, benefits are directed at members of the co-operative whereas a Society for the Benefit of the Community (Bencom) will aim to provide benefits to a wider community, not solely its registered members. Different legal structures also have very different implications with regards to liability, taxation and the administrative burden involved (Wrexham Borough Council,n.d.).

2.5.3.2. Ownership structure

Historically, co-operatives have heavily featured in the Scottish business landscape in sectors such as groceries (Cooperatives^{UK}, 2011a), but have not featured in the community energy sector until recently. These have different ways of operating, suggesting different types of co-operative ownership structures: consumer co-operatives, worker co-operatives, enterprise co-operatives and mixed co-operatives (Cooperatives^{UK}, 2011a).

Table 5. Level of community and private company ownership for CE schemes (information from Harnmeijer et al, 2013).

		Vehicle ownership	
		Full community ownership	Partial community ownership
Type of investment	Individuals	Co-operatives: • BenComs • Bona-fide	Joint Ventures: • Commercial Developer with Co-operative
	Organisation	Local Development Organisations (LDOs): • Development Trusts	Joint Ventures: • Commercial Developer with LDO

Table 5 describes the current main ownership patterns found in the UK for developing CE schemes. Different aims, objectives and individual or collective preferences will dictate different ways of organising the enterprise. These will then imply different legal structures under which to operate, and will therefore be subject to different restrictions and regulatory requirements and changes made by the

government. The manner in which schemes are financed will define the ownership patterns (see table 5). Communities can either fully own the CE scheme (left hand side in table x) or partially (right hand side of table 5). Investment can be made individually (top of table x) or through an organisation (bottom of table 5). Traditionally, schemes in Scotland have fit the description of the scenario in bottom left hand side of table 5.

A manner in which investment in a co-operative operates in the UK is through the use of community shares, launched jointly in 2011 by the Office for Civil Society, the Department for Communities and Local Government, Co-operatives UK and Locality (Co-operatives^{UK}, 2011b). These offer shares of the co-operative to the general public, often at a value of £1 per share. One of the advantages of this the withdrawable share mechanism that guarantees the ability to withdraw the sum initially invested from the organisation. This share is sold back to the organisation itself, providing that this withdrawal will not pose a risk to the organisation financially. The cap to the amount of shares allowed per member has recently been raised in the UK, from £20,000 to £100,000 worth of shares (HM Treasury, 2013). This has raised concerns regarding potential co-operative degeneration among the respondents to the consultation, as this could introduce large inequalities in the amounts owned amongst members (HM Treasury, 2013).

2.6. Niche theory and community energy

The sustainability transitions literature has evolved from the need for a transition towards sustainable society combined with our knowledge of how innovations transform economic and social landscapes. Early research on innovation concentrated mainly on the technological side of transitions (Kemp et al., 1998). In modern times, however, with increasingly complex and interconnected marketplaces, it has been inevitable to include many different levels - from the technological to the social and institutional (Mazur et al 2014). Markard et al (2012) summarised four main frameworks through which to analyse sustainability transitions: Transition Management (TM), Strategic Niche Management (SNM), the Multi-Level Perspective (MLP) on socio-technical transitions, and Technological Innovation Systems. These frameworks are loosely defined and concepts often intersect with each other. However, they are all concerned with explaining how innovations evolve and transform society, from the niche level where they necessarily begin.

Niches are characterised as:

"protected spaces where novel sociotechnical configurations are established (often as a direct response to an unsustainable regime), experimented with, and developed, away from the normal selection pressures of the regime" (Smith and Raven, 2012).

Niche theories explore the mechanisms of radical innovations in sectors where a particular regime exists for meeting societal needs and how these innovations could reach a scale capable of substituting the existing model. Seyfang et al (2013) characterises these as 'cosmopolitan' spaces, not geographically defined yet composed of multiple localised projects, linked by networks and intermediaries. Niches are inherently opposed with regimes, since they constitute an innovation of some sort, departing from the regime currently in place. Their relationship with the regime can be one of competition, aiming to displace the regime entirely, to induce a reforming of the regime without changing it fundamentally, or to replace voids left by the collapse of the current regime (Schot and Geels, 2008).

Strategic Niche Management has been used in recent literature in order to study niche development in more detail (Seyfang et al., 2013). Schot and Geels (2008) summarise the much cited findings of successful innovation practices in the SNM literature. They outline three principal mechanisms for 'managing' niche development at the niche level: (1) expectation management, (2) networking and (3) learning at multiple levels. Specifically, the findings of Elzen, Hoogma, and Schot (1996) outline the following:

"(1) The articulation of expectations and visions. Expectations are considered crucial for niche development because they provide direction to learning processes, attract attention, and legitimate (continuing) protection and nurturing.

(2) The building of social networks. This process is important to create a constituency behind the new technology, facilitate interactions between relevant stakeholders, and provide the necessary resources (money, people, expertise).

(3) Learning processes at multiple dimensions:

(a) technical aspects and design specifications
(b) market and user preferences
(c) cultural and symbolic meaning
(d) infrastructure and maintenance networks
(e) industry and production networks
(f) regulations and government policy
(g) societal and environmental effects"

Another distinction within this field of study concerns the role of citizen initiatives through grassroots enterprises. Seyfang and Smith (2007) distinguish intrinsic and diffusion challenges faced by grassroots innovation for sustainable development. The intrinsic challenges indicate types of projects which require a "particular combination of skills, key individuals and champions, resources and supportive contextual factors" (Seyfang and Smith, 2007, p.595-596). Common challenges across grassroots eco-innovations in the literature revealed the problems faced by innovations were in the diffusion phase (Hargreaves et al, 2012). The small scale of grassroots innovations mean that their influence is limited and scaling up the use of a model can be limited

(Seyfang and Smith, 2007). Kemp et al (1998) define three necessary ingredients for niche growth and emergence: managing expectations, building networks and learning. Consequently, an additional critical factor for niche diffusion of grassroots innovations is to carefully negotiate this element of group identity and community building and to manage the competing voices comprising the niche (Seyfang and Haxeltine, 2012).

2.7. Hypothesis

The literature review revealed that CARES funding in the pre-planning stage is likely to be a crucial factor for any CE scheme due to the extent and nature of the risks at this stage of development. As a government-administered fund, the provision of grants and loans is contingent on meeting certain criteria set by the funder - the Scottish government. The policy discourse found in the literature displays a will by the government to scale up CE in order to increase energy generation from RE and attain CC targets. The choice of methodologies is first explained, followed by an exploration of the case studies and finally findings are discussed.

3. METHODOLOGY

3.1. Methodology literature

3.1.1. Framing the methodology

In social science research, the aim of collecting data is fundamentally to describe and conceptualise a certain aspect of reality. The manner in which conceptualisations are formed are central to understanding exploratory or inquisitive forms of research. It is important to point to the difference between social and natural science research in that the former employs a "single hermeneutic" (Danermark et al, 1997, p.36) and the latter employs a "double hermeneutic" (ibid). This describes the fact that social science must attempt to interpret people, who have themselves interpreted the natural world around them. At a societal level, the meaning of certain institutional structures cannot be defined as fixed in and of themselves, as the formulation of meaning itself is socially constructed and reshaped constantly. Sayer (1992, p.35) states: "The relevant constitutive meanings, (...) associated practices and different groups have very different or even contradictory material stakes in their reproduction or transformation.". This summarises the field of critical realism, which describes the fact that social phenomena is explained through revealing mechanisms that produce them (Archer, 1995). Critical realism has its roots in a critique of positivist approaches to the social acquisition of knowledge (Meyer and Lunnay, 2012). Danermark et al (1997) point to the study of causality as an important consideration for producing useful social science research. Describing objects and four central aspects of these: their structures, powers, mechanisms and tendencies is a feature of the field of critical realism. Their interrelationships assist in understanding significance of different factors in causal relationships: for example:

> "things have the powers they do because of their structures. Structures cause powers to be exercised, given some 'efficient cause', e.g. the match lights when you strike it." (Collier, 1994, p43).

Four different methods of conceptualising social science research are situated along a spectrum from a positivist perspective to a post-normal perspective (Danemark et al, 1997). These four different strands are: deduction, induction, abduction and retroduction. Traditional research has followed a deductive approach, which is characteristic of the positivist tradition of inference (Danemark et al, 1997). Deduction is the cornerstone of scientific research as it aims to describe in a logical manner. It is used in propositional logic and predicate logic to examine the validity of an argument (for example, if all A are B, and C is A, therefore C is B (predicate logic)) (Danemark et al, 1997). Inductive inference is, as is deductive logic, a type of formal logic. However, inductive

logic does not necessarily entail causality between a premise and a conclusion, meaning that other explanations for the conclusion can be used (Danermark et al, 1997). It can be used for the explanation of a general phenomena from a single phenomenon observed. Abductive inference aims to analyse data that is beyond the scope of an initial premise. Danermark (2002) argues that abduction responds to the limited capacity for deductive inference for explaining how knowledge is acquired, what makes events, experiences and phenomena possible. Abduction is also seen as less reductionist in that it removes the theoretical lens through which interview data is sometimes assessed, reducing the scope of the findings to theoretical framework within which the premise is situated (Danermark et al, 1997). It is therefore "an inference where redescription or recontextualisation is the central element (...) understanding it within the frame of a totally different context." (Danermark et al, 1997, p.96). A retroductive approach allows for the description of qualitative data which has been recontextualised through abduction. This implies that the use of a particular theory to interpret and explain necessary conditions for the phenomena under study can be applied (Meyer and Lunnay, 2012).

3.1.2. Case studies

Meyer and Lunay (2012) point to a number of ways in which retroductive inference can be used to interpret results of social science research. One of these is the use of case studies, which can help to examine differences between situations in order to discern "What properties must exist for X to exist and to be what X is? (...) and determine what mechanisms must be in place for X to occur" (Danermark et al, 1997, p96). Characteristics of the choice of the cases to study include number, similarities in some aspects but differences in others and the extent of these differences. Comparability of key characteristics can draw out similarities in structures or mechanisms to ascertain causality and produce research outcomes.

The most notable type of case study research has been the exploratory case study (Yin, 1993). It is often seen as a prelude to other research projects, particularly in the field of innovation studies (Yin, 1993). The research design is unspecific and unbound at first, later to be refined through iterations through multiple pilot surveys as understanding of the context progresses. Yin (1993, p.7) recommends, however, that "the exploration is following some exploratory "theory", and that you are not merely wandering through the exploratory phase". Another type of case study is the explanatory case study. This framework is used for testing competing theories in testing a causal relationship. Complexity can be analysed through a pattern-matching analysis making the comparison between hypothesised and actual course of events (Trochim, 1989).

3.1.3. Coding

In qualitative research analysis, a code is:

"a researcher-generated construct that symbolises and thus attributes interpreted meaning to each individual datum for later purposes of pattern detection, categorisation, theory building and other analytic processes." (Saldaña, 2012, p.12).

Punch (1998) summarises three main stages usually undertaken for coding qualitative data: (1) open coding, (2) axial coding and (3) selective coding. This process is aimed at grounding the data in a theory which helps to make some sense of the findings. During open coding, the empirical findings must be analysed with "first-level coding" (Punch, 1998, p.205). This level of analysis aims to summarise the data into a more simplified form, and respond to the question "what is this piece of data an example of?" (Strauss and Corbin, 1990, p.62). At this level, labels are not conceptual. The axial coding stage attempts to harmonise the data into categories through connecting the results of open coding by giving them a higher level of meaning. These relationships can still be linked to different conceptualisations. In the third stage - the selective coding stage - the researcher must deliberately select one aspect as a core category. This category is a theoretical concept that in most cases will have been identified in the literature before data collection commences (Punch, 1998).

3.2. Methodolgy employed

3.2.1. Framing the methodology

A retroductive type of research methodology was chosen as this research was exploratory in nature, and was concerned with explaining mechanisms in a social context. A deductive approach would provide a limited picture of the reasons behind the recent surge in co-operatives in the Scottish CE landscape. In addition, the renewable energy industry and the field of CE in the UK are known to be particularly rapidly evolving and dynamic. Given the complexity and interdependencies of political, economic, social and technical aspects to the field of community RE, the many drivers and barriers at play are likely to enhance and hinder project success at different levels and in different respects.

In order to pursue this exploratory method of enquiry, a combined approach of secondary and primary data was used. A desk-based survey of documents first established important developments in the UK and Scottish context, such as policy changes, introduction of new actors.

Interviews were then carried out with experts in the field of CE and the co-operative business model in order to provide a full context provision.

3.2.2. Case studies

Six case studies of Scottish CE cooperatives who were at advanced stages in the development process were then selected and key members of the board were selected for interview, each with recent and relevant knowledge of the project and often in-depth knowledge of the industry. As the first few community energy projects to be formally recognised as led by co-operatives in Scotland they were uniquely placed to provide evidence for the enabling factors of their unfolding success. As well as key members of selected co-operative schemes, intermediaries with expert knowledge of the field of community energy were also interviewed.

The case study data was constructed using the available information on the websites of each scheme and the planning portal on their respective councils' website. Primary data gathered from telephone interviews of members on the board of each selected scheme. A review of the literature indicated that the choice of organisational structure was reliant on pre-planning phase processes, notably, the rationale for the scheme and access to finance. Questions were posed to members of the board who were likely to have knowledge of these areas of focus or who were acting as treasurer of the association. The use of semi-structured interviews allowed for a focus on the selected aspects of the projects, while maintaining flexibility to accommodate the interconnected nature of the subject, along with the ability to follow up on aspects in the answers which were relevant to the research question.

Primary data was also collected from numerous discussions, emails and follow-ups with stakeholders in the field. The Dingwall Wind Co-operative's first Annual General Meeting was attended on 12 July 2014 and was also the source of some primary data.

3.2.3. Coding

Coding of the data was undertaken and selective coding revealed strong relevance of niche theory. In particular, Strategic Niche Management concepts provided a useful tool to analyse the data. In order to explain and discuss further relevance of findings, concepts borrowed from this field of literature were employed, and three main categories of niche development emerged: visions and expectations, learning, and networking also used in Seyfang et al (2013).

4. RESULTS

Table 6 below shows the main characteristics of the cases that were the objects of this comparative case study analysis. The landowner of case 6 did not consent to be identified in this study. The data for the total project costs of case 5 was not disclosed due to its commercially sensitive nature.

*Table 6. Summary of main characteristics of case studies. The source of this data was the website of each respective scheme (See Appendix I) (*this data was commercially sensitive and could not be disclosed by the developer.)*

Project	Initiators	Energy source	Legal structure	Capacity	Status	Share raise (£)	Total project cost (£)	CARES loan?
Case 1 (**GMY**)	LDO	Hydro	Bencom	320	Build	330,000	1,300,000	Yes
Case 2 (**HH**)	LDO	Hydro	Bencom	65	Build	333,000	1,400,000	Yes
Case 3 (**DW**)	Private Landowner	Wind	bona-fide	250	Generating	856,000	856,000	No
Case 4 (**ILA**)	LDO	Wind	BenCom	330	Build	535,000	1,270,000	Yes
Case 5 (**SOL**)	Private Developer	Wind	bona-fide	45,000	Generating	2,700,000	Undisclosed*.	No
Case 6	Private Landowner	Wind	n/a	500	Pre-planning	n/a	n/a	No

The main findings demonstrated a clear split between types of project in many respects. The legal definition of a Bencom (Community Benefit Society) was not found to be entirely distinct from a bona-fide co-operative in the literature, as they are both Industrial and Provident Societies. Findings suggest that among many different models in application, the two differ in many ways and manifest two main discourses. The characteristics of Bencoms and the Bona-fide co-operatives are therefore compared with specific reference to the most important aspects of niche development before discussing the implications of these differences in the Scottish context.

4.1. Visions and expectations

4.1.1. Scheme rationales

Normative

Visions and expectations counted several main differences. First, the normative motivations of Bencoms, as prescribed by their purpose and legal status, was to generate social benefits to the wider community as a priority. These projects tended to focus on goals of implementing projects with a social focus, which were strictly local. Social cohesion was stated as an outcome, for example, HH: “money is not what interests people - what people want to do is come together”. HH also described a vision of becoming a platform to start social enterprises.

The bona-fides, on the other hand, described their schemes as concerned by its members, and these were considered to define the community. The members were characterised as investor-members, with a rationale of personal investment. There was an outward focused vision, and goals of CC mitigation were dominant. The community ownership targets outlined by the government were cited as central to the reason behind the schemes. Differences within the bona-fides were linked to the differences in initiators - SOL was initiated by the for-profit developer and therefore the profit motive was the primary motivator, and the co-operative scheme was part of the developer’s business model of being a proactive company and a frontrunner in the field of community engagement. DW was initiated by the landowner as an alternative to debt finance and to open his project to the local community for investment. Case 6 was perhaps the project with the least defined vision, as the landowner described “It seems to be a growing trend.” as a source of motivation.

Instrumental

Second, instrumental rationales were also features. A central element in all cases was the FiT incentive proposed in 2008 on small-scale projects. The Bencoms, initiated by Local Development Organisations (LDO), were used as a Special Purpose Vehicle (SPV). A key finding in the literature was confirmed: The traditional method of raising funds for RE schemes using grants was incompatible with FiTs for CE schemes. An extra incentive was provided by FiT degressions, as the motivation to meet FiT deadlines in order to secure the "best deal possible" (HH, Interviewee 2b). Generating engagement was an instrumental motive for HH, interviewee 2b stated:

“we could have got a loan through LES and just built this, and very few people in the community would have paid that much attention to it, even though there would have been this pot of cash coming in I think they would not have been connected to it at all”.

At the same time, there was also a role for the scheme to attract membership to the LDO, therefore engagement in the activities of the LDO.

Another incentive was to reduce the size of debt finance needed to raise funds:

“when we started this project, we thought we could run it as part of the community Development Trust and just spin it off, it was only when we discovered that the banks wouldn’t loan a 100per cent of the money and we would have to raise about 30per cent of it that we started to think 'oh gawd, we need a separate structure here' and that was when we started looking at it, that’s why we went down the co-op route.” (GMY, Interviewee 1).

This highlights the small size of the projects in the RE field relative to the amount of risk involved. The financial due diligence costs also made this a prohibitive investment for smaller projects with lower rates of return:

"The process, for reasons I don’t understand, seems to cost nothing less than 40,000 pounds. If you want to borrow 300,000 pounds, adding 40,000 is a pretty hefty lump." (HH, Interviewee 2a).

The individual financial benefit was also mentioned as an instrumental incentive in Bencoms, even if the return per share was lower than in bona-fide schemes, the investment was seen as an alternative to investing in a savings account.

There was a clear divide between two competing visions and expectations drawn by these motivations. Although there was a recognition among the interviewees that individual member benefits were important in raising money towards the scheme, there was a negative perception of schemes which centered on investment for membership benefit rather than community benefit. As found in the literature, the definition of community was subject to different interpretations. The latter form of community was not seen as authentic by HH. The fact that the CBF was small in these schemes meant that the wider community would not benefit from the scheme, whereas DW saw the members of the co-operative as defining the community. In SOL, there was a disagreement at the group formation stage, and one of the members of the board of directors chose not to pursue any further with the initiative:

“a couple of the directors didn't feel it was for them, one of them didn't feel it was for him because he was more interested in the community benefit side, so we had to say look this is a co-op, it's about individuals investing, community benefit is separate.” (SOL, Interviewee 5).

In DW, the intermediary involved saw the bona-fide model as “more honest”, which emphasises the focus on investment of this type of scheme and the community benefit is a positive externality rather than the drive of the project. The objections received at DW were reported to criticise the fact that the scheme was aimed at making money and the scheme was a way for the landowner to capitalise on the opportunity brought on by the introduction of FiTs. Another reported criticism

was the suspicion that the co-operative scheme was implemented simply as a means to obtain PP. In this case, the landowner had already obtained PP prior to the capital stage.

4.1.2. Benefits

A second area of consideration concerning the visions and expectations was the distribution of benefits from the scheme. A central finding was that expectations of a "community benefit" was sometimes unclear as to what constituted the community of locality. The size of the community considered to be local varied. In the case of GMY, the island of Mull was considered to be the beneficiary of the project, but the two adjacent islands were considered local in the share offer. In HH, the two nearest villages were included as local investors, although they were not beneficiaries of the LDO's social investments. In DW, the local community was a defined 25 miles around the turbine itself. In each case, the target of having 70per cent of the members originate from the 'local community' was applied.

The amount offered in return to investing in the schemes was lower in the case of Bencoms and higher in the bona-fides. Returns were ultimately linked to the performance of the wind turbine and the amount of wind at the site every year. The manner of distribution of the benefits is central to the difference between the two models, with the CBF taking a higher or lower proportion of the sales of electricity. On the one hand, in HH, it was viewed that the CBF should benefit from at least 50per cent of the profit raised by the turbine. The democratic system, one member, one vote was also appealing. The notion of retaining a centralised system of control was important, as there were members of the LDO on the board of directors. This was also reported to be central in convincing the local authorities in one case, where a lease was necessary for the public land:

"what helped national forest land scheme accept it was that all the net profits from the scheme will be paid into a community benefit fund and that fund will be completely locally controlled". (GMY, Interviewee 1).

In SOL, the CBF was minimal and was mainly used to maintain the turbines.

The need for centralised control was expressed strongly in the case of Bencoms, due to their relationship with the anchor organisations - the LDOs. At HH, the mechanism was described: "the surplus money would be channelled through the BVT, and the village trust has the ability to nominate 3 of the directors of [HH]. So the two are pretty tightly coupled." (HH, Interviewee 2a). The friction between the two visions was evident: "If push comes to shove and there's a big war between the two organisations, then the rules can be changed". The vision of the LDO was to use the co-operative as a means to fund social projects run by the anchor organisation for local regeneration. The CE scheme was therefore important to maintain a steady and sustainable form of

income. In HH, the directors of the BVT were reluctant to relinquish control, but the principle of offering shares and membership to the community through an IPS meant that the control would be divided equally among members, regardless of whether they were members of the LDO. In addition, within the range of organisational structures, there were no other options which would allow both raising equity through the community and guaranteeing control under the LDO:

"So we went round and round in circles but (...) you can't have control and also invite membership - invite people to put in money to a community share offer, these two things do not tie up." (HH, Interviewee 2b).

4.2. Learning and knowledge

4.2.1. Key knowledge and skills

In the case of ILA, the chairman held a wide knowledge of the energy industry as he had previously worked for an international oil company. Interviewee 4 stated: "if it hadn't been for him, then this project would not have got off the ground for want of a better phrase". The drive on behalf of the individual was also key in this case, as well as a team of people with the appropriate skill base. These specific skills were reported to be quantitative analysis, accountancy and business development. Another member was a world-renowned orthinologist who also helped assess the impact on the local wildlife during the EIA. The skills required were therefore often previously acquired from the professional domain, in relevant industries. For the Bencoms, most of the members of the board were working on a volunteer basis. HH had two full-time employees and one retiree to cover the long hours necessary for the development process. Other help came from individuals in the local community signalling their willingness to assist, with the possibility of integrating the board of directors. Marketing was one of the key skills applied by the members of the board during the share offer, and in developing future projects. GMY had 3 founder members with significant levels of experience in engineering, project management, business management and marketing.

For the bona-fides, the types of skills possessed were similar. In DW, the members of the board were trained in environmental and agricultural sciences, and less of a background in business management, accountancy and finance, but owned and operated the family farm business. They also had the support of Sharenergy, a co-operative specialising in the development of co-ops, and Realise Renewables, a local developer who helped towards gaining PP. The support of Sharenergy led the group to learn about energy co-operatives, in early 2013. Indeed, the co-operative was only planned after having secured PP in December 2012: "So we'd got PP but at the time we got PP, we

hadn't even really heard of RE co-ops let alone considered setting up one ourselves" (DW, Interviewee 3).

SOL displayed the important role of experience and reputation, as the interviewee highlighted the fact that Energy4All had never failed to raise capital for a joint venture project. Experience has led Energy4All to ideally seek for 6 locally-sourced board members, including 1 from the Energy4all team, as interviewee 5 felt that 4 was too little. Marketing was a key skill for both types of IPS: The marketing budget was the main variable when raising money was a problem by increasing the spending on outreach.

4.2.2. Stakeholder engagement

Early engagement with the local community was an important part of the pre-planning process, for example in GMY, public consultation regarding technology type being used was undertaken. In ILA, there was a survey to explore the range of benefits that the community would want the funds to be used for. There were no significant issues reported with local opposition. Planning permission in GMY was experienced as challenging due to the local council being extremely thorough: "planning department here can be very very picky (...) they will check the whole thing, I think it took 6 weeks to go through planning validation because we were missing the red line" (GMY, Interviewee 1).

In the case of the bona-fides, the main form of engagement was through the share offer, due to the fact that the co-operative was only organised after having received PP. In the case of SOL, the principal rationale being financial investment, marketing through the share offer was essential, although various events in the towns aimed to raise awareness as well as investment from the local community. At DW, there were little reported problems with gaining PP, and the landowner was said to have maintained contact with the local council from an early stage. There were some objections, and planning approval was given after the downscaling of the size of the turbine from 400kW to 250kW. At CASE 6, the landowner decided to advertise the scheme as a co-operative from the conception phase, as his intent was to replicate the successful scheme of DW. The website states that the scheme aims to be one hundred percent community-owned, with a community benefit fund planned to achieve £10,000 per year, twice the level in a commercial arrangement. However, PP was refused at the time of writing. The documents uploaded to the planning portal on the council website include many objection comments and letters from members of the public. The objections included many concerns regarding visual and cumulative impact, creeping development, among others commonly found in the literature. Regarding community ownership, there were comments that this scheme was attempting to bribe locals into acceptance and that only a select

wealthy few would be able to invest, whilst others would pay indirectly through increased electricity bills. This was referred to as 'servitude' rather than 'genuine community ownership'. Another main notable fact is that PP was refused on the grounds that it would result in "adverse impact in detriment to the character and appearance of the local landscape" and a detriment to the historic monument. The turbine was indeed to be located within the view of a site of historical interest, near a historic monument. The historians in charge of this were consulted and the response was:

"Viewpoint 3 shows that the turbine will be visible in outward views and will have an impact on its setting. However, we consider that the level of impact is not of such significance to object to the proposal for our historic environment interests. We would therefore be happy for your Council to determine this application without further reference to us." (Objection letter, Anonymous).

The grounds to refuse PP was therefore in part arbitrary, and mostly related to the dozens of objections received on behalf of the community. Interviewee 6 refused further comment on the planning refusal as an official appeal against the decision had been made at the time of writing.

4.3. Networks

4.3.1. Dynamics within groups

Networking starts within the community groups themselves. The size of the local community was stated as a necessary condition for raising awareness and funds during the share offer: "DW is a big enough town, you know the town where the [other scheme] is, they don't have that critical mass" (J. Halle, Personal communication, 12 July 2014). The diversity within this local community also enabled for the contribution of an array of skills through volunteers who were interested in the scheme, and in the case of HH, some of these became members of the board as a result:

"about 70per cent of our shareholders are within our locality and that gives us access to a whole lot of people that had skills that were hidden to us before (...) and are now acting as the project managers for the build." (HH, Interviewee 2b).

The interviewee estimated that the scheme saved around £60,000 on costs in the pre-planning stage by having access to these volunteers. This small initial network could expand in many ways, one of those reported in HH was through a seminar on co-operatives attended by a member of the board at her job for a community action group.

Another factor which was reported to be influential in developing using an IPS structure was the consultation of grassroots projects in England that had been successful: HH contacted Sheffield

Renewables and the West Oxford co-operative (HH, Interviewee 2b). The members of the board that were at first skeptical of the IPS model were persuaded after an explanation of how these schemes operated and the benefits for the local community.

4.3.2. Community groups and advisory bodies

A second level of networking took place between community groups and other consulting bodies. The latter were a source of advice and often possessed the key skills needed to develop projects. In all cases, except for SOL, the projects could be characterised as 'grassroots', as they were initiated by community groups or individuals, who then sought advice from external sources of support. The sharing of expertise was important in the case of GMY, where the consultants Paul Phare (Energy4All) and Dave Hollings (Co-operative and Mutual Solutions) helped elaborate the rules of the organisation and helped with marketing and publicity. Their assistance was particularly valuable to the GMY project, as: "every step of the way, when something big was about to happen, they were there to help us." (GMY, Interviewee 1). Another source of advice was from legal professionals, particularly when the wording of certain documents was important or when deciding on an organisational structure, as reported in the case of ILA.

Consulting advice from professionals in the field is also possible when these professional organisations become member-investors in projects. There is then a mutual benefit of success of the project, as the board members have access to the knowledge and network of the consultants. Consultancies can use projects as a low risk investment opportunity and as a means of generating returns for the company, as the failure of the project sees the returning of the totality of investments to the shareholder. In order to lower the risk or liability for the community group, consultants sometimes work at risk, meaning that their remuneration is dependent on the success of the project. However, these work at the capital phase and are not involved in the pre-planning phase, which is considered too risky. A recent attempt to do so by Energy4All has had limited success, through the Energy Prospects co-operative. The expansion of these formal networks was also key in helping learning and sharing knowledge, and the concentration of this through hubs: "just by joining with [the co-op hub], I'm surprised how much it opened a whole lot of doors for us." (GMY, Interviewee 1).

There was evidence that networks were also informal in nature. Personal referrals were commonplace and existing friendships used, for example in DW, where the developer referred the community to Sharenergy for raising the capital. In SOL, a friend of the Energy4All consultant, who was a co-operative enthusiast, was contacted about the initiative and went on to become a

board director. In ILA, one of the board members knew a consultant in England, who directed them towards the Bencom model, which he personally supported.

One of the key findings was the importance of trust. On the side of the Bencoms, there was a specific advantage in having an anchor organisation, with a proven track record and reputation. HH reported having previous relationships with grant-funding organisations for other sustainability projects, through the Climate Challenge Fund for example. In the case of DW, the relationship of trust was shown through the fact that the landowner was a well-known and respected member of the village community and other board members were an established part of the community: "The directors were very good at chatting to everybody and knew loads of people [...] people like them are well connected" (J. Halle, Personal communication, 12 July 2014).

These connections may have been a crucial part of weakening opposition to the scheme experienced in the early stages of the project. The role of network trust is perhaps most demonstrated by the failure of the case 6 project. In case 6, the certain objections in the public comments denounced an "absentee landowner" who would be benefitting at the expense of those living in the village. Another criticism was that of "carefully worded flyers" in an attempt to manipulate local inhabitants into accepting the scheme and joining the co-operative. The rationale behind marketing the co-op from the conception stage could be to demonstrate the intention for benefitting the local community through the common ownership of the turbine, thus following the government's local benefits discourse. In practice, however, there are two facts that reduce the potential effectiveness of this: the fact that the future ownership of the turbine is a non-material factor in the PP process and the fact that the landowner (and two co-op board members) will own the turbine and there is no legal guarantee that a share offer will be proposed after PP is obtained.

4.3.3. Community groups and government bodies

The groups' interaction with the government or government bodies was down to two main reasons: obtaining financing and obtaining PP. GMY secured a lease from the Forestry Commission, through the National Forestry Land Scheme (NFLS). The NFLS requires project developers to provide detailed information regarding the many aspects of the project, including potential risks, community responses and how the benefits intend to be managed. This was experienced as challenging for GMY, as the mention that the scheme would be a co-operative prompted concerns of local control:

"We did struggle and we are still struggling with bodies not understanding the co-op structure. I mentioned earlier the National Forest Land Scheme but they don't understand and it took a lot of persuading for them. Their concern was that because we sold shares to everybody, we couldn't guarantee local control, and now, we have far more local" (GMY, Interviewee 1).

In the pre-planning stage, the Bencoms all received a grant through the government-backed CARES fund for the feasibility study. Indeed, ILA pointed out that this was a critical source of funding: “By that point [the CARES loan] was the only way we could get any funding to continue the development and to pay the deposit for the grid connection” (ILA, Interviewee 4).

In addition to the finance, HH found the networking provided by CES a valuable asset: “CES have connections with the co-operative movement, and they’ve got the right people to talk to.” (HH, Interviewee 2a). The advisory role of a local government branch was seen as a frustrating process due to the risk averse behaviour of those concerned:

“trying to get each department within the council to assess the risk for their department (...) nobody wants to take the ultimate decision and say ok that’s fine because everyone’s worried that they need to dot the i’s and cross the t’s in case it comes back to bite them.” (HH, Interviewee 2b). This problem was overcome by the involvement of more senior figures who had the power to make decisions. In the case of ILA, access to the REIF through the government-backed Scottish Enterprise, presented additional learning challenges:

“Scottish Enterprise who are probably more used to dealing with organisations, corporations or businesses, they have to understand that if Big Society is going to work, they're going to have to accept that there's a different support required” (ILA, Interviewee 4).

The bona-fides, in contrast, only dealt with the government when it came to obtaining PP, before the capital stage. In the case of SOL, the project was privately-led from the feasibility study and the co-operative was only set-up at the final stage of the project. In the case of DW, the decision to form a co-operative to raise funds only emerged after PP had been granted. At case 6, the owner had self-funded the pre-planning stage and had made an attempt to contact Local Energy Scotland for assistance with no reply: “I'd already committed to spending funding, which I'd have to pay for myself, but I'm still waiting to hear from them whether they're willing to help or not”. A key fact is that the manner in which funds are raised is not a material consideration during the planning procedure. However, as with any type of government funding, there is a higher accountability and disclosure necessary regarding how the funds will be spent, or how the benefits from public land will be used. At this point in time, the only CE bona-fide co-operative in operation that is entirely owned by the members is at DW, by a private landowner and with no CARES grant or loan for the pre-planning stages.

4.4. The significance of CARES

The CARES fund has therefore been an important source of funding for Bencoms, and despite being in theory available to bona-fide co-operatives, the first successful bona-fide scheme with full community ownership did not benefit from this fund. Information provided by the Chief Executive Officer of CES revealed that CES did not consider bona-fide co-operative schemes to represent their vision of CE. Regarding the scheme in DW, he stated:

> "It's a community scheme insofar that I think most of its investors are from the wider Ross-shire community and in particular the farming community. However, its purpose is not to support local community development per se, but to generate income for its private investor-members" (N Gubbins, Personal e-mail communication, 31 July 2014).

He later added, however, that a case could be made if members could use the electricity generated from the scheme in their own homes, meaning that the purpose of the scheme would be to benefit the community directly and not solely a means of gaining financial return on investment (N Gubbins, Personal telephone communication, 31 July 2014). One of the many barriers to this is the large number of households required in the UK for such a scheme to be authorised by Ofgem, which is over twice the amount of members than in countries such as Denmark and Germany (P. Phare, Personal Communication, 4 June 2014).

5. DISCUSSION

5.1. Findings in context

The main enablers for the current successful schemes have been, on the one hand, (1) government loans from CARES and REIF and commercial loans from green banks for Bencom schemes, and (2) a sole reliance on a combination of skills, knowledge and networks in the case of SOL, DW and failed case 6. The amount of personal risk undertaken by the private landowner in the case of DW was not softened by any grant or loan from CARES. The failure of case 6 is proof that this risk is real, and that without the presence of a trust network and proper consultation of the local community, the risk is even higher. The evidence provided by the Chief Executive Officer of CES leads us to believe that the DW scheme as it exists today would not have been eligible for the loan, as there was a perception of it being commercially oriented. In addition, the fact that DW did not advertise the scheme as a bona-fide co-operative before submitting for PP meant that the local authority could not have rejected it on this basis. The fact that Bencom schemes were granted these government-backed contingent loans confirms that these are in agreement with the government's expectations of what CE should resemble. Moreover, they were initiated by LDOs, who already fulfil a role of providing 'community social benefits' and have wide network in place, and previous relationships with government agencies.

The difference in expectations of CE schemes between Bencoms and Bona-fides can be seen in terms of a difference in the wider vision of both schemes. On the one hand, Bencoms aim to generate local benefits for a wider number of individuals than the members of the co-operative alone. These benefits are usually social projects in the scheme's village or area. One the other hand, Bona-fides aim to generate benefits for investor-members in who could theoretically be located in many areas of the country. This could be framed in terms of a disagreement on whether the CE schemes should be seen as a niche to be strategically managed in order to change the governance of the energy system in Scotland and the UK. The Bencoms could be described as 'grassroots' in nature, and the bona-fides could be described as 'system builders', as found in Seyfang and Smith (2007), where the grassroots projects are focused on developing the projects themselves and the system builders are interested in replicating the model on a wider scale. An important

consideration is that these two different actor types draw from knowledge and skills from two different philosophies for developing RE schemes currently co-existing in the RE landscape: (1) the developer-led model, which is dominant, and (2) the DT model, the current CE niche. The developer-led model is characterised by large scale and is profit-driven, along with a CBF and constrained by public acceptance levels whereas the DT model is socially oriented, grant-funded and constrained by government budget availability.

When discussing CE niche development, we are therefore discussing whether the co-operative model should be ‘scaled up’ or whether each project should be treated in its own unique context. There are some discussion points regarding the implications of scaling both models, particularly in terms of governance, and CE 'benefits'. At this point in time, these aspects seem key considerations in terms of unlocking much needed support for projects in the pre-planning stage of development, where the risk profile is disproportionately large, particularly for grassroots initiatives.

In this study, it was found that the Bencoms have a particular advantage in access to networks due to the fact that they are created by members of the LDO, which becomes their 'anchor' organisation towards which the revenue of the Bencom is channelled for benefit distribution. The LDOs in the current study were a well-established and trusted part of the local community. The *raison d'être* of the LDO is already oriented towards producing social benefits for the local community, and has a ‘trust network’, with the experience of leading previous projects for social benefits, often using government-backed grants. The actors involved will therefore trust the motivations behind the scheme, more than in the case where the Bencom is unaffiliated. This is an important factor during the share offer, as it is essential to the project that the local community invest in order to comply with the local benefit requirements.

In the case of the Bonafides, DW is illustrative of the role of trust, as the initiator of the scheme was a landowner rather than an organised community group. Although there were no barriers concerning pre-planning non-capital costs, obtaining PP still requires local acceptance as part of proving the absence of ‘significant’ impacts on the landscape. Informal relationships are an important component in gaining trust in this case, in the absence of a previously constituted community. In the case of SOL, the role of E4All, as a

mediator between the developer and the local community, required trust in the scheme and the reputation of E4All. Acting principally as investors, the level of detail contained in the share offer is important, and findings suggested that this requires advanced skills in financial appraisal, marketing and business. A combination of reputation, skills and professional input would reduce the perceived risk for the traditional investor, who would trust the quality of the research presented in the share offer. The schemes then become attractive to a different audience, potentially with experience in investing and higher incomes meaning more investment per member and thus a higher proportion of member ownership. Furthermore, the returns per share can reach 12 per cent net of tax deductions, which exceeds the traditional 7 per cent average raised through the stock market, creating additional financial appeal to traditional investors, whereas the 4 per cent in Bencoms is a good savings account replacement, depending on the prevailing base rate.

The discussion then surrounds the notion of how much profit to accumulate, keep and re-invest in these ventures. The manner in which co-operatives are currently regulated by the FCA requires that share offers must only offer an interest on shares that is sufficient to "attract and retain" the investment. If a higher interest rate level is required to attract investment, the total revenue necessary for distribution will be higher, and the surplus (or profits) smaller. In the case of DW, by offering a high interest rate on shares, the scheme was able to cover the entire capital costs. The scheme avoided a joint-venture with the developer or costly bank loans, which would have taken large portion of the profits. Being that this scheme is entirely owned by its members, the argument then surrounds whether benefitting the members equates to benefitting the community. Including the community of interest to be a legitimate part of defining CE would therefore allow schemes to increase the scale of the project through attracting more members. The risk would be losing part of the local control, which would have to be agreed upon by a majority within group, however it is defined in the rules of the co-operative.

5.2. Further research

This research was limited by the prior knowledge of this complex and interconnected field of research necessary to fully analyse its characteristics. The findings suggest an interesting opportunity to study the narratives regarding the role of profits in CE,

particularly in Scotland. The use of Q methodology could be useful in this regard, as there is a clear split in opinion between the ‘grassroots campaigners’ and the ‘system builders’. The Q-methodology allows for a study of different main narratives regarding a controversial topic of importance to society. This grassroots-system builder dichotomy is admittedly more complex and an in depth Q-study would be useful in order to reveal important distinctions. More effective policies could then be crafted in order to ensure the delivery of an energy policy which can benefit all stakeholders as well as the environment.

6. CONCLUSIONS

6.1. Linking policy and projects on the ground

The aim of this piece of research has been to explore the reasons behind the recent surge in CE projects in Scotland that use the co-operative as an organisational structure, when it has been commonplace in other nations across Europe and in other countries in the UK. In the European countries selected, a mixture of cultural acceptance of co-operatives and strong and sustained state support were key enabling factors. The characteristics of CE schemes in Scotland were however very different, having relied solely on state capital grants and loans in the 1990's and early naughties. This model of funding was cemented further by the perceived success of the Isle of Gigha's Heritage Trust's community-owned wind turbines. The literature highlighted the key role of the EU rules on state aid in breaking this tradition of the CE sector's reliance on capital grant funding in Scotland. At the same time, the introduction of binding CC targets through the Climate Change Act in 2008 was accompanied by the introduction of the FiT regime, announcing the intention of the government to apply a market-based approach to small-scale projects.

Results from the case studies revealed similarities and differences. First of all, there were similarities among the schemes that successfully raised shares and were close to the final stage of electricity generation. These similarities concerned the combination of skills and knowledge required to carry out CE schemes. The areas identified were finance, business management, marketing and engineering. These skills were an important aspect of integrating practices from the dominant regime into the niche, as part of niche development. Members of the board often had significant experience or were currently working in roles requiring this type of expertise and working for the co-operative on a part-time voluntary basis. There was also a key role played by intermediaries for both Bencoms and bona-fides. The Bencoms, as well as DW in the bona-fides, could be characterised as successful grassroots CE projects. A large part of this success, as well as expertise possessed by the founder members, was shared learning between the intermediaries members of the board. The intermediaries were experts in the field of co-operatives, which was key in providing a solution to the reluctance of banks to lend large amounts to community groups often with no collateral. The SOL project was led in partnership

between the private developer Falck Renewables and Energy4All, a specialist consultancy with experience in successful share raises. This type of project is professionally-led, although there are members of the board working on a volunteer basis from a grassroots perspective. Such networks enabled shared learning, and the latter case reveals the role of the co-operative as a platform of exchange between the developer-led model and the grassroots groups in LDOs.

This latter example highlighted the controversial nature of the role of profits in co-operatives, displayed by the different vision of CE between the two models. Bencoms saw a more limited role for the community of interest, and channelled much of the profits towards the anchor organisation for implementing local sustainability. The bona-fide projects sought autonomy and focused on distributing revenue to individual members. The joint-venture in SOL was concerned with maximising the use of wind at the site, therefore maximising profits and scale. The negative perception of generating private profit is however hindering coherent niche development. The cases of Denmark and Germany show that significant expansion of RE through co-operatives did not happen without involving the private sector. The motives for developing CE schemes currently expressed by Bencoms is similar to those found for schemes in the Netherlands, where co-operatives have struggled to make a significant impact and many private individual farmers still prefer to invest alone.

6.2. Final thoughts and recommendations

The landscape pressures of ongoing global geopolitical instability, peak oil and CC prompt a rapid decarbonisation through increasing the amount of RE in the energy mix. Given the success of co-operatives as an organisational structure for carrying out RE in Denmark and Germany, allowing schemes to reach a significant scale could be considered a matter of national energy security.

The CARES scheme has demonstrated successfully funding and guiding local community groups composed predominantly of volunteers through the riskiest stage of project development to near-completion (at the time of writing). This signals that the barriers to CE schemes in Scotland such as raising sufficient finance and planning refusal can be

overcome by using this unique community-government intermediary. Several recommendations could then be:

(1) Access to CARES funding should not restrict investments from the community of interest. Scotland has a wealth of existing LDOs with a membership and network of individuals committed to implementing local sustainable development initiatives. These are opposed to individuals profiting individually from schemes, revealing a reticence to allow the community of interest to invest and own a large share of schemes. However, the Bencoms in this study had already experienced the limits of heavily restricting share offers for the local community, as investment was also being prioritised for other towns or islands which were not intended beneficiaries of the CBF, therefore the communal benefits were not being distributed to some of the members. The motivation for investment, therefore, could not be for the CBF, meaning only that these members were either investing for private returns or because it was a green investment: placing them in the community of interest.

(2) Community co-operatives which follow the bona-fide model could provide a bridge between these groups and the private sector, whilst helping individuals reap profits which would usually go to big business through co-operative equity deals such as with Energy4All. Even if the CBF is a small part of the scheme, as seen in DW, a small percentage of a large sum is much more likely to be bigger than a large percentage of a small sum. Personal donations to charities in line with each individuals could also avoid sub-optimal centralised decisions through the anchor organisations.

(3) The ownership of consumption through green energy utility co-operatives should be encouraged. These consumer co-operatives, as they exist in Sweden, would provide the direct benefit of electricity provision to the local community. Inviting investment from outside sources would therefore not present a conflict between communities of locality and communities of interest. The larger the scale and the revenue of the development, the lesser the fuel poverty and the higher the income to the local community could be.

BIBLIOGRAPHY

Aitken, M. (2010) Wind power and community benefits: Challenges and opportunities, *Energy Policy*, **38** (10): 6066–6075.

Agterbosch, S., Vermeulen, W. and Glasbergen, P. (2004) Implementation of wind energy in the Netherlands: the importance of the social–institutional setting, *Energy Policy* **32** (18): 2049–2066

Agterbosch, S., Meertens, R. M. and Vermeulen, W. J. (2009) The relative importance of social and institutional conditions in the planning of wind power projects, *Renewable and Sustainable Energy Reviews* **13** (2): 393–405.

Archer, M. (1995) *Realist Social Theory: The Morphogenetic Approach*. Melbourne: Cambridge University Press.

Bailey, J. (1955) *The British Co-operative movement*. London: Hutchinson & Co.

Barton, D.G. (1989) Principles In: Cobia, D.W. (Ed.) *Co-operatives in Agriculture*. New Jersey: Prentice-Hall: 21-34.

Bell, D., Gray, T. and Haggett C. (2005) Policy, participation and the 'social gap' in wind farm siting decisions, *Environmental Politics* **14** (4): 460–477.

Birchall, J. and Simmons, R. (2007) The role and potential of co-operatives in the poverty reduction process: A research agenda, *Journal of Co-operative Studies* **40** (1): 43–51.

Bolinger, M. (2001) *Community wind power ownership schemes in Europe and their relevance to the United States*. Lawrence Berkeley National Laboratory. Report. [online] Available at: http://emp.lbl.gov/sites/all/files/REPORTper cent2048357.pdf, Last accessed: 27/06/2014.

Butler, L. and Neuhoff, K. (2008) Comparison of feed-in tariff, quota and auction mechanisms to support wind power development, *Renewable Energy* **33** (8): 1854–1867.

Cass, N., Walker, G. and Devine-Wright, P. (2010) Good Neighbours, Public Relations and Bribes: The Politics and Perceptions of Community Benefit Provision in Renewable Energy Development in the UK, *Journal of Environmental Policy and Planning,* **12** (3):255-275.

Chevalier, M. (2011) The co-operatives' sources of efficiency: A catalyst for the emergence of stable and localised norms, *Journal of Co-operative Studies* **44** (1): 31–40.

Collier, A. (1994) *Critical realism: an introduction to Roy Bhaskar's philosophy*. Verso: London.

Community Renewables Implementation Group [CRIG] (2010) *Financing Community Renewables Schemes*. Forum for Renewable Energy Development in Scotland. Report. [online] Available at: http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-sources/19185/Resources/17613/FREDSCRIG/CRIGRecJune2010, Last accessed: 16/07/2014.

Cooperatives[UK], (2011a) *Simply Governance: A comprehensive guide to understanding the systems and processes concerned with the running of a sustainable community enterprise*. [online] Available at: http://www.uk.coop/sites/storage/public/downloads/coopsuk_simplygovernance_webdownload_0.pdf , Last accessed: 07/06/2014.

Cooperatives[UK] (2011b) *The practitioners guide to community shares*. Report. [online] Available at: http://www.uk.coop/sites/storage/public/downloads/practitioners_guide_to_community_shares_jul11.pdf, Last accessed: 11/08/2014.

Cousins, M. (1994) *A Guide to Legal Structures for Voluntary and Community Organisations. Combat Povert Agency*. E-book. [online] Available at: http://www.openisbn.com/free_ebooks/read_93049_A_Guide_To_Legal_Structures_For_Voluntary_And_Community_Organisations, Last accessed: 06/06/2014.

Cornforth, C. (1995) Patterns of co-operative management: beyond the degeneration thesis, *Economic and Industrial Democracy* **16** (4): 487–523.

Daly, H.E. (1987) The Economic Growth Debate: What some economists have learned but many have not, *Journal of Environmental Economics and Management* **14** (4): 323–336.

Danermark, B., Ekstrom, M., Jakobsen, L. and Karlsson, J.C. (1997) *Explaining Society: Critical realism in the social sciences*. New York: Routledge.

Danermark, B. (2002) *Explaining Society: Critical Realism in the Social Sciences*. New York: Routledge.

Danielsen, O. (1995) Large-scale wind power in Denmark, *Land Use Policy* **12** (1): 60–62.

Danish Energy Agency [DEA] (2013) *Energy Statistics 2012: Data, tables, statistics and maps*. Report. [online] Available at: http://www.ens.dk/en/info/facts-figures/energy-statistics-indicators-energy-efficiency/monthly-statistics 21/05/2014, Last accessed: 16/06/2014.

Department for Business, Innovation and Skills [DBIS] (2013) *State Aid: The basics*. [online] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/261384/bis_13-1330_state_aid_the_basics.pdf, Last accessed: 10/08/2014.

Department for Business, Innovation and Skills [DBIS] (2014) *Guidance: State Aid.* Report. [online] Available at: https://www.gov.uk/state-aid#state-aid-rules, Last accessed: 10/08/2014.

Department for Energy and Climate Change [DECC] (2010) *Feed-in tariffs Governments response to the Summer 2009 consultation*. Consultation response. [online] Available at: http://www.fitariffs.co.uk/library/regulation/100201FinalDesign.pdf, Last accessed: 05/07/2014.

Department for Energy and Climate Change [DECC] (2014a) *Digest of United Kingdom energy statistics (DUKES). Chapter 6: Renewable sources of energy*. [online] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/337684/chapter_6.pdf, Last accessed: 10/08/2014.

Department for Energy and Climate Change [DECC] (2014b) *Community energy strategy*. Policy paper. [online] Available at: https://www.gov.uk/government/publications/community-energy-strategy, Last accessed: 15/03/2014.

Department of Trade and Industry [DTI] (1999) *Local Agenda 21 and Renewable Energy*. [online] Available at: http://webarchive.nationalarchives.gov.uk/+/http:/www.dti.gov.uk/renewables/publications/pdfs/kbd00179.pdf, Last accessed: 21/03/2014.

Department of Trade and Industry [DTI] (2003) *Our energy future- creating a low carbon economy*. London: The Stationery Office.

Development Trust Association Scotland [DTAS] *What is a Development Trust?* Website. [online] Available at: http://www.dtascot.org.uk/content/what-is-a-development-trust, Last accessed: 27/06/2014.

Devine-Wright, P., McAlpine, G., Bately-White, S. (2001) Wind turbines in the landscape: An evaluation of local community involvement and other considerations in UK wind farm development. *Proceedings of the 32nd Annual Conference of the Environmental Design Research Association*, Edinburgh, 2001; 133–137.

Devine-Wright P. (2005) Local aspects of renewable energy development in the UK: public beliefs and policy implications, *The International Journal of Justice and Sustainability* **10** (1): 57–69.

Devine-Wright, P. (2012) Fostering Public Engagement in Wind Energy Development: The Role of Intermediaries and Community Benefits. In: *Learning from Wind Power: Governance, Societal and Policy Perspectives on Sustainable Energy,* (Eds.) by Szarka, J., Cowell, R., Ellis, G., Strachan, P.A. and Warren, C. Basingstoke: Palgrave.

Dunlap, R.E. and McCright, A.M. (2008) A widening gap: Republican and Democratic views on Climate Change, *Environment: Science and policy for Sustainable Development*, **50** (5): 26–35.

Elzen, B., Hoogma, R. and Schot, J. (1996) *Mobility with a future: Towards a demand-oriented technology policy*. Report to the Ministry of Traffic and Transport. Rotterdam: Rijkswaterstaat.

Energy Savings Trust [EST] (2008) Scottish Community and Householder Renewables Initiative (SCHRI). Website. [online] Available at: http://webarchive.nationalarchives.gov.uk/20081112122229/energysavingtrust.org.uk/scotland/scottish-community-and-householder-renewables-initiative-schri, Last accessed: 08/08/2014.

Energyshare (2013) *Profile: Isle of Gigha Heritage Trust*. Website. [online] Available at: http://groups.energyshare.com/isle-of-gigha-heritage-trust/, Last accessed: 10/08/2014.

Enzensberger, N., Fichtner, W. and Rentz, O. (2003) Evolution of local citizen participation schemes in the German wind market, *International Journal of Global Energy Issues* **20** (2): 191–207.

Financial Conduct Authority [FCA] (2014) Mutual Societies: Registered Societies. Website [online] Available at: http://www.fca.org.uk/firms/firm-types/mutual-societies/industrial, Last accessed: 31/07/2014.

Fielding, K.S., Head, B., Laffan, W. and Hoegh-Guldberg, O. (2012) Australian politicians' beliefs about climate change: political partisanship and political ideology, *Environmental Politics* **21** (5): 712–733.

Fittariffs (2014) How the tariffs work. [online] Available at: http://www.fitariffs.co.uk/FITs/principles/, Last accessed: 24/06/2014.

Flieger, B. & Klemisch, H. (2008) Eine andere Energiewirtschaft ist möglich: Neue Energiegenossenschaften, *Widerspruch* **54** (1): 105–110.

Hain, J.J., Ault, G.W., Galloway, S.J., Cruden, A. and McDonald, J. R. (2005) Additional renewable energy growth through small-scale community orientated energy policies, *Energy Policy* **33** (9): 1199–1212.

Hall, C.A. and Murphy, D.J. (2011) Energy return on investment, peak oil, and the end of economic growth, *Annals of the New York Academy of Sciences* **1219**: 52–72.

Hargreaves, T., Hielscher, S., Seyfang, G. and Smith, A. (2013) Grassroots innovations in community energy: The role of intermediaries in niche development, *Global Environmental Change* **23** (5): 868–880.

Harnmeijer, J., Parsons, M. and Julian, C. (2013) *The Community Renewables Economy: Starting up, scaling up and spinning out*, Respublica Green Paper, September 2013. [online] Available at: http://www.respublica.org.uk/documents/yqq_Communityper cent20Renewablesper cent20Economy.pdf, Last accessed: 08/07/2014.

Hau, E. (2013) *Wind turbines: Fundamentals, Technologies, Application, Economics*. 3rd ed. Berlin: Springer-Verlag.

Hielscher, S., Seyfang, G. and Smith, A. (2011) *Community innovation for sustainable energy*, CSERGE working paper EDM, No. 2011-03.

HM Treasury (2013) *Industrial and Provident Societies: growth through co-operation*. Consultation outcome. [online] Available at: https://www.gov.uk/government/consultations/industrial-and-provident-societies-growth-through-co-operation/industrial-and-provident-societies-growth-through-co-operation, Last accessed: 27/07/2014.

van der Horst, D. (2007) NIMBY or not? Exploring the relevance of location and the politics of voiced opinions in renewable energy siting controversies, *Energy Policy* **35** (5): 2705–2714.

Hunter, S. and Leyden, K. M. (1995) Beyond NIMBY: explaining opposition to hazardous waste facilities, *Policy Studies Journal* **23** (4): 601–619.

Intergovernmental Panel on Climate Change [IPCC] (2013) Summary for policymakers. In: *Climate Change 2013: The Physical Science Basis*. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Stocker TF, Qin D, Plattner GK et al. (Eds). Cambridge University Press, Cambridge, UK; NY, USA.

International Co-operative Alliance [ICA] (2011) *Co-operative identity, values & principles*. Website. [online] Available at: http://ica.coop/en/whats-co-op/co-operative-identity-values-principles, Last accessed: 13/08/2014.

International Labour Organisation [ILO] (2002) R193 - Promotion of Cooperatives Recommendation, 2002 (No. 193) Recommendation concerning Promotion of Cooperatives Adoption: Geneva, 90th ILC session (20 Jun 2002).

Isle of Gigha Heritage Trust (2014) *Frequently asked questions about the Gigha Windmills*. Website. [online] Available at: http://www.gigha.org.uk/windmills/TheStoryoftheWindmills.php, Last accessed: 10/08/2014.

Jackson, T. (2009). *Prosperity without growth: Economics for a finite planet*. London: Earthscan.

Jensen, M.C. and Meckling, W.H. (1976) Theory of the firm: Managerial behavior, agency costs and ownership structure, *Journal of Financial Economics* **3** (4): 305-360.

Jorgensen, U. & Karnoe, 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*. London: Pinter.

Kemp, R., Schot, J. and Hoogma, R. (1998) Regime shifts to sustainability through processes of niche formation: The approach of strategic niche management, *Technology Analysis & Strategic Management* **10** (2): 175–198.

Lawhon, M. and Murphy, J.T. (2012) Socio-technical regimes and sustainability transitions: Insights from political ecology, *Progress in Human Geography* **36** (3): 354–378.

Local Energy Scotland [LES] (2014a) *About Local Energy Scotland*. Website. Available at: http://www.localenergyscotland.org/about, Last accessed: 30/07/2014.

Local Energy Scotland [LES] (2014b) *CARES Toolkit*. Website. [online] Available at: http://www.localenergyscotland.org/resources-advice/cares-toolkit/, Last accessed: 27/06/2014.

Lund, P.D. (2009) Effects of energy policies on industry expansion in renewable energy, *Renewable Energy* **34** (1): 53–64.

Markard, J., Raven, R. and Truffer, B. (2012) Sustainability transitions: An emerging field of research and its prospects, *Research Policy* **41** (6): 955–967.

Marsh, G. (2013) Community, crowd and conversion, *Renewable Energy focus* **14** (4): 16–17.

Martinot, E. (2014) *Renewables 2014: Global status report*. Paris: REN21.

Mazur, C., Contestabile, M., Offer, G.J. and Brandon, N.P. (2014) Assessing and comparing German and UK transition policies for electric mobility, *Environmental Innovation and Societal Transitions*, In Press. [online] Available at: http://www.sciencedirect.com/science/article/pii/S2210422414000392, Last accessed: 27/07/2014.

Mendonça, M., Lacey, S., Hvelplund, F. (2009) Stability, participation and transparency in renewable energy policy: Lessons from Denmark and the United States, *Policy and Society* **27** (4): 379–398.

Meyer, S.B. and Lunay, B. (2012) The Application of Abductive and Retroductive Inference for the Design and Analysis of Theory-Driven Sociological Research, *Sociological Research Online* **18** (1):12. Last accessed: 13/07/2014.

Mills, C. (2001) Distributions, and what it means to be a co-operative, *Journal of Co-operative Studies* **34** (3): 173–181.

Mintzberg, H. (1996) Managing Government, Governing Management. *Harvard Business Review* **74** (3): 75–83.

Munday, M., Bristow, G. and Cowell, R. (2010) Wind farms in rural areas: How far do community benefits from wind farms represent a local economic development opportunity? *Journal of Rural Studies*, **27** (1): 1–12.

Nissenbaum, M.A., Aramini, J.J., Hanning, C.D. (2012) Effects of industrial wind turbine noise on sleep and health, *Noise and Health* **14** (60): 237–243.

Office For Gas and Electricity Markets [OFGEM] (2013) *Feed-in Tariff: Guidance for renewable installations (Version 5)*, Guidance Note. [online] https://www.ofgem.gov.uk/ofgem-publications/58855/fit-generator-guidance.pdf. Last accessed: 20/07/2014.

Office For Gas and Electricity Markets [OFGEM] (2014) *Feed-in Tariff Payment Rate Table for Non-Photovoltaic Eligible Installations for FiT Year 5 (1 April 2014 to 31 March 2015)*. [online] Available at: https://www.ofgem.gov.uk/ofgem-publications/86011/rpiadjustedtariffsnon-pvconditionaldaterpiadjusted.pdf, Last accessed: 24/06/2014.

van Oorschot, K., de Hoog, J., van der Steen, M. and van Twist, M. (2013) The three pillars of the co-operative, *Journal of Co-operative Organization and Management* **1** (2): 64–69.

Pasqualetti, M. J., Gipe, P. and Righter, R. W. (2002) *Wind power in view: Energy landscapes in a crowded world.* San Diego: Academic Press.

Punch, K.P. (1998) *Introduction to social research: Quantitative and qualitative approaches*. Sage: London.

Renewable Energy Asssociation [REA] (2014) *REA response to the Consultation on support for community energy projects under the Feed-In Tariff Schemes* [online] Available at: http://www.r-e-a.net/resources/pdf/176/140707_Community_Energy_FiT_REA_consultation_response.pdf, Last accessed: 18/07/2014.

Saidur, R., Rahim, N.A., Islam, M.R. and Solangi, K.H. (2011) Environmental impact of wind energy, *Renewable and Sustainable Energy Reviews* **15** (5): 2423–2430.

Saldaña, J. (2012) *The Coding Manual for Qualitative Researchers*. Sage, London.

Sawin, J. (2004) *National policy instruments: policy lessons for the advancement and diffusion of renewable energy technologies around the world*. International Conference for Renewable Energies, Bonn. [online] Available at: http://wofuco.inet.de/fileadmin/user_upload/Miguel/Sawin__2004__National_policy_instruments.pdf, Last accessed: 11/07/2014.

Sayer, R. Andrew (1992) *Method in social science: a realist approach*. London : Routledge. Second edition.

Sustainable Community Energy Network [SCENE] (2014) *Working with communities*. Website. [online] Available at: http://www.sceneconsulting.com/community#community-intro, Last accessed: 27/07/2014.

Schively, C. (2007) Understanding the NIMBY and LULU Phenomena: Reassessing Our Knowledge Base and Informing Future Research, *Journal of Planning Literature* **21** (1): 255–266.

Schreuer, A. and Weismeier-Sammer, D. (2010) Energy cooperatives and local ownership in the field of renewable energy technologies: A literature review. Research Reports / RICC, 4.

Schreuer, A. (2012) Energy cooperatives and local ownership in the field of renewable energy: Country cases Austria and Germany, Research Institute for Co-operaton and Co-operatives, Inter-University Research Centre for Technology, Work and Culture.

Schot, J. and Geels, F.W. (2008) Strategic niche management and sustainable innovation journeys: theory, findings, research agenda, and policy, *Technology Analysis and Strategic Management* **20** (5): 537–554.

Scottish Enterprise (2013) *Gigha gets more power through REIF*. [online] Available at: http://www.scottish-enterprise.presscentre.com/Press-releases/Gigha-gets-more-power-through-REIF-62a.aspx, Last accessed: 10/08/2014.

Scottish Enterprise (2014) Renewable Energy Investment Fund. [online] Available at: http://www.scottish-enterprise.com/services/attract-investment/renewable-energy-investment-fund/overview, Last accessed: 04/08/2014.

Scottish Government (2009a) *Climate Change (Scotland) Act 2009. Elizabeth II. Chapter 1. (2009)* Edinburgh: The Stationery Office.

Scottish Government (2009b) *Scottish community empowerment action plan, celebrating success: Inspiring change*. Edinburgh: Scottish Government.

Scottish Government (2013a) Renewable energy for communities. [online] Available at: http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-sources/19185/Communities, Last accessed: 20/06/2014.

Scottish Government (2013b) *Community And Renewable Energy Scheme*. Website. [online] Available at: http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-sources/19185/Communities/CRES, Last accessed: 20/06/2014.

Seyfang, G. and Haxeltine A. (2012) Growing grassroots innovations: exploring the role of community-based initiatives in governing sustainable energy transitions, *Environment and Planning C: Government and Policy* **30** (3): 381– 400.

Seyfang, G., Hielscher, S., Hargreaves, T., Martiskainen, M. and Smith, A. (2013) *A grassroots sustainable energy niche? Reflections on community energy case studies*. Working Paper. Science, Society and Sustainability Research Group, Norwich.

Smith, A. and Raven, R. (2012) What is protective space? Reconsidering niches in transitions to sustainability, *Research Policy* **41** (6): 1025–1036.

Sommerville, P. (2007) Co-operative identity, *Journal of Co-operative Studies* **40** (1): 5-17.

Spear, R. (2004) Governance in democratic member-based organisations, *Annals of Public and Cooperative Economics* **75** (1): 33–60.

Strauss, A. and Corbin, J.M. (1990) *Basics of qualitative research: Grounded theory procedures and techniques*. Thousand Oaks: Sage.

Sustainable Development Commission [SDC] (2005) *Wind power in the UK: A guide to the key issues surrounding onshore wind development in the UK*, SDC Online Report. Available at: http://www.sd-commission.org.uk/data/files/publications/Wind_Energy-NovRev2005.pdf, Last accessed: 05/06/2014.

Thomas, S. (2006) The grin of the Cheshire cat, *Energy Policy* **34** (15): 1974–1983.

Trochim, W.M. (1989) Outcome pattern matching and program theory, *Evaluation and Program planning* **12** (4): 355–366.

Tuominen, T., Tuominen, J. and Jussila, I. (2013) A Tool to be Used Deliberately: Investigating the Role of Profit in consumer co-operatives, *International Business Research* **6** (11): 122–133.

UK Government (1997) *The Town and Country Planning (Scotland) Act, 1997*. London, Eyre & Spottiswoode.

UK Government (2013) *Co-operatives and Community Benefit Societies bill 2013* (SG 282) London: The Stationery Office.

Unruh, G. (2000) Understanding carbon lock-in, *Energy Policy* **28** (12): 817–830.

Unruh, G. (2002) Escaping carbon lock-in, *Energy Policy* **30** (4): 317–325.

Walker, G. and Devine-Wright, P. (2008a) Community energy: What should it mean? *Energy Policy* **36** (2): 497–500.

Walker, G. and Devine-Wright, P. (2008b) What are the barriers and incentives for community-owned means of energy production and use? *Energy Policy*, **36** (12): 4401–4405.

Walker, G., Devine-Wright, P., Huntera, S., Higha, H. and Evans, B. (2010) Trust and community: Exploring the meanings, contexts and dynamics of community renewable energy, *Energy Policy* **38** (6): 2655–2663.

Warren, C.R. and McFadyen, M. (2010) Does community ownership affect public attitudes to wind energy? A case study from south-west Scotland, *Land Use Policy* **27** (2): 204–213.

Wizelius, T. (2014) *Windpower Ownership in Sweden: Business Models and Motives*. New York: Routledge.

Wolsink, M. (2000) Wind power and the NIMBY-myth: institutional capacity and the limited significance of public support, *Renewable Energy* **21** (1): 49–64.

Wrexham Borough Council (n.d.) *Different structures; legal structures*. [online] Available at: https://www.wrexham.gov.uk/assets/pdfs/business/se_manual/71_different_structures.pdf, Last accessed: 25/05/2014.

Yin, R.K. (1993) *Applications of case study research*. Applied social research series 34. London: Sage publications.

APPENDIX I. PROJECT DEVELOPMENT DESCRIPTION (SIMPLIFIED)

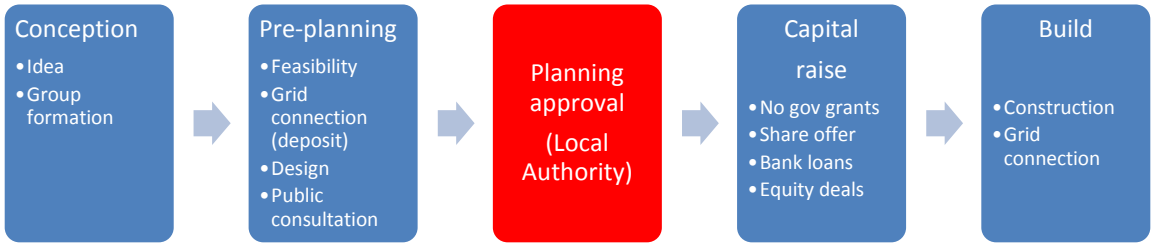


Figure 1. Simplified description of the Development Pipeline process (Source: Scene, 2014; LES 2014b)

When the group initiates a CE project, there are many steps in the process, each of which hinges on the last. The community needs to establish clear objectives for the project and how it will accomplish these. It also needs to decide the members of the committee which is tasked with running the association, and how they run it. Some members will be appointed to manage the finance and logistical arrangements must be put in place such as the frequency of meetings and dissolution provisions in the event of a failure of the initiative. A clear management structure along with a project management plan and adequate skills to accompany the projects through to completion.

Once these steps have been undertaken, the community must set up a Special Purpose Vehicle, which is a subsidiary which acts to incorporate the association into a legal form, with the specific purpose of providing for an anchor organisation. This is an important step as, depending on the size of the project, it defines its ability to raise capital through grants and investment, sets the degree of freedom with which earnings are managed and is able to protect individual members from their financial exposure to the risk attached to the development.

The legal structure of community schemes are manifold and there exist many classification systems to characterise these. For the purposes of this paper, it is appropriate to focus on the issue of

ownership of CE schemes. This facet is characterised by two overarching categories, each with two defining traits which help us make sense of the CE landscape.

The ownership of the vehicle used to incorporate the community can either be fully owned by the community or partially owned; and the liability can either be limited to the vehicle or extend to the individual members of the community. The distribution of earnings usually follows a risk-reward logic: the higher the risk for a stakeholder, the higher the financial compensation. This exposes the difficulty for communities to fully own and develop their projects compared to Joint Venture models, as the latter enjoy a higher access to technical expertise and skills. These are crucial in developing CE schemes and, importantly, attracting investment, grants and loans due to reduced perceived risk.

After having decided on the legal structure of the enterprise and registering with the Financial Conduct Authority (FCA), the next steps constitute what is known as the pre-planning phase of the development process (Slide number 2 of conference). The community must verify the validity of the initial idea. Engaging with key stakeholders such as the local planning authority and the local electricity distribution organisation, as well as local residents from the initial conception of the project allows an initial screening of major barriers and threats likely to present themselves. In addition, the instigators must undertake extensive feasibility analyses: the scheme must be at least likely to provide the energy and socio-economic returns that is anticipated of it. Typical pre-planning costs are up to £350,000.

Funding for the expertise required for this must often be sought from outside sources. Societies generally apply for grant funding, which is a transfer payment from a governmental or non-governmental institution which is provided to kick-start a project. As these are in high demand, communities must provide assurances regarding how this grant money will be spent. In the UK, support of this kind has emerged through several government-affiliated development agencies (See section x.x). A business case and business plan should be elaborated, describing in detail the rationale for the project and how the project's business will be carried out. Other sources of funding include sponsorship agreements. However, because the community provides a service for the sponsor (i.e. advertising), this could be seen as a trade in services, which is eligible for VAT and other taxes - making the scheme tax-inefficient. A new way of raising funds has recently emerged through community shares programmes which seeks funding from the online community, much like the crowdfunding phenomenon.

Technical feasibility studies will typically assess the topography of the area and the wind flow patterns. It will establish clear and appropriate site boundaries and assess whether any houses are

likely to be directly affected by the development. It will check for road access for the delivery and maintenance of the turbine. The consultancy firm can also elaborate a picture of the future turbines as they would appear in the landscape. Along with the technical aspects, the financial forecasts for the project plays a vital role in determining access to grants, and equally whether investors will be willing to invest in the project. Financial models have been developed by funding agencies in order to reduce complexity for project managers, and risk for the funder. A third important component is stakeholder engagement: gauging the support of the local residents without which community schemes cannot proceed, and the conditions which underlie this support. After this stage is complete, a planning application can be filed with the local council, who must answer within 4 months of the initial proposal.

Planning permission is one of the most important milestones in the project's delivery. In Scotland, new constructions must follow the Town and Country Planning Regulations of 2013. Results from the technical feasibility study and the Environmental Impact Assessment are assessed by the local planning authority. Important aspects for a successful application are:

The type of funding which should be sought depends on the nature and size of the scheme. For example, if returns are mainly social rather than financial, grant funding

For producer-type co-operatives, grid connection must be negotiated with the appropriate Distribution Network Operator (DNO). This entity is in charge of transmitting the electricity produced by the CE scheme to the national grid.

APPENDIX II. CASE STUDY INFORMATION

Case 1: Garmony Hydro.

Interviewee 1: Richard Thorne, Garmony Hydro

Website: http://www.garmonyhydro.info

Case 2: Harlaw hydro.

Interviewee 2a: Martin Petty, and Harlaw Hydr

Interviewee 2b: Lynn Molleson, Harlaw Hydro,

Wesbite: http://www.harlawhydro.org.uk/

Case 3: Dingwall Wind Co-operative.

Interviewee 3: DW Wind Co-op, Richard Lockett, Co-director and landowner

Wesbite: http://dingwallwind.org.uk/

Case 4: Islay Energy Community Benefit Society.

Interviewee 4:, Jenni Minto, Treasurer, Islay Energy Trust Community Benefit Society.

Wesbite: http://islayenergycbs.com/

Case 5: Spirit of Lanarkshire Wind Co-operative.

Interviewee 5: Paul Phare, Spirit of Lanarkshire, Co-director and consultant

Wesbite: http://www.spiritoflanarkshire.coop/

Case 6: Undisclosed

Interviewee 6: Undisclosed

APPENDIX III. INTERVIEW CONSENT FORMS

Consent Form

for participation and personal data to be used for research

Thank you for agreeing to participate in the research project, the details of which are:

Research Project name:	Explaining the recent emergence of Community Renewable Energy co-operatives in Scotland.
Name of researcher: Name of interviewee:	Mr David Smith Mr Richard Thorne
Researcher's Contact details:	David Smith 4/8 Argyle Park Terrace Edinburgh, EH9 1JY Email: s1357978@ed.ac.uk Phone: 07460913852
Scope of the project:	Comparing case studies of co-operatives – enabling factors and barriers.
Confidentiality and Anonymity	The raw interview data will remain unpublished and is securely stored.

Please complete the following:

I consent to participating in this research project and understand that I may withdraw at any time. YES

I consent to my personal data, as attached, being used in the research project detailed above YES

I consent to the organisation(s) of which I am a member being made reference to in the research project. YES

Signature:	
Date:	06/08/2014

Consent Form

for participation and personal data to be used for research

Thank you for agreeing to participate in the research project, the details of which are:

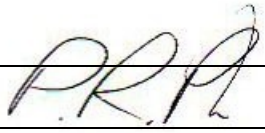
Research Project name:	Explaining the recent emergence of Community Renewable Energy co-operatives in Scotland.
Name of researcher: Name of interviewee:	Mr David Smith Mr Paul Phare
Researcher's Contact details:	David Smith 4/8 Argyle Park Terrace Edinburgh, EH9 1JY Email: s1357978@ed.ac.uk Phone: 07460913852
Scope of the project:	Comparing case studies of co-operatives – enabling factors and barriers.
Confidentiality and Anonymity	The raw interview data will remain unpublished and is securely stored.

Please complete the following:

I consent to participating in this research project and understand that I may withdraw at any time. YES / ~~NO~~

I consent to my personal data, as attached, being used in the research project detailed above YES / ~~NO~~

I consent to the organisation(s) of which I am a member being made reference to in the research project. YES / ~~NO~~

Signature:	
Date:	06 August 2014

Consent Form

for participation and personal data to be used for research

Thank you for agreeing to participate in the research project, the details of which are:

Research Project name:	Explaining the recent emergence of Community Renewable Energy co-operatives in Scotland.
Name of researcher: Name of interviewee:	Mr David Smith Mr Jon Halle
Researcher's Contact details:	David Smith 4/8 Argyle Park Terrace Edinburgh, EH9 1JY Email: s1357978@ed.ac.uk Phone: 07460913852
Scope of the project:	Comparing case studies of co-operatives – enabling factors and barriers.
Confidentiality and Anonymity	The raw interview data will remain unpublished and is securely stored.

Please complete the following:

I consent to participating in this research project and understand that I may withdraw at any time. **YES** / NO

I consent to my personal data, as attached, being used in the research project detailed above **YES** / NO

I consent to the organisation(s) of which I am a member being made reference to in the research project. **YES** / NO

In-text quotes personally attributed:

"Dingwall is a big enough town, you know the town where the [other scheme] is, they don't have that critical mass"

"The directors were very good at chatting to everybody and knew loads of people [...] people like them are well connected"

Signature:	
Date:	070814

Consent Form

for participation and personal data to be used for research

Thank you for agreeing to participate in the research project, the details of which are:

Research Project name:	Explaining the recent emergence of Community Renewable Energy co-operatives in Scotland.
Name of researcher: Name of interviewee:	Mr David Smith Mr Martin Petty
Researcher's Contact details:	David Smith 4/8 Argyle Park Terrace Edinburgh, EH9 1JY Email: s1357978@ed.ac.uk Phone: 07460913852
Scope of the project:	Comparing case studies of co-operatives – enabling factors and barriers.
Confidentiality and Anonymity	The raw interview data will remain unpublished and is securely stored.

Please complete the following:

I consent to participating in this research project and understand that I may withdraw at any time. YES

I consent to my personal data, as attached, being used in the research project detailed above YES

I consent to the organisation(s) of which I am a member being made reference to in the research project. YES

Signature:	
Date:	7/8/14

Consent Form

for participation and personal data to be used for research

Thank you for agreeing to participate in the research project, the details of which are:

Research Project name:	Explaining the recent emergence of Community Renewable Energy co-operatives in Scotland.
Name of researcher: Name of interviewee:	Mr David Smith Ms Lynn Molleson
Researcher's Contact details:	David Smith 4/8 Argyle Park Terrace Edinburgh, EH9 1JY Email: s1357978@ed.ac.uk Phone: 07460913852
Scope of the project:	Comparing case studies of co-operatives – enabling factors and barriers.
Confidentiality and Anonymity	The raw interview data will remain unpublished and is securely stored.

Please complete the following:

I consent to participating in this research project and understand that I may withdraw at any time. YES / NO

I consent to my personal data, as attached, being used in the research project detailed above YES / NO

I consent to the organisation(s) of which I am a member being made reference to in the research project. YES / NO

Signature:	Lynn Molleson
Date:	8.8.2014

Consent Form

for participation and personal data to be used for research

Thank you for agreeing to participate in the research project, the details of which are:

Research Project name:	Explaining the recent emergence of Community Renewable Energy co-operatives in Scotland.
Name of researcher: Name of interviewee:	Mr David Smith Mr Richard Lockett
Researcher's Contact details:	David Smith 4/8 Argyle Park Terrace Edinburgh, EH9 1JY Email: s1357978@ed.ac.uk Phone: 07460913852
Scope of the project:	Comparing case studies of co-operatives – enabling factors and barriers.
Confidentiality and Anonymity	The raw interview data will remain unpublished and is securely stored.

Please complete the following:

I consent to participating in this research project and understand that I may withdraw at any time. YES

I consent to my personal data, as attached, being used in the research project detailed above YES

I consent to the organisation(s) of which I am a member being made reference to in the research project. YES

Signature:	
Date:	7th August 2014

Consent Form

for participation and personal data to be used for research

Thank you for agreeing to participate in the research project, the details of which are:

Research Project name:	Explaining the recent emergence of Community Renewable Energy co-operatives in Scotland.
Name of researcher: Name of interviewee:	Mr David Smith Ms Jenni Minto
Researcher's Contact details:	David Smith 4/8 Argyle Park Terrace Edinburgh, EH9 1JY Email: s1357978@ed.ac.uk Phone: 07460913852
Scope of the project:	Comparing case studies of co-operatives – enabling factors and barriers.
Confidentiality and Anonymity	The raw interview data will remain unpublished and is securely stored.

Please complete the following:

I consent to participating in this research project and understand that I may withdraw at any time. YES / ~~NO~~

I consent to my personal data, as attached, being used in the research project detailed above YES ~~/ NO~~

I consent to the organisation(s) of which I am a member being made reference to in the research project. YES / ~~NO~~

Signature:	Jenni Minto
Date:	12/08/14

Consent Form

for participation and personal data to be used for research

Thank you for agreeing to participate in the research project, the details of which are:

Research Project name:	Explaining the recent emergence of Community Renewable Energy co-operatives in Scotland.
Name of researcher:	Mr David Smith
Researcher's Contact details:	David Smith 4/8 Argyle Park Terrace Edinburgh, EH9 1JY Email: s1357978@ed.ac.uk Phone: 07460913852
Scope of the project:	Comparing case studies of co-operatives – enabling factors and barriers.
Confidentiality and Anonymity	The raw interview data will remain unpublished and is securely stored.

Please complete the following:

I consent to participating in this research project and understand that I may withdraw at any time. **YES /**

I consent to my personal data, as attached, being used in the research project detailed above **YES /**

I consent to the organisation(s) of which I am a member being made reference to in the research project. **YES /**

<u>In-text data personally attributed:</u>

Information provided by the ~~executive~~ CEO director of CES revealed that CES did not consider bona-fide co-operative schemes to represent their vision of Community Energy.

"It's a community scheme insofar that I think most of its investors are from the wider Ross-shire community and in particular the farming community. However, its purpose is not to support local community development per se, but to generate income for its private investor-members."

Signature:	[signature]
Date:	6/8/14