Bangor University

DOCTOR OF PHILOSOPHY

Energised Welsh communities: Examining the development and social impacts of community renewable energy in Wales

Williams, Sioned

Award date:
2022

[Link to publication](#)

ENERGISED WELSH COMMUNITIES:

EXAMINING THE DEVELOPMENT AND SOCIAL IMPACTS OF COMMUNITY RENEWABLE ENERGY IN WALES

Thesis submitted in fulfilment of the requirements for the Degree of Doctor of Philosophy in Bangor University, October 2021

Sioned Page Williams

Bangor University

School of History, Law and Social Sciences

DECLARATION

'Yr wyf drwy hyn yn datgan mai canlyniad fy ymchwil fy hun yw'r thesis hwn, ac eithrio lle nodir yn wahanol. Caiff ffynonellau eraill eu cydnabod gan droednodiadau yn rhoi cyfeiriadau eglur. Nid yw sylwedd y gwaith hwn wedi cael ei dderbyn o'r blaen ar gyfer unrhyw radd, ac nid yw'n cael ei gyflwyno ar yr un pryd mewn ymgeisiaeth am unrhyw radd oni bai ei fod, fel y cytunwyd gan y Brifysgol, am gymwysterau deuol cymeradwy.'

Rwy'n cadarnhau fy mod yn cyflwyno'r gwaith gyda chytundeb fy Ngrichwyliwr (Goruchwylwyr)'

'I hereby declare that this thesis is the results of my own investigations, except where otherwise stated. All other sources are acknowledged by bibliographic references. This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree unless, as agreed by the University, for approved dual awards.'

I confirm that I am submitting the work with the agreement of my Supervisor(s)'.

Signed .... (candidate)

Date   ....…

CONTENTS

INDEX OF TABLES

INDEX OF FIGURES

ACKNOWLEDGEMENTS

GLOSSARY OF TERMS

Key Terms	Abbreviation
Community Renewable Energy	*CRE*
Renewable Energy	*RE*
Ynni Padarn Peris CRE Project	*YPP*
Ynni Ogwen CRE Project	*YO*
Awel Co-op CRE Project	*AC*
Gower Regeneration CRE Project	*GR*
Cyd Ynni consortium	*CY*
Well-being of Future Generations (Wales) Act (2015)	*WFG Act*
Welsh Government	*WG*
Feed in tariffs	**FITs**
Electric Vehicles	**EV**
Solar Photovoltaics	**PV**
Community Benefit Society	**BenComs**

SUMMARY

The study focused on exploring the perceived social impacts and experiences of engaging in community renewable energy (CRE) by Welsh communities. In this way, it utilised the lens of key stakeholders, but also innovatively the perspectives of shareholders and community hubs. This was across a range of four case studies and a consortium in North and South Wales, UK centred on *Ynni Padarn Peris, Ynni Ogwen, Awel Co-op* and *Gower Regeneration* CRE projects, as well as *Cyd Ynni*. The role of CRE has increasingly been recognised within a low-carbon transition and tackling climate change as an area of policy and innovation within communities, in an international and UK context. The narrative literature review identified the emergent area of CRE as a new field of enquiry, surfacing the need for a closer examination of the process relating to social impacts for communities. This knowledge gap was examined through the research question focused on understanding *how* CRE projects generated social impacts, alongside renewable energy to create 'energised' local communities.

The study design focused on an explanatory, multiple-embedded case study approach (Yin, 2014). It positioned the study within the theoretical literature on community and place attachment as well as social and cultural capital. The study initially focused on the perspectives of key stakeholders and shareholders involved in projects. It subsequently widened the scope to include the broader views of local civic society through community hubs. This resulted in a total of 57 interviews (67 participants). Furthermore, a series of observations and fieldwork was completed. Data analysis focused on within-case and cross case analysis (Yin, 2014; 2018), focused on coding and analytic procedures and an iterative approach between theory and data.

The study generated a number of substantive original contributions. The findings importantly highlighted *how* place attachment was the context for, but also shaped the engagement of communities with CRE projects. This included *how* natural resources were utilised over time in post-industrial communities. In addition, the findings presented a novel lens that documented how projects were positioned

within multiple communities within a community. Furthermore, a key contribution in the findings identified that CRE projects utilised and generated bonding, bridging, and linking social capital. In addition, to be successful they used and benefited both internal and external networks. It also innovatively mapped the importance of cultural capital in CRE, centred on key stakeholders' existing knowledge and experience.

Significantly, the findings identified the challenges not only at the development phase but also at the established stage of projects. An important insight was that it highlighted how civic engagement in projects, centred on the interplay between local and global issues. Significantly, a key contribution of the overarching findings was the importance of social impacts beyond the boundaries of financial returns. This included local decision-making, building capacity and sense of ownership. Importantly, it also identified *how* projects were catalytic and created awareness and education about renewable energy and global environmental issues, embedded in the local context. Further, the findings identified *how* a long-term income from projects, generated a sense of stability and autonomy for communities.

CHAPTER ONE:
INTRODUCTION AND BACKGROUND CONTEXT

1.1 Introduction

The chapter provides an overview of the PhD study, including its setting, background context and the overarching aims and objectives. The study focused on how community renewable projects generated both renewable energy and social impacts through civic engagement, leading to energised communities. As part of the study, the researcher focused on the Ynni Padarn Peris (YPP), Ynni Ogwen (YO), Awel Co-op (AC) and Gower Regeneration (GR) CRE projects, as well as the Cyd Ynni (CY) consortium.

CRE projects not only generate energy but also aim to deliver economic benefits and carbon reduction strategies as well as developing a wider set social impacts within communities (Slee, 2015; Hicks and Ison, 2018), being embedded in a broad set of sustainability aims (Seyfang, Park and Smith, 2013). As such, CRE is focused on collective action with a shared goal by communities, with implications on socio-economic and technical change based on enhanced sustainability (Walker and Cass, 2007; Rogers *et al.*, 2008). Indeed, within the literature, the early work of Walker *et al (*2010) recognised that CRE may have additional impacts and act as a catalyst in enhancing awareness of sustainability issues and a wider acceptance of renewable energy. In this way, within both policy and literature, there has been an increasing discussion around the potential connection between the development of CRE projects and the possible positive benefits for communities, in a variety of settings (Haggett and Aitken, 2015). In particular, the relationship between the degree of participation in CRE and the positioning of community benefits (Creamer, Eadson, van Veelen, *et al.*, 2018).

Initially, the chapter outlines the key research questions, aims and objectives centred on understanding the experiences and perceived social impacts from CRE. This is followed by a set of operational definitions that anchor the study within the field of community renewable energy, social impacts, and sustainable development. Subsequently, the chapter maps the policy context in the UK and Wales, providing an account of the broader energy policy environment. Importantly, the researcher maps the key theoretical areas involved in the study, focused on community and place attachment as well as social capital. This is followed by an overarching view of the Welsh communities and CRE projects involved in the study, including a description of the local contexts and case profiles that scaffold the study. The final section of the chapter summarises the overarching structure of the subsequent chapters in the thesis.

1.2. Background and scope of the PhD research study

The overarching focus of the study is to understand the social impacts emerging from CRE. This was based on a detailed consideration of particular case exemplars of different CRE schemes in Wales, set within an UK context. In this way, the study utilised the lens of an explanatory multiple-case study approach based on Robert Yin (2014; 2018). It focused on detailed fieldwork across five case studies, including four CRE projects and a consortium and centred primarily on interviews and observations to gather data. As part of this approach, the case study work sought to understand the broader research questions through a detailed exploration of the perspectives and experiences of CRE through the lens of stakeholders, shareholders, and community hubs as part of energised communities. It was framed as a KESS 2 programme based on a partnership approach between Welsh Government and EU funding. This centred on a local industrial company and Bangor University. The industrial partner involved in the KESS2 study centred on Ynni Padarn Peris (YPP) CRE project. In this context, the researcher was expected to provide additional feedback as part of the study to the partnership (Ynni Padarn Peris and KESS2). This was facilitated by a series of initial and final written reports, which were also disseminated to all five case studies, summarising the insights

relating to each case and the expectation of a final overarching KESS2 report for Welsh Government.

The study of CRE projects in Wales was set within an UK and international context. The area of CRE has increasingly emerged within the literature and policy as an area of development. Indeed, the broader area of renewable energy, including CRE, has increasingly gained prominence over the years as part of a low-carbon transition, with the surfacing of the concerns over climate change. As the thesis work is being completed, recent debates have been ignited by the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow, UK, reviewing and seeking to build on the previous COP25 strategies and commitments (IPCC, 2021). This has re-reemphasised the role of renewable energy as part of an active arena of policy and practice interventions in the UK and globally. In addition, this emphasises not only the role of governments but also the key significance of community and individual level action to tackle climate change on multiple levels.

Overall, within an international setting, there has been much diversity in the development of CRE, highlighting different patterns of development in the UK compared to other countries, particularly in a European setting. For instance, Germany and Denmark represent a more established environment of electricity generation, operating at a more significant scale compared to the UK. In this way, CRE is rooted in a low-carbon transition by these countries, based on substantive investment, with Germany having a significant proportion of households owning RE (DECC, 2013b). These exemplars highlight the differences between different countries centred on policy infrastructure as well as governance and legal frameworks, and cultural components, such as a tradition of cooperatives in Germany. The issues around diversity in the CRE sector, as well as the potential impacts from CRE projects will be explored further as part of this introductory chapter, so as to contextualise the case studies utilised in the study.

1.2.1 Outline the research questions

The study focused on four central and interlinked research questions that guided the study and provided the benchmarks for framing the findings reported in the thesis:

- What is the role of 'Community and place' for Welsh communities in a community renewable energy context?
- What are the social processes driving forward community renewable energy in Wales?
- What are the social impacts for Welsh communities in a community renewable energy context?

Overall aims and detailed objectives

As part of the study, the overarching aim centred on mapping *what* is important for people engaged in driving forward CRE projects but also *what* are the social processes involved as part of the development of schemes. In addition, a key focus of the study is not only on *how* CRE projects generate renewable energy as part of a transition to a low-carbon society, but also *how* they produce social impacts within their local communities. As such, the detailed objectives focused on:

- To identify *what* are the roles and meanings of community and place attachment for Welsh communities within a CRE context, in these often place-based projects.
- To explore what are the social processes underpinning civic engagement in CRE projects within Wales. This centres on understanding *how* CRE projects are developed and *why* key stakeholders, shareholders, and community hubs become engaged.
- To examine *what* are the social impacts for communities within a community energy context and *how* they are experienced and perceived by key stakeholders, shareholders, and community hubs. This centres on understanding the nature and scope of social impacts across key actors, focused on stakeholders and shareholders as well as the wider community and hubs.

1.2.2 Terms of reference and defining the field

A number of key terms were central in the study centred particularly on community renewable energy, social impacts and the theoretical context: community, place, social and cultural capital. Furthermore, additional key terms utilised within the study were sustainable development and forms of civic engagement through community benefit societies.

Community renewable energy

The researcher adopts the definition by (DECC, 2013b) that defines CRE projects as representing a significant component of community participation either in ownership or managing projects, with benefits centred financially and more broadly on the community:

> *"Community energy covers aspects of collective action to reduce, purchase, manage and generate energy. Community energy projects have an emphasis on local engagement, local leadership and control and the local community benefiting collectively from the outcomes"* (DECC, 2013, P1)*.*

The term community renewable energy (CRE) focuses on citizens having a direct level of engagement in energy transition. It relates to a wide range of different configurations and set of activities focused on a community scale. CRE may be positioned as geographically focused on communities or involve communities of interest (Regen, 2021b). In this context, there is an expectation that those involved in CRE projects are active actors in the scheme and that any impacts will be focused on the wider community (van Veelen and Haggett, 2016; Walker and Devine-Wright, 2008; Devine-Wright and Wiersma, 2013). In the PhD study, the researcher adopted these key parameters and the case studies included different technologies ranging from micro hydro, wind, and solar but were all community-led and owned. This included significant involvement by local people in communities to initiate and develop the CRE projects, as part of the process and often having an emphasis on local ownership and local distribution of income as outcomes.

Social impacts

The researcher utilised the work of Berka and Creamer (2018) to establish the boundaries around the term social impacts in the context of CRE. In this way, social

impacts from CRE projects are viewed and experienced by particular communities as involving economic and environmental dimensions. This focuses on the interrelationship and any alignment between any activities or outcomes from the CRE project and the priorities, values and the requirements of a particular community, anchored in individual or collective experiences (Berka and Creamer, 2018). Significantly, Berka and Creamer (2018) identify the specific attributes of social impacts as opposed to economic impacts. This is based on the way in which social impacts are not amenable to objective metrics or measurement. Rather social impacts are often represented in different ways by a range of actors or constituencies, with meanings often contested. Also, there may be potential positive or negative social impacts arising from CRE projects for local communities. However, Berka and Creamer (2018) indicate that economic aspects may relate to aspects of social impacts in a community centred on the way schemes may be impactful on individual or group wellbeing.

Overall, the area of research and policy identify how CRE projects may develop a spectrum of social impacts. These may extend across the development of greater community cohesiveness, employment and local services, as well as the generation of enhanced knowledge and skills-base (van der Waal, 2020). However, the area around the nature and scale of benefits from CRE projects is an area of further inquiry. In the study, the researcher explored social impacts in how they are experienced as part of CRE projects, centred on process and outcomes and examining a range of potential impacts.

Theoretical context: community, place, social and cultural capital

Within the study a number of key theoretical contexts framed an understanding of social impacts, focused on community and place attachment as well as social and cultural capital. The study is anchored in the literature that suggests communities may be both complex and contested. As such communities are viewed as 'material' with their social relations embedded within physical spaces, aligned with positive and negative characteristics (Liepins, 2000).In the study, place attachment was viewed as relating to a particular 'sense of place' that provides the platform for

constructing identity of place (Hernandez *et al.*, 2007; Devine-Wright and Howes, 2010; Lewicka, 2011; Süsser, Döring and Ratter, 2017)**.** Devine-Wright and Batel (2017) identify those specific areas have an inherent set of attributes which range across physical location and spatial setting, social relationships, and emotional ties. These cumulatively represent place attachment.

Social capital can be defined as mapping the phenomenon of social relations, focused on interrelationships and social networks. These are often underpinned and emerge from a collective form of action and active civic engagement (Rivera et al., 2019; Yilditz et al., 2015). The study recognised the complexity of social capital yet centred on a number of key features based on the overarching definition provided by Kilpatrick (2007): *"Social capital oils the process of working together to achieve a mutual objective"* (P248).

The typology by Putnam (2000), later extended by Woolcock (2001) characterise social capital as consisting of bonding, bridging and linking capital. The benefits arising from bonding, developing cohesiveness within communities, and bringing people together to mobilise. In addition, bridging and linking facilitates communities to engage and collaborate with wider audiences and key stakeholders, drawing on a broader set of resources (Woods, 2011; Howell and Haggett, 2014). Overall, the study sought to understand CRE projects and social impacts through the lens of bonding, bridging, and linking social capital.

In the context of cultural capital, the work of Bourdieu initially focused on using it to understand inequality, based on academic progress by children among different social class groups (Field, 2003). As such, a key part of cultural capital centres on the deployment of skill sets, experience, and knowledge within particular contexts, such as developing a network (Bourdieu, 1984; Bennett et al, 2009). More recently, cultural capital has been applied in a CRE context. For example, Samson (2018) indicated how key individuals' significant skill sets, knowledge and resources was crucial. This was in addition to accessing wider networks which had utility, focused on gaining resources or support.

Sustainable development

In the study, the researcher defined sustainable development as centred on Bruntland (1987) set within a policy framework context across the United Nations (UN) and national governments, including the WFG Act (2015). The concept of sustainable development provides a core scaffolding for the United Nations, centred on *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* It includes four pillars or dimensional attributes that highlight its priority areas, tackling society, environment, culture, and the economy.

In renewable energy, the sustainable development principle and policy framing is increasingly recognised as being addressed by CRE projects across the range of its dimensions (Haf and Parkhill, 2017). The framing of sustainable development was further developed in 2015 by the UN through 17 Sustainable Development Goals that mapped areas for global action by 2030.

Models of citizen engagement: Community Benefit Societies (BenComs)

Within Community Benefit Societies, the focal point is to address the wider community interest rather than deliver benefits to members of a cooperative. It does provide interest payment on the share capital provided by the members of the BenComs, there are no dividends provided as part of a broader pay-out. There is also the option of an 'asset lock' which is unavailable to cooperatives (Community Shares, 2020). As such there is legal assurance that the community is benefiting from the scheme. Furthermore, as in a cooperative the BenComs operate as a democratic, one member –one vote and voluntary membership, irrespective of the amount of investment (DECC, 2013b). The formalised structures within the CRE sector include community-based ownership such as cooperatives, community benefit societies, community charities, developmental trusts and community interest companies (Walker and Devine-Wright, 2008; Creamer, Eadson, van Veelen, *et al.*, 2018). In this way, the different models of citizen engagement have implications for the development and management of a CRE project, as well as the delivery and distribution of local social impacts.

1.3. Policy context for the study

The recent United Nations IPCC (2021) Sixth Assessment Report reinforces the need to frame both current and future policy around tackling climate change priorities, across the UK and on a global level. The assessment highlights the serious nature of the climate crisis based on scientific data, validated by international governments. Indeed, the IPCC Report (2021) identifies the increasing severity and scope of climate change effects on global communities, including the highest temperatures during the past 5 years since 1850. The assessment indicates the urgent need for a reduction in greenhouse emissions. As such, CRE is positioned within a wider environment of a transition to a low-carbon society and tackling climate change.

Currently, in an UK wide context the Government has confirmed in legislation the most significant global climate change target by reducing emissions by 78% for 2035, in relation to the benchmark of the 1990 level (GOV UK, 2021). Within the UK, RE electricity generation has extended dramatically since 2010 to 50% of overall generation. Through embedding targets in legislation, the current administration is seeking to reach its target 15 years earlier than initially planned. As such, it seeks to reduce emissions by 80% by 2050 based on a recent sixth Carbon Budget. In this context, a significant event has been the hosting of the COP26, the 2021 United Nations Climate Change Conference, at a critical juncture in an international policy context. It represents the 26th yearly summit and aims to build on the 'Paris Agreement' involving 190 global leaders and other key stakeholders to negotiate future strategies, targets and plans for tackling the climate crisis. As the President, the UK is seeking to encourage global leaders and organisations to also deliver net-zero global targets by the mid-century and reduce emissions significantly by 2030 (GOV UK, 2021).

The study findings surface a number of implications related to the wider policy landscape, centred on local ownership and renewable energy targets as well as the role of communities in a transition to low-carbon society. Within a devolved context, Haf *et al (*2018) indicates its relevance in supporting renewable energy (RE) and the prominent role of Scotland in developing the sector within the UK, with a

particular focus on community RE. The development of CRE in the UK is framed within a policy framework and the case of Scotland highlights the importance of a positive policy context in supporting the growth of the sector. As a devolved government, Scotland established a target of 1GW of locally owned and community led RE by 2020 (van der Waal, 2020). As noted by Creamer *et al (*2018), devolved governments have a significant capacity to move beyond the national policy infrastructure, for instance the Scottish Government building on the initial target of 1GW and extending to 2GW by 2030.

Further, as exemplified by Scotland, devolved policy acts beyond targets and provides the infrastructure for RE grants and loans. In Wales there has also been infrastructure created to support RE such as through the Local Energy Support Service that includes grants and loans for projects (Haf *et al.*, 2018). Although local energy is broader than CRE projects, the increasing role of community -led models and joint ownership in the future, indicates a shift that positions communities as having a small but significant role within the RE sector. Indeed, the earlier work of DECC (2013) highlighted the importance of community schemes in the mobilisation of local people to engage in activities that support a low-carbon transition. In this way, 'top-down' governmental action in isolation is largely ineffective and requires 'bottom-up' community-based action to address local needs and tackle broader societal issues.

In this context, the Future Generations Report (2020) identifies the relevance of climate change within this broader policy landscape. The Welsh Government highlight the importance of targeting net zero carbon emissions by 2050 as an outer boundary, informing the policy objectives of 'A Low Carbon Wales'. As such, it seeks to build on the Environment (Wales) Act targets of an 80% reduction in emissions by 2050 (Future Generations Commissioner for Wales, 2020b). Indeed, in April 2016 the Welsh Government released a climate emergency declaration in Wales, responding to public concerns and the IPCC Reports on global warming. In this way, it signalled that the climate crisis was a major issue for future generations in Wales that necessitated a policy response, coordinated actions and leadership (Welsh Government 2021; Welsh Government, 2019a).

The overall, energy targets for Wales focus on 1 GW of locally owned renewable electricity generation by 2030, and new RE projects to include a degree of local ownership by 2020 Regen (2021a). In a Welsh context, Buckland-Jones (2019) highlight how the Welsh Government acknowledged the value of targets as part of policy, in achieving socio-economic and environmental benefits of local ownership and a CRE model. Importantly, the Welsh Government viewed such an approach as facilitating a low carbon transition, linking communities to their energy, and supporting a prosperous Wales. Indeed, the IWA (2018) identify how a transition to RE provides a key opportunity for Wales to meet a significant part of the Well-being goals from the WFG Act (2015). For instance, a decentralised model supporting the development of resilience, the reduction in energy demand and more energy efficiency resulting in greater health and generating prosperity as well as community models of ownership leading to cohesive communities.

In addition, less dependency on carbon-based energy would contribute to a globally responsible Wales. In this context, IWA (2019) indicate the centrality of ensuring the local retention of social, economic, and environmental benefits from RE, as a key policy priority. Significantly, the Future Generations Commissioner (2021a) identified how there is an increasing call on the Westminster Government to build on the platform created by the Welsh (2015), developing an UK Well-being of Future Generations Bill. This approach resonates with a public survey highlighting 69% support for a focus on developing an UK-wide long-term policy that addresses key future priorities. These centre on preventative strategies that focus on tackling the climate challenge, poverty, and pandemics, focusing on sustainability as the UK recovers from COVID-19. Importantly, such a sustainability agenda includes addressing socio-economic, environmental, and cultural well-being.

Overall, the State of the Sector Report (REGEN, 2021b) highlights the significance of the impact of CRE within the renewable energy (RE) sector at a global level by promoting the reduction of emissions as well as supporting a low-carbon transition, including national targets. Indeed, during 2019 the CRE sector was able to prevent 65,200 tCO2e of greenhouse gas emissions in the area of energy generation. The

development of energy efficiency, saving and education initiatives by CRE projects are anticipated as contributing to a further increase in its impact.

In an international context, CRE represents an integral part of the energy sector and is present at a significant scale, as exemplified by Denmark and Germany. In this context, these countries display a strong cultural tradition of co-operative enterprises and the adoption of RE (DECC, 2013b; Simcock, Willis and Capener, 2016). Furthermore, these countries have developed a distinct policy, governance, and regulatory framework, which differs from the centralised UK system. As such they promote the development of community focused RE generation across regions and localities. Significantly, CRE projects were facilitated by a consistent national policy infrastructure, combined with robust local governmental support (Radtke, 2014; Simcock, Willis and Capener, 2016).

1.3.1 UK Energy policy
Positioning CRE

Increasingly, over the last 20 years the term community has been linked to both renewable energy schemes and policy (Walker *et al.*, 2007b; Becker and Kunze, 2014). Building on the activism of the 1970s, there was a recognition of the value of a decentralised energy model, based on collective action (Walker and Devine-Wright, 2008). From the 1990s onwards governmental discourse highlighted the importance of the local and moving away from a centralized model of energy generation (Walker *et al.*, 2010; Hielscher, 2011). In many respects, community RE was framed as a 'policy tool' (Seyfang, Park and Smith, 2013, P977) to facilitate the move towards a low-carbon society (Walker, 2008b). The engagement of communities was assumed to address the phenomenon of local opposition to commercially-driven schemes (Rogers *et al.*, 2012a). Further, the policy emphasis was based on anticipated social impacts, including contributing to social cohesion and localised economic benefits (Walker *et al.*, 2010).

In the wider UK energy context, the dominant position of traditional and large-scale fossil fuel and nuclear energy schemes will continue to be part of the energy environment to address national targets and demand. In parallel the role of CRE has

been recognised as a discrete potential part of a decentralised model (Strachan *et al.*, 2015; Haf and Parkhill, 2017). The policy can be characterised as having a 'lock-in to centralisation' (Rydin, Turcu and Austin, 2013) and the emergence of CRE is set within this diverse energy-mix. This operates as a continuum of scales, including governmental, business, community and household levels having an active role in a low-carbon transition (Walker and Cass, 2007; Walker and Devine-Wright, 2008; DECC, 2013).

Feed-in Tariffs and Business tax rates

Overall, the raft of previous energy policies provided a platform to stimulate the community energy sector based on short term-grants. The introduction of the Feed in Tariffs (FITs) provided a coordinated approach for community energy, securing a consistent income to develop the sector (Hielscher, 2011). FITs is a government subsidy administered by the Energy Regulator (OFGEM) to encourage the development of renewable energy generation (Nolden, 2013).

The Government's approach to FITs represents a trajectory of change, with FITs commenced in 2010, reduced in 2015 and proposed ending in 2019. The rationale for change was based on the Government's evaluation that due to reduced costs, an altered public mindset around RE, developing technology and the impact on consumer bills, a strategic withdrawal of support by Government was needed, based on the 'Industrial Strategy and Clean Growth Strategy' (HM Government, 2017). In this way, the reductions to FITs in 2015 had a negative impact on the CRE sector, it accentuated the risk for schemes and narrowed the profit margin in the case of generating electricity. Also, the ending of Pre-Registration of solar (roof-based) projects exacerbated the situation (Scene Connect, 2018).

In their report, Scene Connect (2020) indicated there was an increase in installations in 2018-19 prior to changes in FITs in March 2020, particularly in the area of solar (Figure 1). Whilst the modified financial support for projects in the period 2020-21 has signalled a reduction in project development, leading to CRE groups exploring other potential models to retain viability and generate social impacts. Although due to the Coronavirus Amendment Order, there was a

transient extension of FITs accreditation until September 2020. In many respects, the focus is moving away from the development of multiple energy generation projects towards social and technical innovation, centred on smaller but more collaborative and energy-demand focused projects (UKERC, 2017). Whilst the sector acknowledged the rationale for an overall reduction in subsidy-based support, the sudden shift has created instability and the call for greater consistency in providing long-term policy infrastructure for CRE (Regen, 2021b). However, despite the policy changes the community sector remains resilient, adapting to change by re-evaluating their aims and objectives as well as ways of working (Braunholtz-Speight *et al.*, 2021).

Figure 1:   Overview of policy impacts on CRE generation (scene Connect, 2020)
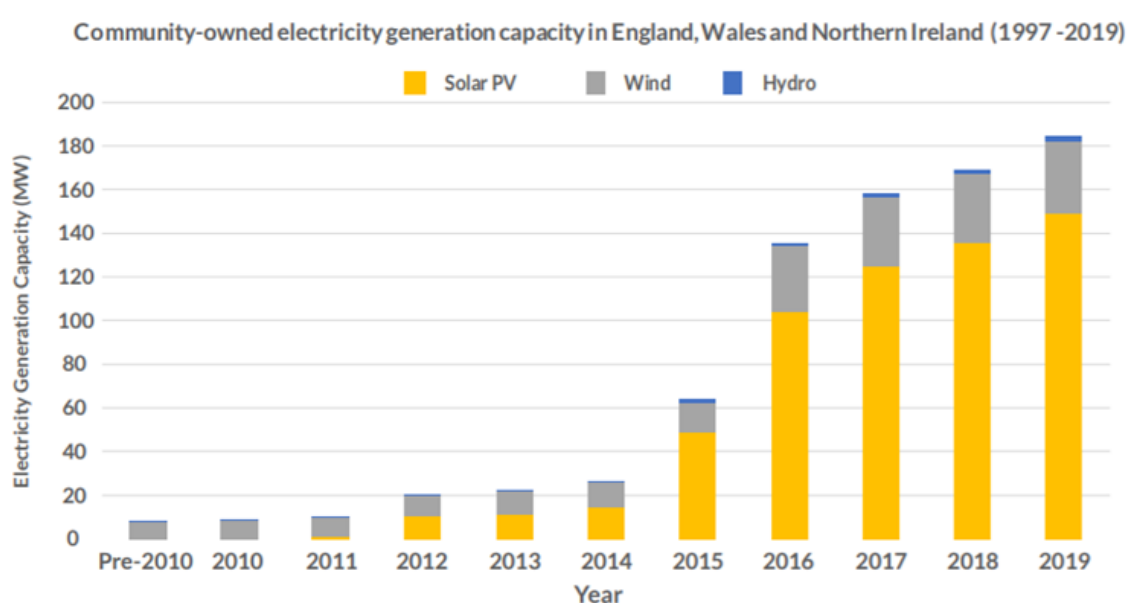
The unanticipated changes to the business tax rates resulted in negative impacts for CRE projects as part of their business plans, with significant increases in the tax owed for some schemes (Regen, 2021b). The increase in business rates presents a major challenge for the future development of community energy, particularly in the case of small-scaled hydro schemes pushed to a position of loss-making because of their use of machinery. The modifications to business rates resulted in

profits benefiting local councils and damaging community projects (Messenger, 2018).

1.3.2 Wales policy context: Well-being of Future Generations (Wales) Act (2015)

"What Wales is doing today, the world will do tomorrow"

(Nikhil Seth, UN Assistant Secretary General, cited in Davidson, 2020)

The WFG Act (2015) is focused on addressing ongoing challenges by Wales across climate change, health issues, including coronavirus, as well as tackling socio-economic concerns, such as employment. At its core, the Act seeks to support a high quality of life for the present and future generations in Wales based on a consideration of long-term decision-making processes (Welsh Government, 2021b). Overall, the development of the WFG Act (2015) reflects a recognition that the availability of substantive natural resources in Wales provides a platform for generating sustainability. This was signalled by the First Minister's foreword in the 'Energy Wales: A Low Carbon Transition (Welsh Government, 2012).

> *"As a nation, we are rich in energy resources and this provides a tremendous opportunity to fuel our drive for a fairer and more prosperous Wales and to achieve a better quality of life for our own and future generations"* (P8).

In this context, the WFG Act (2015) is centred on improving the social, economic, environmental, and cultural well-being of Wales underpinned by the 'Sustainable Development Principle'. It *"seeks to ensure that the needs of the present are met without comprising the ability of future generations to meet their own needs"* (2:5:1). In this way, within the Act, 'sustainable development' is viewed as a mechanism and a process for enhancing the well-being of Welsh citizens across economic, social, environmental, and cultural contexts. The Act requires Public Bodies to consider how current decision-making may impact on future generations and apply a set of 'Ways of working' to deliver collaborative action to address long-term issues. In this way, the Act prompts the public bodies named in the Act to think more about the long term, with a more joined-up approach and look to

prevent problems. In this context, WCVA (2020) indicate how the WFG Act (2015) was not only a unique exemplar of national legislation but also closely aligned with the UN Sustainable Development Goals and the UN's 2030 Agenda.

The 'Sustainable principle' aims to achieve the 'Well-being Goals' (Figure 2) as a requirement for Public Bodies. In this way, for Wales to be sustainable, it is important that all four aspects of well-being are taken into account. In this context, the Well-being Goals provide the scaffolding for moving forward with the 'Sustainable principle' in practice. These key areas are envisioned as a future framing for Wales as a country, built on sustainability and a collective vision by Public Bodies, to be enacted as a whole not selectively.

Figure 2:   The Well-being of Future Generations (Wales) Act (2015) 'Well-being Goals'

The enacting of the 'Ways of working' focuses on Public Bodies engaging with five components, ranging across the key areas of: *Long term, Prevention, Integration, Collaboration and Involvement*.

Furthermore, the seven Well-being Goals centre on A *Prosperous Wales, A Resilient Wales, A Healthier Wales, A More Equal Wales, A Wales of Cohesive Communities, A*

Wales of Vibrant culture and thriving Welsh language, and *A globally responsible Wales*. These goals represent the vision for Wales detailed in the Act.

As part of the WFG Act (2015) a number of the national indicators are particularly relevant to CRE, particularly focused on the capacity measured in MW of RE technology that is installed as well as the number of households operating within the boundaries of appropriate energy performance. In addition, another indicator centred on the degree of greenhouse emissions in Wales. In this context, CRE provides an example of the connections that can be made between community energy and the 'Well-being Goals'. For instance, striking a balance between the delivery of a globally responsible and prosperous Wales as part of sustainability. In this way, it contributes towards carbon reduction targets whilst at the same time, bringing local benefits to communities, such as the retention of income locally.

1.4. The CRE sector

The CRE sector has developed as part of an international range of projects characterised by diversity. This includes roof-based solar in Australia, to bioenergy communities in Germany and Danish 'Wind Guilds' (Hicks and Ison, 2018). In an UK context, there were 424 CRE organisations consisting of 72 in Scotland, 290 in England, 60 in Wales and 2 in Northern Ireland (Figures 3 and 4). In this way, the sector produced 319MW in renewable energy, whilst also engaging 380,000 people in CRE and climate change and 132 organisations operating within the area of energy efficiency, with the creation of 84 new employment roles. The sector also generated £30.2M from community shares and £3.13M in community benefit income (Regen, 2021b). Within Scotland, there is a greater level of wind and hydro CRE projects than other parts of the UK, with England having the highest number of solar PV projects. In Scotland the devolved government has driven CRE programmes through targets and the Community and Renewable Energy Scheme. Within Wales, the devolved government has provided a supportive policy environment with targets for increased capacity for 2030. In many respects, Northern Ireland is at an early stage of development (Regen, 2021b).

Figure 3: National progress on community-owned wind, solar and hydro energy (Regen, 2021b).
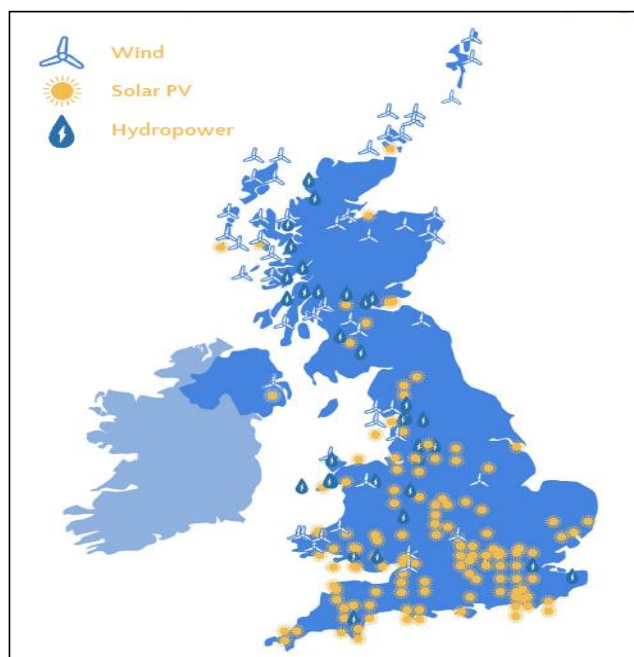
Figure 4: Community energy organisations in Wales (Regen, 2021a)

In Wales, the Welsh Government (WG) established 1GW target for local-owned CRE by 2030 and with all renewable energy (RE) schemes to include a component of community ownership by 2020. In a recent review, Wales had developed an overall capacity of 22.6MW of RE, significantly lower than England and Scotland (Regen, 2021a). This was despite supportive WG policy initiatives and resulted from the broader negative effects of the UK policy environment centred on removing financial incentives. For instance, WG committed to a target of reducing annual carbon emissions including an 80% target by 2050, set within the Environment (Wales) Act 2016. This included introducing carbon budgets and targets for RE and community energy (IWA, 2019). However, a problem area within a Wales context has been the ambiguity regarding governmental responsibility between the Welsh and UK Government leading to challenges to having a flourishing Wales centred energy-policy due to the limitations of devolution (Strachan *et al.*, 2015; Llewellyn *et al.*, 2017b). For instance, planning for substantive projects are controlled through central government (Table 1).

Table 1:   Devolved context and control (Strachan et al., 2015)

Devolved energy powers in Wales.	
Offshore	Projects of 350 MW or below in Welsh territorial waters
Onshore – dealt with through local authority planning powers	Generation projects of up to 350 MW Sub-stations and distribution networks up to 132 kV

The table shows which the devolved planning and consenting powers held by the Welsh Government (Wales Act, 2017).

In a Welsh context, specific support included the development of Community Energy Wales (CEW) which sought to address the challenges faced by community energy projects in Wales. It was positioned as a key facilitator to support innovation, providing *"a voice to community groups working on energy projects in Wales"* (Community energy Wales, 2021, P1). A particular feature of energy funding

within Wales is 'Ynni Lleol', succeeding 'Ynni'r Fro' in 2016 as a scheme to facilitate local energy provision. As with the Scottish exemplar of Scotland Community and Renewable Energy Scheme (CARES) it provides a 'toolkit' with expert assistance and funding to enable communities and local businesses to engage with RE. Consequently, it has supported 22 community-based projects (Scene Connect, 2018). Since 2018 the WG generated the Welsh Government Energy Service (WGES) to support the continued development of RE and energy efficiency.

1.5. Research context: Study boundaries

This section of the chapter will provide an overview of the key contexts for the study, focused on the case sites.

1.5.1 Overall Case Study context: Wales and community areas

The case studies involved in the study reflected the range of potential CRE project configurations operating within Wales and the UK, providing a discrete set of characteristics. In relation to the study, Wales represents the overall context for the study and its characteristics will be outlined, prior to the researcher providing an outline of the four case study areas and subsequently the detailed profiles of the respective case studies (Figure 5).

Figure 5:   Location of case studies within Wales

Case-settings: Wales and communities aligned to CRE projects

In terms of providing a background regarding the social context for the respective cases, an outline of the social profile in Wales is outlined, prior to an overview of the case-sites. This is summarised using the Welsh Index of Multiple Deprivation (WIMD) as a comparative frame of reference across the community areas. This provides an official metric of relative deprivation across areas within Wales as a comparative measure, enabling the ranking of deprivation within the principality (IWA, 2019). It includes a range of indicators, including community safety, income, access to employment, Health, Education, Access to Services, Physical Environment and Housing (Welsh Government, 2019b). In this context, the WIMD map of Wales provides a useful overview of the levels of deprivation across the communities linked to the CRE projects and community hubs (Figure 6).

Figure 6:   Welsh Index of Multiple Deprivation (2019)
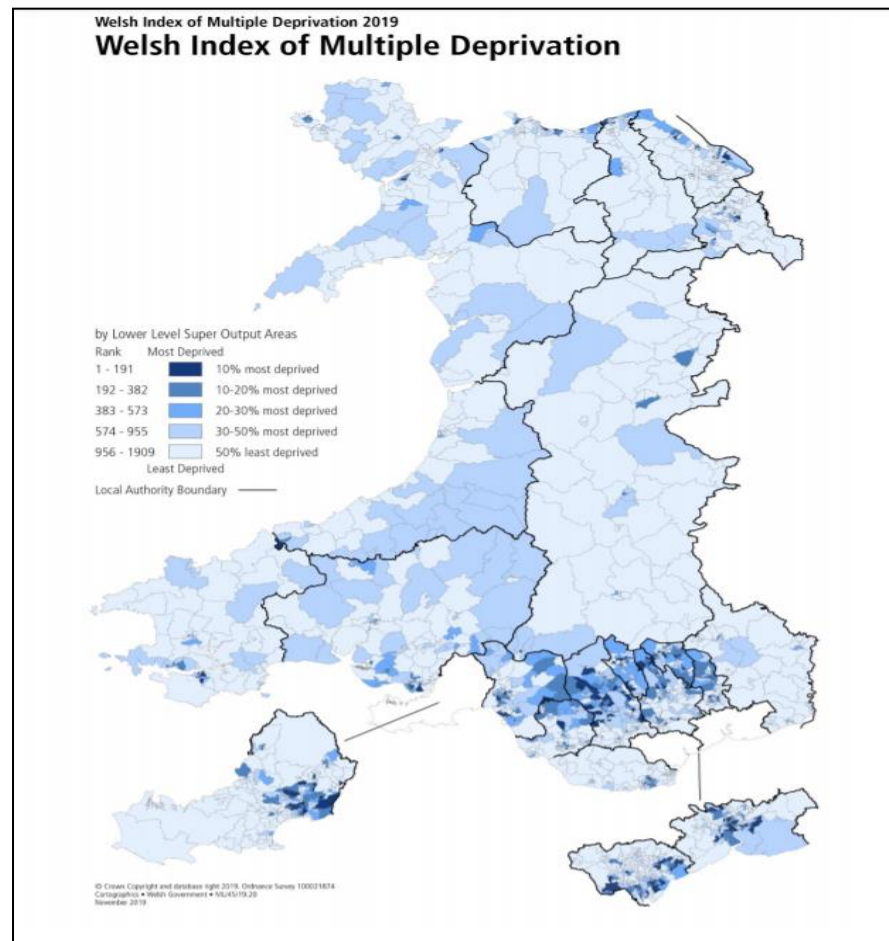
In relation to the CRE projects, the communities include key characteristics, representing a range of characteristics (Table 2). In summary, the profile maps the nature of the rural, economic, heritage, environmental and social contexts of these communities. Within a rural context, the communities aligned with CRE projects range across a rural authority (Gwynedd) aligned to YPP and YO. Whereas AC is positioned within a rural ward of Neath Port Talbot and Carmarthenshire (Neath Port Talbot as an urban local authority and Carmarthenshire a rural authority). In contrast, GR is aligned to an urban ward, with the solar panels located in a host community with the neighbouring (service) rural ward benefitting, both within the Swansea County. In terms of industrial heritage, the communities are characterised by coal mining in relation to the communities linked to AC and GR, with YO and YPP embedded in the history of slate quarrying. In an economic context, there is diversity as the Swansea Valley is characterised by the major employers linked to

the public sector, East Pit and manufacturing, and the Amman Valley, set within Carmarthenshire County Council, is predominantly centred on schools and leisure. The communities around YO and YPP are predominantly focused on the public sector and tourism.

Within a social context the communities aligned to AC CRE project are described as representing 30-50% most deprived, whereas the other communities are seen as 50% least deprived according to the WIMD (2019). In terms of Welsh Language, the majority of communities had a significant percentage of Welsh speakers apart from those around GR. From the perspective of environmental contexts, the communities were characterised as being within or adjacent to national parks (the Snowdonia National Park and Beacons National Park) or in the case of GR on the edge of and within Gower Area of Outstanding Natural Beauty (AONB). These initial outline characteristics to the case study areas are detailed further in Table 3, prior to a detailed consideration of the respective CRE projects and the CY consortium, representing the five bounded (Yin, 2014) case studies.

Table 2   Community area characteristics in relation to CRE projects (Welsh Government, 2019b)

Descriptor	Community characteristics			
Location	Swansea and Aman Valley, Neath Port Talbot and Carmarthenshire	Peris Valley, Gwynedd	Ogwen Valley, Gwynedd	Gower, Swansea
Community Renewable Energy project	Awel Co-op	Ynni Padarn Peris	Ynni Ogwen	Gower Regeneration
Rural context	Within a rural ward of Neath port Talbot and Carmarthenshire (Neath Port Talbot as an urban local authority and Carmarthenshire rural authority)	Gwynedd is a rural local authority	Gwynedd is a rural local authority	Urban ward linked to solar panels host community with the neighbouring rural ward benefitting from urban Swansea County)
Industrial Heritage	Coal mining and iron industries	Slate quarrying	Slate quarrying	Coal mining (aligned to host community)
Economic Context	*Major employer:*	*Major employer:*	*Major employer:*	*Major employer:*

	Swansea Valley: public sector, East pit, process plant and manufacturing operatives Amman Valley: Carmarthenshire County Council (Schools and leisure)	Manufacturing, Dinorwig power station, tourism, hospitality and food services	Welsh slate, timber, tourism and manufacturing	Bay East: Swansea city and county: Schools, Health Board, Universities, retail park Bay West: Swansea city and county: Schools, service, tourism, and agriculture business
Social Profile	Welsh Index of Multiple Deprivation (WIMD): 30-50% most deprived	Welsh Index of Multiple Deprivation (WIMD): 50% least deprived	Welsh Index of Multiple Deprivation (WIMD): 50% least deprived	Welsh Index of Multiple Deprivation (WIMD): 50% least deprived
Environmental Context	Close to the Brecon Beacons National Park	On the edge of the Snowdonia National Park	On the edge of Snowdonia National Park	On the edge of and within Gower Area of Outstanding Natural Beauty (AONB)
Cultural Context	In total 58.8% Welsh speakers (Swansea Valley) In total 68.7% Welsh speakers ('Quarter Bach', Carmarthenshire)	In total 80% Welsh speakers (in the Caernarfon area)	In total 51% Welsh speakers (in the Bangor area)	In total 10.2% (Bay East Area) In total 9.7% Welsh speakers (Bay West Area)

1.5.2 CRE projects: Case descriptions and characteristics

The study focuses on four CRE project case studies which have distinct characteristics, operating at different scales across different geographies and communities in North and South Wales. As such, these cases were bounded (Yin, 2014) having distinct characteristics as part of their area and community profiles but also areas of shared attributes. However, a common thread was that they represented post-industrial rural communities, focusing on the extraction of coal and slate which has actively shaped their social and political contexts.

Ynni Padarn Peris

The CRE project is set within the Peris Valley which represents a particular range of characteristics, based in a rural authority. The position of the CRE project within the community area is indicated in Figure 7 and its characteristics in Table 3.

Figure 7:   CRE project within local area

Table 3:   Case characteristics of Peris valley

Case description and characteristics: Peris Valley			
Economic	**Environmental**	**Social**	**Cultural**
The main economic driver in Gwynedd is tourism, with over a £1 billion income received from tourism in 2016 as its most successful year, with average tourist numbers being in excess of 7 million. The Peris valley and Llanberis in particular, is recognised as a hub for outdoor activities including mountaineering and walking as well as	As part of the mountainous landscape in the Peris Valley and its outdoor activities, it also features the Dinorwig Power Station. The major pump-hydro storage scheme was built within the remains of the slate quarry and completed in 1984 (Owen, Thomason and Chambers, 2019a).	A wide range of community groups and organisations are based within Llanberis, including the Llanberis Community Centre, funding itself and other local organisations based on income from its car park. There is also the Llanberis Grŵp Datblygu - Llanberis Development Group supporting litter picking activities, and Y Festri providing a venue for community-based arts and activities (Owen, Thomason and Chambers, 2019a).	The Peris Valley, and Llanberis in particular, has been deeply influenced by the slate mining industry. At its height in the later part of the 19th century there were over 3,000 workers employed in the slate quarry and it represented the second most significant opencast slate mine globally, extending over 700 acres. Yet, by 1930 it had reduced by one-third and closed in 1969. The workshops of the Dinorwig Quarry (Figure 8) have been developed as the site of the National Slate Museum of Wales, highlighting the cultural heritage of the area (Owen, Thomason and Chambers, 2019a). In terms of Welsh language, the 2011 Census highlighted that 80% of the

other users of the mountainous landscape. Llanberis includes the tourist attractions of the Snowdon Mountain Railway, established in 1896, and serves as a base for people wishing to climb Snowdon (Owen, Thomason and Chambers, 2019a).			population in the Caernarfon area were able to speak Welsh, representing the most significant proportion across Gwynedd and Wales. However, this has declined by 5% over the last 30 years, although lower than Gwynedd which has reduced from 76% to 65% during this period (Gwynedd Wellbeing Assessment, 2017).

Figure 8:   Dinorwig Slate Quarry mountain landscape (UNESCO, 2021)

Ynni Ogwen

The CRE project is situated within the Ogwen Valley which represent a particular range of characteristics as summarised in the following profile, based in a rural authority.   The position of the CRE project within the community area is indicated in Figure 8 and its characteristics in Table 4.

Figure 9:   CRE project within local area

Table 4: Case characteristics of Ogwen valley

Case description and characteristics: Ogwen Valley			
Economic	**Environmental**	**Social**	**Cultural**
The main economic driver in Gwynedd is tourism, with over a £1 billion income received from tourism in 2016 as its most successful year with average tourist numbers being in excess of 7 million (Gwynedd Wellbeing Assessment, 2017). However, in terms of Bethesda the potential economic benefits of tourism have not been realised, with the central areas of the town and its amenities receiving low visitor numbers resulting in decline of the high street. Rather, visitors tend to focus on particular activities or areas outside the town, such as the attractions of the 'Zip	The Ogwen valley and Bethesda are situated by the mountainous areas of Snowdonia, including recognised sites of international importance linked to nature, habitat, and wildlife such as Cwm Idwal Nature Reserve (Gwynedd Wellbeing Assessment, 2017). The Ogwen Valley includes the Carneddau mountain range which represents the most significant contiguous area over 2,500 or 3,000m across Wales and England and over six of the tallest peaks in the UK (Owen et al,. 2019b).	Within the Ogwen Valley, Partneriaeth Ogwen represents a key vehicle for community development in the local area. Significantly, these three Community Councils support Partneriaeth Ogwen, which is a key social enterprise in the Ogwen Valley which was developed in 2013 to provide funding for community initiatives. It aims to benefit communities through the regeneration of the economy and seeks to promote innovation within the Ogwen Valley. In this way its business plan addresses environmental, economic, social and cultural sustainability. For instance, this includes a number of regeneration Projects, including Dyffryn Ogwen Community Library,	Bethesda developed in response to the presence of the Penrhyn Quarry (Figure 10) established in the 1770s and growing to be the largest global quarry at the close of the 19th century employing 3000 quarrymen. A significant cultural turning point in Bethesda and the Ogwen Valley was the onset in 1900 of a major strike in the Penrhyn quarry which continued for three years and remains the most prolonged strike in British industrial history. The events caused longstanding divisions within the community (Owen, Thomason and Chambers, 2019b). In terms of the Welsh language, the 2011 Census identified 51% of people in the Bangor area (including the Ogwen Valley) speaking Welsh. Yet, the

World Penrhyn Quarry' as the fastest in the World and the mountain activities within the surrounding area of the Snowdonia National Park, including Cwm Idwal Nature Reserve (Owen, Thomason and Chambers, 2019b).		and Siop Ogwen. Alongside these there are sustainability projects, for instance Dyffryn Gwyrdd (Green Valley) that draws together a number of sustainable projects in the Ogwen Valley and the Sustainability Centre based on a grant from the Welsh Government acting as a hub for Partneriaeth Ogwen's environmental and sustainability work (Owen, Thomason and Chambers, 2019b). Within Bethesda there are also some additional community enterprises and organisations, for instance Caffi Coed y Brenin, Pesda Positif, WI and Fforwm Busnes Bethesda.	percentage has significantly declined by 15% during the last 30 years (Gwynedd Wellbeing Assessment, 2017).

Figure 10: Bethesda and Penrhyn Slate Quarry (UNESCO, 2021)
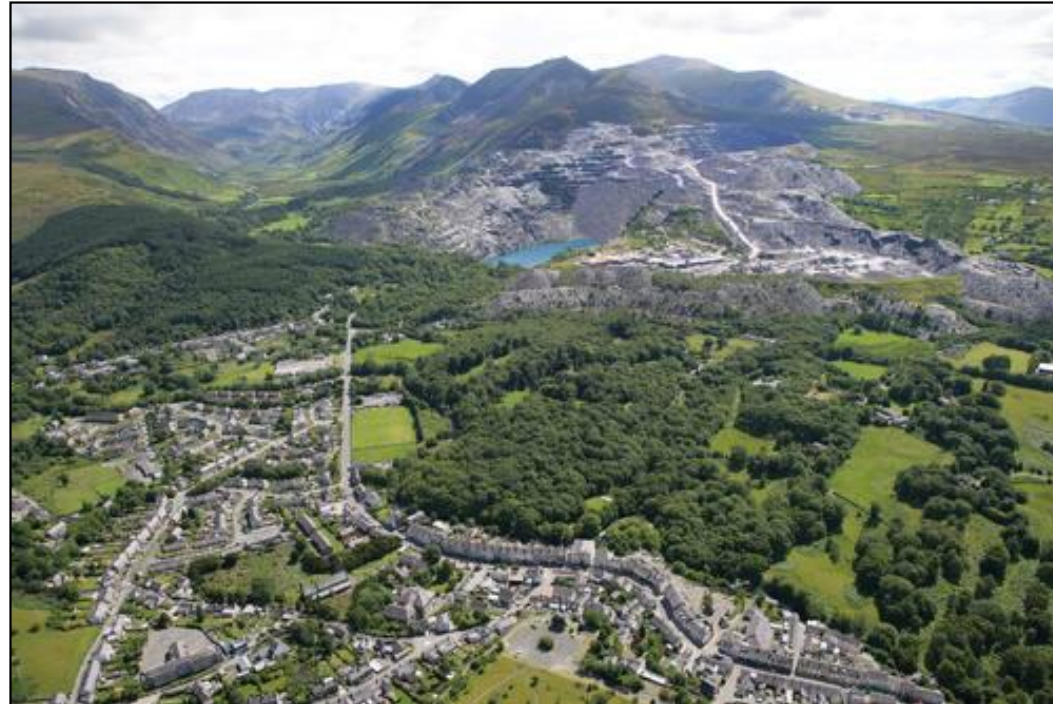
Awel Co-op

The CRE project is set within the Swansea and Amman Valley which represent a particular range of characteristics as summarised in the following profile. In terms of Cwmllynfell, the setting for the CRE project, it represents a rural community located at the western boundary of the Brecon Beacons National Park. As such, it is located some 17 miles north of Swansea City (Cwmllynfell Community Council). The position of the CRE project within the community area is indicated in Figure 11 and its characteristics in Table 5.

Figure 11:   CRE project within local area

Table 5   Case characteristics of Swansea and Amman valley

Case description and characteristics: Swansea and Amman Valley			
Economic	**Environmental**	**Social**	**Cultural**
Overall, the nature of the natural environmental and landscape have impacted on the access by parts of theses local communities in rural areas in gaining employment within urban centres (Neath Port Talbot, Swansea Valley Wellbeing Assessment 2017)	The CRE project with its wind turbines is located next to the open-cast coal East Pit that is positioned at the northern edge of the South Wales coalfield, within the upper Amman Valley, producing anthracite coal. Also, the area is characterised by access to a wide range of outdoor-based activities focused on the Brecon Beacons, rivers as well as canal-system (Neath Port Talbot, Swansea Valley Wellbeing Assessment, 2017).	Although Cwmllynfell and Upper Brynamman represent small rural communities there are a range of community hubs positioned within the community. For instance, in Cwmllynfell these include a Welsh medium primary school, GP surgery, post office, two community centres, a grocery shop, pub, social club and rugby club (Cwmllynfell Community Council. 2021).	A major characteristic of the area is the industrial heritage centred on the iron and coal industries that extended over a 200-year period. The village of Cwmllynfell was strongly aligned to the growth of the coalfields during the 19th century, leading to a growth in its population. However, in recent years there has been a major shift in the area following the decline of the coal mining industry, including its development as part of the growth in Renewable Energy schemes representing both commercial and community schemes (Cwmllynfell Community Council) (Figure 12). In terms of Upper Brynamman, the village was also shaped by the coal mining and iron industry in the 19th century

			based on coal mines and the Amman Ironworks developed in 1847 (Chwarter bach Community Council, 2021).
			Significantly, the development of community hubs in both Cwmllynfell and Upper Brynamman were due to the support of coal miners funding the construction of community facilities, such as the Brynaman Public Hall and cinema in 1926 to accommodate a 1000 people. In Cwmllynfell a modern Millennium Hall was built in 2003 on the site of the original Miners Welfare Hall that had been originally funded by local miners (Cwmllynfell Community Council).
			As part of the area there are strong attachment to the Welsh language within particular communities, displaying significant levels of Welsh speakers across the Amman and Swansea valleys representing a high percentage of Welsh speakers

			at 44.1%. However, in recent years these traditional communities have experienced a decline since 2001. (Neath port Talbot, Swansea Valley Wellbeing Assessment 2017).

**Figure 12:   Close proximity of communities to both the opencast mine and the
               wind turbine (Field site visit)**

Gower regeneration

The CRE project is positioned within Gower, Swansea which represents a distinct
range of characteristics as summarised in the following profile. The position of the
CRE project within the community area is indicated in Figure 3 and its
characteristics in Table 6.

Figure 13:   CRE project within local area
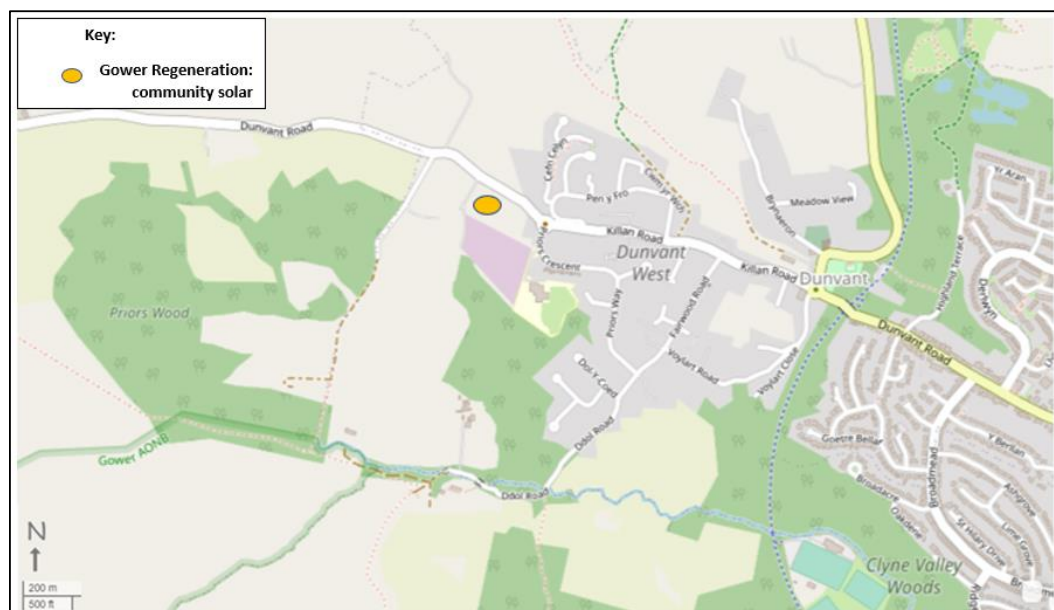
The Gower, Swansea area represents a uniqueness through its mix of rural and urban settings, positioned on the southern coast of Wales, defined as 'host' and 'service centres' for completely rural wards. A particular feature is that Swansea City Centre is abutted by rural areas and the Gower peninsula, including farming and past mining communities (Swansea Council, 2020).

The organisation of the Gower, Swansea area is best understood through the lens of administrative- electoral wards that provide a map of rural and related host communities (Figure 14). The city and county are divided administratively into 6 community areas, centred on Bay East, Bay West, City, Cwm Tawe, Llwchwr, and Penderi. The CRE project relates to 'Bay East' representing sub-urban host communities for the solar panels, and 'Bay West' as the rural service ward (Swansea Local Wellbeing Assessment, 2017).

Figure 14:   Gower, Swansea: Mapping the 'service and 'host' wards (Swansea Council, 2020).
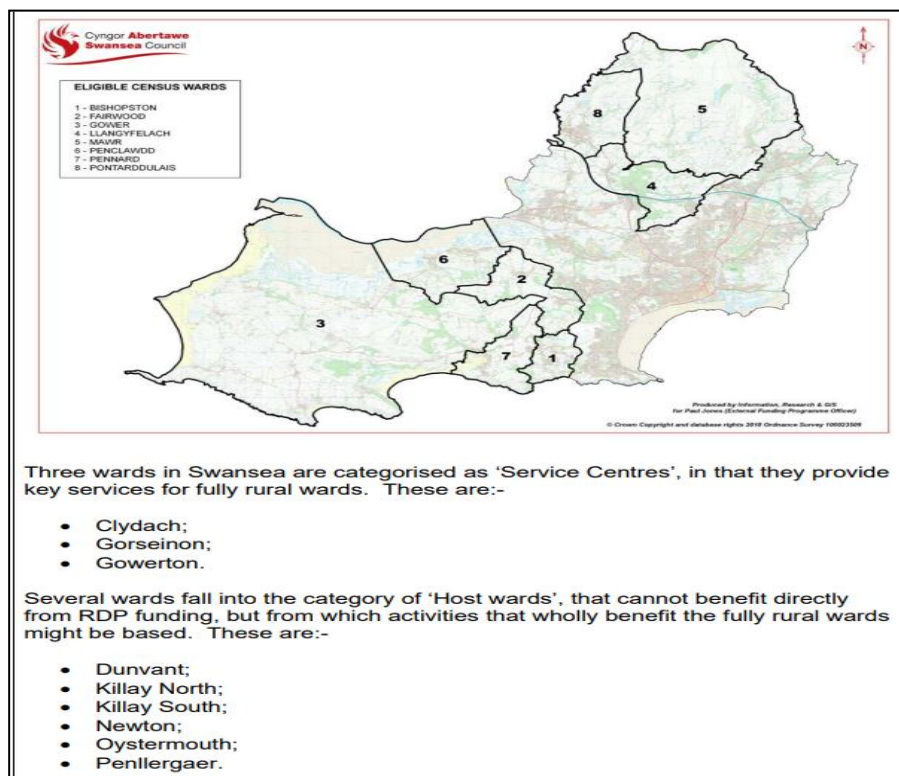
Table 6   Case characteristics of Gower and Swansea area

Case description and characteristics: Gower and Swansea Area			
Economic	**Environmental**	**Social**	**Cultural**
The environment of the Gower, Swansea area provides a source of income through tourism as well as hosting businesses and a resident population. Also, Swansea operates as a sub-regional hub, resulting in substantive 'in-commuting' from the adjoining authorities of Neath Port Talbot and rural Carmarthenshire.	The Gower peninsula was designated as the first Area of Outstanding Natural Beauty and Local Nature Reserve in the UK due to its distinctive landscape and coastal areas (Swansea Council, 2020). The concentration of designated areas is positioned in the west of the county, for instance Bay West and Llwchwr Community Areas (Swansea Local Wellbeing Assessment, 2017). As such the environment of the area contributes to the quality of life of the	In the host ward Dunvant represents a sub-urban area of Swansea located within reach of the Gower Peninsula and the city. It includes a range of service provision, including schools and small-scale provision of services including local shops and post office. As a community Dunvant is renowned for its rugby club and male voice choir (Gower Regeneration, 2017). In the service ward the Gower Heritage Centre has a history as a hub of community activities,	The 'Host ward' Dunvant is positioned on the edge of the Gower peninsula and developed as a result of mining for coal during the 1800s, retaining historical buildings such as chapels . The Dunvant Colliery operated until the 1920s employing 400 miners, alongside the coal mining operations at Penclawdd and Morlais (Gower Regeneration 2017). The Gower Heritage Centre, Park Mill is set within the Gower peninsula and is centred on a 12th century watermill, providing a tourism-resource as well as rural museum. It has a history as a hub of community activities, with different usages from a sawmill to its more recent role as a centre to promote enterprise for artisans and local businesses (Figure 14). As a centre Parkmill was developed in 1990. In

	population as well as supporting tourism.	with different usages from a sawmill to its more recent role as a centre to promote enterprise for artisans and local businesses (Gower Heritage Centre, 2020). The ward is made up of a number of rural villages and hamlets, primarily Kittle, Pennard and Southgate.	terms of the Welsh language the percentage of people in Swansea able to speak Welsh decreased to 11.4% (26,300) from 2010- 2011, yet this is currently increasing in the under 16s population (Swansea Local Wellbeing Assessment, 2017).

Figure 15: Parkmill and Heritage Centre (Field site visit)

1.5.3 Case profiles of the CRE Projects

This section provides an overview of the respective CRE projects and consortium involved in the study, outlining a profile of each case. As indicated earlier, the CRE projects were based in North and South Wales (Figure 16). The key aim of all the CRE projects were to harness the natural resources for generating energy and income. This is based on a Community Benefit Society model, enabling the benefits from the CRE schemes to be re-invested back into the local community. Alongside this, some of the CRE projects were at an early stage of local innovation by developing local supply, storage, and demand management schemes (REGEN, 2021b).

The CRE projects represented distinct features, ranging from different locations, scales, and technologies but also with shared aspects such as the ownership models (Table 7). In terms of a variety of scales and technologies, in North Wales micro hydros the YPP project involved a 55KW hydro and YO 100KW hydro. In contrast, in South Wales, larger scale projects included AC focused on a 2.35MW wind turbine and GR involved a 1 MW solar farm. In this way, the scale of technologies in each CRE project results in different scales of income being generated by schemes, then being available to Welsh communities to deliver social impacts.

Furthermore, there were also differences across CRE projects in the scale of membership and the positioning of shareholders within the locality. The smaller schemes in North Wales had a more localised set of shareholders anchored in the

41

locality in raising finance for the schemes, with 206 shareholders in YPP and 313

members in YO. In contrast, South Wales had larger schemes, with AC having 1000

shareholders (involving 40 local groups) and GR 435 members, but with both

drawing in shareholders from a wide area, including outside the locality. In the

larger schemes there was a need to involve a wider membership to finance the

substantive nature of the schemes. A summary of the case profiles is outlined in

Tables 8 –11.

Figure 16: CRE projects in North and South Wales: location
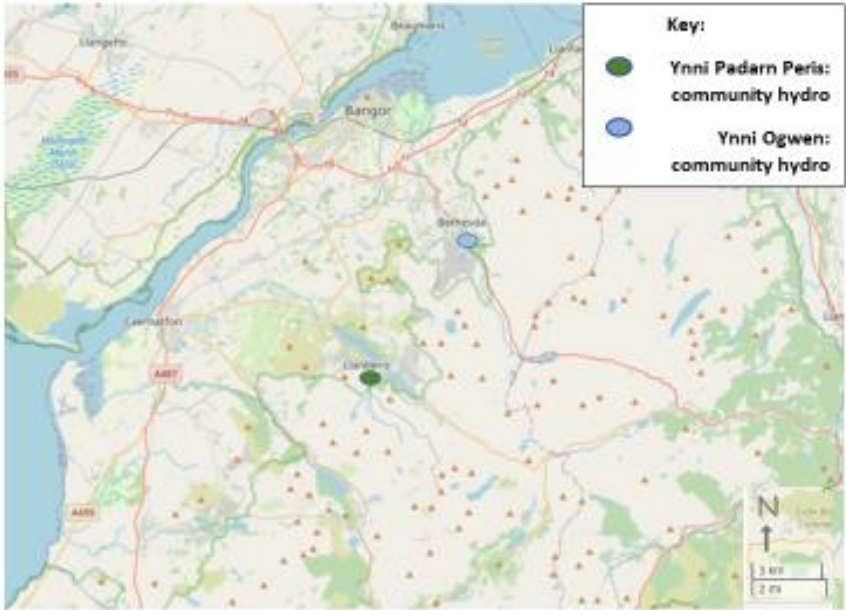
Table 7   Overview of CRE projects

Name	Location	Technology	Energised	Ownership Model	Number of Shareholders	Surplus Income
Ynni Padarn Peris	Peris Valley, Gwynedd	55 kW hydro-electric turbine	June 2017	Community Benefit Society	206	Target: 200,000 surplus over the lifetime of the period.
Ynni Ogwen	Ogwen Valley, Gwynedd	100 Kw hydro scheme	June 2017	Community Benefit Society	313	Target: £450,000 to the community over 20 years.
Awel Co-op	Mynydd y Gwrhyd, Neath port Talbot	Two 2.35 MW Enercon wind turbines	January 2017	Community Benefit Society	1000 (with over 40 local groups)	Target: £3million over the lifetime of the project.
Gower Regeneration	Dunvant, Swansea	Solar 1 MW	March 2017.	Community Benefit Society	435	Target: £500,000 over the lifetime of the project

Table 8: Cyd Ynni consortium profile

- **Location:** Gwynedd
- **Technology:** overall, the CRE projects have delivered approximately 400Kw of renewable energy generation, in the form of community hydros combined with energy saving projects.
- **Energised:** It received a 'Big Lottery' grant in March 2018 for 3-year period administered through Datblygiadau Egni Gwledig (DEG) including the creation of two posts to deliver current and future developments.
- **Ownership model:** The consortium represents a local network for CRE energy projects which brings together a hub of activity in North Wales. The members consist of established CRE projects, Ynni Anafon, YO and YPP as well as those in the initial developmental stages represented by both Egni Mynydd and Ffarm Moelyci.
- **Aims:** A group of CRE projects (including YO and YPP case studies) came together to share learning by forming a consortium.
- **Social impacts:** In the future, CY aims to move forward using this collaborative approach to underpin innovative initiatives within their communities. This focuses on the alleviation of fuel poverty, increasing renewable energy generation and energy efficiency measures as well supporting co-operation and addressing shared challenges between different CRE groups.

Table 9:   Ynni Padarn Peris CRE Project profile

- **Location:** Llanberis within the Peris Valley, Gwynedd

- **Technology**: small 55 kW on the Afon Goch(Figure 17)

- **Energised:** The CRE YPP project was energised and officially opened and started generation on 24th June 2017.

- **Ownership model:** BenComs

- **Aims:** The project aimed to establish a charity to tackle fuel poverty and fund ways to make the community even more sustainable, including support for education projects around climate change and benefit other local community groups (CEW 2021).

- **Social impacts:** The charity named 'Elusen Dyffryn Peris CIO' was recently established at the end of the study period, to distribute profits in the community focused on approximately £10, 000 per annum.

Figure 17:   Ynni Padarn Peris Turbine house and installations (Site visit)

Table 10: Ynni Ogwen CRE project profile as well as Energy Local, Dyffryn Gwyrdd and Heuldro Ogwen

- **Location:** Bethesda, within the Ogwen Valley, Gwynedd

- **Technology**: The project generates energy as a hydro scheme on the Afon Ogwen, up to 100kw (Figure 18).

- **Energised:** The project officially opened and started generation on 24th June 2017.

- **Ownership model:** It was initially developed by Partneriaeth Ogwen Cyf and then became Ynni Ogwen Cyf as a BenComs in 2015.

- **Aims:** The key aim of the project was to generate a sustainable source of revenue for the community, with benefits accrued from the use of renewable resources available from natural resources in Dyffryn Ogwen.

- **Social impact:** The overall surplus from the scheme is gifted to a charity to enable benefits to be released to the local community, supporting social and environmental projects in the locality. This is facilitated by the charity named 'Elusen Ogwen', distributing benefits within the community. This focuses on potential projects addressing local priorities, such as fuel poverty, environmental volunteering in the community or sustainable transport. It requires potential projects to apply for support from the charity, up to £2,000.

Figure 18: Ynni Ogwen hydro (Site visit)
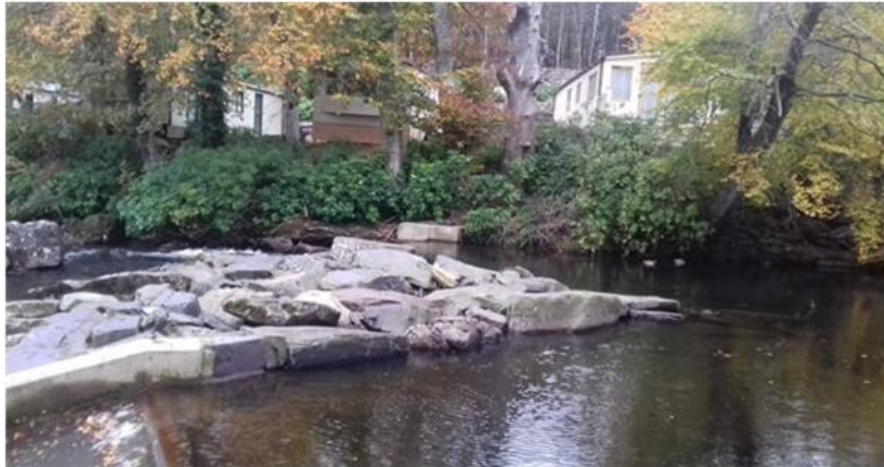
Ynni Ogwen: Energy Local Club Profile

Alongside this generation of low-carbon electricity, YO is moving towards connecting local supply and demand as well in the future. It was initially focused on the National Trust 100KW scheme on the Afon Berthen and subsequently aims to involve YO. The aim is to double the number of households involved and increase the scope of the Energy Local Club within the community.   As a trial scheme, the Energy Local Club engages local households involved in the scheme to align their energy use more closely with the production of local renewable energy, resulting in reduced energy costs amounting to 30%. This is based on two tariffs, initially centred on encouraging members match their energy use to the hydro generating and focused on the 'time of use tariff'. This requires members to maximise the benefits of using energy during quieter periods of the day rather than during busier times with more expensive tariffs such as at breakfast or tea-time. In this way, it develops a partnership with local people to gain access to lower cost electricity, with the added benefit of supporting the use of the local hydro scheme (Regen, 2021a).

Profile: Dyffryn Gwyrdd and Heuldro Ogwen

In addition, a recent development in 2019 between Partneriaeth Ogwen and YO was the Dyffryn Gwyrdd project. This centred on facilitating sustainable and environmental initiatives in the local area, including generating community-based transport, volunteering, local food production and energy efficiency. As part of this initiative a hub was established on the high street in Bethesda. At the time of the study, an application for funding was being submitted to the National Lottery Community fund which subsequently awarded from 2020.

An additional development that was planned by YO as part of a submission for funding by March 2020 was the Heuldo Ogwen project. This focused on establishing solar panels on public buildings in the community centred on the rugby club, Neuadd Ogwen and the Dyffryn Gwyrdd hub office(Figure 19). It aimed to lower the energy costs for public buildings in the community and increase the use of CRE within the local area. The application was being prepared during the study period and subsequently at the end of the study, the project has now been established.

Figure 19:   Heuldro Ogwen project (Simone, 2020)

Table 11: Awel Co-op CRE project profile

- **Location:** Mynydd y Gwrhyd, Cwmllynfell, Neath Port Talbot and the boundaries of the AC scheme bridge the Aman and Tawe valleys
- **Technology**: two 2.35 MW wind turbines
- **Energised:** It was energised in January 2017
- **Ownership model:** Awel co-op as a BenComs was established in 2015 by the Awel Aman Tawe community energy charity, which was developed initially in 1998.
- **Aims:** The CRE project aims to provide an opportunity for the community to directly own local wind turbine and tackle climate change
- **Social impact:** The CRE project focuses on bringing benefits to the local community through generating low-carbon energy, with the surplus income channelled back into the community through a local charity, Awel Aman Tawe. This is used to help address fuel poverty, build community engagement on climate change and develop follow-on renewable energy projects. Awel Aman Tawe is an established energy charity supporting the generation of community schemes across technologies, such as wind and solar as well as engaging in energy efficiency across the region (Figure 20).

Figure 20: Awel co-op wind turbine (Field site visit)

Profile: Egni co-op

Building on the Awel co-op CRE project and the initial work of the Egni Co-op initiative establishing roof based solar installations within the local area, the community group are developing a further extension of Egni Co-op. This increases the scope to over 250 sites across Wales (Figure 21). It focused on reducing energy cost and increasing renewable energy generation, alongside support climate change awareness and education work within schools Egni-coop, 2020)

Figure 21:   Egni co-op rooftop solar on community buildings including schools (Egni-coop, 2020)

Table 12: Gower Regeneration CRE project profile

- **Location:** Situated at Killan Farm, Dunvant, Swansea

- **Technology**: capacity of 1 MW solar farm

- **Energised:** It was energised in March 2017.

- **Ownership model:** The GR CRE project was developed by Gower Power Co-op CIC as a collaboration with 'Y Felin Dwr Charitiable Trust' who manage the Gower Heritage Centre to develop the Gower regeneration Community Benefit Society.

- **Aims:** The key aim of the project is to utilise the surplus income accrued during its 30-year lifespan to reinvest into new environmental-projects and sustainable development education (Figure 22).

- **Social impact:** The CRE project aims to develop community investment focused on future projects around the ecology of the local natural environment and highlight the value of local heritage, as well as support community sustainability initiatives locally.

Figure 22:   The Killan solar farm (Gower Regeneration, 2019)

Profile: Gower Power solar storage project

Subsequently, GR has provided a template for future innovative developments and scaling-up of schemes, using battery technology for electricity storage and supply model (Figure 23). The project was under the development of Gower Power during the study period. The project has been completed in 2020 with the connection of 228 kW storage to the existing GR solar farm. As such, the community and local businesses were able to take advantage of the energy and storage from GR CRE project, with any top-up energy provided in renewable form by 'Ecotricity' (Regen 2021b). It aimed to tackle a key target of community energy, facilitating local communities to benefit from locally produced renewable energy by reducing energy bills and directing surplus income for use within local communities (Community Energy Wales, 2018). It secured £610k of European funding as a storage scheme that could met the needs of approximately 300 local residents utilizing smart meters.

Figure 23: Battery storage installation on the GR solar farm (Regen, 2021a)

1.5.4 Case studies: Generating electricity and income

The CRE identified a key aim to produce renewable energy and also provide localised benefits for the community. In this way, the projects sought to support energised Welsh communities. The CRE projects generated both energy and income as part of an integrated and dynamic process (Figure 24). The initial stage from producing energy through the solar, hydro or wind CRE project was followed by a series of steps focused on firstly '*Selling the energy'* to the Grid, based on FITs or ROC. As part of the FITs, the two tariffs focus on the Generation tariff which provides payment per unit of electricity guaranteed for 20 years, although based on the scale of the installation. Secondly, as part of FITs the Export tariff is a further payment per unit of electricity fed-back to the Grid. However, in the case of GR, it operated via a Renewables Obligation Certificate (ROC) over a 20-year period, representing 50% of its income. The ROC is paid per unit of electricity. The subsequent stages involve utilising the '*Income stream'* to meet a range of commitments and then continuing to provide a '*Return on investment'* for shareholders. In terms of a return on investment, the majority of CRE projects indicated a 5% rate of return extending across a 20-year timespan. Further, shares were not transferrable and could not be traded on a stock exchange. The final stages of this dynamic cycle involve using the *'Surplus income'* for community benefit, leading to the development of a '*Charity*' to distribute community benefits.

Figure 24:   Generating energy and income from CRE projects: A summary

The CRE projects sell their electricity to the Grid to gain long-term income. This is through the FITs or ROC over 20-year period, including two tariffs.

The administration of income arising from CRE project for distribution within local community:
Awel Aman Tawe, Dyffryn Peris and Elusen Ogwen.

Generating Renewable Energy

CRE Projects

Generating Income for Communities

The revenue will be divided between repaying loans, meeting operational maintenance costs, return to shareholders and benefiting the community. Any revenue weather dependent.

The surplus income from projects directed to support social impacts for communities based on Community Benefit Society model, focused on the mechanism of a charity, related to the CRE project aims but a separate entity from the project itself.

Providing interest payment to shareholders every year, ranging from 3-5%.

Selling Energy

Charity

Income Stream

Surplus Income

Return on Investment

1.6. Thesis Chapters

The respective chapters within the thesis are as follows:

- **Chapter Two: Literature Review -** the chapter focuses on details a narrative review completed by the researcher and maps a number of key thematic areas. It provides a critical appraisal of the literature aligned to the research questions. In this way, it establishes the research gaps and identifies key themes in the existing evidence, positioning the research questions within the broader literature and maps how the study seeks to address the research gap.

- **Chapter Three: Methodology and methods** -The chapter details the methodology and methods used to address the research questions. This was underpinned by a constructivist stance by the researcher. As such the chapter documents the qualitative case study approach adopted to explore CRE, centred on Yin (2014) and a study design operationalising a multiple embedded (explanatory) approach focused on a number of case studies across a North and South Wales context. Consequently, the approach to the literature, the role of theory as well as the sampling, data collection and analysis strategies are identified. Further, there is also a reflection on the application of the design in practice and its strengths and weaknesses.

- **Chapter Four: Findings and Analysis: Community and Place –** The chapter details the contextual setting for the renewable energy projects across the case studies, identifying the relationship between communities, their landscape and renewable energy. In this way, the study explored a range of perspectives on the meanings, experiences and representations of 'community' and 'place', including different forms of place attachment

- **Chapter Five: Findings and Analysis: Social and Cultural Capital** -The chapter presents the findings focused on bonding capital and how it operates *within* CRE groups, whilst bridging capital is focused on the social connections *between* CRE projects and other community energy groups. In contrast, linking capital extends the interconnections to how CRE groups relate to policymakers. The findings predominantly highlight the significance

of social capital but also surface the relevance of cultural capital such as skills, knowledge, and experience.

- **Chapter Six: Findings and Analysis: Civic Engagement in CRE -** The chapter identified different modes of civic engagement across case studies, including the challenges faced in engaging with CRE. In addition, the findings document what local and global factors were important in being motivated to become involved with a CRE project. The findings highlighted how these operated across different actors and represented varying degrees of engagement with the CRE projects. Further, the findings identified the BenComs model used by CRE groups that aimed to deliver benefits for local communities.

- **Chapter Seven: Findings and Analysis: Social Impacts from CRE** - The findings indicated a range of direct and indirect impacts identified by participants involved in the CRE projects focused on key stakeholders and shareholders, as well as the wider perspective of community hubs. The social impacts emerging from CRE projects were perceived and experienced by participants as cutting across socio-cultural, environmental, and economic aspects.

- **Chapter Eight: Synthesis -** The chapter initially identifies the main novel contributions detailed in the findings, prior to reflecting a series of recommendations centred on policy, research, and practice. The final section of the chapter considers some final concluding remarks.

1.7. Summary

This chapter provided an overview of the focus of the thesis, framed around a series of research questions and objectives that sought to explore social impacts in CRE and the way a range of case studies illuminated energised Welsh communities. It presented an outline of the key operational definitions centred on CRE, social impacts and sustainable development as well as mapping the contextual setting within the sphere of policy context. The main features of the CRE sector were identified, with reference to an international and UK context. Equally, the

theoretical framing of the study is positioned focused on community, place attachment and social capital and their relevance to CRE. Finally, the detail around the respective case studies underpinning the study were identified, in order to map the setting for the four CRE projects and consortium, prior to finally describing the subsequent chapters in the thesis.

CHAPTER TWO:
'ENERGISED' COMMUNITIES: A REVIEW OF THE LITERATURE

2.1 Introduction

The arena of community renewable energy (CRE) research has significantly developed over the past 10 years, leading to an established and distinct field of inquiry based on empirical research. As the area of CRE has become more established as a social phenomenon, there has been a subsequent development of the research work building upon the platform provided by seminal authors, in its formative stages within the UK (Walker, 2008a, 2011; Walker and Devine-Wright, 2008; Devine-Wright, 2009). There continues to be a strong emphasis on the UK context within the literature with the prominent role of rural Scotland and some early work in England and Wales (Walker *et al.*, 2007, 2010; Walker and Cass, 2007; Rogers *et al.*, 2008; Devine-Wright, 2011; Devine-Wright and Howes, 2010; Bomberg and McEwen, 2012; Haggett and Aitken, 2015; Markantoni and Aitken, 2016; Steiner and Markantoni, 2016). In this way, the research work has developed in parallel to the increased presence of CRE in these regions.

In a broader sense, the literature has also been extended, focusing on a European perspective. The literature details how Germany, Denmark and the Netherlands represent the leading areas driving forward CRE in Europe (Radtke, 2014; Schoor and Scholtens, 2015; Bauwens, Gotchev and Holstenkamp, 2016; Bauwens, 2019; Kalkbrenner and Roosen, 2016;), with an additional international focus on the US and Australia (Hoffman and High-Pippert, 2010; Hicks and Ison, 2011; Hoffman *et al.*, 2013). Although CRE has emerged as a discrete research area within the literature, it remains a dynamic and emerging field of research in an applied context. In this way, the development and implementation of CRE is represented

across a range of technologies, scales, stakeholders, governance structures and community contexts (Becker and Kunze, 2014; Van Veelen, 2018).

 Overall, the literature has increasingly focused on a number of thematic areas which provide a more detailed account of the field, focused on attitudes towards and local participation in CRE developments (Creamer, Eadson, van Veelen, *et al.*, 2018). The earlier period of research in CRE focused on seeking to understand what was meant by CRE and the social attitudes towards it (Rogers *et al.*, 2008; Walker and Devine-Wright, 2008; Warren and McFadyen, 2010; Devine-Wright, 2011), as well as a focus on motivational factors and barriers for civic engagement (Walker, 2008; Hoffman and High-Pippert, 2010; Allen *et al.*, 2012; Bomberg and McEwen, 2012; Walton, 2012; Seyfang, Park and Smith, 2013; Brummer, 2018). The literature also highlights socio-economic impacts emerging from CRE projects, including the outcomes from community-led and owned projects on rural development (Bere, Jones and Jones, 2015; Haggett and Aitken, 2015; Slee, 2020; van der Waal, 2020).

There was also an initial exploration in the literature on the potential role of communities in developing sustainable transitions on a wider scale (Seyfang and Haxeltine, 2012; Hargreaves *et al.*, 2013). A recent development is an increasing focus on the examination of social and political domains of CRE, which was driven through attention on energy justice and fuel poverty (Park, 2012; Catney *et al.*, 2014; Simcock, 2016; Forman, 2017). These themes and the relationship between 'community' and 'energy' has been recognised and explored by geographers. This has centred on examining the interconnections associated with place involved in CRE projects, including having a stake and collective benefits (Bristow, Cowell and Munday, 2012; Creamer, Eadson, van Veelen, *et al.*, 2018).

The literature on CRE as a whole is divided into two broad approaches, centred on either detailed qualitative case studies or large-scale surveys (Anna L. Berka and Creamer, 2018). The focus of different studies reflects their choice of approaches. Case studies centred on understanding exemplars of CRE projects in practice focused on drivers, the barriers faced and benefits (Walker and Devine-Wright,

2008; Hicks and Ison, 2011, 2018; Allen *et al.*, 2012; Rogers *et al.*, 2012a; Markantoni and Woolvin, 2015; Haf and Parkhill, 2017; Slee, 2020). The qualitative case study work presents an in-depth analysis of the development of CRE projects, and increasingly the emerging impacts. In contrast surveys seek out patterns across the CRE sector and wider regional or national areas (Walker *et al.*, 2007b; Bomberg and McEwen, 2012; Mills, 2012; Seyfang, Park and Smith, 2013; Bere, Jones and Jones, 2015; Robinsion and Stephen, 2020).

The literature review in the study focuses on the emerging areas and research gaps identified in the literature. As such the chapter details a narrative review (Taylor and Spicer, 2007; Allen, 2017) completed by the researcher and maps a number of key thematic areas. These centre on mapping the literature around community renewable energy (CRE), including '*Initial Concepts', 'Civic Engagement with CRE'* and *'Social Impacts'.* These themes provide a critical appraisal of the literature aligned to the research questions, centred on CRE:

- What is the role of 'Community and place' for Welsh communities in a community renewable energy context?
- What are the social processes driving forward community renewable energy in Wales?
- What are the social impacts for Welsh communities in a community renewable energy context?

2.2. Emerging Themes and Gaps Within the Literature: Initial Concepts

2.2.1 Meanings and the use of 'Community'

Community as a contested concept

The evidence-base presents multiple definitions of what is meant by 'community', with a blurring of its boundaries as a concept, based on an established literature in the area of community studies (Walker and Devine-Wright, 2008; Peters *et al.*, 2012; Markantoni and Woolvin, 2015). A central thread within the literature focuses on how community relates to renewable energy transitions and a range of views on the nature of the definitions of 'community', its value and then its role within the emergence of CRE (Walker and Devine-Wright, 2008; Walker *et al.*, 2010; Süsser, Döring and Ratter, 2017; Creamer *et al.*, 2019). Although there is a lack of

consensus within the literature about what constitutes 'community', the concept still retains a deep relevance for understanding the context for CRE despite the divergent perspective of researchers. It provides a lens for understanding what is meant by community for those involved in CRE, as a frame of reference for analysis and remains meaningful:

> *"Just because community can be fuzzy and is imagined and materialised differently, does not imply community is any less 'real' or unimportant wherever we find its ghostly presence" (*Creamer *et al.*, 2019, p2)*.

Despite the range of views on the value and meaningfulness of what is represented by 'community', a common set of characteristics have emerged within the literature. These draw on the important role of geographical place in understanding 'community', its situational and localized, scale as well as a sense of the familiar and positivity (Walker *et al.*, 2010; Becker and Kunze, 2014; Creamer *et al.*, 2019). Some researchers increasingly focus on the need to move away from an overemphasis on resolving the conflicted definitions around what constitutes 'community'. Rather they argue it is crucial to recognize the pluralist nature of 'community' and seek to understand the context in which meanings and values are built (Creamer et al., 2019). It is why and how these meanings are mobilized by members of a 'community' in various contexts that matter in shaping CRE (Walker and Devine-Wright, 2008; Walker, 2011; Hicks and Ison, 2018). This highlights the importance of framing 'community' from the perspective of diverse actors and avoiding the pitfall of a singular and unidimensional concept in the field of CRE. As such community is not conceptualized as a concrete definition with firm idealized boundaries but seen as a 'bottom up' social dynamic, created by its own context. In this way, research needs to examine 'why community matters in any particular situation' (Creamer *et al., 2019, P2)*.

In the study, the researcher sought to examine the contextual meanings of community as articulated by participants involved in CRE projects, situated within particular community settings across a series of case studies.

Communities of place and interest

Overall, a consistent theme is an emphasis on CRE having a focus on projects centred on ownership (part or full) within a '*community of place or interest*' (Haf and Parkhill, 2017, P103). In this context, 'community of place' focus on a specific area, whereas 'community of interest' centre on a shared set of experiences or ethnic identity (Walker and Cass, 2007; Becker and Kunze, 2014; Süsser et al., 2017). In this way, the UK represents a pattern of community energy projects that are citizen led by key individuals within the community and focused social and economic impacts that are anchored within a particular geographical area (Parag *et al.*, 2013; Haggett and Aitken, 2015; Markantoni and Woolvin, 2015).

Although largely centred on particular geographical areas, there may be multiple communities present that are not always strictly bounded and '*transcend physical delineations*' (Walker *et al.*, 2010, P2657). Indeed, the literature suggests that examining CRE uncovers the problematic nature of attempting to account for what represents a 'community' in an applied context (Walker, 2011; Seyfang, Park and Smith, 2013; Hicks and Ison, 2018). The assumption that a specific community relates directly to a particular place is a key issue in mapping CRE, requiring care and attention to the complexity and pluralism of communities (Bristow, Cowell and Munday, 2012). This has been an established criticism from authors such as (Shucksmith, 2010), involving the overlapping areas of communities of place and interest:

> *"Indeed, it has long been established that communities of place are far from homogeneous and include multiple and diverse 'communities of interest' "* (Bristow, Cowell and Munday, 2012, P1109).

Consequently, communities are potentially highly complex with different strands of relational ties and may represent a range of conflicting 'communities of interest' as part of its diversity (Bristow *et al.,* 2012).

Different conceptualisation of community within CRE literature

Within the field of renewable energy, a range of interpretations and representations of 'community' have emerged. In this way, there are diverse representations and applications of the term 'community' within a policy-based or practice context in CRE (Markantoni and Woolvin, 2015). The value of Walker's (2011) account is its review of *how* community has been utilised within the range of discourses involved in renewable energy and the environmental context, extending across a number of levels from policy, research to implementation in local renewable energy practice. Walker's (2011) work results in a degree of clarity and formulates a set of core meanings which can be applied to community in a low carbon transition (Table 13).

In summary, 'community' is viewed through the lens of a particular set of actors, the scale and scope of community activities, its position within the context of place and particular networks (Walker, 2011).

Table 13: Defining 'community' in low carbon transition (Walker, 2011)

Community descriptor	Focus and context
Community as actor	This form of community is characterised by its ability to take action focused on a set of actors that engage in collective action, based on interconnecting networks and interrelationships. These actors are viewed as a part of the 'public' or community.
Community as scale	This form of community is positioned within a hierarchical scale of environmental action, involving 'collective' form of action government structures.
Community as place	This form of community denotes a web of relationships centred in a particular 'place', around a particular geographical area or location. This notion is applied in renewable energy, such as a village being transformed into a 'low-carbon community'.
Community as network	This form of community is composed of a set of networks and social interrelationships but can extend beyond specific boundaries of place-focused networks. Exemplars include 'investor networks' in a CRE project or virtual networks associated with 'climate justice'.
Community as process	This form of community focuses on a particular form of action involving participation of citizens in environmental sustainability initiatives This frequently involves practical input with volunteering and engagement of community members.
Community as identity	This form of community is aligned to a 'way of thinking' as an approach to day-to-day life. involving being 'civic minded'.

Uncritical framing and role of community within CRE

In many respects, the concept of 'community' in the literature has been characterised by its reporting through an overtly romanticised or critical lens. With the increasing emphasis on community-based initiatives there has been a parallel development in the literature, seen as a renewed interest in the concept (DeFilippis, Fisher and Shragge, 2006). The role of community within CRE is identified by Creamer *et al.*,(2018) as being inadequately described in the literature, often based on unchallenged positive assumptions. The positivity assigned to the term 'community energy' often relates to a sense of CRE having a 'moral good' (Aiken, 2014) as well as 'community sprit', denoting strength (Veelen, 2018). This is grounded in the notion in a communitarian perspective that may overemphasise the goodness and unidimensional nature of communities, often set apart from any context (Walker and Devine-Wright, 2008; Aiken and Aiken, 2015). For instance, communities may be divisive and exclusive in nature whilst appearing cohesive and inclusive (Walker, 2011). As such, the meaning of community is contested and configured differently by the range of people living within those communities (Walker *et al.,* 2010). This more nuanced account of community is required to critically appraise CRE, so as to avoid *"rose-coloured presumptions and associations"*(Walker *et al.*, 2010, P2658)*.* Indeed, Creamer *et al.*, (2018) echoes the importance of viewing the relationship between community and CRE as being complex and nuanced**.** Consequently, there is a need for greater research to examine the interrelationship between what is meant by aligning 'community' with the term 'energy' in practice (Bristow, Cowell and Munday, 2012; Devine-Wright and Wiersma, 2013; Hicks and Ison, 2018).

In the study the researcher sought to examine the role of 'community' within CRE across local stakeholders, shareholders, and community hubs. This included exploring how community was constructed and evidenced in CRE projects, focusing on how they were community-led and distributed social impacts.

Continuum of community engagement in CRE

The term community is often used to imply not only cooperative action and local decision-making but also a distributive form of benefits (Walton, 2012; Veelen and Haggett, 2017). As noted by Berka and Creamer, (2018) there is a variable degree of direct or indirect engagement with communities by CRE projects, which lead to a range of possible positive community outcomes. Therefore, "*it cannot be assumed that they will generate uniformly positive local impacts*" (Berka and Creamer, 2018, P3401). The diverse nature of community as a concept in practice is echoed by Walker *et al.*, (2007), challenging the view of a 'communitarian principle' in the context of renewable energy. In this context, research highlights that the presence of trust and cohesion may not be guaranteed among communities and local groups merely by the application of the label 'community' project. In particular, different parts of communities may consider that they have not been part of shared processes or obtain benefits from a CRE project (Walker *et al.*, 2010).

The model by (Walker and Devine-Wright, 2008) provides insight into the complexities of how CRE is operationalized in practice. It recognises the importance of local participation and shared benefits in CRE (Haggett and Aitken, 2015). In this context, Walker and Devine-Wright, (2008) identify that CRE is not only limited to the scale or type of the technological features of the scheme, but is underpinned by the developmental 'social arrangements' of a project (Hicks and Ison, 2018). As a framework it provides a platform that builds a greater understanding of the wide range of interpretations and meaning related to the twofold components of process and outcomes, in CRE projects. The model facilitates clarity on focusing on two clear dimensions, namely process and outcome (Figure 25) which underpin the diverse ways renewable energy are viewed and implemented as projects. These are defined by Walker and Devine wright (2008) as:

> "*First, a process dimension, concerned with who a project is developed and run by, who is involved and has influence. Second, an outcome dimension, concerned with how the outcomes of a project are spatially and social distributed- in other words, who the project is for, who it is that benefits particularly in economic or social terms.*" (p498)

Figure 25: Mapping process and outcomes in CRE projects: Walker and Devine-Wright's (2008) model
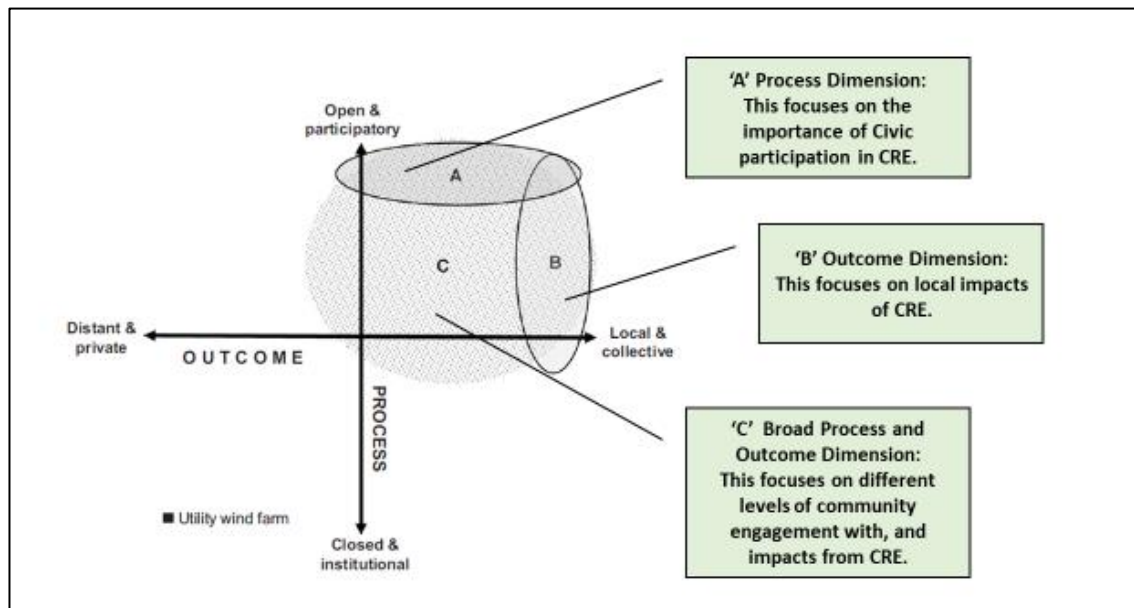
Within their framework, Walker and Devine-Wright (2008) present a dimension of Process, framed as a continuum ranging from '*Open and participatory*' to '*Closed and institutional*'. CRE projects at an '*Open and participatory*' extremity centre on significant local involvement by communities to develop a scheme. However, a '*Closed and institutional*' extremity identifies projects lacking community involvement. The Outcome continuum varies from '*Distant and private*' to '*Local and collective*' positions. For outcomes characterised as '*Local and collective*' represent ownership and benefits to specific communities. Yet, as part of the '*Distant and private*' extremity, benefits were accrued by external stakeholders. often framed around in commercially owned projects. Walker and Devine-Wright (2008) utilise illustrative exemplars to highlight the varied positions of CRE projects along the Process-Outcome continuum, with a utility wind farm characterised as '*Closed and institutional*' and occupying a lower-left extremity in the quadrant. In contrast, a community orientated project was positioned at the upper right quadrant, incorporating a significant community rootedness, combined with localised benefits as Outcomes (Walker and Devine-Wright, 2008; Creamer *et al.*, 2019).

Recent research highlights the role of the framework as a critical juncture in moving forward an understanding and the meaning of CRE and its development across a range of contexts. As such, it presents a framework to inform what may be the parameters and key concepts linked to CRE (Creamer *et al.*, 2019). The model provides a degree of clarity through its representation using a visual representation of *how* process and outcome are configured in different community renewable energy projects. Overall, the framework drives forward an understanding of CRE that is applicable for other researchers, policy and practice (Creamer *et al.*, 2019).

Although, Hicks and Ison, (2018) identify the potential weakness of the framework focused on its reliance on the dimensions of process and outcome. They argue the need for greater specificity of what constitutes a legitimate process and outcome, as well as a more nuanced approach to understanding their application in practice. A key challenge for the utility of the framework is the diverse forms of CRE processes and outcomes amidst varied definitions of community energy. A potential risk for the development of CRE is the application of the framework a critical appraisal of its utility, fit and relevance to those contexts (Creamer *et al.*, 2019).

An important aspect of the critique of the framework by Creamer *et al.*, (2019) is its division of process and outcomes operating independently of each other within the context of CRE. However, recent research emphasises that there often exists an interrelationship between process and outcome in CRE (Creamer *et al.*, 2019). For instance, CRE projects may generate empowered communities as an outcome, but this also requires the interrelated process of democratic participation. Although, the research developed from Walker and Devine-Wright's (2008) model highlights '*who the project is by*', (P497) centred on who is involved or not in the processes of development in CRE. However, a key future agenda is extending the framework by addressing '*who the project is for*',(P497) as there is limited evidence on *how* communities benefit from CRE and recognizing any dis-benefits (Creamer *et al.*, 2019). In the study, the researcher explored both processes and outcomes, aligned with Walker and Devine-Wright's, (2008) model as a framework, in terms of who was engaged in developing CRE projects and their experiences of social impacts.

2.2.2 Place attachment

The relationship between 'place' and people has received increasing interest within the literature. Despite differences in the interpretation of what is meant by 'place' a shared thread is how people relate to place and assign meaning to locations (Devine-Wright, 2009; Devine-Wright, 2013). Its meaning relates to a range of scales from locality to a global context and is associated with a sense of identity and belonging (Mclachlan, 2009; Devine-Wright and Batel, 2017). In this way, place is significant not only as a physical environment but also: '*Place is not just a thing in the world ... place is also a way of seeing, knowing and understanding the world*' (Cresswell, 2003, p. 11). Therefore, place attachment can be best understood as representing the connection between individuals and the physical environments that generates meaning for them (Devine-Wright and Howes, 2010; Lewicka, 2011; Veelen and Haggett, 2017).

Arguably, place attachment is a precondition to 'place identity'(Hernandez *et al.*, 2007) and a particular form of a 'sense of place' (Venables *et al.*, 2012). However, broadly 'place' suffers from a lack of conceptual clarity within the literature, ranging from a sense of place, place attachment and identity (Veelen and Haggett, 2017). The main difficulty is that 'place' has been examined by a range of differing disciplines utilising a spectrum of approaches leading to blurred interpretations of its meaning. This results in a lack of distinction between what are different but related concepts. Yet a shared area of agreement is the largely positive meaning attributed to place (Lewicka, 2011; Devine-Wright, 2013). In terms of place attachment, it focuses on what is the process and outcome of 'attachment' and an emotional relation to a particular location. In this way, it involves both physical and social attributes and resulting in individual and community action (Manzo and Perkins, 2006; Devine-Wright, 2009). In the study, the researcher adopted the stance of Devine-Wright (2009) by viewing place as representing a *"variety of meanings"* (p.427) that were centred on a particular locality and related to both individuals and groups within communities.

Place and renewable energy opposition

Place attachment has been widely applied to understanding communities responding to substantive commercial projects as part of a narrative centred on opposition (Bell *et al.*, 2005; Dan Van Der Horst, 2007; Cass and Walker, 2009; Devine-Wright, 2011; Burningham, Barnett and Walker, 2015). Within the field of renewable energy, the modification of landscapes is a common thread and frequently framed in the form of communities being opposed to developments because of interference with their landscapes, particularly linked to placing of windfarms (Wolsink, 2006; Llewellyn *et al.*, 2017a). Furthermore, in the context of RE and place attachment, Devine-Wright (2009) critiques the use of NIMBYism and proposes an alternative approach, based on moving away from a focus on physical dimensions of a developmental site. This centres on examining the social construction, symbolic meanings of place and their interpretation by communities, and how they align or conflict with the proposed project

The area of place attachment has emerged as a key concept in the literature for interpreting how communities respond to substantive renewable energy schemes (Bell *et al.*, 2005; Devine-Wright, 2009; Devine-Wright, 2011). Yet there is a research gap in understanding the role of place attachment in defining people's responses to community initiatives (Veelen and Haggett, 2017). Indeed, the work of van Veelen and Haggett, (2017) highlights the importance of exploring the influence of place attachment in driving forward the development of CRE projects. This contrasts with an exclusive focus on evaluating its position in shaping local responses to CRE projects. In the context of CRE it has relevance in understanding how projects are aligned with the community's sense of 'place', including local cultural, historical and environmental contexts (Dan Van Der Horst, 2007; Devine-Wright and Howes, 2010; Devine-Wright, 2011). Community-led projects may benefit from being shaped around an emplaced local context, centred on the symbolic meanings of place and the history of those communities (Devine-Wright, 2011a). Indeed, Creamer, (2015) highlights the importance of communities being aligned or associated with a particular place in influencing engagement with CRE.

Social and physical aspects of place attachment

The contemporary literature has increasingly viewed place attachment as composed of both physical and social domains (Gunderson and Watson, 2007; Devine-Wright, 2011). In this context, although place attachment represents an interrelationship between both these dimensions, it is important to distinguish their physical and social dimensions (Table 14). In this way, the physical dimensions centre on functional attachment (Lin and Lockwood, 2014a)(Lin and Lockwood, 2014b) and emotional attachment (Hernandez *et al.*, 2007). These relate to how people use their local landscapes as well as construct and embed their identity within the physicality of place. Furthermore, the social dimension is focused on social attachment, based on historical-cultural anchors in a place that derives meaning for individuals and the wider community (Hidalgo and Hernández, 2001; Walker and Devine-Wright, 2008; Lin and Lockwood, 2014b). Consequently, there is a dynamic interconnection between the physical and social contexts of place as suggested by van Veelen and Haggett (2017), indicating how meanings of place were framed around fixed geographical parameters with added historical attachments.

> "*Although these 'places' are both administrative and geographically bounded areas, they are not static, pre-given entities. Rather their meanings are contingent and at times controversial produced through the practice of social relations both within and external to the location*" (van Veelen and Haggett, 2017, P535).

The study examined the constructions of the interactions between the social and physical aspects of place. The focus was on exploring the context, meaning and relationship to place within which CRE projects were situated. The researcher sought to examine how CRE projects were potentially tangible ways of connecting with the environment and the physicality of place. In parallel, the study sought to understand the social relationships and cultural identity of place, surfacing people's constructions as part of their lived experience of a locality.

Table 14: Physical and social dimensions of place attachment (Van Veelen and Haggett, 2016)

Physical Dimension	Social Dimension

Physical Dimension	Social Dimension
Functional attachment *Utility of place* It describes a dependence on natural resources of the local environment to support activity. **Emotional attachment** *Affinity to place* It describes the way people construct and embed meaning to their landscapes, locating people's sense of identity.	**Social Attachment** *Community belonging and social ties to place* It describes a connection to a place, including emotional and social ties. It centres on historical or cultural grounding to a locality. As a result, people experience a cumulative sense of identity at a community scale and an embedded sense of belonging that may relate to an individual and collective level.

Making connections between place and CRE

The literature suggests that place has an important role in supporting local participation with CRE, based on a connectedness with place and belonging aligned with localised benefits (Hoffman and High-Pippert, 2010b; Bomberg and McEwen, 2012; Haggett and Aitken, 2015; Süsser, Döring and Ratter, 2017; Creamer , *et al.*, 2018). The literature requires a more detailed consideration and understanding of the complex relationships between place and communities, focused on *how* communities relate to local energy transition. Further, there is a need for research to *"highlight the importance of individual and collective place meanings as well as actions of local entrepreneurial individuals and groups as significant factors in their success"*(Llewellyn *et al.*, 2017a, P820).

The work of Veelen and Haggett, (2017) provides a useful account in this area and identified that place attachment was a key factor in the motivation of community

members in developing CRE projects the context of two highland Scottish schemes. However, the study also highlighted how varying forms of place attachment also led to disagreements within communities. Another key study centres on a *et al.*, (2017a) which utilised a *'stories of change'* approach to open-up the discourse and meanings associated with *'evolving energy landscapes'* (p.818), based on past coalmining and current innovative renewable energy developments within the South Wales Valleys. However, Llewellyn *et al.*, (2017a) focuses on the responses to place within the context of commercial and large scale RE energy and does not provide a detailed consideration of community-led projects. In addition, an important study by Haf and Parkhill, (2017) highlighted cultural attachments focused on belonging and place, which were grounded in a shared history and language. In this way, engaging with the CRE projects aims to promote cultural sustainability by supporting the Gaelic and Welsh languages

The study builds on this work and seeks to explore differing forms of place attachment within the context of the communities linked to CRE projects. Furthermore, the researcher sought to examine the extent to which attachment to place was a driver for engaging in these place based CRE projects.

2.2.3 Social capital

Social capital as process

Social capital is best understood as being focused on social interrelationships and networks, across those pursuing common goals underpinning and resulting from collective action (Rivera *et al.*, 2019; Putnam, 2000). However, there is a lack of clarity within the literature in identifying and delineating what are contributory factors of social capital, and what are its benefits (Walker *et al.*, 2007b; Berka and Creamer, 2018). An important catalyst for social capital is active citizen involvement, underpinning the development of sustainable communities. As such, it supports collective action and local entrepreneurship (Yildiz *et al.*, 2015). Yet within the literature, a key research gap is mapping the processes involved in how social capital develops and generates community energy activities (Morrison and Ramsey, 2019). Significantly, there has been an increasing recognition of the need

to explore how social capital operates within the context of civic groups using qualitative approaches, so as provide a more detailed account (Kingsley *et al.*, 2007; Firth, Maye and Pearson, 2011).

Bonding, bridging and linking social capital

The central concepts in social capital were identified by Putnam in '*Bowling Alone'*, signalling the importance of bridging and bonding as a typology (Patulny and Lind Haase Svendsen, 2007; Putnam, 2000). The definition of bonding social capital refers to the set of relations within a specific group and an 'inward' focus (Halpern, 2005). As part of a community context this would be akin to cohesiveness and strong social ties, aligned with collective action (Bere, Jones and Jones, 2015; Rivera *et al.*, 2019). In contrast, bridging is directed towards an 'outward' interrelationship between individuals and groups that are more distantly positioned yet have some shared interests, generating out-group trust (Bere, Jones and Jones, 2015; Rivera *et al.*, 2019). The implications of bonding are framed by Putnam as being centred on 'getting by' whereas as bridging is focused on 'getting on' (Agnitsch, Flora and Ryan, 2006; Claridge, 2018). In relation to linking, there is also an emphasis on an 'outward' focus however there is a distinction in extending across power-based hierarchies (Halpern, 2005; Bere, Jones and Jones, 2015; Woolcock, 2001). Significantly, the areas of bonding, bridging, and linking social capital are required to develop well-connected communities. However, a key factor is achieving a balanced approach across these different forms of social capital (Firth, Maye and Pearson, 2011; Morrison and Ramsey, 2019).

The work of Bere, Jones and Jones (2015) highlight that the CRE literature tends to account for social capital in an implicit way. In particular, it focuses on how projects develop community cohesion and civic engagement. The work of Bere *et al*., (2017) provides a key exemplar of a study which centred on social impacts emerging from two hydro CRE projects, with particular reference to bonding capital. Overall, 64% of participants reported that the hydro projects could facilitate building empowerment and increased confidence by communities (Bere *et al.,* 2017). Similarly, Bomberg and McEwen, (2012) examined a 100 Scottish CRE projects and

highlighted the importance of common aims and values that underpinned trustworthiness and addressing obstacles. This aligns with the literature associating bonding social capital with the development of common objectives and interpersonal networks as a resource to generate community action (Berka and Creamer, 2018).

There is relatively little attention given in the literature to bridging and linking components of social capital, despite the key role they may play in CRE. There needs to be a greater consideration of bridging as a pathway for the dissemination of knowledge and experiential amongst CRE groups. Equally linking social capital is significant, as it potentially develops interrelationships between CRE projects and governmental organisations or actors, including in the area of funding and policy (Bere, Jones and Jones, 2015). Overall, the work of Bere, Jones and Jones (2015) highlight the significant growth in both bridging and linking activities in the CRE sector. This was exemplified by one of the cases, the Torrs Hydro, involving eighty visits ranging from community groups, schools, universities and governmental ministers.

Although some research has explored the role of intermediaries, such as local authorities, engaging in brokering to support and facilitate CRE projects (Hicks and Ison, 2011; Hargreaves *et al.*, 2013; Parag *et al.*, 2013; Callaghan and Williams, 2014a; Fudge, Peters and Woodman, 2016; Berka and Creamer, 2018). Parag et al, (2013) highlighted the role of 'knowledge brokers' spanning a range of levels from Local Authorities to charities, and local low carbon community groups in Oxfordshire. Further, the focus has been on the socio-technical and multi-level perspectives and contextualising intermediaries predominantly through the lens of their roles to enable fostering niches (Hargreaves *et al.*, 2013; Fudge, Peters and Woodman, 2016; Creamer, Eadson, van Veelen, *et al.*, 2018). However, this literature is situated in isolation, and it remains separate from the theoretical framework of bridging and linking social capital.

Within the literature Callaghan and Williams (2014) reflect on the generation of new networks across a range of levels in the case area of rural Scotland. This

includes enhancing the linkage within and between community groups and facilities. This process was illustrated by CRE projects opening up their sites for visits by other groups (Callaghan and Williams, 2014). Furthermore, CRE projects resulted in having greater community networking with the provision of adequate heating in community facilities. Overall, the evidence-base has not examined sufficiently the development of networks between the CRE and wider community groups, at the local level. The study explored this research gap, with an explicit focus on the case of the Cyd Ynni Consortium in North Wales. This was to understand in detail how such local CRE group connections were facilitated and what were the impacts. In addition, the study explored the wider CRE networks from across the case studies. Furthermore, Callaghan and Williams (2014) presents one of the few exemplars of not only focusing on CRE groups but also the interconnections between CRE groups and the wider community infrastructure. Again, the study sought to examine not only how CRE groups connected with each other, but also how they related and were positioned to civil society networks in their localities.

Interrelationships across different types of social capital

Within the field of CRE research there is limited engagement in a holistic assessment of these different types of social capital. Nonetheless, there are exceptions within the literature that provide insights in this area. This is exemplified by Morrison and Ramsey (2019) who examine social capital in a rural CRE context and identify the value of internal and external social networks. In particular, they highlight the important role of a small number of locally embedded key leaders that engage and connect within and outside communities to drive forward CRE.

Furthermore, (Hicks and Ison, 2011) identify that the full range of social capital is required for, and supported, by CRE projects. In these exemplars, bonding and bridging provide the internal connectors in a community that underpin the generation of community developments. Also, linking is important for community developments, for instance Community Energy Scotland as a supportive external form of CRE support producing social capital (Hicks and Ison, 2011). In this way, the

complex ways in which bonding, bridging, and linking social capital may be generated in local CRE context requires further exploration as part of empirical research, recognising its 'messiness' in practice. Significantly, social capital within CRE requires more detailed exploration, including across the differing contexts of projects and studies in building internal or external networks (Berka and Creamer, 2018). The study examined this knowledge gap and sought to extend the literature, building an understanding of bonding, bridging, and linking social capital.

Social capital as an outcome

Overall, there is limited research reported in the literature concerning how '*social capital is (re)produced*' by CRE projects, with a less consistent evidence-base compared to the way in which social capital enables success in projects (Berka and Creamer, 2018). At the grassroots level, engaging with CRE projects may generate trust as an outcome, underpinning current and potential renewable energy community initiatives (Walker *et al.*, 2010). Furthermore, the work of Parkhill *et al.*, (2015) highlighted the importance of social capital and civic engagement in developing social resilience as an outcome. It focused on a detailed and longitudinal qualitative study of both work and place based CRE projects.

Hicks and Ison, (2011) identify that an increase in social capital within communities is facilitated by generating new social networks grounded in shared objectives and values. Consequently, the development of CRE enables the growth of community capacity to address their local needs (Kilpatrick, 2007). Indeed, in terms of social capital, the developmental process involved with CRE projects, and the subsequent income helps create, expand and enhance community links. As such, "*developing the initiative and the activities supported by its income creates new social linkages and strengthens pre-existing relationships*" (Bere, Jones and Jones, 2015, P30).

This was based on community members being drawn together through the project and possessing the capacity to build the wellbeing of their own community (Slee, 2015). Also, Callaghan and Williams (2014) suggest that individual gains may not be significant, yet the overarching development of empowerment and confidence across CRE projects over time, is highly impactful. The literature details how CRE

projects utilise and develop social capital, providing a platform of capacity building acting as a 'feedback loop' that moves forward future sustainable projects through an empowering process (Walker *et al.*, 2010; Creamer, 2015).

The study sought to build on the literature and explore the knowledge gap regarding benefits from CRE projects in relation to social capital. This focused on the outcomes emerging from collective action and civic cooperation, exploring enhanced existing networks or the forming of new relationships. This was centred on CRE projects themselves and extending outwards towards other community hubs and CRE groups. In this way, the study also sought to explore how building social capital and capacity in CRE projects, led to the development of further local sustainability initiatives in Welsh communities.

The literature also reports potential negative consequences emerging from CRE projects. These focus on the erosion of social capital due to the complexity of projects requiring long-term commitment and being potentially contentious, leading to fractured community responses (Berka and Creamer, 2018). Indeed, Yildiz *et al.*, (2015) highlight that although trust is important as part of the developmental process, and a potential outcome of CRE projects, it may be highly sensitive to context and the nature of local communities. Therefore, as indicated by Walker *et al.*, (2010) trust may not be *"universally ensured solely by the community label"* (P2662). The results highlighted the potential for dissonance within community relationships, as exemplified by a negative response to a farmer-led wind turbine initiative compared to the positive framing of those viewed as community-led. Furthermore, (Radtke, 2014) indicated from a survey of 84 CRE projects in Germany, that women and lower socio-economic groups were mostly not involved as project members, with reliance on existing social networks.

2.2.4 Cultural Capital

In the case of cultural capital, the concept of cultural capital emerged from the work of Bourdieu (1984), defined as being aligned to skills, expertise, and experiences. As such, it could be utilised to mobilise relevant knowledge as a mechanism for advantage, in a particular context. Therefore, within Bourdieu's

work there is a strong emphasis on social class and social stratification as part of the critique, aligned to securing advantage (Bourdieu, 1984). Indeed, Field (2003) highlighted how cultural capital provided an explanatory concept for the transfer of power within a societal context, leading to the maintenance of social class. In many respects, Field (2003) identified the primacy of economic capital and focused on how social and cultural capital were interrelated to continue social inequality. Importantly, cultural capital is viewed as positioned alongside other forms of capital and influences the capacity of a community to engage in action (Woods, 2011). In the study, the researcher did not focus on class or education in relation to cultural capital as initially outlined by Bourdieu. Rather, the study focused on how actors deployed and utilised skills, knowledge and/or experience within a CRE context. This resonates with the work of Bomberg and McEwen (2012) in the context of CRE, which identify the relevance of established levels of knowledge and skills as well as experience by key stakeholders in being able to take advantage of opportunities. Consequently, the research suggests that understanding the differing forms of 'practical capacity' is crucial in the degree of engagement with CRE (Park, 2012). Rogers et al (2012b) highlight having key actors with characteristics, such as experience in raising finance and social connectivity. In the study, the researcher utilised cultural capital as a lens to explore not only social networks but also the contribution, where relevant, of previous experience, skills, and expertise in developing and being able to engage in CRE projects (Figure 26).

Figure 26: Operational definitions and key characteristics bonding, bridging, and linking social capital

Types of capital	Descriptor	Key Characteristics
Bonding Social capital	Internal networks focused on *within* CRE groups	Inward focused Within-group relationships and trust Collective-based action and sense of cohesion 'Getting by' (Putnam, 2000) Closed networks
Bridging Social capital	External networks focused on *between* CRE groups	Outward focused relations Across group shared interests and trust Collective-based action 'Getting on' (Putnam, 2000) Engaging with broader constituencies and stakeholders through collaboration Access to external resources and information Tends to be fragile but inclusive in orientation
Linking Social capital	External networks focused on *between* CRE groups and policy makers	Outward focused relations Ranges across power structures Opportunity for greater influence and access to resources
Cultural capital	Capacity and knowledge to act and engage in supporting CRE project	Presence of pre-existing skills, expertise and experiences of key actors Capacity to engage in civic action

2.3. Emerging Themes and Gaps Within the Literature: Civic Engagement with CRE

Overall, communities having an active role in a low-carbon transition, focused on the degree of engagement by community members in both the developmental processes of a scheme and the outcomes emerging from the project (Creamer, Eadson, van Veelen, *et al.*, 2018; van Veelen, 2018). Yet a particular feature identified in the literature is the tendency for CRE projects to be led by a small number of highly motivated key individuals, which in turn may lead to the broader community having only a limited role or involvement (Middlemiss and Parrish, 2010; Markantoni and Aitken, 2016; Creamer *et al.*, 2019). However, the literature also highlights that CRE projects do not necessarily need to operate at the maximum level of citizenship power, for community members to consider themselves engaged or gain benefits from involvement (Rogers *et al.*, 2008). In the study the research explored the degree of local participation in CRE projects, focused on the central role of key stakeholders and the more peripheral position of shareholders and community hubs.

2.3.1 Drivers

The literature highlights the value of understanding the drivers underpinning involvement by community members with CRE projects (Rogers *et al.*, 2008; Allen *et al.*, 2012; Bauwens, Gotchev and Holstenkamp, 2016). Overall, a mix of global and local factors seem relevant in motivating participants (Table 15). Haggett and Aitken (2015) note that CRE projects are able to generate a 'sense of responsibility' towards both the local community and the environment. Furthermore, the substantive evidence-base details the broader range of drivers influencing participation in CRE, focused on developing green energy, promoting social cohesiveness and investing in local communities (Seyfang, Park and Smith, 2013; van der Schoor and Scholtens, 2015; Hicks and Ison, 2018). The study complimented the literature-base and explored the local and global factors impacting on a motivation to invest or engage with CRE projects in Wales. Overall, at a local and global level motivations emerge consistently within the literature although they utilise different framings, with the most frequent descriptors

illustrated in Table 15 (Walker, 2008b; Allen *et al.*, 2012; Seyfang, Park and Smith, 2013; Haggett and Aitken, 2015; Bauwens, Gotchev and Holstenkamp, 2016; Brummer, 2018; Hicks and Ison, 2018).

Table 15: Global and local factors cited in the literature

Global Drivers	Local Drivers
Carbon reduction	Local and long-term revenue
Increased renewable energy generation	Local community investment and benefits
Decentralised model of energy	Community ownership and empowerment
Tackling climate change	Social cohesion and sense of community
Pro-environmental behaviour change	Language retention and resilience
	Local decision making and community led
	Reduced energy consumption

The literature tends to focus on the motivations in the early part of CRE projects and do not fully explore the connection between motivations and planned or anticipated outcomes from established CRE projects. In this way, there is a poor link between the overall drivers as a "*common goal and expected collective outcomes*" in CRE projects (Walker *et al.*, 2010, P2657). The study examined both the areas of motivations and any evident and anticipated social impacts once projects are established.

Global drivers

The literature highlights the importance of global drivers in engaging with CRE project (Rogers *et al.*, 2008; Allen *et al.*, 2012; Bauwens, Gotchev and Holstenkamp, 2016). Indeed, Hoffman and High-Pippert (2010) identify the relevance of involvement in CRE projects as part of a broader agenda and acting on global concerns as part of a collective form of action. As such, motivation focused on the combination of small-scale renewable energy generation and a reduction in energy consumption. In this context, the reduction of carbon dioxide emissions is seen as an important motivator for engagement in the CRE sector, centred on renewable energy facilitating a movement away from the reliance on fossil fuels (Seyfang, Park and Smith, 2013).

The work of Hicks and Ison (2018) identify a range of 22 motivational factors driving CRE projects, based on a series of case studies. They highlighted the importance of environmental drivers centred on reducing global carbon emissions but also generating projects that aligned with a local setting and scale, as well as supporting the development of pro-environmental behaviour. Furthermore, these themes are reiterated by Markantoni and Woolvin (2015) who suggests that drivers by community members in setting up CRE projects included promoting pro-environmental behaviours and the adoption of a low carbon approach by businesses and the wider community.

Local drivers

Significantly, the wealth of literature indicates that economic and social impacts are equally important as environmental issues, as part of the motivations driving forward involvement in CRE projects (Hielscher, 2011; Haggett *et al.*, 2013; UK Department of Energy & Climate Change (DECC), 2014; Creamer *et al.*, 2019). At its core, locally based CRE projects reflect priorities that focus on community benefits (van der Schoor and Scholtens, 2015). A particular set of expectations from CRE projects centred on social and directly accrued benefits for community members, based on energy saving and wellbeing (Rogers *et al.*, 2008). In this way, projects are rooted in the present priorities of communities, being '*strongly embedded in*

temporally and spatially immediate needs' (Devine-Wright and Wiersma, 2013, P4221).

In a study by Slee (2020) the community development trusts model in a rural Scottish context, were motivated by obtaining a reliable source of revenue as part of participation. The study highlighted how the balance between local and global issues was firmly focused on the local context, with the main stakeholders concerned with securing additional income to support a spectrum of local projects, rather than advancing a low-carbon agenda.

> *"Key actors in our cases are not so much catalysts of low carbon transition as community development agents seeking new sources of funding for a diverse portfolio of local projects"* (Slee, 2020, P162).

Further, CRE projects sought not to be dependent on grant income, generating projects based on their vision as a community (Markantoni and Woolvin, 2015). In this way, the literature suggests that participants in community-led and voluntary CRE projects tend to be driven by anticipated community-based not personal benefits or outcomes (Hoffman and High-Pippert, 2010). An additional driver reported in the literature focused on small-scale local schemes that were sensitive and connected to a place and cultural context (Haf and Parkhill, 2017; van Veelen and Haggett, 2017). For example, such projects may be driven by safeguarding Welsh and Gaelic language resilience in local communities within Scotland and Wales (Haf and Parkhill, 2017).

2.3.2 Barriers

Overall, the literature suggests alongside potential benefits there are also significant barriers, including a lack of experience and uncertain conditions for innovation (Walton, 2012; Haggett and Aitken, 2015; Markantoni and Woolvin, 2015). The majority of barriers to CRE projects are focused on the *'institutions that facilitate them and the communities that host them'* (Allen *et al.*, 2012, P266). Significantly, an emerging theme within the literature is that a local model of CRE creates a challenging environment for project development and engagement, as it involves obstacles faced by groups characterised as a range of external and internal

barriers (Table 16) (Walker, 2008b; Hielscher, 2011). Within the literature external and internal barriers are consistently reported, although framed using a range of descriptors (Walker, 2008; Haggett and Aitken, 2015; Brummer, 2018; Allen *et al.,* 2012; Park, 2012; Walton, 2012; Seyfang *et al.,* 2014).

There is a rich literature that has tended to focus on community groups attempting to develop CRE projects and the barriers they faced (Walker, 2008; Walker *et al.,* 2010; Allen *et al.*, 2012; Haggett and Aitken, 2015; Parkhill *et al.*, 2015; Brummer, 2018). However, there is a limited literature-base on established projects and their trajectory, challenges once they are operational. In this way, there was limited evidence that explored challenges such as maintenance, volunteering and how CRE projects navigated the delivery of social impacts and set up community benefit funds. The study sought to identify perceived barriers and experiences at different stages of the CRE projects, reflecting on the developmental stage and once the projects were established and operational.

Developing CRE projects includes a degree of complexity and a range of key 'success factors', centred on *group, project, community, network* and *policy* (Seyfang, Park and Smith, 2013). The absence of these factors represents barriers in developing CRE projects. Overall, these issues are not particular to CRE but reflect core challenges associated with initiatives led by civil society across a range of sectors (Allen *et al.*, 2012).

Table 16: External and internal barriers cited in the literature

External barriers	Internal barriers
Changing energy policy environment	Key individuals
Funding	Knowledge and skills
Planning and landowners	Capacity
Role and access to intermediaries	

External barriers

Changing energy policy environment

The overall energy system in the UK positions the CRE sector against the large 'Big Six' energy companies, based on a centralised model, including a market and legal context. As such there is an external barrier for the CRE sector (Strachan *et al.*, 2015; Brummer, 2018). Indeed, Seyfang, Park and Smith (2013) indicate that the policy and regulation infrastructure represent substantive barriers for CRE projects. This included the rapid change in governmental energy policy towards supporting CRE, which was unexpected by CRE groups and required them to adapt to an inconsistent policy environment (Brummer, 2018). In particular, the reduction and subsequent removal of FITS resulted in the absence of subsidies for energy generation at the local level, directly impacting on CRE (Robinson and Stephen, 2020).

Funding

The literature highlights the disproportionate impact of financial barriers at the outset of projects. At this juncture expert surveys and preparatory studies are required to underpin applications for financing through loans, planning approval

and licencing. As such, substantive funding is required to support these activities, however financial support is limited and difficult to access, varying across regions (Walton, 2012). Indeed, Haggett and Aitken (2015) highlight the importance of limited capital as a barrier for CRE, with significant costs as well as risks associated with community developments. A particular issue is the high degree of risk at an early stage which commercially based developers may mitigate through multiple investments, unlike community groups (Haggett and Aitken, 2015).

Planning and Landowners

An additional barrier is the area of planning, despite the assumption that local projects may be able to gain successful planning consent, compared to external schemes (Walker, 2008b; Walton, 2012). This was exemplified by the Awel Aman Tawe CRE project in Wales focused on a wind energy and a protracted planning process. It was initially denied local planning approval in 2005 and this decision was subsequently confirmed on appeal (Walker, 2008b).

Furthermore, access to land and its ownership is a key issue as part of developing a CRE project (Haggett and Aitken, 2015). Across Scotland access has been associated with land reform and CRE projects have been embedded in obtaining community-based ownership of land. Yet most communities developing CRE schemes outside the highlands and islands of Scotland do not own the land required for projects. As a result, a difficult first step is gaining access to land and agreeing rights and a lease (Walton, 2012).

Role and access to intermediaries

The literature highlights how developing CRE projects requires accessing, and then establishing, links and collaborative working with external institutions and groups. This is a key factor in overcoming barriers to CRE projects, surfacing the relevance of intermediary groups or organisations (Seyfang, Park and Smith, 2013), such as Local Authorities and secondly, other local community groups. These provide support for CRE members to generate projects and assist in how best to address policy objectives within localities (Creamer *et al.*, 2019). For instance, Walton (2012) identified how the National Trust collaborated with local communities to

generate community based CRE projects. Overall, intermediaries are important as a source of external support for CRE projects, in addition to the internal strengths located in community groups (Bird *et al.*, 2013).

Internal barriers

Key individuals

Delivering CRE projects is dependent on the need for 'project champions' and 'entrepreneurial individuals' (Haggett *et al.*, 2013) Allen *et al.*, 2012). In this way, an internal barrier is the absence of these key individuals to establish and maintain CRE projects. This is particularly relevant in long-term initiatives such as CRE projects which require key individuals with a core set of skills, time and commitment, especially given their complexity (Walker, 2008b; Markantoni and Woolvin, 2015).

Furthermore, as CRE projects extend over a number of years from initial development to start-up, there may be tensions due to the reliance on volunteers. For instance, maintaining motivation in the face of protracted and problematic planning approvals (Walton, 2012; Haggett and Aitken, 2015). As a result, the duration of CRE projects and their reliance on volunteering may lead to 'volunteer burn out' (Markantoni and Woolvin, 2015). The dependency on small group of key individuals represents a degree of fragility and if they leave the project, it results in a major loss of expertise and skills (Walker, 2008b; Bere, Jones and Jones, 2015; Berka and Creamer, 2018). This aspect of long-term sustainability once the CRE projects are established has received insufficient attention in the literature and represents a research gap.

Knowledge and skills

Significantly, the literature highlights how the majority of organisations and community members lack the time, skills and capacity to focus on generating a CRE scheme representing a barrier to local citizen participation (Rogers *et al.*, 2008; Haggett and Aitken, 2015). In particular, an insufficient knowledge base and poor confidence levels may deter community members from participating in projects,

with CRE schemes being viewed as breaking new ground and unfamiliar (Walton, 2012; Brummer, 2018). In this way, Berka and Creamer (2018) identify that a successful 'bottom up' CRE project requires the presence of pre-existing skills and knowledgebase, drawing on cultural capital. Although ownership of CRE projects may represent an attractive option for communities, in practice their management by members of rural communities may be unfeasible (Rogers *et al.*, 2008).

Capacity

Overall, the literature suggests that the success of CRE projects is dependent on the ability and capacity of local communities to mitigate barriers and participate in CRE (Allen *et al.*, 2012). As such, capacity shapes the capability of a community and its members to be responsible for their 'ecological footprint', dependent on the inherent individual, institutional or cultural capacity within those communities (Middlemiss and Parrish, 2010). In this way equity of access to participation with CRE projects is a key issue linked to capacity to act (DECC, 2013b). The engagement with CRE project tends to be located, disproportionately within members of the community with greater education (Middlemiss and Parrish, 2010). Furthermore, the lack of involvement by the wider community is often based on a limited understanding around renewable energy and having relevant skills (Bird *et al.*, 2013; Berka and Creamer, 2018).

Within the literature the issues of equity and justice are highlighted as inherent part of capacity within range of different communities and their ability to operate CRE projects (Bulkeley and Fuller, 2012; Park, 2012; Bird *et al.*, 2013). As such, CRE may be seen as '*a special interest which exists only for better equipped and capable communities*' (Park, 2012, P404). This lack of equity is reiterated by Catney *et al* (2014) cite the exemplars of disadvantaged communities in the West Midlands, which were unable to utilise the opportunities of the 'Big Society Capital', the Green Deal and other schemes. This contrasted with the affluent areas of Shrewsbury with pre-existing civil engagement in community and energy issues, including having good levels of energy literacy. In this way, an emphasis on market-based mechanisms to drive forward CRE may lead to an 'energy underclass' building on,

rather than moving away from established social and economic inequality (Catney *et al.*, 2014).

2.4. Emerging Themes and Gaps Within the Literature: Social impacts

The literature identifies that social impacts in CRE are both multifaceted in nature and complex. For instance, Hicks and Ison (2018) indicate that CRE projects not only produce KwH of energy but also social impacts which extends further than technology and environmental impacts. Such social impacts include key areas for example ownership by communities, an empowering approach and learning. This point was reiterated by Haf and Parkhill (2017) citing *'connected benefits'* (P103), for instance more cohesive communities, developing skill-sets and financial impacts. In this way, community engagement and participation contribute to local control and decision-making in CRE projects, as well as a sense of ownership and additional revenue. These localised and discrete aspects present benefits for communities (Strachan *et al.*, 2015; Llewellyn *et al.*, 2017a).

The work of Berka and Creamer (2018) reflect on the limited literature that details the direct social impacts from the developmental processes of CRE projects and their accrued outcomes. The evidence indicates that most locally based impacts emerge from medium-to-longer term indirect outcomes from CRE projects, with revenue channelled into communities. Furthermore, Berka and Creamer (2018) suggest that the transformation of local social impacts pivots on the processes of decision-making around distribution of income within communities, and to what extent it would have local social impact. There is significant literature in this area on the processes and motivating factors, yet there remains a gap in the literature around social impacts of CRE beyond social acceptance. This is due to the tendency of the CRE literature to focus on the processes involved in developing CRE projects rather than impacts (Creamer *et al.*, 2019).

In Figure 27 the researcher summarises the key themes and cross-cutting impacts emerging from the literature, focused on social, cultural, environmental, and economic components of CRE. Although the important socio-economic outcomes from CE are recognised, due to the infancy of the CRE sector and field there is a

94

limited evidence-base that details the added value to communities (Walton, 2012). Overall, there are consistent social impacts from CRE as experienced and perceived by communities surfaced within the literature, although categorised in different ways. These focus on socio-cultural, environmental and economic aspects (Walker *et al.*, 2010; Hicks and Ison, 2011, 2018; Rogers *et al.*, 2012a; Walton, 2012; Haggett and Aitken, 2015; Berka and Creamer, 2018; Brummer, 2018; Slee, 2020).

The literature suggests that the local transitions involved in CRE projects may also have wider societal implications (Van Der Schoor and Scholtens, 2015). Overall, the literature and policy tend to assume positive social impacts from CRE within communities, alongside renewable energy generation. Indeed, Walker and Cass (2007) highlight there is a tendency in the literature to consider impacts from CRE without critical appraisal. Interestingly, van der Waal (2020) examines both the negative and positive aspects of these issues, suggesting that a more robust approach to identify local impacts, including the use of 'change mapping' to evaluate CRE. In this context, the account provided by Berka and Creamer (2018) is a seminal piece of research evaluating the research on social impacts within the evidence-base on CRE projects. A number of key areas are signposted in the literature that receive insufficient attention, including empowerment, accessibility to 'affordable energy' and social capital.

Further, a range of studies tend to allude to positive impacts by implication or ambiguously, rather than delineating clearly specific evaluation of local outcomes from CRE projects (Walker *et al.*, 2007b; Berka and Creamer, 2018). This is exacerbated by community groups focusing on community action rather than measurement, combined with limited resources and the necessary technical skill set required to evaluate outcomes. An additional issue is the lack of standard assessment approaches or metrics. Further research is required from CRE projects to provide community groups with a better picture of actions on the ground and any impacts, as well as informing future activity and funding support (Walton, 2012; Berka and Creamer, 2018). In this way, more substantive studies are required to provide a rationale for policy makers to support CRE and highlight its social value (Walker *et al.*, 2007b; Hobson and Mayne, 2016; Berka and Creamer, 2018; van der

Waal, 2020). Indeed, Walker *et al (*2007) emphasises the importance of underpinning the development of the CRE sector by extending beyond claims of social impacts as an 'article of faith'. The work of Creamer *et al (*2019) highlights that establishing a more holistic approach to studying CRE may prove a platform for insights into the nature of impacts from projects and identifying specific beneficiaries within particular contexts *"asking more centrally what does CRE do in practice"*.

Figure 27:   Social impacts cited in the literature
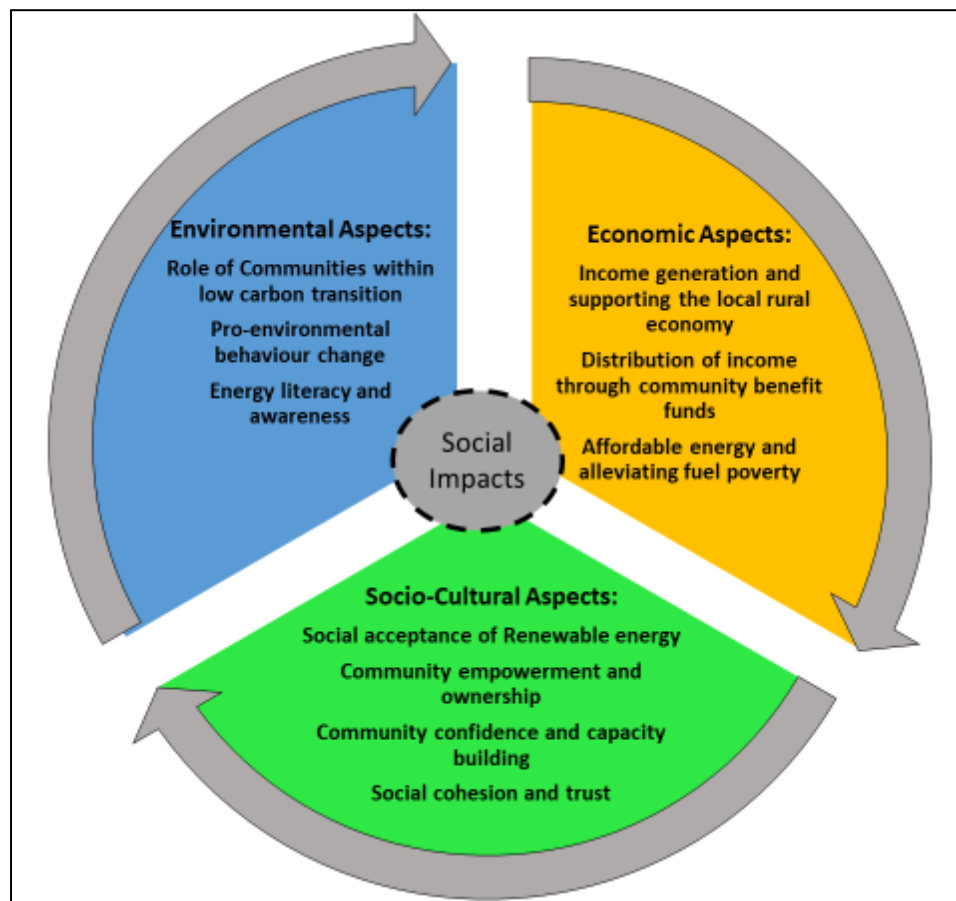
2.4.1 Environmental Aspects of Social Impacts

Role of communities within low carbon transitions

The literature review highlights that CRE projects make a contribution towards a system change in the context of energy (Hoffman and High-Pippert, 2005; Seyfang and Haxeltine, 2012; Smith, Fressoli and Thomas, 2014). Walker (2011) highlighted that local CRE initiatives were focused on galvanising 'bottom up' actions and drawing on local skills with innovation being largely social rather than technology driven. That is, such project work was orientated towards 'innovation niches' or creating a protective area for new practices and centred on organising, managing and engaging with communities (Seyfang *et al.*, 2014). The work of Creamer, Eadson, van Veelen, *et al* (2018) highlight the difficulties associated with CRE projects and strategic niche management as well as more broadly socio-technical transitions. Overall, the literature indicates CRE projects occupied a niche, but it is uncertain whether CRE could be viewed as disrupting existing energy regimes (Seyfang and Haxeltine, 2012; Creamer *et al.*, 2019). In the study, the focus is not directed towards macro wide-system change, rather it is focused on change within communities at a local level, centred on an in-depth analysis of case studies.

Pro-environmental behaviour change

Overall, the research on CRE projects identify behavioural impacts that centre on changes to lifestyle that are sensitive to environmental concerns, addressing climate change and building awareness around renewable energy (van der Waal, 2020). Walker (2011) suggests that there is an expectation that CRE projects produce impacts that influence behaviour through education and change, based on understanding sustainability and renewable energy.

As part of an exploration of micro-hydro context, in Bere, Jones and Jones' (2015) study, participants reported core changes in behaviour including 48% engaging in energy efficiency interventions and 26% involved in the installation of a household renewable energy system. Indeed, a review of the literature on modifying environmental behaviour by Berka and Creamer (2018) suggest that local and civic

driven CRE projects represent a greater opportunity to promote behaviour change. This is due to a sense of collective action, compared to an individual focus.

Energy literacy and awareness

As a result of CRE projects, DECC (2013) highlight an increasing awareness of wider energy concerns as well as modifying community attitudes towards energy. In many respects, CRE projects surface the potential of engaging in environmental action at a local and individual level, rather than seeing these as remote (Berka and Creamer, 2018). However, apart from some exploration of energy use as part of consumption, there has been scant empirical research in this area, focused on direct and indirect environmental outcomes from CRE. There is a robust, often quantitative research literature covering influences on enhanced energy literacy as well as the use of energy efficiency initiatives and 'load shifting' for households (Keirstead, 2007; Bergman and Eyre, 2011; Brounen, Kok and Quigley, 2013; Gram-Hanssen, 2013). Yet there is an absence of similar work in a community-based context (Berka and Creamer, 2018).

An exception is the work of Bere, Jones and Jones (2015) a response of 25 participants indicated a robust shift in attitudes around increased energy literacy and awareness. This included 73% of respondents highlighting an improvement in their understanding about renewables, energy security and climate change, combined with 53% having an awareness of their individual consumption of energy. In this context, the study included a discrete focus on the involvement of key stakeholders and shareholders with CRE projects and any impacts on energy literacy and awareness.

2.4.2 Economic Aspects of Social Impacts
Income generation and supporting the local rural economy

The benefits of CRE for rural areas is particularly relevant for communities that lack economic diversification. In this context, engagement by communities to produce CRE may augment both economic and community resilience (Mills, 2012; Steiner and Markantoni, 2016; Slee and Harnmeijer, 2017). In this way, the work of Hicks

and Ison (2011) suggest that economic and community-based developments result from CRE projects by generating new and additional revenue for communities. This may result from using local employment, resources and contractors as well as returns for local shareholders that support the local economy (Hicks and Ison, 2011). The CRE project generated a 'Windfall Fund' that contributed to the Tiree Music Festival (Haf and Parkhill, 2017). Furthermore, Berka and Creamer (2018) identified how the an emphasis on local suppliers was often the case in smaller-scaled projects in Scottish and Welsh contexts, whereas not as evident in larger hydros. However, in the case of medium-sized wind energy projects local suppliers were not seen as applicable or possible in most instances (van der Horst, 2008; Bere, Jones and Jones, 2015; Bere *et al.*, 2017).

In terms of the research gap the literature suggests that the outcomes from CRE are often understood primarily in economic terms. There has been less attention focused on the social dimension of CRE, which is less visible and more difficult to quantify. Research and policy require a focus on both the social and economic dimensions of CRE in parallel with equal weighting to map and respond to its complexity.

Distribution of income through Community benefit funds

The opportunity to develop social and economic regeneration is mainly focused on the investment of longer-term income from CRE projects, into a range of initiatives that address the needs of the local community (Berka and Creamer, 2018). This represents a mechanism for an economic contribution to local communities by CRE projects by the development of 'Community Funds' or 'Trusts' that operate beyond the shareholders as beneficiaries and invest income into the local community (Haggett and Aitken, 2015; Steiner and Markantoni, 2016). Indeed, Steiner and Markantoni (2016) identifies that the attractiveness of CRE projects supporting communities to reduce its dependency on external sources of funding and time-bounded grants (Walton, 2012; Haggett and Aitken, 2015). Further, Slee (2020) indicates that the impactful nature of community development trusts is centred on their aims being framed as place-focused and centred on sustainable community

building. A difficulty reported by Bere, Jones and Jones (2015) and Berka and Creamer (2018) in understanding benefits from distribution of benefits from revenue and any social impact, is that the evidence is mainly focused on community development trusts in Scotland despite the diverse nature of CRE.

 DECC (2014) highlighted that the evidence-base did not provide clarity about how revenue was integrated into communities or indicate the impacts during the life course of the CRE project. However, the relevance of CRE projects in producing income was that revenue was 'recycled' and utilised within communities (DECC, 2013). Indeed, Slee (2015) highlights the lack of research on economic impacts from CRE projects in terms of how income is retained locally and distributed to provide community benefit, avoiding the 'leaky bucket' scenario of benefits dissipating out of the local area (Slee, 2015). As such, the nature of benefits for the community will vary according to the type of project arising from the Community Benefit Fund (Callaghan and Williams, 2014; Bere, Jones and Jones, 2015).

The amount of social impact is also linked to the scale of projects, for instance smaller projects generating £12000 -18000 surplus income per year. In contrast larger schemes produced £40000- 60000 income per year, for instance projects over 400KW (Bere, Jones and Jones, 2015). In addition, Scottish and Welsh case studies highlight that as a result of CRE, investments have been spread across a broad range of areas in localities, including housing, health and social wellbeing as well as local facilities, recreational provision, forestry and recycling activities, as well as advancing other CRE projects (Walton, 2012; Callaghan and Williams, 2014b; Bere, Jones and Jones, 2015; Berka and Creamer, 2018). This area in the literature requires further attention and scrutiny in understanding the socio-economic impacts from CRE projects. In this way, the study sought to explore the aims of the community groups within the case studies, and how this related to social impacts for the community, linked to the income generated.

Affordable energy and alleviating fuel poverty

Berka and Creamer (2018) suggest that accessing energy which is affordable, is often a motivating factor for community members to invest in CRE. Yet the CRE

sector in the UK does not feature as a core part of policy in delivering affordable energy solutions for communities. Although the UK evaluates data on fuel poverty and householder costs of energy, there is sparse research on the impact of CRE project on affordable energy (Walker, 2008b; Bergman and Eyre, 2011; Middlemiss and Gillard, 2015; Gillard, Snell and Bevan, 2017). Neither is there a focus on developing indicators or metrics such as energy performance, modifications in the amount of available income by householders or the holistic wellbeing of community members involved in schemes (Berka and Creamer, 2018). Further, Slee (2020) notes that CRE projects in the UK, unlike European cooperative examples (RESCOOPs), are not focused on energy cost reduction for members. with only some limited interventions to enhance energy efficiency of householders.

Yet the literature identifies that CRE projects are not only involved in energy generation but are often engaged in efforts to improve energy efficiency, focused on reducing carbon and costs for community members as energy consumers (Walton, 2012; Callaghan and Williams, 2014). Furthermore, broader economic impacts from CRE projects were highlighted by Walton (2012) using the case study of Abergwngregyn. This resulted in income being used to support energy efficiency initiatives, such as insulation as well as reducing emissions by the provision of solar PV.

2.4.3 Socio-Cultural Aspects of Social Impacts
Social acceptance of RE

There is a substantive literature on the role of community and its engagement with CRE. This has been viewed as a key component in determining whether schemes result in resistance or opposition (Devine-Wright, 2011; Musall and Kuik, 2011; Slee, 2020).

Such a negative response from communities often characterises privately led schemes (Walker, 2011). In terms of acceptability, Walker (2011) suggests that CRE benefits from being perceived as engaging local communities, being well-positioned within the local context and producing local impacts. Therefore, CRE projects which have community ownership tend to encounter less difficulties as part of the local

planning approval process (Bell *et al.*, 2005; Wolsink, 2006; Walker *et al.*, 2007; Walker, 2008). This centres on the importance of projects emanating from trustworthy networks being viewed as having credibility in delivering fair local impacts for communities (Gross, 2007; Rogers *et al.*, 2008; Haggett and Aitken, 2015). Consequently, CRE projects tend to generate less resistance (Berka and Creamer, 2018).

In this context, McLaren Loring (2007) in a review of 18-case studies across England, Wales and Denmark highlighted the strong relationship between significant community involvement, ownership and leadership roles and its positive social acceptability. However, Warren and McFadyen (2010) suggests that local acceptance of CRE projects may be facilitated by community involvement but this may not automatically be the case, nor result in impactful outcomes. Overall, there remains a gap in the literature around social impacts of CRE that extend beyond social acceptance. These focus on greater detail around how social impacts are experienced and perceived, also how communities engage and participate in CRE as well as to what extent they benefit.

Community empowerment and ownership

Berka and Creamer (2018) identify that the term 'community empowerment' is a problematic concept which lacks consensus, represented as a process and outcome of CRE. In terms of outcome, it is often defined by community members reporting that they have an active 'voice' and are involved in the project processes that have an impact upon them, as well as being able to engage in action to achieve change (Li *et al.*, 2013; Slee, 2015; van der Waal, 2020). The process of enabling community empowerment centres on social capital and community capacity, as both a requirement and core component in its development (Radtke, 2014; Berka and Creamer, 2018). Significantly, the process of drawing people with a shared goal towards a more collective form of action results in the mechanism of community empowerment, facilitating change (Seyfang, Park and Smith, 2013). Furthermore, Hoffman and High-Pippert (2010) identify that successful outcomes may include communities developing or strengthening their sense of cohesiveness, with greater

resilience or a sense of control over the nature of energy systems in their localities. DECC (2013) identify the importance of CRE projects having a 'sense of ownership' with communities positioned as being responsible for the scheme. Furthermore, the embeddedness of the project within communities through the participation of its members results in a project addressing local priorities.

The work of Hicks and Ison (2018) highlighted how a CRE project adopted a shared objective that resulted in a sense of empowerment and pride in the community, with the turbine as a tangible end-result present in the lives of the community members. Furthermore, the study by Haf and Parkhill (2017) detail the importance of community ownership within CRE projects in promoting long-term social and cultural sustainability. Within the Scottish setting there was a significant literature with a particular attention on rural island communities (Markantoni and Woolvin, 2015; Slee, 2015; Hicks and Ison, 2018; van der Waal, 2020). Although this provided a rich and detailed account, arguably this literature may not be transferrable to other contexts due to its remote nature and specific cultural nuances.

Community confidence and capacity building

A qualitative study by Callaghan and Williams (2014) with representatives from Scottish CRE projects, indicated that local ownership models led to a greater sense of empowerment and confidence. However, these are difficult to quantify, with community members using descriptors focused on a sense of pride, being stronger and empowered as a community. Van der Waal (2020) highlight the relevance of locally based ownership in generating community capacity and underpinning the ability of communities to fund and address their own local priorities. Furthermore, the processes of addressing challenging circumstances involved in project management may lead to capacity building (Parkhill *et al.*, 2015; Steiner and Markantoni, 2016). This was especially evident by the challenging processes of developing a project, including tackling barriers (van der Waal, 2020). In this way, the development of CRE projects involved building on, and extending existing cultural capital focused on skills and knowledge leading to enhanced capacity and confidence.

The literature suggests that the overall pattern of generating community capacity from CRE appear somewhat variable (Berka and Creamer, 2018). This is exemplified by some schemes failing and other operating as catalysts for further developments within the locality, building on their success and generating more substantive projects (Hicks and Ison, 2011; Callaghan and Williams, 2014). Equally, successful projects may result in organisations becoming intermediaries for other projects at a local or wider level (Bere, Jones and Jones, 2015). In the study, the researcher sought to explore how the case study CRE projects developed other community schemes or local sustainability projects, as well as any shared learning between community energy groups. In terms of capacity building, this was related to the development of both skills and knowledge, arising from community member being actively engaged with CRE projects (Callaghan and Williams, 2014; Bere, Jones and Jones, 2015; Steiner and Markantoni, 2016). For instance, a survey of 84 Scottish CRE projects indicated that 65% of the key stakeholders managing the projects had gained additional skills from their involvement (Mills, 2012). Furthermore, the literature suggests that most of the learning-based benefits tend to remain within the boundaries of key stakeholders leading the project (Berka and Creamer, 2018). In this context, cultural capital is dependent on a small number of key actors and as an asset for CRE projects that may not be consistently available to all communities.

Social cohesion and trust

A key part in successful community projects is gaining and maintaining both trust and cohesion, representing a 'glue' around CRE schemes. This underpins motivation to engage community members as well as building collaborative working and shared benefits (Hoffman and High-Pippert, 2010; Walker *et al.*, 2010; Allen *et al.*, 2012; Bomberg and McEwen, 2012). In this context, civic involvement within CRE draws together communities and organisations, possibly resulting in the generation of social capital (Becker and Kunze, 2014; Radtke, 2014). For instance, DECC (2013) suggest that CRE projects facilitate community members to collaborate and focus on a community-orientated objective, leading to greater social cohesiveness. In many respects, the areas of trust, cohesiveness and social networks represent not only process involved in developing CRE but also potential outcomes that accrue

from it (Walton, 2012; Callaghan and Williams, 2014; Van Der Schoor and Scholtens, 2015; Martiskainen, 2017).

Further, the literature has identified how CRE projects may contribute towards resilience within communities. However, Haggett and Aitken (2015) identify how a strong sense of identity by a community drives forward CRE projects and represents a precondition. Overall, the literature does not clearly distinguish whether cohesion is required as a precondition or mainly occurs as a result of the CRE project, echoing the debates around social capital (van der Horst, 2008; Hoffman and High-Pippert, 2010; Walker *et al.*, 2010; Allen *et al.*, 2012; Bomberg and McEwen, 2012; Radtke, 2014; Armstrong, 2015; Berka and Creamer, 2018). The study explored how they bring people together focused on shared objectives and whether the CRE projects resulted in strengthening social networks at a local level, contributing to social capital.

2.4.4 Interrelationships between social processes and impacts
Relationship between motivations and outcomes

The work of Berka and Creamer (2018) presents insights into the relatedness of social impacts in CRE projects. In this context, the literature tends to associate aspects such as empowerment as long-term and indirect impacts compared to direct, and project-focused impacts centred on acquiring knowledge and awareness of renewable energy (Walton, 2012; Hicks and Ison, 2011, 2018; van der Waal, 2020). In the study, the researcher sought to build on the literature centred on a CBS type of cooperative model in detail and examining social impacts, centred on the processes involved in the project development that led to particular outcomes.

Significantly, Hicks and Ison, (2018) highlight a transition within case studies, from motivation as part of a process that is then transformed into an outcome through setting up the project. This is exemplified by 'localised ownership and decision-making' and 'reducing carbon emissions' as jointly a motivation and impact across the majority of the case studies. Equally, although motivation was present as part of the process, these were not necessarily transformed into outcomes in CRE projects, for instance generating 'actors in a renewable energy powered future'.

Overall, the literature review highlights the tendency within the evidence to conflate motivations and outcomes in CRE projects. The work of Hicks and Ison (2018) illustrates an initial attempt to clarify and distinguish which motivations transform into outcomes in projects. Significantly, van der Waal (2020) highlights the need to have an increased focus on the processes that impact on outcomes, including project-specific contexts such as the location of CRE projects and developmental or participatory processes. As such the insufficient exploration of these areas leads to a gap in the literature:

> *"It is not possible to draw robust conclusions about the impact or added value benefits of community energy projects"* (van der Waal, 2020, P51).

The study focused on what factors shape social impacts, including the characteristics of CRE projects, where it was sited, and its development, as well as the nature of the community. In addition, it also explored the way community members were engaged and built social networks and skill sets.

Temporal Dimension

The research tends to focus on CRE projects at an early stage of development, either at a developmental phase or increasingly at an operational stage. Importantly, both the proceses and social impacts of CRE projects may be modified linked to a temporal context and involve a varied sequence of phases in development (van der Waal, 2020). For instance, Hicks and Ison (2018) and Bere, Jones and Jones (2015) explore established CRE projects which were expected to generate impacts after becoming operational.

An important area for further work is the exploration of impacts at differing time points in the trajectory of CRE projects, as the literature has tended to focus on the earlier stages due to the relatively recent emergence of CRE as a field of inquiry. The study examined the early stages of implementation and operation of CRE projects but also sought to identify the emerging social processes and impacts. This focus complements and enhances the current literature-base providing greater understanding of the dynamic nature of CRE projects.

2.4.5 Types of social impacts across different social groups

The majority of the literature on CRE centres on key actors driving forward energy projects, often in-depth semi-structured interviews that provides detailed insights. This is exemplified by Hicks and Ison (2018) focusing on case studies in Scotland and the US. However, within the literature there is a limited examination of other viewpoints, (van der Waal, 2020). This centres on the perspective of other project members who may take less of an active role within the project, as well as the wider community in which the project is positioned and who may benefit from the project. In this way, there is a need for the literature to represent a wider constituency to provide a more rounded account of social impacts incorporating different perspectives and experiences:

> *"Exploring the long-term local impacts of CRE beyond the experiences of the relatively small number of people who lead or participate in these projects would add value to our understanding of CRE"* (Creamer *et al.*, 2019, P4)*.*

Within the literature there are exceptions that not only focus on key actors within CRE projects but also address the perspective of the wider residents that are peripheral to the scheme within a locality (Rogers *et al.*, 2012a; Haf and Parkhill, 2017; van Veelen and Haggett, 2017). Equally, in the work of Rogers *et al (*2012) alongside the directors of the CRE projects in the Lake District, the research included the viewpoints of local residents who represented different positions of familiarity with the CRE. In the study this research gap is explored by focusing on key stakeholders driving forward the CRE project and the viewpoints of shareholders and wider community hubs within the case studies. In this way the study examined the extent to which community hubs had an awareness of the project, any involvement and perceived local benefits.

2.4.6 Capturing Social Impacts

The majority of the literature under-represents the issues around social impacts, whilst over-emphasising the role of economic impacts. Furthermore, the discussion of social impacts is embedded in a consideration of economic impacts and emerge as a subsidiary part of the broader account of CRE socio-economic project outcomes (Walton, 2012; Callaghan and Williams, 2014; Bere, Jones and Jones, 2015; Okkonen and Lehtonen, 2016; Slee, 2020; van der Waal, 2020). For instance, Callaghan and Williams (2014) examine the impacts for local economies from CRE projects but also raises the importance of community confidence as a social impact. In a similar way, Bere, Jones and Jones (2015) predominantly emphasise the economic impacts of a micro hydro schemes in Wales but also consider the social components of bonding social capital. Overall, the literature would benefit from building on such accounts and providing a fuller account of social impacts as an area of enquiry in its own right. As noted by Bere, Jones and Jones, (2015) further work is required:

> *"The research is at the same time only scratching the surface of a complex and under-researched subject"* (Bere, Jones and Jones, 2015, P28)

Indeed, Berka and Creamer (2018) in their review suggest that there was a paucity of studies in the area of CRE that robustly explored social impacts. In the study, the researcher sought to gain a more detailed understanding of the social impacts of CRE projects within the case studies, exploring its nuances and contextual contingencies. Indeed, there remains a need to extend beyond 'proxy' metrics of local social impacts such as economic measures (van der Waal, 2020). The study sought to address this gap identified by both Walker *et al.*, (2007) and reiterated by van der Waal (2020). In this way, there is a need to adopt a different strategy:

> *"Undertake or encourage more in-depth studies of process and impacts of community energy projects at the project level."* (DECC, 2013, P7)*.

The nature of evidence on benefits linked to CRE projects range from a quantitative to qualitative forms, providing different foci and addressing contrasting metrics. In

terms of quantifiable outcomes, these centre on particular impacts including reduced carbon emissions, the generation of energy, the reduction in energy use, reduced costs and employment gains (DECC, 2013b). In contrast, qualitative research surfaces in-depth and contextual evidence that relates to the experiences of individuals, groups and communities as well as providing insight into their perspective (DECC, 2013b).

The application of a quantified assessment of social impacts, such as using a Social Return on Investment (SROI) is complex in an applied context (Nicholls *et al.*, 2009; Cooney and Lynch-Cerullo, 2014; Maier *et al.*, 2015). Some of the challenges focus on the availability of appropriate data and the difficulty of securing meaningful potential indicators (NEF, 2012). For instance, certain components are easily quantified, including reduced fuel poverty and the mean annual electricity expenditure within communities. Furthermore, a difficulty is that often impacts are relational in nature based on the complex interactions operating across people, place and the CRE project (Hicks, 2018).

Some of the issues within the evidence-base focus on the difficulties in identifying and evaluating social impacts over a period of time, with a tendency to oversimplify metrics to items that can be easily reduced to quantifiable impacts (Creamer *et al.*, 2019). In this way, there is a gap in the literature which Creamer *et al., (*2019) summarises as focused on aspects which may be intangible yet also seen as having meaning. These should be captured to fully understand the impacts of CRE:

> *"Challenges of establishing and tracking meaningful outcomes over time and of not reducing these only to outcomes that can* be re*adily quantified"* (Creamer *et al.*, 2019, P5)*.*

Within the parameters of the study, the researcher focused on identifying some of the intangible impacts emerging from local CRE projects within a Welsh context. This centred on exploring what processes and conditions that may lead to outcomes at a project level, with an in-depth examination of context that extends beyond what can be easily quantified.

2.5. Summary

Overall, the literature review highlighted that the evidence-base on CRE was rich and diverse, characterised by its emergence as a new field of enquiry over the last 10 years. The societal implications of communities having a role in a low-carbon transition continues to be developed but requires more empirical research. In this way, the study addressed this knowledge gap and sought to understand how CRE projects generated social impacts alongside renewable energy, in creating 'energised' local communities.

CHAPTER THREE:
METHODOLOGY, METHODS AND STUDY DESIGN

3.1 Introduction

This chapter details the epistemology and methodology guiding the study and the methods applied as part of the study design. The researcher adopted a constructivist stance in guiding a case study approach. This provided a flexible lens to understand the complexities of how CRE was developed and established within a Welsh community context, centred on four CRE case studies and the additional case of the CY consortium. In particular, it centred on understanding the perspectives and experiences of stakeholders, shareholders and community hubs as part of energised communities. The study utilised an explanatory multiple-case study approach based on Yin (2014; 2018), focused on interviews and observations.

The initial section of the chapter will present an outline of constructivism and highlight its utility in providing a platform for exploring the area of CRE and the research questions underpinning the study. Following on from a consideration of case study as a methodological approach, the researcher will detail the study design used in practice and the characteristics of the respective case studies. This includes a consideration of sampling, recruitment, and methods, as well as rigour and transferability. The chapter will also provide illustrative exemplars of how the data analysis were applied as part of the study, focused on coding and thematic analysis (Yin, 2018; 2014; Miles, Huberman and Saldana, 2014; Bazley, 2013). The final section includes reflection on the application of the study design in practice.

3.2. Epistemological Stance

Moses and Knutsen (2013) highlights the importance of researchers being clear in defining the relationship between ontology as nature of being, epistemology as philosophical stance on knowledge, and methodology in framing an inquiry. In the

study, constructivism provides the ontological and epistemological stance of the researcher in exploring the development and establishment of CRE within Welsh communities. The work of Flick (2014) identified the importance of considering the epistemology and theoretical orientation of research work. Indeed, researchers are informed by a set of assumptions and epistemological positions that consequently frame their study designs, across all qualitative methodologies (Flick, 2014). In this context, the researcher needs to surface the assumptions underpinning a qualitative study design, recognising the different stance aligned to differing research methodologies, representing the "*fundamentals*" (Flick, 2014, P33) of an inquiry. Indeed, they are seen as driving the application of methods and the framing as well as interpretation of meaning-making within a study. In qualitative research, Marby (2008) highlights how a constructivist approach has emerged as one of the epistemological positions adopted by researchers in informing their research inquiry. As such, in the study a focus on the personal construction of knowledge was underpinned by the key work of Guba and Lincoln (1994) around naturalistic inquiry, a subjectivist epistemology and the use of a hermeneutic 'meaning-making' approach as part of qualitative research. In this context, meaning-making centres on how actors or institutions generate realities through an interactive process, with such perspectives accessed by researchers through methods such as interviews (Flick, 2014; Kvale, 2007; Gibbs, 2007).

The area of constructivism (Guba and Lincoln, 1989; Mabry, 2008) provides a particular lens to understand the social world and phenomenon. In essence, constructivism is centred on the principle of multiple, plural and socially constructed realities. As such, social reality is not only a construction but is represented within the interaction between individual actors. This is seen as a dynamic, highly contextual and changing social process. Consequently, knowledge is also shifting and fluid as part of an interactive social reality, which is modified over time. Significantly, such a social reality is viewed as occurring at an individual and wider level, arising from social interaction and a sharing of realities within a context. This leads to a negotiated process amongst multiple realities and the

112

development of a consensus among individuals in a context, so that it represents a construct that has certain characteristics (Guba and Lincoln, 1989).

Constructivism and case study methodology

In the study, the blending of constructivist stance alongside a case study approach provided an effective lens for understanding the complex and plural perspectives on CRE projects in a number of distinct community settings. Indeed, Marby (2008) highlights the central importance of researchers seeking to understand the multiple meanings and complexity involved in a phenomenon in the context of case studies. As such, case study work is intrinsically focused on mapping the plural perspectives on a 'case', including the meanings of participants within a situational setting: "*contextuality is an aspect of the dynamism and complexity of a case*" (Marby, 2008, P217), including its physical and socio-cultural nature. Overall, case study designs are inherently flexible, and this is reflected in its broad epistemological orientation. As noted by Yin (2014), it can occupy different positions from constructivist to realist lens.

As such, the study focused on understanding *how* CRE projects were framed within people's constructs and perspectives, including the relevance of these perspectives and context. For instance, around the areas of what was meant by social impacts, community or place attachment aligned to CRE projects. As such, a constructivist stance enabled the researcher to develop a case study design that focused on "*comparing thick independent and informed stories*" (Moses and Knutsen, 2013, P254). The adoption of a case study approach (Yin, 2018; 2014; Mabry, 2008) presented a way to explore context-rich settings and the perspectives of particular 'cases' within which the researcher could examine and complete a comparative analysis of the positions of different key stakeholders, shareholders and community hubs in relation to distinct CRE projects. In this way, the researcher sought to understand plural perspectives, but draw them together as part of an explanatory approach to CRE in practice, set within community settings (Flyberg, 2001; Moses and Knutsen, 2013). In this way, constructivism provided an appropriate platform

for case study work in the context of CRE projects, illuminating perceived social benefits.

3.3. Methodology: Case Study

Establishing the approach

The study centred on an explanatory, multiple-case study approach (Yin, 2018; 2014) to explore the research questions focused on understanding social impacts as part of energised communities in Wales. However, a range of alternative methodologies could have been considered to frame the design of the study. For instance, an ethnographic approach (Creswell and Poth, 2017; Hammersley, 2006; Herbert, 2010; Gordon, 2016)would have provided a different perspective, with a particular emphasis on the cultural and sub-cultural contexts of CRE groups and projects. Ethnography represents a broad range of approaches to enquiry, involving both "*baggage and power"* (Herbert, 2010, P653). Although, an ethnographic approach often utilises a case study design its emphasis would have focused on a different, more immersive researcher role. This would have generated an in-depth inquiry but there may have been less opportunity for transferability and analytic generalisations (Yin, 2014; 2018). In this way, the research questions would not have focused on the 'how' and 'why' questions as framed by Yin (2018; 2014) in the same way or centred on an explanatory view of social impacts.

In contrast, a survey approach (Gordon, 2016; De Vaus, 2014) could have been adopted, reflecting the range of similar studies in the CRE sector. However, although the survey could have adopted a comparative across case design (De Vaus, 2014), it would have been centred on a perspective rooted primarily in the researcher's stance, embedded in the literature, guiding the design of a questionnaire. An advantage of a survey approach would have been the greater number of cases and participants in the study. However, although there would have been greater breadth to sampling potentially across cases (Gordon, 2016), there would have been significantly less in-depth data or insights into the area of situational factors and context through a quantitative analysis. Further, the social

impacts within CRE projects are often intangible (Walker *et al.*, 2007b) and may not be easily quantifiable or identified through survey work.

Case Study Approach: An overview

Overall, case study work has an established tradition within applied research across a range of different disciplines, including within Social Science, and utilised across qualitative and quantitative designs (Gerring, 2017). However, within the area of qualitative research, a case study design has emerged as an important approach for researchers (Creswell and Poth, 2017). In particular, Mabry (2008) highlighted the utility of case study work, in order to understand complex social contexts, noting its core attribute "*as deep understanding of particular instances of phenomena*" (P214), a theme reiterated by Yin (2014). The main rationale for adopting a case study approach centres on its appropriateness in examining 'how' and 'why' questions, a contemporary focus and exploring a setting where the researcher and design do not retain control over behaviours (Yin, 2014). As such, case study work is centred on understanding context and initially starts from the basic unit of comprehending a 'case' and its intrinsic nature (Stake, 1995). Yet, there is much diversity and flexibility in the application of case study designs in unpacking complex context(s), centred on either a single or multiple set of cases. This includes its use to explore what are often deeply qualitative research questions (Mabry, 2008).

Although well established, there are challenges involved in the clarity of definitions regarding what represents case study work, as well as its application in practice. A central feature is an in-depth examination of phenomenon as a 'case' in their naturalistic context, resulting in new insights and meaning gained within real-world settings (Yin, 2012). However, a criticism levelled at case study work is its perceived over-emphasis on exploration of the case as part of its design rather than a focus on generating explanation (Yin, 2018). Yet, the literature around case study work indicates a highly flexible approach that provides outcomes ranging across a continuum of description to explanation (Baxter and Jack, 2008; Yin, 2018).

In terms of engaging in case study work, there are a number of challenges, as noted by Yin (2018) "*doing case study research remains one of the most challenging of all social science endeavours*" (P3). An initial starting point is that a case study approach is best understood as focused on a single case or set of particular cases which are able to *"shed light on a larger population of cases"* (Gerring, 2017, P28). As such, a case has distinct characteristics and may be viewed as being "*simple or complex"* (Stake, 1995, p.87).

In order to understand complexity, at the core of case study work is the definition of what is meant by a 'case' and how this is applied within the parameters of a study, often referred to as its 'boundness' or boundaries (Yin, 2014; 2018). In this way, a key step in case study work is defining the nature of 'boundness' (Yin, 2014) of the 'case'. Indeed, Bazeley (2013) provides a useful starting point, affirming that "*cases are generally characterized on one hand by their concreteness and circumstantial specificity and on the other by their theoretical interest or generalizability*" (Schwandt, 2007; P27). As such, a case may be "*one among others*" (Stake, 2000, P436) but enables an understanding of other cases. In the study, the boundness of cases were defined around their distinct characteristics as four Welsh CRE projects. These features included differing rural community contexts and RE technologies as well as being community-led, with all schemes being recently established. As such, Flyvbjerg (2006) identifies the importance of a 'strategic selection' of cases which account for a range of CRE projects operating in a differing context. In this context, the framing of *how* cases are utilised is further detailed by Yin (2014) centred on a framework for taking single or multiple cases forward. These centre on the sub-divisions of either holistic or embedded units of analysis within the overall case.

Within this framing of cases, the research question directs the level of analysis and focus required, for instance, in holistic designs the researcher sets parameters around the case with a global focus, such as an organisation or programme, either at the level of a single or multiple case study design. However, the research question may require drilling-down to other sub-units of analysis at a sub-case level, representing embedded units of analysis (Yin, 2014). Again, this may occur as

part of single or multiple case designs, but the researcher has to be clear in defining the boundedness of the case and the level(s) of analysis as part of the design.

The study focused on a multiple embedded case study (Yin, 2014), with the respective 'cases' representing the CRE projects and CY consortium, and the embedded units being key stakeholders, shareholders, and community hubs as well as CY staff. It also focused on the blending of theoretical and empirical contexts within particular cases as part of the inquiry, as recommended by Flyvbjerg (2006) and Yin (2014).

3.4. Study Design: A case study approach

As noted earlier the study design utilised a case study analysis focused on four CRE projects in a Welsh context, as well as the CY consortium, forming a multiple and explanatory case study (Yin, 2014; 2018). The CRE projects involved key stakeholders, shareholders and the wider community through community hubs, representing embedded units of analysis (Yin, 2014) within each of the cases, to map the social impacts from CRE projects (Figure 28). As such, they had a number of defining characteristics, with key stakeholders represented core individuals that were heavily involved in driving forward the projects. In this way, the stakeholders had a certain skill set and a capacity to act, including a strong motivation to invest time and energy to facilitate project development. The shareholders co-owned the CRE schemes and had a say, in terms of how the project was set up and run, based on the one member, one vote principle, irrespective of the number of shares owned. The community hubs have been defined based on the Community Research Unit (2011).

> "*Community hubs are designed to encourage social gathering and provide spaces for people to congregate and meet together in both planned and incidental ways a hub typically involves a facility and/space that allows for local organisations and community groups to offer a range of activities, programs, services and events which address the social needs of the community*" (Community Research Unit, 2011, p7).

In this way, participants from community hubs enabled the researcher to explore *how* CRE projects fitted into a local network of social and environmental

organisations. The CY consortium presented an additional case in North Wales, it represented an infrastructure to facilitate CRE project development and included two funded support posts.

Figure 28: Case study participants
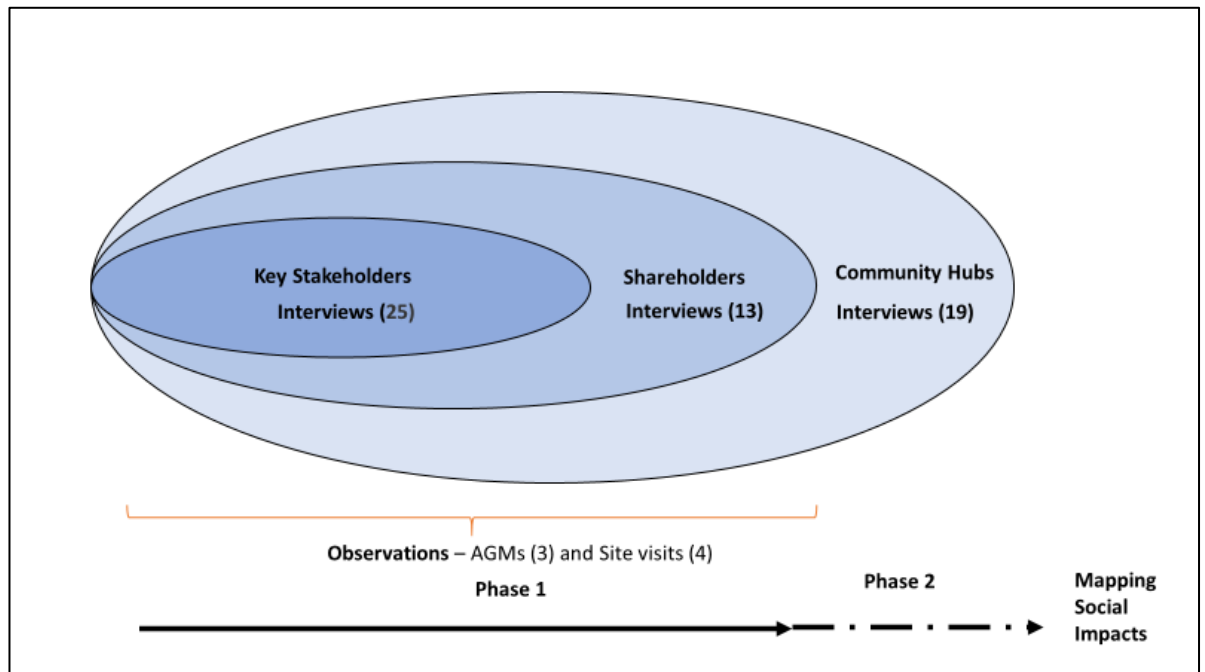
The study design sought to map the social impacts based on the experiences and perceptions of these distinct constituencies across these different settings and contexts. Overall, the study design involved Phase 1 centred on CRE projects and the consortium (August 2018 - September 2019) and Phase 2 exploring the perspective of community hubs (August 2019- January 2020). These phases resulted in a total of 57 interviews (Figure 28). This included 67 participants, involving interviews through the medium of English and Welsh depending on the participant preference. Further, in total 25 stakeholder interviews were completed and 13 shareholder interviews across three case studies. A range of community hubs were sampled across the project areas, resulting in a total of 19 interviews. In addition, a series of observations and fieldwork was completed, focused on AGMs and field

visits. Supplementary data was included as analects as part of fieldwork, linked to interviews centred on the community share offer documents for the projects.

3.4.1 Sampling and Participants

The sampling strategy was guided by the case study design (Yin, 2018; 2014) and Marby (2008), focused on purposive sampling. In this way the sampling and criteria for inclusion focused on recruiting a set of case sites that represented specific 'cases' that have particular characteristics (Yin, 2014). The sampling for Phase One involved a range of participants embedded in 5 case studies that included 4 CRE projects (YO, YPP, AC and GR) and a consortium (CY) to enable the research question to be addressed. This included a purposive sample of participants within each case study that were recruited because they had a defined role as either a stakeholder or shareholder associated with the CRE project, or were part of the CY, representing different configurations.

The initial case was centred on CY which is a community energy consortium in North Wales consisting of 4 projects, YO, YPP, Ynni Anafon and Coed Tir. It provided a local network based on developing support for current and future CRE projects. The other 4 case studies were specific CRE projects, YO, YPP, AC and Gower Regeneration.

These 4 CRE projects provided a range of perspectives across different Welsh contexts and included 2 projects involved with the consortium (*YO, YPP*). The additional 2 cases were located in South Wales (*AC and GR*) representing different characteristics and not embedded in a consortium. The details of the rationale, sampling and participants in the respective case are detailed in Table 17, including participants involved in the study from each case study. All were adult participants and included a combination of Welsh-English bilingual participants.

Table 17: Case descriptions: Rationale, sampling and participants

Case Description	Case: Cyd Ynni	Case: Ynni Padarn Peris	Case 3: Ynni Ogwen	Case: Awel Co-op	Case: Gower Regeneration
Rationale for Case Selection	CY represents an exemplar of a consortium for supporting the development of 5 local CRE projects and capacity building. Furthermore, 2 CRE projects selected in the North Wales region are part of the CY consortium. In this way the case selection facilitates mapping the impacts of local networks associated with this consortium and its connection with CRE projects.	The project officially opened and started generation in June 2017. As such, the project has been operating for the minimum 1-year duration required in the study, enabling the link between energy generation and social impacts to be explored. The case also represents a particular form of ownership (Community Benefit Society) and technology (Hydro). A BenComs is defined as requiring benefits to be accrued to the communities and therefore the case provides a good platform for	The project officially opened and started generation in June 2017. As such, the project has been operating for the minimum 1-year duration required in the study, enabling the link between energy generation and social impacts to be explored. The case also represents a particular form of ownership (Community Benefit Society) and technology (Hydro). A BenComs is defined as requiring benefits to be accrued to the communities and therefore the case provides a good platform for	The project opened and started generation in January 2017. As such, the project has been operating for the minimum 1-year duration required in the study, enabling the link between energy generation and social impacts to be explored. The case also represents a particular form of ownership (Community Benefit Society) and technology (Wind). As a BenComs is defined as requiring benefits to be accrued to the communities and therefore the case provides a good platform for	The project opened and started generation in March 2017. As such, the project has been operating for the minimum 1-year duration required in the study, enabling the link between energy generation and social impacts to be explored. The case also represents a particular form of ownership (Community Benefit Society) and technology (Wind). As a BenComs is defined as requiring benefits to be accrued to the communities and therefore the case provides a good platform for

		examining social impacts. It is positioned in North Wales as part of understanding the wider All Wales context in the study design. Furthermore, it is located in an area with a history of industrialised slate quarrying now transitioning to renewable energy. In this way, it enables the study to explore the experiences of energy transition from an industrial to renewable energy context and their place attachment.	examining social impacts. Furthermore, it is positioned in North Wales as part of understanding the wider All Wales context in the study design. Also, it is located in an area with a history of industrialised slate quarrying now transitioning to renewable energy. In this way, it enables the study to explore the experiences of energy transition from an industrial to renewable energy context and their place attachment.	examining social impacts. It is positioned in the South Wales region and is located in an area with a history of industrialised coal mining now transitioning to renewable energy. In this way, it enables the study to explore the experiences of energy transition from an industrial to renewable energy context and their place attachment.	examining social impacts. It is positioned in the South Wales region and is located in an area with a history of industrialised coal mining now transitioning to renewable energy. In this way, it enables the study to explore the experiences of energy transition from an industrial to renewable energy context and their place attachment.
Rationale for Participant Selection and sample: key stakeholders	The rationale for selecting the participants was their role as stakeholders for a range of CRE projects within the CY local networks. In addition, there was a funded post to provide	The rationale for selecting the stakeholder participants was their strategic role in developing and maintaining the project. As such, interviews with different	The rationale for selecting the stakeholder participants was their strategic role in developing and maintaining the project.	The rationale for selecting the stakeholder participants was their strategic role in developing and maintaining the project. There were	The rationale for selecting the stakeholder participants was their strategic role in developing and maintaining the project. There were

administrative and coordination support as part of Cyd Ynni. overall, there were 5 participants. The Stakeholder participants focused on representatives of the 4 projects currently involved in Cyd Ynni. These focused on 4 (CYKS1-4) interviews, involving stakeholders leading the current projects within Cyd Ynni. These projects were positioned at different stages of development, although all were established. Yet Ynni Anafon was further ahead and Egni Mynydd and Moel y Ci were still in an early stage. In this way, there were different insights on CYfrom different groups at differing	stakeholders aimed to provide different perspectives of the processes and perceived benefits of CRE. This included different levels of civic engagement, centred on how key stakeholders engaged with the CRE projects and shaped the social processes, including project management role and responsibility for the CRE project being energised from conception to development. There were 6 key stakeholder participants in YPP (YPPKS1-6), with 6 interviews.	There were 7 key stakeholder participants in YO involving 5 interviews (YOKS1-5). There was also an additional participant focused on the development of Energy Local (ELKS1).	4 key stakeholder participants in AC (ACKS1-4), involving 4 interviews.	5 key stakeholder participants in GR(GRKS1-5), involving 5 interviews.

	stages of development. Also, there was an interview with 1 CY staff member (CYKS3), employed to support its development and operation. However, there were two participants who had a role primarily in the CRE projects but also Cyd Ynni. These participants were from YO and YPP and a section of the interviews centred on their specific role as part of the CY consortium (YOKS2 and YYPPKS5).			
Rationale for Participant Selection and sample: Shareholders		Shareholders who have invested in the CRE project and involved in the project but not in its management, to provide a range of perspectives and experiences.	Shareholders who have invested in the CRE project and involved in the project but not in its management, to provide a range of perspectives and experiences.	Shareholders who have invested in the CRE project and involved in the project but not in its management, to provide a range of perspectives and experiences.	Shareholders who have invested in the CRE project and involved in the project but not in its management, to provide a range of perspectives and experiences.

		Sampling focused on 3 interviews involving 4 participants (YPPKS1-3).	Sampling focused on 5 interviews involving 6 participants (YOS1-5).	Sampling focused on 5 interviews involving 5 participants (ACS1-ACS5).	Due to local circumstances within the CRE project, no shareholders were recruited at the time of the study.
Rationale for Participant Selection and sample: Community hubs		Participants from community hubs which were not formally part of the CRE projects. Focus on recruiting participants to provide perspective on wider community awareness, involvement and perceived benefits from CRE projects within local civil society in which CRE projects are situated in.

Sampling focused on 7 interviews involving 7 participants (yPPCH1-7). | Participants from community hubs which were not formally part of the CRE projects. Focus on recruiting participants to provide perspective on wider community awareness, involvement and perceived benefits from CRE projects within local civil society in which CRE projects are situated in.

Sampling focused on 4 interviews involving 4 participants (YOCH1-4). | Participants from community hubs which were not formally part of the CRE projects. Focus on recruiting participants to provide perspective on wider community awareness, involvement and perceived benefits from CRE projects within local civil society in which CRE projects are situated in. Sampling focused on 4 interviews involving 5 participants (ACCH1-ACCH4). | Participants from community hubs which were not formally part of the CRE projects. Focus on recruiting participants to provide perspective on wider community awareness, involvement and perceived benefits from CRE projects within local civil society in which CRE projects are situated in.

Sampling focused on 4 interviews involving 8 participants (GRCH1-4) |

In Phase Two of the study, the researcher focused on sampling participants drawn from a range of community hubs within the four case study areas, potentially representing a diverse set of perspectives on the CRE projects within their locality and in relation to their particular community hubs. In this way, the study sought to explore the positioning of the CRE projects within a wider community network of local civil society. As such, community hubs were selected according to the Community Research Unit (2011) definition that emphasised the boundaried nature of hubs. As such the study explored the perspective of individual participants recruited within five themed categories of hubs, set within the case study areas (Figure 29). The community hubs included a broad range of groups and organisations, respectively: *social community groups or organisations, environmental community groups or organisations, community centres, faith-based* and *tourism-based hubs*. These were drawn from the perspective and experiences of individual participants sampled from the community hubs across the case study areas. In this way, the participants did not formally represent the views of the hub, rather their accounts represented a lens to explore the positioning of the CRE project within a wider community context. Again, participants were adults and included a combination of Welsh-English bilingual participants.

Figure 29:   Sampling community hubs: A range of characteristics
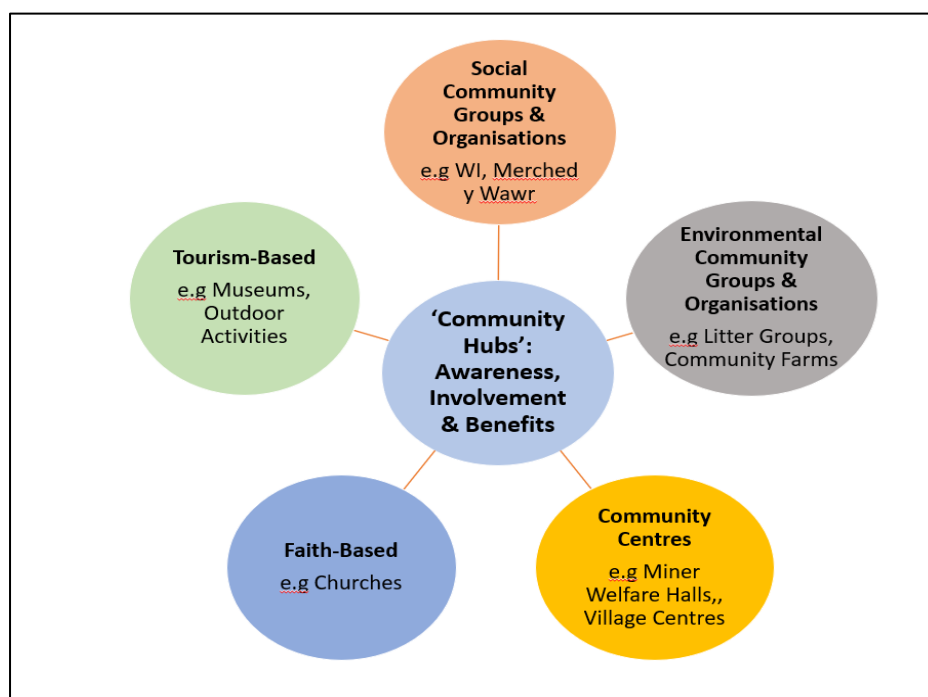
The recruited hubs were clustered by the researcher according to their focus on social or environmental goals. This provided an indication of the different types operating within the communities aligned to the CRE projects (Figure 30). In this way, hubs within the GR community area were mainly centred on environmental activities in contrast to the communities aligned to AC which were primarily social in orientation. The hubs relating to YPP and YO represented a mix of both environmental and social objectives

Figure 30: Community Hubs: Characteristics and profile

Predominantly Environmental community hubs	**Gower regeneration community area** **Community centre** **Women's institute** **Environmental centre** **Community farm**
	Ynni Ogwen community area **Community centre** **Merched Y Wawr** **Litter Picking group** **Conservation charity**
Mix of environmental and social community hubs	**Ynni Padarn Peris community area** **Community centres** **Merched Y Wawr** **Museum** **Litter Picking group** **Faith based** **Outdoor centre**
Predominantly social community hubs	**Awel Co-op community area** **Community centres** **Merched Y Wawr** **Outdoor education**

3.4.2 Recruitment

In terms of CY, stakeholders across the 4 consortium projects were recruited (YO, YPP, Ynni Anafon and Egni Mynydd). The consortium was contacted as part of the preparatory work for the study and agreed to involvement with the study and to provide necessary permissions and access. They forwarded an initial invitation e-mail/information to all stakeholders and staff. This included a Participant Information Sheet (PIS) and consent form (Appendix 1). The stakeholders are publicly named as working with CY, for instance on websites and published material. Recruitment of stakeholders was facilitated by CY, with the Development Officer as a gatekeeper.

In relation to the recruitment of key stakeholders within CRE projects (YPP, YO, AC, GR), the project directors were contacted as part of the initial work for the study, and they agreed to involvement and provided the necessary permissions and access. They forwarded an initial invitation e-mail/information to all stakeholders and active members. This included a PIS and consent form (Appendix 2).

In the case of shareholders, access and recruitment was facilitated through individual gatekeepers with information about the study communicated within the network of shareholders aligned to each CRE project. In the case of YPP this was accomplished by e-mail, whereas for YO and AC this was completed through AGMs. Subsequently, this included disseminating a PIS and consent form (Appendix 3). The recruitment of shareholders was challenging through e-mails with YPP, and the recruits had not attended AGMs and in a way were less actively engaged. The initial difficulty with email recruitment of participants prompted the researcher to seek an alternative strategy through AGMs, which in contrast resulted in greater numbers but also a more active set of shareholders. In this way, these two groups of shareholders represented different perspectives, resulting from the sampling and recruitment strategy.

Equally, the key representatives of community hubs were recruited by the researcher through an initial invitation e-mail/information to gatekeepers within the designated organisations and groups. At times, certain community hubs could

only be contacted by telephone contact with representatives, such as churches. The detail of individuals contacted as gatekeepers were currently available in the public domain with open contact details. Subsequently, a PIS and consent form was forwarded to participants (Appendix 4). The recruitment of community hubs was challenging across all the case sites, focused on the broad range of hubs. The researcher utilised a combination of e-mail and telephone contact, with subsequently, a PIS and consent form was forwarded to participants (Appendix 4. A particular issue was limited representatives from churches due to the small number of personnel and ill-health. Furthermore, there were no representatives from community councils due to time and practical issues by potential recruits.

3.4.3 Theoretical Framework

As part of the data collection and data analysis process, case study work may utilise theory and literature as part of the inquiry process as well as be located indifferent epistemological positions. The researcher adopted a constructivist stance (Marby, 2008) to inform the approach, which underpinned the importance of uncovering the perspective of participants. However, the design also included reference to theoretical framework to support aspects of the study. Case study work focuses on theoretical propositions or theory that inform the data collection-analysis process (Yin, 2014; 2018). In this way, as detailed by Yin (2014), case study work benefits from prior theoretical development or propositions to evolve research questions and guide data collection and analysis. As such, case study work may iterate between theory and data during the inquiry process, with theory providing a sounding board as well as verification of some aspects of interpreting findings (Flyvbjerg, 2006; Yin, 2014; 2018).

In the study, the researcher focused on insights gained from relevant theory around the research area of CRE and the research questions. This centred on theory on social and cultural capital, as well as community and place attachment. They provided an important platform for the initial design of research questions as well as interpretation of findings during analysis and later integration of findings as part of the study. Further, there was also the theoretical framework around a range of social processes and outcomes from CRE focused on (Walker and Devine-Wright

(2008). In this way, rigour was built into the design as supported by Yin (2014) with theory providing a source of external validity, through the iterative use of theory combined with the primary importance of data from case study participants.

3.4.4 Data Collection

Interviews

As noted by Bryman (2016), interviews are a key method in qualitative research, linked to exploring and developing descriptive and conceptual insights. It facilitates theoretical work to emerge and at its core is a reflexive and open-minded approach. Indeed, Rubin and Rubin (2012) indicate how interviewing provides a source of in-depth data with rich sources of information for interpretation, based on participant experiences and their account. In the study, interviews enabled a meaningful engagement between the researcher and participants, facilitating a conversation that moves beyond question and answer towards a discourse, seeking to address equity in developing knowledge. As such, the researcher adopted the stance identified by Holstein & Gubrium (2003) at its core: "*Interviewing provides a way of generating empirical data about the social [and geographical] world by asking people to talk about their lives [and places]*" (P3). In this context, interviews provided a thick description of CRE, importantly representing the accounts and descriptions of those with first-hand experiences (Bryman, 2016; Gibbs, 2007). In the study, this included gaining the different perspectives of stakeholders, shareholders, and community hubs, seeking to unpack the social impacts of CRE projects, set within a range of case-contexts.

In the present study, the participants involved as part of Phase 1 and 2 data collection procedures, included 23 telephone interviews and 34 face-to-face encounters. In the context of completing the telephone interviews (n=23), the researcher utilised the best practice detailed by Sarantakos (2013), centred on adjusting the framing of questions to ensure clarity of content yet following the same structure as face-to-face. These telephone interviews had the advantage of being convenient for participants, based on preference on recruitment, ease of communication and avoided the limitations of a single researcher engaging in

fieldwork across four geographically spread case study sites. In this context, there were more telephone interviews conducted with participants in South Wales, representing 14 as opposed to 9 in North Wales. This included practical considerations, such as ease of access and convenience for participants as at times they were unable to meet for face-to-face interviews during fieldwork periods.

In this context, 57 interviews were completed during fieldwork, including a number of two-person or small group interviews (n=7), mostly focused on two people, with one interview involving four people in a GR community hub. A potential challenge in small group or two-person interviews is the management of multiple viewpoints being expressed and the more complex interaction with the researcher, including at times one participants potentially dominating the discourse (Rubin and Rubin, 2012). However, the benefits of such encounters include surfacing more nuanced or a wider range of perspectives as part of a multi-person conversation during the interview (Gubrium and Holstein, 2003; Kvale, 2007). In the study, the researcher utilised fieldnotes to identify patterns of interaction during interviews and how particular viewpoints were generated and constructed during conversations.

A central part of the data collection process involved a cycle of semi-structured interviews with stakeholders, shareholders, and community hubs centred on uncovering their first-hand experiences and perspectives, a key benefit of interviews (Rubin and Rubin, 2012). The researcher built on the recommendations of Silverman's (2000) seminal work and viewed the interviews around CRE projects as an opportunity to have a thematic, semi-structured exchange with participants about their values, experiences, and viewpoints, seeking meanings of "*the world from the point of view of the people studied*" (Hammersley, 1992, P165). As such, the researcher approached the interviews as "*conversation(s) with a purpose*" (Berg 2004, P75) and sought to address power as part of the interview relationship. In this way, the framing of interviews as a semi-structured format sought to enable participants to have control over exploring the topic areas whilst retaining a degree of consistency through structure (Brinkmann, 2018).

In the study, the researcher focused on key thematic areas related to the research questions, ensuring there was a consistency in the set of questions used by each constituency, which were framed as open-ended whilst pursuing key lines in the enquiry (Denscombe, 2007). An overarching theme across stakeholders, shareholders and community hubs was social impacts and local place. In this way, the interview guides were tailored to each constituency and interviews were conducted bilingually according to the preference of participants. As part of the development of an iterative approach to using the interview guide, some questions were 'fine-tuned' or clarified through the experience of completing interviews. In this way, the interviews were conducted in an iterative manner (McGrath, Palmgren and Liljedahl, 2019; Rubin and Rubin, 2012). This process was accounted for as part of an audit trail through the researcher's fieldnotes (Yin, 2014).

The interview schedule purposefully reflected the themes embedded within the research questions, centred on an initial planning process for fieldwork (McGrath, Palmgren and Liljedahl, 2019; Fontana and James, 2003). The researcher framed the interview work around the principles of Kvale (2007) centred on three quality criteria. These focused on a thorough knowledge of the topic area by the researcher (including relevant theory), a structured approach to interviewing with a clear set of question areas aligned to the research questions, and clarity in expression.

The stakeholder interviews centred on exploring their perspectives and experiences, based on a number of core themes including managing the project (Appendix 5 a, b). These focused on initially seeking some biographical background prior to an exploration of the 'idea of community, place and community energy', including identifying what was meant by 'community energy'. It also included a reflection on what was important about their local area and it's the historical context, prior to examining how the CRE project was established and managed. In particular, the interview examination the motivations of stakeholders in becoming involved in the CRE project. This included examining who else was involved with the project from within the community, any obstacles and its impacts and the relevance of a Welsh and National policy context. In terms of those involved with CY, the

interview examined their role in the consortium and the links between CY and the CRE projects. Further, it sought to identify the outcomes from the consortium and future developments.

The shareholder interviews explored the area of motivations for involvement with CRE projects, how they kept up with developments within the scheme. It also sought to identify the impacts to them directly as shareholders from their involvement with the CRE project and potentially to the wider community. Further, it examined the degree of trust in stakeholders, as well as exploring if involvement in the scheme had influenced their perception of energy in day-today life (Appendix 6).

The community hubs interviews initially sought to outline the main characteristics and activities of the hub within the locality, prior to exploring their awareness of the CRE project. It also examined the degree of involvement with CRE projects, as well as considering any potential impacts or benefits to the local community from the CRE project (Appendix 7).

Overall, the interviews for stakeholders, shareholders and community hubs were focused on key thematic areas and questions which were guided by the study's research questions. In this context, particular themes and questions were directed towards specific constituencies (Figures 31-33).

Overall, the researcher actively built rapport and trust with participants, outlining the purpose of the study and the focus of interview topics as an important platform for gaining access to the experiences and perspectives of participants (McGrath, Palmgren and Liljedahl, 2019). In the study, the researcher adopted a reflexive stance, ensuring participants were given an opportunity to explore their perspective, through active listening with the use of probes when necessary (Creswell, 2013).

Figure 31: Interviews: Key thematic areas and questions around community and place
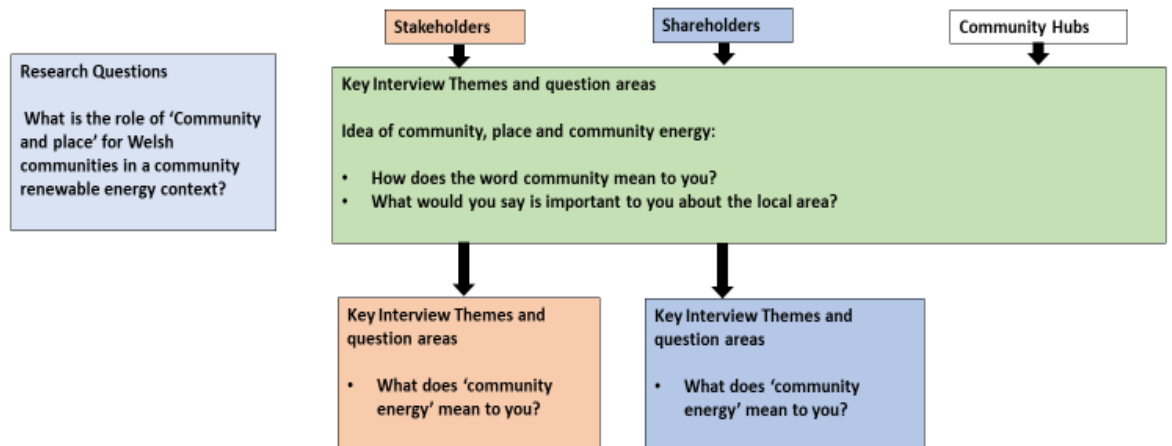
Figure 32: Interviews: Key thematic areas and questions around social processes and civic engagement with CRE
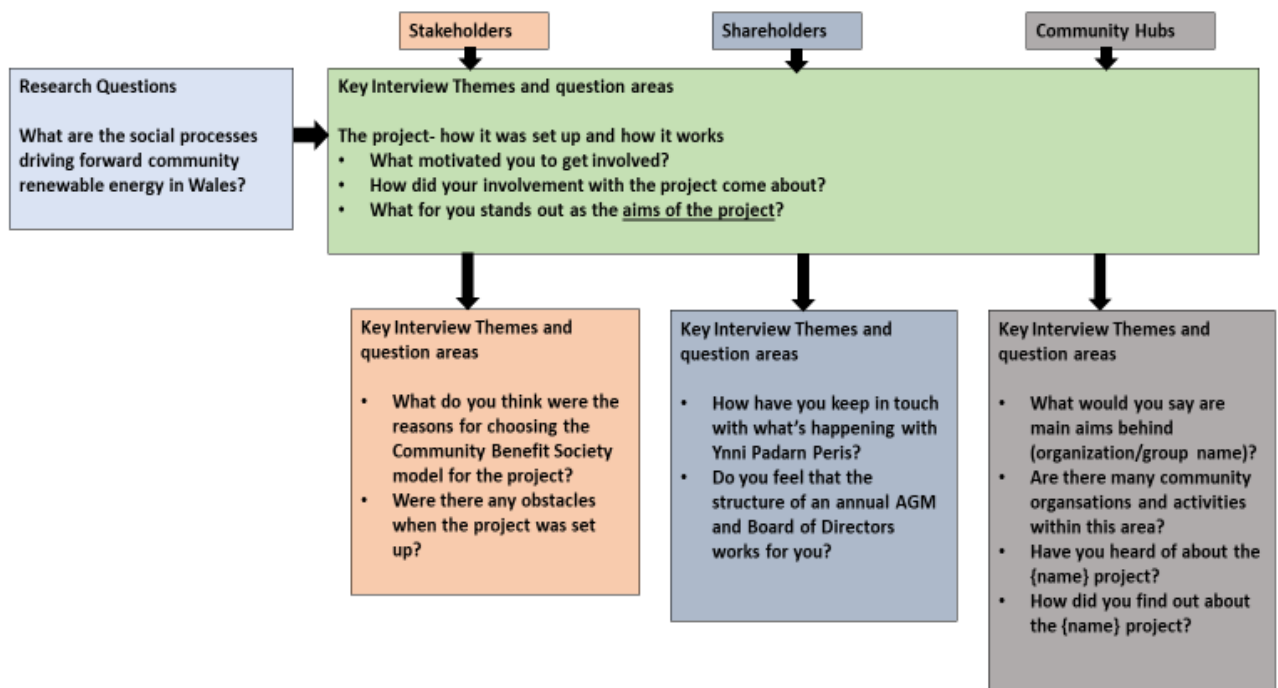
Figure 33: Interviews: Key thematic areas and questions around social impacts from CRE
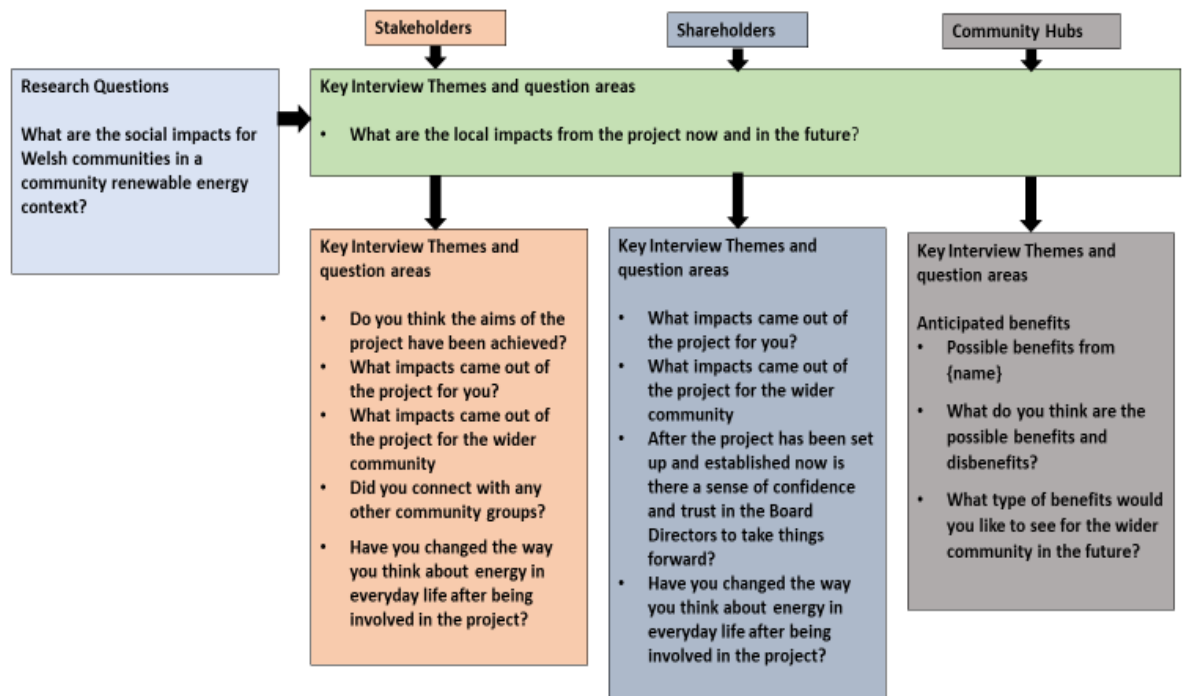
In the study, 22 interviews were completed through the medium of Welsh, and of these 21 were in the North Wales case studies. As part of the interviews, 52 were audio recorded and five involved fieldnotes, based on preference. The interviews involved an encounter of 40-90 minutes and, as part of the semi-structured format, including the use of probes. As part of this process the researcher framed interviews as involving 'social practice' (Brinkmann, 2018), linked to understanding the lived experiences of participants within a context and exploring their perspectives, experiences, and alternative viewpoints. In this way, within the study all interviews were framed as "*enacted conversations*" (P596) in generating knowledge through social practice within people's social worlds, centred on talking to them in naturalistic settings (Brinkmann, 2018). As such, interviews were held in a variety of settings, including cafes and community-based premises. For instance, participants were interviewed in offices, community buildings and local cafes or involved walking interviews. The use of walking interviews provided an additional physical context, with participants not only talking but engaging within their

environment through 'street phenomenology' as described by Brinkmann (2018), exemplified by volunteers talking the researcher around the YO hydro and turbine house. The walking interviews or those completed in cafes had both positives and negatives, facilitating engagement with participants in naturalistic settings but also background noise impacting on the quality of recordings and later transcription, or requiring fieldnotes only (McGrath, Palmgren and Liljedahl, 2019; Silverman, 2000). In the study, they provided important neutral and contextual settings facilitating useful insights.

In the case of stakeholders, there were follow-up interviews with a sample of key actors, some 12 months after the initial interview. These were conducted with CRE projects to track how processes and the delivery of social impacts may have changed over time due to the dynamic nature of schemes. These centred on considering a range of key thematic areas, including reflecting on the development of community benefits from the CRE project such as the development of charities. This centred on the structure and processes of generating a charity and its aims and objectives, with an exploration of anticipated outcomes and local benefits.

Observation

In case study, observation provides not only a key method but also a supplementary method alongside other methods of data collection (Yin, 2014; Robson, 1993). For instance, Miles and Huberman, 1994) identify how transcripts of interviews may deplete context of the encounter, which can be captured by observation within, as well as alongside, interviews. Indeed, Yin (2018) highlights the value of direct observations, as either a formal or informal record of encounters or activities and interviews around walking with participants. These provide insights into "*the condition of the immediate environment …may suggest something about the culture of the organisation'* (P122).

As part of the study, the researcher utilized direct observation to understand the context of CRE projects as organisations and how they operated in practice, using the work of Yin (2014) and Mabry (2008). This centred on non-participant work, with the researcher viewing participants, events within their setting as a detached

observer, providing opportunities for insights into CRE. In this way, the researcher gained insights, even briefly into the *"ethnography of the particular"* (Angrosino and Perez 2000, P143) rather than only examine the surface context or culture of the social setting, interaction, or group as part of the study of CRE. Indeed, Watson and Till, (2010, cited in DeLyser et al, 2010) highlight that at its core, observation requires description and reflection on interactions, settings, and emotional experiences in the field, with particular benefits in understanding the construction of meanings within a physical and social context.

The researcher used direct observation, including discrete periods of observations at AGMs (3) and site visits (4), as well as walking interviews. For instance, observing volunteering with the community hydros as part of YO and YPP. The observations were unstructured and recorded in fieldnotes as a narrative record with thematic headings providing structure, focused on the event or setting, key points and reflexivity (Yin, 2014; 2018). As such, within the study, the observations were important in enabling the researcher to view *how* CRE projects operated in their natural setting. For instance, in AGMs enabling observation of the voting procedure and how democratic processes were framed within AGMs, including who participated as part of such events. This included being able to record how they were inclusive and completed bilingually, through the lens of fieldwork. Furthermore, direct observation (Yin, 2014) facilitated observation of visual data supporting the interview data, such as the visual murals in a GR community hub, as well as the solar panel installations in an AC community hub.

A key challenge in observational work is the balance between distance and proximity between researcher and participants in a setting (Bratich, 2017). This includes the degree of intrusion by the researcher as observer which may be a limiting factor (Robson, 1993). In the study, the researcher used a reflexive approach to be critical of the researcher position in a setting, for instance ensuring rapport with participants in AGMs but remaining distanced by focusing on observing key thematic areas such as participatory processes, the characteristics of shareholders and stakeholder discourse. Further, the use of fieldnotes to document observations enabled integration of accounts into the analytic procedures of the

study (Yin, 2014). A challenge in observation work is the degree of selectiveness in what the researcher choices to observe as part of the process (Miles and Huberman, 1994). In the study, the observations were guided by the interview data and analysis, but also remained open to new insights from engaging with participants in naturalistic settings.

Fieldnotes

As part of the interviews and observation work the researcher completed fieldnotes which were part of the data collection process but also contributed towards and informed data analysis. As indicated by Yin (2014) there is a high value of the researcher being in the field and completing detailed notes. As such, they are associated with both interviews and observations as well as part of the memoing activity, relevant in the activity underpinning the within and across-case analysis. The fieldnotes were a core part of recording fieldwork observations, such as AGMs or site visits. A key requirement is that they are converted into a formal record that indicates categories of interest, including subject, date, and reflexive notes (Yin, 2014; 2018). This is exemplified by an extract from the researcher's study fieldnotes focused on fieldwork in AC project in June 2019. It involved fieldnotes generated from attendance at the AGM, which included observation work (Yin, 2014) as well as a supplementary fieldnotes from a site visit to the wind turbines with the CRE shareholders and some key stakeholders (Table 18). The fieldnotes included descriptions, some analysis and initial impressions and the use of photographs taken by the researcher which were subsequently useful as part of data analysis and memoing (Yin, 2014).

Documentation

As part of case study work, documents provide useful sources of evidence, alongside other methods (Yin, 2014; Mabry, 2008). In the study, the researcher accessed CRE project share offer documents centred on exploring potential insights into motivations driving schemes, expressions of how CRE projects were positioned within place-based communities and framing of anticipated social impacts. In this context share offer documents included textual descriptions and visual

representations, for instance illustrating the anchoring or linking of CRE projects to a particular place, such as the Peris valley in YPP. The share offers were accessed across all CRE projects from online (publicly available) sources. Further, the researcher also accessed draft documents of charity applications, where available. In this context, charity applications were shared by key stakeholders for YPP and YO as part of interview encounters. In the case of GR and AC, documents focused on Annual Reports or websites.

Table 18: Fieldnotes extract: Awel Co-op

Subject: Site visit and AC AGM/Egni co-op share offer **Tuesday 23rd June 2019 3-8:30pm in the** **Location: CRE Site and Pontardwe Arts centre**

Event/setting: AGM:
- In introductions, key stakeholder pointed out, with pride how via Welsh Government backing and support have been in the project success in terms of financing, decreasing risk as didn't have to use own money in the early stages.
- This was responded and well received with clapping from all the shareholders in the room.
- Donation of shares £5000 worth of shares providing a sustainable income stream (over a 20-year period) not a lot of money but broader engagement with community enterprises who wouldn't be able to invest otherwise.
- Job creation (3 jobs) in low-income areas jobs with Egni co-op match funding and 2 student placements with marketing Egni co-op new share offer development.
- Further plans for potential ground solar PV to try and make the most of the grid connection as we can.
- Egni co-op new share offer (second one) across Wales roll out.
- {name} company looking at the accounts and reporting how much money have and where its going and the progress that is being made- all okay ('making sure not going to Bahamas', external accountability and credibility)
- Talked about surplus £6,000 helping to reduce deficit.
- 'Are you happy with the accounts?' (show of hands)- democratic in terms of community governance
- Shareholders put hands up to approve different things. Consensus across AGM and happy with both the accounts and directors
- Quite a joyful atmosphere and highly engaged audience
- Electrical engineers who look after the turbine gave a talk.
- Directors happy to carry on (show of hands again)
- Shareholders comments- thank you for all the hard work you put in by key stakeholder {name}
- Shareholders Question- how can members (not identify as shareholders) can be more active in promoting the co-operatives and co-operative learning. And how renewable community energy crosses over all the STEM learning, could be incorporated in curriculum and Welsh bac?
- Great working with schools already but could develop further eg a young neighborhood council.
- Already educational materials using within schools- but with email out there if anyone interested in developing educational aspect further.

- Focus on the future generations here coming through strongly

Site visit:
- When talking about walking up today to see the wind turbines (the coach broke down) but also highlighted how they are positioned on common land, if you ever want to walk up there again you can
- Windfarm was seen and used as an educational tool.

Photographs taken by researcher on site visit (with consent):

Key points

- Community energy was seen as in stark contrast to commercial companies, insofar CRE project is harvesting local resources for local benefit
- Co-operatives used a lot to describe AC and Egni solar new share offer rather than community energy or BenComs very much seen and talked about as a co-operative and part of the co-operative movement
- Our wind turbines (sense of ownership there) do better always seem to be turning when the others don't (the others being owned by foreign companies) not only socially better with local benefit but also technical turning more frequently too its commented.
- Whilst walking up to the wind turbines a shareholder commented on motivations to invest in co-operatives like this "**was not to make a quick buck but wanting to invest in social enterprises."**
- Another shareholder-local people set up and owned these wind turbines compared to foreign companies coming in and making profit going out

Reflexivity

- People knew I was from North Wales and Sioned (Welsh name) people automatically spoke to me in Welsh or Welsh learners tried to speak to me in Welsh only. And questions like 'are you a welsh speaker?' 'Oh fantastic'.
- North Wales- distance allowed to ask about Swansea valley but also familiarity as have family in the next valley across (Blaenau Gwent)
- Young women- way communicated with people, wife came to talk to me a lot to point me in the right direction to right people
- Demography:
- Mostly 50 plus to retired and over as an age range lots of couples investing husband and wife.
- Mother and children (X4)
- Mostly resident in Swansea valley or South Wales

3.4.5 Data analysis

The aim of qualitative analysis in case study work, is to produce a rich and detailed account that includes fine grained data analysis which may "*seduce the eye*" for readers (Yin, 2014, P206). In the study, the data was subject to within-case and cross case analysis (Yin, 2018; 2014). As such, the overarching analysis of the four CRE projects and CY as cases (within and across case) was based on a comparative approach, enabling the researcher to gain insights through the richness of data (Yin, 2018; 2014). Furthermore, the researcher also recognised the important inter-connection between data collection and analysis cycles in the study, as both "*went hand-in-hand*" (Creswell, 2014, P195) in developing the overarching analysis. In this way, the core of the analytic process was a focus initially on the intrinsic and within case, which provided the platform for an iterative process, enabling an understanding of the wider group of cases (Stake, 2000).

The researcher framed data analysis around the work of Yin (2014), focused on coding and analysis of individual interviews followed by a comparative analysis of sets of interviews within each case, involving stakeholders, shareholders, and community hubs, as well as the participants within the CY case. Building on the cycle of analytic methods and techniques (Yin, 2014), the researcher utilised a coding and analysis process, prior to building explanations and moving from within-to-cross case analysis.

Coding and analysis process

The interviews were transcribed verbatim to ensure accuracy, and analysed alongside fieldnotes, providing the basis for coding and thematic analysis as well as thick description in reporting (Bazeley, 2013; Kvale, 2007). As noted by Flyvbjerg (2006) the transcription process is both time consuming and an intensive part initially of data analysis. In this context, the researcher completed the transcription of 27 interviews and a commercial company provided 28. Furthermore, the interviews involved both Welsh and English language participants and the researcher translated 18 interviews, with 2 being translated by a company. In this context, Santos, Black and Sandelowski, (2015) identified the importance of

language and its usage in social settings in qualitative research and the significance of interpretation in translation of data. A key challenge in translation is the issue of interpretation, centred on vocabulary and grammar in relation to words and phrases in particular contexts (Esposito, 2001). For instance, in the study the transcripts from participants using the Welsh language presented a different grammatical arrangement and sentence structure to English. In this way, 'comparability of meaning' or seeking 'conceptual equivalence' is a key task (Sarantakos, 2013). Importantly, a bilingual researcher provides a valuable lens as translator, providing interpretation that bridges cultural context and assists in clarifying meaning (Shklarov, 2007; Birbili, 2000). In the study, the research was attentive to these issues as a bilingual researcher and adopted the guidelines of Birbili (2000).

The qualitative interviews were analysed using the strategies and procedures indicated by Miles & Huberman (1994) and Yin (2014), including pattern coding, categorisation and thematic construction leading to concept mapping. This was supported by a process of memoing aligned to fieldnotes associated with interviews as well as observations. The aim of the analytic process was to move beyond description and simple reporting of codes and themes, so as to generate an interpretative approach, building explanatory case study work (Yin, 2014). In this context, the researcher focused on iterative cycles of data analysis within and cross cases (Miles and Huberman, 1994). For instance, extending the analysis from the stakeholders and shareholders perspective to the wider setting of diverse community hubs, centred on verification and looking for 'blind spots' in relation to social impacts. As such, the researcher embedded data collection and analysis within the fieldwork, "*it makes analysis an ongoing, lively enterprise that contributes to the energizing process of fieldwork*" (Miles and Huberman 1994, P50). The process of documenting fieldwork was extended in the analysis stage, with the researcher using memo writing and summaries to identify insights through coding and thematic development (Gibbs, 2007).

Overall, in the study the main foundation of data analysis was systematic coding leading to the formulation of themes and sub-themes. The researcher focused on

the core elements of thematic analysis as a strategy for building on codes and extracting what are seen as 'themes' in the data, in each transcript as well as across transcripts (Bryman, 2016). This involved a cycle of work that centred on within and cross case analysis, centred on social process and social impacts within and across CRE projects.

The researcher focused on codes as the basic unit of analysis that underpinned the identification and development of themes (Bryman, 2016; Miles and Huberman, 1994). Indeed, Miles and Hubermann (2014) provide a succinct definition of codes, which also outlines the process of coding: "*codes are tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study*" (P56). The foundation of the interpretative act was exploring the data, codes, and coding from the starting point of the research questions.

In this context, the work of Miles and Hubermann (2014) provided the researcher with a detailed map of coding in case study work, centred on a shift from descriptive to inferential work with codes. The types of codes range from *descriptive* which centres on attaching a 'class' or attribute to a section of text, to *interpretative* focused on understanding the complexity of the phenomenon and finally *pattern*, focused on an explanatory and inferential code. This also included the cycle of revisiting codes and completing additional developmental analysis, including *filling-in, extension, bridging* and *surfacing*. As part of *filling-in*, over time and through cycles of data analysis the researcher sought to identify any gaps in codes or additions, which were then integrated as part of developing a coherent account. The *extension* work centred on revisiting early accounts and analysis and reframing or refining as appropriate, generating new insights or relationships across codes or construct. In contrast, *bridging* focused on uncovering new connections or relational elements in the data. At times reframing relationships between codes and *surfacing* highlighted new thematic areas and categories as part of the process of within and cross case analysis (Miles and Hubermann, 2014).

Overall, the process of analysis in the study required data reduction and then assembling and building meaning by the researcher (Bryman, 2016). The coding procedures were completed by hand with the assigning of categories to codes to attach meaning as part of conceptually development of themes, both within and across transcripts (Miles and Huberman, 1994; Bazeley, 2013; Creswell, 2014). Of central importance was not only identifying codes but seeking and validating connections among codes, enabling the construction of themes and subsequently relationships between themes (Bazeley, 2013). Within this process there was a comparison across codes as units within text as well as clustered codes leading to themes or sub-themes, as well as comparing within and across transcripts. A key steppingstone for the researcher in the study was summarising emergent codes and clusters of codes through labelling text, as well as summarising to capture the drawing of interpretations and their verification (Rubin and Rubin, 2012; Miles and Huberman, 1994).

Within the data analysis a difficulty for the researcher was ensuring a focus on specific text, whilst also retaining a focus on the wider set of narratives and cases as well as the overarching study (Miles and Huberman, 1994). Overall, data analysis required reflexive questioning of the data by the researcher, based on initially building familiarity with the data prior to its reduction into codes and assembling categories or themes as higher-order constructions. As part of this process memos were important for the researcher, providing a conceptual audit trail, and enabling the researcher to represent the analytic story and stages of interpretation in a summary or display visually in mind maps or schematic diagrams (Miles and Huberman, 1994). In the study, the researcher completed memos by-hand in notebooks and used NVIVO (13) to assist with organising the data and subsequently mapping summaries to highlight assist in the describe, compare, and relate stages, including visual displays.

In the study, the researcher integrated an iterative approach between theory and data as part of the coding and analysis process as exemplified by the work of Haf and Parkhill, (2017), Devine-Wright and Wiersma (2013) and Gibbs (2007). In the study, the codes were shaped by data, rooted in participant textual descriptions or

meaning gained from detailed interviews, whilst also being underpinned by theory in understanding CRE. The theory itself was driven by constructions from the literature combined with the inductive insights of participants involved with the CRE projects. Overall, the procedure of coding by the researcher was developed towards higher order codes as part of the cycle of analysis (Yin, 2014; Miles and Hubermann, 1994). This initial process of coding, and its later links to pattern codes and memoing is summarised by an extract in the exemplar of '*motivations'* by stakeholders engaging with CRE projects (Table 19).

Table 19: Coding exemplar: motivations from key shareholder interview - Extract from transcript

Code	Shareholder code: YPPS1	1. Coding Analysis (initial iteration of descriptive, interpretative and pattern)
		Extract from interview verbatim transcript
	"Why? We have been complaining since I was a young boy that Welsh natural resources going to England and so on. And this was one way of keeping natural resources locally isn't it…and brining some income in for the local people in the community that's a reason. Another reason, I believe, in things like having renewable energy"	
Descriptive code: Motivation	"Why? We have been complaining since I was a young boy that Welsh natural resources going to England and so on. And this was one way of keeping natural resources locally isn't it…and brining some income in for the local people in the community that's a reason. Another reason, I believe, in things like having renewable energy"	Extract highlights particular description of the reasons for participant becoming involved with Ynni Padarn CRE project – focuses on **MOTIVATION**

Interpretative Code	"Why? We have been complaining since I was a young boy that Welsh natural resources going to England and so on. And this was one way of keeping natural resources locally isn't it...and brining some income in for the local people in the community that's a reason. Another reason, I believe, in things like having renewable energy"	"Why?" – underpinning explanation for why people invest and get involved in CRE projects – starts to highlight elements influencing civic engagement and what represents components of motivation
Pattern Codes	We have been complaining since I was a young boy	Long standing / established community sense of grievance around issues underpinning motivation and personal linked to wider sense of community as 'we'
	Welsh natural resources going to England	Key issue from long standing complaint underpinning motivation focused on sense of ownership of local natural resources 'going to England'
	one way of keeping natural resources locally	

Pattern Codes		Community focus on **local people benefitting** and the environmental benefits being directed locally, related to sense of ownership
	and Another reason →	
	brining some income in for the local people in the community →	**Multiple motivations** and complexity of range of different motivational factors emerging through description
	, I believe, in things like having renewable energy →	Economic motivation centred on **income generation being retained locally** An increased uptake of renewable energy, generation identified as 'belief' relating commitment on personal level and CRE seen as one way of expressing. **Summary** Participant describes sense of ownership of local natural resources, linked to community focus and impacts for local people, commitment to renewable energy more broadly - so **wide range of social-cultural motivations.**

	Extract Coding Summary ⟶	
	"Why?" – underpinning explanation for why people invest and get involved in CRE projects: • Multiple motivations - wide range of social-cultural motivations. • Sense of ownership of local natural resources • Local people benefitting - income generation being retained locally • Engaging in renewable energy transition	**2. Broader within/cross case analysis** Cycle of analysis working through coding and thematic development (based on Yin, 2014; Bazeley, 2013) and iterative filling-in, extension, bridging and surfacing. Based on building from description focused on comparison within/cross cases (YPP, YO, AC, GR) and relate across based on focus on Motivation theme. ⬇ **3. Memoing** (Notation from bridging across interviews with shareholders – YPP and other CRE projects) A shareholder in YPP exemplifies crossover between motivations and benefits in shareholders perception and how they understood local benefits on the ground within their Welsh communities. Evidenced in other interviews reflecting codes and emerging theme of 'M**otivations'** and sub-themes around **multiple motivations, sense of**

| | | **ownership, local decision making increasing renewable energy generation** and **tackling climate change**

⬇

4. **Theme: Motivations**
Sub-theme: Interplay between local and global drivers

In the overall analysis of cross case data set the theme of motivations included sub theme 'Interplay between local and global drivers'. The YPP shareholder extract and coding analysis was utilized to underpin and exemplify the interrelationship between local and global factors as part of motivation in shareholders centred on multiple motivations including local and global dimensions – focused on community issues and broader renewable initiatives moving forward renewable energy and a low-carbon transition. |

Building Explanations

As part of thematic development in the study, the process of memoing provided a steppingstone from coding towards more conceptual explanations of the data, based on pattern codes (Yin, 2014). For the researcher memos in notebooks documented connections in the data, as well as reflections from observations. Importantly, the summarising of case material provided the researcher with a detailed account of the analysis and highlighted the key elements and features of the case. In this way, they provided the researcher with a key resource for building explanation from the case study work: "*the interim summary pulls together what you know about a case*" (Miles and Huberman, 1994, P79). As part of this process the researcher summarised the findings from the four CRE projects as within case summaries as a platform for a later cross-case analysis. As such, summaries became more refined over time, emerging as explanatory summaries centred on identifying relationships and inter-relationships. For example, the project KESS2 reports produced for the CRE projects as part of the study process facilitated the formalising of '*interim summaries'*. In this context, they provided an opportunity for further verification by stakeholders and shareholders groups on two occasions as part of reporting findings within the duration of the study (Yin, 2018; 2014). The summaries included thick descriptions (Bryman, 2016; Gibbs, 2007) and visual display of data findings.

In the study, the researcher not only used the cycle of memos and summaries, as part of building explanation but also continued to make reference to relevant theory. The researcher focused on the theory linked to social and cultural capital, place attachment and CRE as part of coding cycles and thematic development (Yin, 2014). This centred on *pattern* work (Miles and Hubermann, 1994) and the shaping of explanatory and inferential codes, as well as providing a platform or lens to assist with *filling in, bridging,* or *surfacing* as part of revisiting codes and testing out emerging themes. As such, in the study the researcher utilised a theory-based coding framework as well as inductively generated codes in the analysis of CRE projects. In this way, it provided a dynamic approach to coding built on flexibility and going back and forth across data and theory (Devine-Wright and Wiersma,

2013; Haf and Parkhill, 2017). An exemplar from the initial theory-based framework is detailed in Figure 34, reflecting key conceptual areas emerging from the theory.

Figure 34: Theoretical-based framework
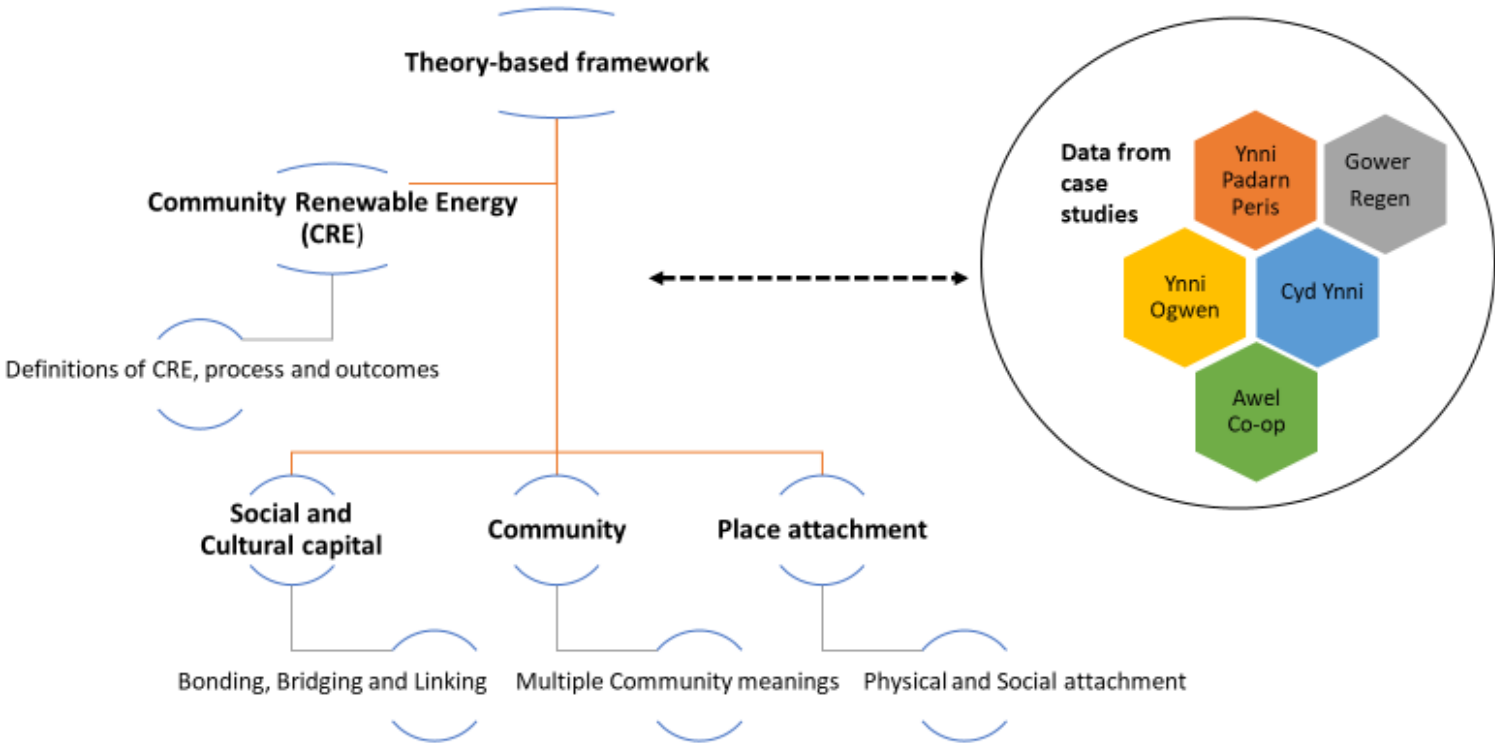
Within-to-cross case analysis

In the study the analytic process involved both within and cross-case analysis to provide a comparative frame of reference for addressing the research questions (Yin, 2014). This was a particular strength of the multiple case design (Miles and Hubermann, 1994). At its core, in the study the researcher sought to examine the *how* and *why* questions within the 4 CRE projects as well as CY as a set of discrete cases, prior to then systematically exploring how the emerging findings *related* across the cases. In this context, the approach adopted by Yin (2014) and (Bazeley, 2013) was utilised, including the use of theory as appropriate to sharpen the focus of analysis as well as contextualise the perspective of participants. Importantly, theory was not rigidly applied to 'force' the data but provided a tool in identifying explanations.

The first step of within case analysis was to comprehend the intrinsic nature of separate cases through the coding and thematic within-case analysis, leading to explanatory findings. In this process mapping the contingencies within cases provided an important first step prior to the second step of cross case analysis. At this stage, patterns of consistency and differences were noted and explained as part of ordering and explaining the analysis of data (Miles and Hubermann, 1994). A key purpose underpinning cross-case analysis is:

> *"At a deeper level the aim is to see processes and outcomes across many cases, to understand how they are qualified by local conditions and thus to develop more sophisticated descriptions and more powerful explanations"*.
> (Miles and Hubermann, 1994, P172)

In this way, the researcher engaged in a comparative view of the respective findings from the cases, based on reviewing the interim summaries and the themes and sub-themes detailed. The cross-cases analysis sought to distinguish what was particular to cases and what were part of an overarching storyline as part of explanatory building process (Yin, 2018; 2014). For instance, a range of similarities were seen across cases, centred on common themes such as the theme of 'Motivations' by stakeholders and shareholders for engaging in CRE projects as well as 'Social

impacts', as well as the overall context of having generated for at least a year. In terms of case differences, YO was distinguished by engaging with an Energy Local Club and YPP did not have a pre-existing structure to underpin its development. Equally, GR differed from other schemes as it was in the process of developing a charity to disseminate social impacts. However, there were no 'deviant cases' (Miles and Hubermann, 1994), although the researcher was attentive to any negative cases or differences in the analytic process. The analytic process required reviewing and revisions of codes and sub-themes, involving at times the collapse and integration of items. At its core, due to the multiple-case design the cross-case synthesis facilitated the identification of the most significant features of the findings from case studies, explored any rival explanations and provided an overarching account (Yin, 2014). This was assisted by the detailed within-case work, theoretical development and the NVIVO mapping. This is exemplified by extracts from the mapping of stakeholders and shareholder analysis completed on NVIVO software, alongside the analytic procedures (Figures 35 and 36).

Figure 35:   Stakeholders: Barriers as part of development stages (cross case analysis)
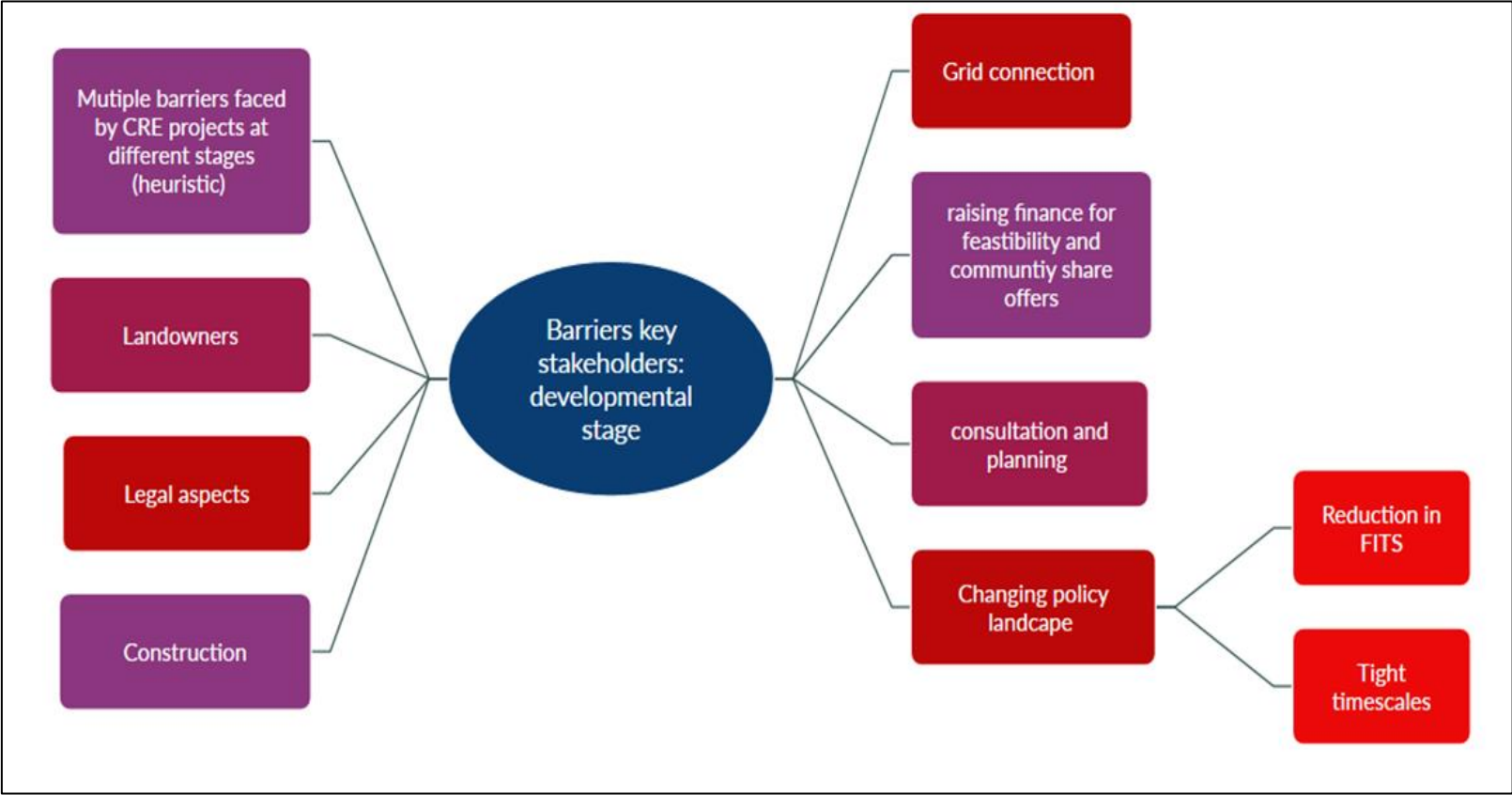
Figure 36: Shareholders: Process of engagement with CRE projects (cross case analysis)
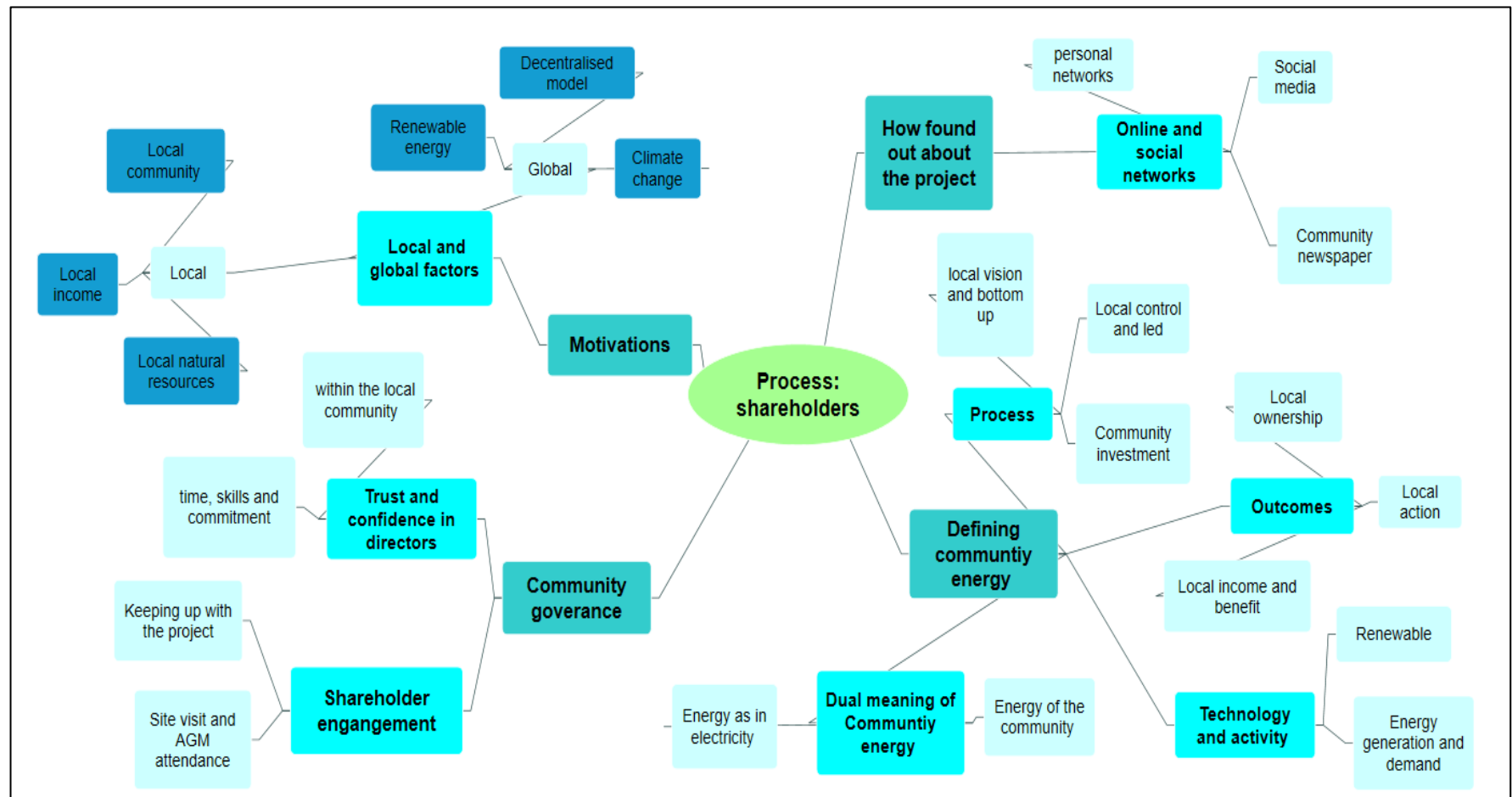
3.4.6 Rigour and Reflexivity

Rigour

Critics challenge the degree of rigour in case study work, given its focus on particular cases. However, Yin (2014) identifies key requirements for ensuring rigour in case designs enabling robust findings to emerge. In the study, the researcher adopted the approaches and methods advocated by Yin (2014) to embed rigour in the design and application of case study in practice. As such, rigour involved a number of systematic strategies across initial decisions about study design then the application of data collection and analysis. These included the clarity in boundedness of the 'case', systematic application of approach, data collection and analysis methods and techniques in the study. Further, the researcher included the use of triangulation, negative case or outlier analysis, replication of findings (theory and data), as well as reporting through summaries (Creswell, 2013; Flyvbjerg, 2006; Kvale, 2007; Miles and Hubermann, 1994, Yin, 2014, 2018).

In addition, Yin (2014) identified the importance of quality criteria in case study work centred on construct, internal and external validity and reliability. In the study, as part of construct validity, data collection included multiple areas of evidence that were connected as a trail of evidence, with composition of findings involving 'summaries' for comments by some participants. For instance, this was exemplified by the sequence of KESS 2 reports as summaries for each CRE case. In terms of internal validity, the researcher engaged in data analysis that focused on the development of explanation in the case study work (within and cross case), including an examination of competing explanations of the data. This was facilitated by detailed coding procedures and the movement through the analytic procedures, including memoing. The support for external validity was addressed in the study design by the researcher focusing on the use of theory in multi-case study designs, grounded in the selection of cases with particular characteristics. The researcher generated clear boundaries around the cases and sampled cases and embedded units of analysis that had distinct characteristics. In terms of reliability, the

researcher developed a protocol for the study, with a transparent form of case reporting and summaries (Yin, 2014).

Rigour, reflexivity and researcher role

Rigour was further enhanced by attention to the role of the researcher during the study. This was framed around reflexivity, across data collection and data analysis procedures (Yin, 2014, 2018; Bryman, 2012). In this way, the researcher ensured during interviews there was a stance of being an 'interested student' with participants, seeking to obtain their perspectives and experiences, without pressure or too many interruptions, creating an environment of openness, trust, and rapport (Marby, 2008; Bryman, 2012; Gibbs, 2007). For instance, participants seemed to establish a sense of rapport in some interviews because the researcher was a Welsh speaker. For instance, in attending the AGM in AC (ACCH2), meeting one of the committee members:

> P1: "(name) *Here is Sioned* (researcher)?
>
> P2: (switches to Welsh) *Oh mae hi'n Gymraeg ta.* (Oh, so she is Welsh then).
>
> INT: *Yr enw bach yn give a way yndi*! (laughs) (The name is bit of giveaway isn't it!)"

Further, the position of the researcher within communities was important for some participants, requiring a reflexive approach (Finlay and Gough, 2003; Yin, 2014; 2018). As such, the researcher used these connections to facilitate rapport with participants yet ensured a critical approach and distance from the viewpoints of participants. For example, the researcher was familiar with the local area within North Wales: *"there is a quite good society here. You live here you know yourself"* *(YPPS2).* Equally, in a South Wales context, there was also a familiarity with the area due to family connections, which resulted in the researcher not being viewed as a complete outsider and facilitating rapport. Furthermore, in engaging in observation with volunteers in the hydros, the researcher's background with geo-engineering. This was seen as a positive factor, as the conversation started around the technical aspects of the hydro facilitating more initial engagement and an openness by

volunteers. In a similar way, having a background in geography was seen as a positive factor for some participants, such as when discussing environmental issues in the Peris valley: *"you studied geography didn't you?" (*YPPKS6)

Reflexivity and the research Process

As part of the research process the researcher had to adopt a flexible approach in terms of implementing the study design. For instance, initially the study design identified a series of potential focus groups with shareholders but, as a result of feedback from potential recruits, this was adapted to small group interviews or individual interviews to engage with participants at their preferred times. Furthermore, at times participants had difficulty recalling events if they had occurred some time ago, such as in AC developing over 18 years: *"that's a good question because it was long time ago now think it was 15 year or something." (*ACS5) However, other CRE schemes were more recent but still required participants to reflect retrospectively on events. This was noted in the researcher's fieldnotes and analysis, including the use of triangulation of sources to clarify particular aspects of CRE projects.

At times encounters with participants were quite challenging as part of fieldwork, requiring the researcher to adapt existing strategies within interviews to ensure engagement with participants. For instance, interview with a participant from a local community hub:

> *INT: "What would you say are the main aims behind Merched y Wawr?*
>
> *P: Well, Merched y Wawr, you can go and research the aims of Merched y Wawr yourself can't you!" (*YPPCH1)

Reflexivity, translation, and transcription

The bilingualism of the researcher enabled the majority of the Welsh interviews to be transcribed and translated by the researcher (18), enabling attention to cultural context as well as linguistic nuances.   This enabled the way in which CRE projects

were viewed to be represented in a culturally sensitive manner with a focus on meanings which otherwise might be lost (Sarantakos, 2013).

3.4.7 Case study and transferability

Flyvbjerg (2006) highlighted the criticisms levelled at case study regarding its scope for generalisability based on an argument regarding the limitations on focusing on particular cases. However, this position is disputed not only by Flyvbjerg (2006) but also other researchers (Yin,2018, 2014; Marby, 2008; Baxter and Jack, 2008; Miles and Hubermann, 1994). Indeed, as part of transferability, Stake (1998) identifies the potential for "*discovery learning*" (P94) from case study work, focused on transferring insights from the research**.** Importantly, case study does provide an opportunity to generate transferability, based on the particular framing of the research design and its approach (Yin, 2014). A core issue in rigour and transferability centres on the nature of the case study approach adopted by researchers as defining clearly the nature of the 'case' and the research questions. Yin's work (2014, 2018) frames transferability around analytic generalisations. This focuses on both single and multiple case study work, aligned with the use of theory and a suite of methods and techniques in case study design.

In this way, the study, analytic generalisations were at the core of the researcher's strategy for ensuring transferability of findings, embedded in the careful selection of the CRE projects and consortium as cases, combined with the use of theory and appropriate methods (Yin, 2014, 2018). As argued by Bryman (2016), the focus on in-depth understanding of cases combined with theoretical reasoning provides a sound basis for analytic generalisations. In this context, the researcher addressed the point made by Mabry (2008) regarding how analytic generalisations in case studies enabled linking to a wider context, represented by a "*web of theories"* (P223). In the study, this centred on the researcher's focus on social capital, community, place attachment and the frameworks around CRE, particularly Walker and Devine-Wright (2008). Furthermore, the development of interim summaries (Yin, 2014) supported rigour in the process of interpretation and verification and enhanced transferability.

3.4.8 Study ethical considerations

The study was approved by the College of Arts and Humanities (CAH) AEC, Bangor University (BLSS16 02.08.18; CAHPHD04 4. 07. 2019) In relation to the study, a number of ethical considerations were relevant as part of the design and its implementation. A standard PIS and CAH Consent Form was utilised for the study.

The area of ethics has a range of considerations in qualitative research, focusing particularly on ensuring there are no conflicts of interest, a balance between burden and benefit as well as risks to confidentiality and informed consent (Kaiser, 2009); Fisher and Anshko, 2008). In the study, there were no conflicts of interest by the researcher, and informed consent was assured through detailed Participant Information Sheets (PIS) and consent forms, including the rehearsal of consent at interviews. The issue of burden was addressed by the researcher through seeking to limit the duration of interviews for participants but also engaging them in a conversational style (Rubin and Rubin, 2012). Interviews were also set within social and convenient settings, as well as offering telephone interviews as appropriate.

Furthermore, there were considerations around benefits for participants as part of recruitment, with the researcher considering the impact of interviews on participants as recommended by Creswell (2014), "*meaningful for others apart from the researcher*" (P97). Given the focus on CRE projects within localities, participants reported viewing participation as potentially benefiting local communities in the future by sharing their perspectives and experiences. The risks to privacy and confidentiality were significant as part of detailed case study work, with efforts to ensure anonymity, yet with constraints due to the nature of qualitative fieldwork (Fisher and Anshko, 2008). For instance, in the case of stakeholders operating in relatively small localities with open public profiles in the community. However, within case study work the intrinsic nature of the case is viewed as important within the analytic and reporting process (Yin, 2014; 2018). The ethical issues involved in the study and mitigation strategies is summarised in Table 20.

Table 20: Ethical issues and mitigation

Key ethical Issues	Mitigation strategies
Identification of the case study sites and participant anonymisation as part of data collection and reporting	- The 5 case study sites and community hubs were selected based on a number of key characteristics necessary to address the research question. The general information about these projects and community hubs was already in the public domain prior to the study, including a profile of activities and in the case of CRE projects the key stakeholders, based mainly on website material and documentation. - Participants involved in the 4 CRE projects and the consortium were made aware in the PIS that the CRE projects and consortium would be identifiable as part of the study. As such individual participants may also have been identifiable, despite anonymity procedures during data collection and analysis. The anonymisation procedures focused on allocating unique codes/identifiers to each participant. However, the sample sites were specific CRE based projects which were identified in the study and they involved a relatively small number of participants who may well be recognisable. This also applied to the 'community hubs' in some areas, which were relatively small so there may be a possibility of particular community hubs and participants to be recognisable. This was highlighted by the researcher in the PIS prior to consent, as well as prior to commencing the interview when consent was reaffirmed. As such participants were able to withdraw from the study if they wished. The key principle applied by the researcher was informed consent, built on the information documented in the PIS and consent form.
Voluntary participation in the study and right to withdraw and retain their data	The PIS and consent form ensured that all participants were aware that participation in the study was voluntary and that they were able to withdraw at any time. Also, they could decide to remove their data from the study at any stage.

Data storage, retention and destruction of data	• All the digital and paper-based data gained from the case study work was stored in accordance with Bangor University Regulations (UREC). • The initial sensitive data regarding participant contact details for recruitment purposes was stored in a password protected University computer and where appropriate a locked cupboard at Bangor University. • Digital recordings were recorded on a password protected recording device and transferred following the recording in the field as soon as possible to a secure Bangor University computer. All digital recordings were provided with a unique identifier /code and stored on a password protected University computer on a secure OneDrive folder with restricted access to the researcher and the two supervisory team members. • The digital and paper-based data was retained in accordance with Bangor University Regulations (UREC). The sensitive data regarding participant contact details (used for recruitment purposes) was destroyed at the end of the project.

3.5. Reflections on Methodology and Methods

Study Strengths

A particular strength of the study is its focus on understanding the underpinning research questions around CRE projects through an explanatory and multi-case case approach (Yin, 2014). As a design, the study was set within a particular context, with Welsh communities representing the overall case study setting, with discrete CRE projects and a consortium as embedded cases. In this way, the study design (Yin, 2018) focused on a diverse set of cases with distinct characteristics. For instance, the cases represented different technologies focused on small-scale hydros, solar farm and wind turbines. In addition, there were small-scale CRE projects (YO and YPP) and larger scaled schemes (AC and GR), providing again a different perspective as part of case characteristics. Yet, these multiple and embedded cases (Yin, 2018; 2014) also represented shared characteristics focused on socio-economic and cultural contexts of post-industrial communities in rural North and South Wales. In this way, the cases had intrinsic qualities (Yin 2018; Stake, 1995) that were particular but also had a shared collective set of characteristics providing a rich thick description of communities' sense of place in relation to CRE as well as linking to the way social processes of development and social impacts were understood. The addition of the CY consortium was also a strength as the case provided evidence in relation to formal structures and processes of support between some CRE projects.

Overall, as explanatory case studies (Yin, 2018; 2014) the findings from the study provided a robust platform for transferability, based on the across-case comparative analysis. This identified overarching themes of importance that extended beyond the individual nature of specific cases, applicable and transferrable to other similar community led projects and rural or semi-rural contexts. These centred on the following core thematic areas (Table 21).

Table 21: Strengths: Case study design facilitating transferability

Transferable themes	
Community and place	Multiple meanings of community and different attachments to place in a CRE setting
Cultural capital	Key actors having skills and knowledge as part of cultural capital
Social capital	Social connections within communities and extending outwards as part of social capital
Civic engagement	Civic engagement in CRE, in terms of barriers and motivations driving forward projects as well as the CBS structures within which civic participation operates
Social impacts	Social impacts as perceived and experienced by different groups that focus on environmental, socio-cultural and economic aspects

In this way, the study design and case selection provided a set of distinct, yet transferrable CRE projects as contexts within which to consider the research questions across different settings, contexts, and technologies. In terms of transferability, an additional strength aligned to the explanatory case study design, was the blending of theoretical and empirical work by the researcher. The study utilised theory on social and cultural capital and place attachment focused on its relation to a CRE context which further reinforced transferability, as part of an explanatory account of case findings. Furthermore, there was also learning about developing the theoretical areas of social capital and place attachment by their application in the distinct context of CRE.

The sample of participants within the case selection also represented distinct and diverse characteristics, centred on key stakeholders, shareholders, and community hubs. In this way, the study explored different perspectives and experiences within cases and across cases (Yin, 2018; 2014). Within the sampling strategy the researcher sought to recruit key stakeholders who were identified as the main actors actively involved in the respective CRE projects, as well as a range of

shareholders from each case. A consistent and diverse set of community hubs were approached within each case study area, set within a bounded definition of community hubs. Overall, the total number of participants across cases and constituencies (stakeholders, shareholders, and community hubs) provided a good sampling frame (total n= 57), providing sufficient robustness to the data aligned to the research objectives.

A particular strength of the study was the nature of the fieldwork involving in-depth interviews with participants, combined with observations and site visits. The combined use of multiple strategies centred on in-depth interviews and fieldwork provide key methods in social science inquiry, enabling a richness to data analysis and a grounding of findings (Burgess, 1984; Mabry, 2008). In addition, the researcher gained access to CRE project documents and the publicly available social media material. A particular feature of the fieldwork was the benefits from the researcher being bilingual, enabling interviews and fieldwork to be completed through the medium of Welsh and the sensitivity to cultural nuances, terms, and phrasing as part of a reflexive approach (Denzin and Lincoln, 1994). Furthermore, data analysis was also completed by the researcher through the medium of Welsh as appropriate, enabling cultural-specific phrasing or explanations to be understood and translated without losing inherent meanings (van Nes *et al.*, 2010)

Study Limitations
Arguably, case study work can also be seen as representing a weakness given its particular focus on the intrinsic singular or a collective set of cases (Baxter and Jack, 2008). However, as argued by Yin (2018; 2014), case study work which is explanatory and focused on multiple cases provides a robust account. In this way, case study can provide findings that are transferrable to other settings, if there are clear characteristics enabling comparison to be drawn in a meaningful manner (Baxter and Jack, 2008). In this context, the focus on rural Wales as an overarching 'case' may also be seen as a limitation of the study. However, the nature of the embedded case studies and their characteristics are comparable with other rural areas which have a similar context, including post-industrial histories or cultural nuances. The relevance of place attachment, social processes and social impacts

and policy infrastructure remain overarching issues applicable across a broad range of settings in the UK and wider contexts. Arguably, a particular limitation of the study is that the findings may be less transferrable in an urban CRE setting due to the rural characteristics of the case studies. Yet the core themes around multiple meanings of community, place attachment and barriers and drivers to civic engagement as well as social and cultural capital may still be applicable, although framed in a different context.

The development of community benefit by CRE projects did represent a distinct characteristic in the study, focused on a CBS approach rather than other cooperative models. In this context, CBS tend to be present primarily in England and Wales, whereas other areas such as Scotland and European countries utilise other cooperative models and Development Trusts. However, the study provided insight into an emerging pattern in the sector and added to the current evidence on other forms of charities or cooperative enterprises. Also, a limitation may centre on the degree of wider community perspective gained during the study, bounded to community hubs in this instance. However, as an emerging area of inquiry, this issue perhaps could be extended in the future work, building on the insights gained from the study

Further, as part of the fieldwork there were some difficulties experienced in accessing some participants in particular cases and involving some constituencies. This centred on the researcher being unable to access shareholders through the gatekeeper in GR due to the timing of developments in the CRE project. Furthermore, accessing the initial number of hubs across the spectrum of community hubs in the sampling guide proved challenging. However, the researcher was able to access sufficient representation across different types of hubs across the cases.

In relation to COVID-19 the data collection was completed prior to the crisis impacting in the UK, although the process of data analysis and writing up was completed during the COVID crisis. As such, the crisis did present a number of challenges in the final stages of the thesis work.

3.6 Summary

The chapter highlighted the importance of a constructivist lens as part of a case study approach focused on using case study work (Yin 20128; 2014), to understand the complexity of social impacts in CRE projects. In this way, the study focused on an explanatory multiple case study approach (Yin, 2014), using interviews and observation centred on four CRE projects and the CY consortium as cases. It centred on using interviews and observations supported by detailed coding and thematic analysis methods. It framed the inquiry of CRE within the theoretical lens of social and cultural capital, as well as community and place attachment. Further, the important areas of rigour and reflexivity were considered, including the role of the researcher. In terms of transferability, the use of analytic generalisation was underpinned by systematic procedures in the study (Yin, 2014). The chapter also reflected on the overall strengths and limitations of the study approach and design.

CHAPTER FOUR:
FINDINGS AND ANALYSIS: COMMUNITY AND PLACE

4.1 Introduction

This chapter details the findings from the cross-case analysis within the study, focused on the areas of community and place. As such, the chapter addresses the following research question: *What is the role of 'Community and place' for communities within Wales engaging with community energy*? In this way, the study provide key insights from the findings that highlight the complex, situational and dynamic nature of communities and their relationship to place. It details the contextual setting for the renewable energy projects across the case studies, significantly identifying the relationship between communities, their landscape and renewable energy. In this way, the study identified a range of perspectives on the meanings, experiences and representations of 'community' and 'place', including different forms of place attachment. This is presented a rich and novel account centred on the perspective of the different constituencies involved in the case studies, focused on stakeholders, shareholders, and community hubs.

Overall, there were similar themes emerging from these constituencies across the cases, with only some discrete differences, surfaced in the analysis and described in the chapter. In this way, the chapter is organised in a number of key sections indicating the themes as part of the cross-case analysis (Table 22).

Table 22: Themes and sub-themes: around community and place

Themes			
Communities within community energy	**Defining and meanings of community**	**Attachment to Place**	**Post-industrial landscape and communities**
Communities of place and interest within community energy	*Complexity and meanings of community of place or interest*	*Physical dimensions of place attachments*	*Using the Local Environment Over Time*
Collective action and benefits	*Community belonging and action*	*Social dimension of place attachment*	*Different place attachments in Welsh communities*
Applying the process-outcome CRE framework	*Multiple communities, divisions and integration*	*Mixture of Physical and Social dimensions of Place Attachment*	

(The left-most column of the sub-theme rows is labelled **Sub-themes** *.)*

4.2 Communities within community energy

In the study, the findings centred on how stakeholders and shareholders constructed the meanings embedded in the term community energy. This highlighted the relevance of communities of place and interest within community energy. It was often grounded in and benefited place-based communities but also focused on shared interests. Participants also identified the way in which communities framed collective action and benefits, linked to CRE projects. This included the importance of local participation and decision making, as well as community ownership, leading to local income and benefits. There were perceived differences between community and commercial projects.

Overall, the findings provide an analytical lens that indicated there were multiple meanings of community energy within communities, representing a range of characteristics evidenced in the data (Figure 37). For instance, these emphasised

the core features of CRE being community led and owned, including participatory civic engagement and harnessing local resources, captured by the phrasing of '*troi'r dwr i'n felin ei'n hunain'*.

Figure 37:   Multiple meanings of community energy in communities

Multiple meanings of community energy

Shared vision and interest

Community participation and local decision-making

Harnessing local natural resources

'Tro'r dwr i'n felin ein hunain'

Community ownership and benefits

Community investment and empowerment

Local retention of income

Community orientated and not for profit model

Community

Community Renewable Energy (CRE)

The findings provided conceptual insights through the empirical data that highlighted multiple meanings of community energy within communities. This focused on energised Welsh communities generating renewable energy, but also producing community empowerment. For instance, a shareholder in YO identified how the CRE project generated renewable energy on a community scale but also drew together the community to become more confident:

> *"I mean, you're talking now about electricity and you're not talking about the energy of a community to do things, for itself?"* (YOS3)

Furthermore, within the YO case, a shareholder highlighted the importance of this dual meaning attached to CRE. It centred on generating energy in the form of electricity from the scheme, whilst also producing a level of community 'energy' that was linked to a *"vibrancy"* of communities in driving forward community action.

> *"We talk about electricity but it's much more than that, isn't it? Energy is about vibrancy as well, so it's getting people excited, the energy I would define as not just being in electrical power, it's got to be the energy of people as well."* (YOS2)

In this context, the work of Creamer et al (2018) indicates the flexibility and problematical nature of community energy as a term, often seen as ambiguous (Hoffman *et al.*, 2013; Seyfang, Park and Smith, 2013). In many respects, the literature identifies how a definition is unhelpful given the lack of consensus within the evidence-base (Hicks and Ison, 2018; Becker and Kunze, 2014). As such, CRE, Creamer *et al (*2019) identifies the importance of moving beyond static definitions to understand community and CRE in applied contexts. The work of Walker (2011) highlighted that within CRE projects the nature of what was represented as community, was subject to negotiation and utilised in a tailored way. Indeed, the term was *"assigned to communities as actors, rooted in places, and able to generate local engagement"* (P780), with a role in delivering low carbon transitions. The findings highlight the nature of CRE within applied contexts. Further, the literature identifies how community energy tends to be viewed as distinctive from

commercial schemes, based on its degree of local engagement within communities, in shaping the project and, or its outcomes (Walker and Devine-Wright, 2008; Creamer, Eadson, Pinker, *et al.*, 2018; Veelen, 2018). As such, researchers adopt a range of tools and frameworks to identify types of CRE projects, including a focus on process and outcome or a normative stance, emphasising benefits accrued within communities (Callaghan and Williams, 2014). The findings from the study significantly identify how process and outcomes in the CRE projects were perceived and experienced, focused on being locally led and generating social impacts within their Welsh communities.

4.2.1 Communities of place and interest within community energy

Within case studies the participants highlighted the relevance of communities of place and interest in locating CRE within a community. The case study CRE projects were described by participants as linked to boundaries of place, set within distinct valleys and geographical locations. In this context, the share offer documents highlight the position of the communities within the topography of the landscape, for instance the Peris and Ogwen valleys bounding their respective communities (Figure 38). CRE projects predominantly focused on communities of place but at times included a combination of place and interest, particularly where CRE projects were at a somewhat larger scale.

Figure 38:   The scope of the Ynni Padarn Peris and Ynni Ogwen Schemes (Ynni Padarn Peris, video, 2016; YO video, 2016)

The findings highlighted how CRE projects were connected to the physicality of place. For instance, in the case of valleys, the AC CRE project was linked to a charity, described as 'Awel Aman Tawe', focused on benefiting the communities in the Upper Amman and Swansea Valley. Further, YPP was anchored to the description of the Peris valley but also its two lakes (Padarn and Peris). In a similar way, YO was framed around the Ogwen valley but also focused on the Afon Ogwen river, which was a central feature. As part of geographic locations GR was embedded in the landscape of the Gower Peninsula. Also, in terms of GR the CRE project highlighting a focus on local place regeneration. As such the benefits were described as grounded within distinct communities of place (Figure 39).

Figure 39:   Framing the CRE projects in communities of place: CRE logos

Overall, as part of the findings, CRE projects were mainly framed as community of place but with also exemplars of community of interest. As such, the community share offers indicated the tensions and at times overlap. The shareholder surveys from smaller CRE projects highlighted how shareholders were drawn from the local communities. For instance, they represented 90% in both YO and YPP as part of raising finance through the community share offer (Arloesi Gwledig Gwynedd, 2017). As such, these communities were willing to invest in the CRE projects due to the perceived local benefits for each of the respective valleys (Arloesi Gwledig Gwynedd, 2017). In contrast, larger projects required a greater scale of investment and therefore included a wider constituency. However, this was offset by providing a lower price share offer to encourage local investment in Gower Regeneration, set at a £100, compared to £300 for those outside the locality (Welsh Government, 2019c). Equally, AC facilitated local community investment by providing local community organisations shares and a stake in the scheme. For instance, 'Tiddlywinks' nursery based in Ystalyfera had been able to invest in thew project and secure co-ownership of a wind turbine, receiving an income from their £500 share (Welsh Government, 2019d).

The findings reflect the observations of van Veelen and Haggett (2017) that community groups framed their identity around place, which included historical boundaries. However, as noted by van Veelen and Haggett (2017) these were not

"*not static pre-given entities*" (P535) but were dynamic. As such, the case studies illustrate how at times this involved contested meanings, shaped by the social relationships embedded within place as well as operating on the place from outside its boundaries (Devine-Wright and Wiersma, 2013; Rudolph, Haggett and Aitken, 2014, Woods, 2011). As with Haggett and Aitken (2015), the study indicated the case studies were community led and based primarily on communities of place. Yet there was also diversity, with the development of communities of interest alongside place, based in the cooperative model adopted for CRE projects. In the study, this was important for projects in securing finance, particularly evident in AC and Gower Regeneration, widening the base of participation to secure funding for larger CRE schemes.

In contrast, YO and YPP were able to secure the majority of their funding within their valleys. There was an attempt to mitigate the potential threat of jeopardising the local identity of projects through share offers (Haggett and Aitken, 2015) by ensuring prioritisation of offers to local groups or organisations at times, as seen in AC. The findings reiterate the suggestion in the literature that there are costs and benefits to widening the share offers for CRE projects. This includes costs centred on challenging community orientated identity of CRE projects but also the benefits of securing funding and wider engagement with renewable energy (Haggett and Aitken, 2015; Creamer, Eadson, Pinker, *et al.*, 2018).

A key stakeholder in the AC highlighted a potential tension in the way community was framed in a community-led and owned CRE project when it was operating at a larger scale. The case of Awel had to respond to challenges in setting-up the project and its extended scale, leading the scheme to require a broader share offer, set outside the geographic boundaries of the local community. As a result, there was a more diffuse community investment in the CRE project, highlighting more of a community of interest than place. Nonetheless, one of the key stakeholders had sought to retain a degree of rootedness in the local community by ensuring that local community organisations had a stake in the scheme.

"I would of very much have liked the initial concept of the turbines that they would be owned and run for our local community. I mean, the Co-op the way things happened and the length of time, the planning and change of laws and all that meant that the share offer went far and wide. So, whilst there's a community of interest in that some people are more interested in the value of the investment than what they're investing in. But there is a type of community there, but it's not as community as would have wanted it to be. I think {name} has done everything he can to have shares given to local community organisations, to make it more community oriented. In the general way of working and the size of the investment it lost a degree of its community focus." (ACS5)

The interconnection between a community of place and interest was highlighted by a shareholder from YO, identifying an important overlap. The geography of the valley shaped the community of place within the locality and framed the identity of the CRE project as aligned with this sense of place. However, it was also combined with a community of interest centred on drawing together local people.

"But I think that, because it's geographic, it also means that you have a sense of belonging to the place… and you have an emotional connection, not to the place but also to the other people and to what's going on there. So, I think when people talk about community energy, they are talking about the local geography but also about doing things together, with the people around us. There is a different interest in bringing the people together." (YOS4)

In terms of communities of place, CRE projects was defined in a number of ways by different communities. A key stakeholder from YPP identified either the pre-established parameters of locality-based community council areas or the features of geography and landscape. This was exemplified by the case of Ynni Anafon, YO and YPP and reiterated the malleable geographical definitions of community in CRE, varying across communities.

"The community decided what the county council defines like their perimeter for what is Anafon. In Bethesda two community councils, they've defined that area. In Llanberis, it has been defined as why Ynni Padarn Peris what we decided was if there was water running down to the river through the middle

of the valley that was it… so geomorphology. But every community defines itself differently." (YPPKS1)

In the case of Ynni Padarn Peris, a stakeholder mapped the Peris valley was not restricted to Llanberis as the main village hosting the CRE project but included a wider area representing a community of place.

"The area where the energy project is based is from the tops of Llanberis Pass down towards Llanrug and up to Deiniolen. You got very different communities within that valley." (YPPKS2)

4.2.2 Collective action and benefits

In the study, the key meanings of community energy for participants were local participation in CRE projects and local impacts. However, some participants highlighted the primary importance of local community involvement in CRE projects, in comparison to other participants who particularly valued its community benefits. From the perspective and experiences of stakeholders and shareholders, unpacking the community aspects of community energy focused on the nature of collective action and benefits.

Local participation and decision making

A shareholder in YPP characterised the importance of CRE within communities being focused on a vision driven by local people, as part of a *"bottom up"* process. In terms of outcomes, the income from the CRE project remained locally based on utilising local resources for the benefit of communities.

"The idea was local to start with has bottom up from local people. And then the committee are local people who are doing it and using the water, a resource which we get for free. And it generates electricity and generates income for local people." (PS1)

Another key stakeholder from AC emphasised the importance of the relationship between CRE and community as pivoting on both the democratic process of involving communities and the distribution of impacts within those communities. In this context, community ownership presented an opportunity to have a *"direct*

stake" and the framing of CRE was linked to having a not for profit or charitable structure. As such it retained an authentic label of 'community'.

> *"I think something that involves people and gives people a direct stake in something, always be linked to a not-for-profit type structure."* (ACKS1)

Furthermore, a key stakeholder in GR identified the importance of the community within CRE, focused on the shared interests leading to collective action around environmental issues. In this way, community energy represented an amalgam of individual and collective efforts, taken forward through the practical mechanism of a share scheme that built on this shared vision.

> *"It's the community bit of it, coming together and collective action. People generally got an interest in the environment, who want to take action individually and collectively. So, lot of community energy of the Gower Regen, we've raised funding through a share scheme…so that's of individual commitment, but it's done collectively."* (GRKS3)

Further, a shareholder in YPP identified the community aspect within CRE projects centred on being able to have a say and retaining local control. As such they chose community rather than large scale commercial projects. It included being able to have an active role in decision-making, based on grassroots level action through community investment in the project.

> *"I think it was a chance to take back control, it's almost to express an opinion and this is what we want… we don't want a massive power station. I think to have a chance to actually put your money where your mouth is, I want it to happen enough to partly fund it, so, yes it's an opportunity to try and make some incredibly small difference."* (PS2)

In a similar way, a shareholder in YO highlighted how collective action acted as a catalyst for change, involving the community raising funds to invest in the scheme. The nature of the technology was also relevant centred on renewable *"green"* initiatives combined with being community run. These components represented

the key parts of CRE within communities. Furthermore, the central importance was how the income being used within the community.

> *"When the community comes together says, 'We're not happy with how it's happening, we want to do something about it'. They are raising money among themselves, and they are building an energy scheme. I think it has to be green…and then it ran by the community. I know if there's income, then forms part of my definition of community energy." (YOS5).*

Local ownership, income and benefits

A key stakeholder from YPP highlighted the relevance of viewing CRE through its community rather than the technical aspects. This was the first community hydro scheme the participant had been involved with and shaped their definition of CRE within a community context. This experience highlighted the importance of collective action to achieve collective benefits for the community, with local decision making and ownership.

> *"The community isn't fussed about the technology really what they like is the benefit. They are the ones who are making the decision, they are supporting it, they own it and the benefit stays with them." (YPPKS1)*

This sense of CRE contributing towards collective benefit within communities, was reiterated by a key stakeholder in YO. The participant highlighted how involvement with CRE projects brought different people together towards a collective aim, enabling them to gain a sense of control over their natural resources and build a sustainable future for their communities. This was framed as focused on being able to *"turn the watermill to your benefit" {"troi dwr i felin ein hunain"},* which contrasted with historical patterns of using local resources that benefited external stakeholders.

> *"There's a Welsh saying 'turn the watermill to your benefit' {"troi dwr i felin ein hunain"} and what community energy is to me is that you use, our natural resources for the benefit of our communities. In English they use the word 'harnessing." (YOKS1)*

Another shareholder within YPP highlighted how the key element of CRE in communities was that it focused on a locally centred process, irrespective of the technology being used. This led to the local generation of energy and income, as parallel outcomes.

> *"To me, something that enables local people to generate energy but also to use it themselves, but just that the profit stays in the community, thinking about this as a hydro, or wind turbine or a solar farm but that the profit or the energy stays within the community." (PS3)*

Furthermore, a shareholder within the YO CRE project identified how the use of local natural resources for local benefit was central. In addition, the profit from the CRE project was importantly retained within the local area for wider community benefit:

> *"Using the valley's local resources that is some financial benefit to the community coming out of the project… to help people within the valley." (YOS1)*

Within AC a shareholder mapped the centrality of viewing community energy as part of community, affirming on a clear definition. This primarily focused on local community benefit but also included the local generation of energy.

> *"I would think there is only one definition, that is, benefit to the community… well its energy for the community being generated within a community, then that energy either goes back to the grid or benefits us in some way." (ACS2)*

Equally, a shareholder in YO defined community as being rooted in moving towards a decentralised model on a local level. This was also anchored in generating social impacts focused on income being retained locally as an outcome.

> *"Community energy to me is, keeping it as local as possible. Generating wealth for the community is good, exporting it out when you've got surplus, that then comes back in, in terms of cash". (YOS2)*

Community versus commercial projects

In the case of a stakeholder in AC, a cornerstone of CRE was its focus on being community led and retention of local income, resulting in community benefit. As such, the community aspect of CRE was paramount. This was in stark contrast to the commercial renewable energy model, which was more distant and lacked connection to the local community.

> *"I think probably things like AC epitomises it really, in that it's been developed by the community, but also the community is benefiting. I think it's got to be a step further than just commercial companies making payments to the community." (ACKS3)*

Within the GR project, a stakeholder identified the centrality of involving the local community in environmental action. Again, a commercial model was remote from the definition and interests of communities and delivered limited community benefit.

> *"How it differentiates from any other renewable energy project, you're bringing local people into the project, either through investment and/or through the community benefit funds. So, being able to spend some of the profits locally rather than it just lining the pocket of some British investor somewhere else." (GRKS2)*

Within AC a stakeholder emphasised that both the community aspect and the energy component underpinned community energy. As such, the participant defined CRE as aligned to the idea of generating renewable energy, as well as income. This was then reinvested and *"recycled"* in the community in comparison to a commercial venture, which "*syphoned off"* benefits.

> *"It's generating renewable energy where the funds are being recycled back into community benefit rather than being syphoned off for some horrible multinational." (ACKS2)*

4.2.3 Applying the process-outcome CRE framework

In the study, the framework developed by Walker and Devine-Wright (2008) was utilised to interpret the relationship between process and outcomes in the CRE projects. It details the relevance of understanding CRE from the standpoint of process, '*who the project is* by' and outcome, '*who the project is for*'. As such, the framework focuses on understanding how multiple interpretations and meanings in how community relates to CRE (Walker and Devine Wright, 2008). In this way, as part of the findings from the study the perceived collective actions and benefits evidenced in the CRE projects represent different positions along this framework.

The findings resonated with the mapping of a refined Process-Outcome framework by Walker and Devine Wright (Creamer *et al.*, 2019). Importantly, this further iteration included the demarcation of areas rather than fixed points, which were featured in the original framework by Walker and Devine-Wright (2008). In this context, the case studies from the study are positioned within such areas, relating to the Process-Outcome continuum within these refined quadrants (Walker and Devine-Wright, 2008; Creamer *et al.*, 2019), as detailed in Figure 40. The respective case studies are now considered in terms of their defining features and their position on the continuum within the framework. This relates to whether they are Process or Outcome focused, or if they involve a mix of these attributes.

Figure 40: Applying the modified framework to the study case studies (Walker and Devine-Wright, 2008; Creamer *et al.*, 2019)
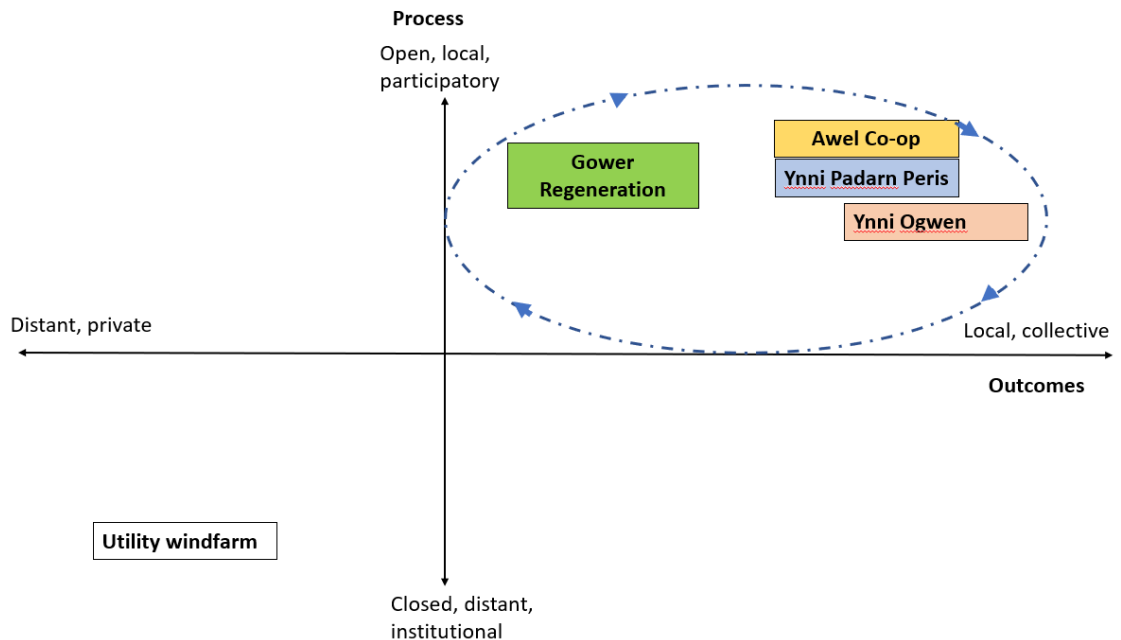
Awel Co-op *(Process and Outcome focus)*

Within the findings, participants identified the prominent features of community energy as being locally led and centred on community benefits, in relation to AC and YPP. As a result, AC is positioned in the upper-right quadrant with a proximity to local process and collective benefits, identified as particularly focused on locally grounded benefits. For instance, participants in AC highlighted the significance of the relationship between CRE and community based on a democratic process centred on communities and embedding benefits: *"developed by the community, but also the community is benefiting" (ACKS3).* In this way, AC a stakeholder identified how income was retained within communities: *"funds are being recycled back (ACKS2)".* As such, community aspects of CRE were aligned to benefits: *"one definition, that is, benefit to the community" (ACS2).*

Ynni Padarn Peris (Process and Outcome focus)

In YPP, being both community-led and community benefits were equally important, reflected in its mid position in the upper right quadrant. For example, participants in YPP identified the centrality of CRE within communities being based on a vision and a process that was framed by local people. The equal emphasis on the community-based process and outcomes was reiterated by a shareholder, with income being retained locally for the benefit of the community based on a grassroots level approach: *"the idea was local to start with, as bottom up from local people… income for local people"* (PS1). As such, there was a focus on collective action and benefits underpinned by local decision making and ownership: *"who are making the decision, they are supporting it, they own it and the benefit stays with them" (YPPKS1).*

Gower Regeneration *(Process focus)*

In the case of there was an emphasis on local people participating in running the CRE project, with community investment seen as important but not a defining feature of community energy. Consequently, GR is positioned more towards the participatory process than the community benefits and outcomes within the upper-right quadrant. For instance, participants highlighted the involvement of the community as part of the participatory process as a key element: *"bringing local people into the project" (GRKS2)* and ensuring that *"local people get involved in it" (GRKS4).* In this way, the community had a shared interest in the development of the CRE project resulting in collective action: *"take action individually and collectively" (GRKS3).* Although, participants primarily highlighted the importance of local participation, there was also an acknowledgement of the benefits resulting from the CRE project through the *"community benefit funds" (GRKS2).*

Ynni Ogwen *(Outcome focus)*

In contrast, the findings indicate that YO was centred on community benefits, as an essential component in defining CRE. In this way, YO position within the upper-right quadrant more towards the community-focused and collective outcomes. For instance, participants in YO identified the key significance of using local resources

for local benefit as a defining feature: *"what community energy is to me is that you use, our natural resources for the benefit of our communities" (YOKS1).* This was captured by a key stakeholder focused on ensuring benefits impact on participating communities: *"turn the watermill to your benefit' {"troi dwr i felin ein hunain"} (YOKS1).* As such, the CRE project was linked to benefiting the local community within the Ogwen valley, in terms of local income being retained: *"Generating wealth for the community is good" (*YOS2).

Overall, the case studies are located within an encircled area in the upper right quadrant (see Figure 40), highlighting their position in relation to the framework initially formulated by Walker and Devine-Wright (2008) and revisited by Creamer *et al (*2019). In this way, it also illustrates the potential for dynamic positioning of case studies and development over time within this encircled area, remaining within the quadrant. The findings suggest that case studies occupy a relative process position and outcome position linked to time, with potential shifts and change within the quadrant. This indicates a temporal dimension to the framework as suggested by Creamer *et al (*2019), which was reflected in the findings from the study. In this context, the delivery of community benefits varies across case studies linked to their stage of development. For instance, the AC CRE project has already established a charity for delivering community benefits, whereas YPP and YO are in the process of registering their respective charities, detailing the potential delivery of community benefit. In contrast, GR is focused on repayment of loans and are not at the stage of developing a charity or clearly articulating how community benefits may be enacted in practice. As such, its position within the quadrant encircled area may well be modified as a charity is established, and community benefits are implemented.

4.3 Defining and meanings of community

In the study, community was constructed by participants as involving multiple aspects, centered on a range of sub-themes. Initially, the complexity of meanings included both communities of place or interest, leading to a sense of being bounded by a particular place as well as shared areas of interest. There was also a

sense of belonging and collective action as part of communities. Furthermore, participants identified how there were multiple communities to be found within a single 'community', framed by both aspects of division and integration.

4.3.1 Complexity and Meanings of Communities of Place or Interest

The complexity of defining community and its multiple meanings was echoed by shareholders across case studies. As a participant in AC noted, *"Well I suppose I would say it's an over-used word that could mean just about anything. That's a subject of a PhD in itself!" (ACS4).* In this way, shareholders not only identified the challenging issue of defining community but also its multiple meanings. Similarly, a participant in YPP emphasised the complexities: "*I think, well its difficult question isn't it… community is something that is quite complex*" (PS3). This was reiterated by a participant in YO who mapped the complexities involved in what could be defined as community. They noted it was problematic articulating a clear definition, requiring a pause in the conversation. In response, the participant highlighted it was shaped by different people's experiences and locations, as well as espoused or actual meanings:

> *"Ah, community (pause), it's such a difficult question to ask because it's so ingrained in who we are, and where you are, and teasing it out is difficult." (YOS2)*

In a similar way, a participant from a social community organisation hub identified the importance of collaborative nature of community. Yet it was problematic defining community, represented by the 'sigh' prior to replying. A common response across all participants in grappling with defining and articulating the embedded individual and wider meanings of 'community': *"Community (sigh), well people pulling together and helping each other" (ACCH1).* As part of the descriptions by participants within Community Hubs there was a sense of a broad 'community' which included diverse characteristics. The pluralism of meanings was exemplified by a participant within a tourism-based hub in the Peris valley, highlighting the term 'community' had a diverse set of interpretations to different people: *"Oh community depends, mean a lot of different things to people doesn't it"* (YPPCH2).

A stakeholder identified the wide range of meanings applied to community. It was seen as rooted in terms of either geography of place or shared interest, but also there was also a recognition that there was overlap: *"Well, can be a lot of different things... its geographical community, or community of interest or the two" (GRKS1)*. Furthermore, the concept of community was seen as having evolved and changed over time, becoming "*less defined*" by place, with more blurred boundaries:

> *"If you were to ask what was their community is 20 years ago, you would refer to it as geographical community far more than their community of interest. The boundaries are becoming less defined." (GRKS1)*

A stakeholder from GR emphasised the multi-layered meanings around what is meant by community. However, there was a unifying element centred on a sense of commonality and connectedness linked to the notion of community, focused on being in the same place or having a shared interest. This led to both relational aspects and a "*shared vision*" emerging around the sense of community and creating the potential for environmental collective action.

> *"Community it's a such wide ranging concept, I guess for me it's a group of people who identify and connect with each other through some common theme, whether that's neighbourhood, they all live in the same place, there's community or through shared interest like the environment, it very varied thinking about community but it's certainly about connection, and perhaps having a shared vision. And wanting something collectively." (GRKS3)*

A stakeholder from AC identified the importance of how the meaning of community was characterised in a Welsh context as "*Bro*" or a particular locality which had meaning as having both physical and social aspects. In this way, community was bounded within the physical parameters of a valley and village, peopled by members of that community. A theme reiterated across case studies.

> *"I kind of like have in my mind's eye the sort of the Welsh kind of 'Bro' {a particular locality}. It's like I sort of have visions of it being on a hillside looking down at the village and the valley. That's the community, it's everybody who's there." (ACKS2)*

In terms of shareholders, defining community was positioned around the area of a shared vision and place as part of the interlocking components of place and people. For instance, in YO a participant defined the contours of community as being strongly place-based on locality, understood as set within the parameters of people who live in close proximity within the same area. Yet as part of this there was a sharing of common values and vision, seen as the key to underpinning the social aspects of a community:

> *"People who live together within one territory with one vision and values and who co-exist together within a neighbourhood." (YOS1).*

A participant within an environmental community group hub in the Peris valley emphasised the importance of commonality and a shift over time in the nature of a community. The presence of the quarry led to a shared experience of commonality within the valley. However, with the decline of the quarry there was a movement away from a community of place to a more diverse community of interest within these communities. The participant framed community as meaningful if understood as a community of interest rather than a community of place. For the participant the key characteristic was a commonality between people and building social networks underpinned by this shared interest, avoiding a definition that "*sounds very warm and good*".

> *"Once a quarry went sort of the essence of the community actually started being very divided. The essence of a community, for me would be the people who live in a geographical area that self-define that they have something in common with each other. The word community is a sort of a Chocolate box sort of way, we are a community they like to say that because it sounds very warm and good." (YPPCH6)*

In the context of commonality, a shareholder highlighted the changing nature of community, with a move towards shared interests. For instance, the participant in YPP reflected on the changing nature of the community in the Peris valley and what brought people together and how this differed from the past. Historically the participant identified how cohesion within communities was built on similar people from the same background and vocations linked to the slate quarry, centred on

quarryman, chapels and teachers all living within the same community. However, in the present community there was a wider *"cross-section"* of people around different civic groups, leading to a community of interest.

> *"It's a collection of people who are similar and believe in the same kind of thing, probably no comparison with the current community you haven't got a place where you got one background, around here it was a lot of quarrymen, chapel ministers, teachers all living local… But by now tend to draw in people of similar interests, from different backgrounds which bring the community together, more of a cross-section of the community now."* (PS1)

Further, a shareholder from YO highlighted the transition from a community centred on the slate quarry to more diverse community of interest. This has led to the development of a range of *"sub-communities"* which represented different communities of interest but were less cohesive than the previous framing around the quarry.

> *"You can just talk about the capacity of the community to coalesce and work together. Indeed, this was very much the case in one industry communities, the slate quarries and that everybody is working much the same way, they had the same kind of experiences of life… So that would be a local community with a sort of high community energy, but now have sub-communities which have varying cohesions."* (YOS3)

4.3.2 Community Belonging and Action

Stakeholders identified how there was a sense of being rooted in a community that facilitated collective action, enabling people to engage in change based on contributing to a *"greater good"* for the community:

> *"I think community to me means developing roots somewhere, but also a community of people working together for the benefit for that community. It's about implementing change, for the greater good really … bring people together to volunteer."* (YOKS1)

For a participant in a faith-based hub in the Peris valley the meaning of community included people and place*,* as well as the idea of community combined with energy of the community. This included a focus on local solutions to global problems based

on working together and making it pertinent for the community. For the participant, there was a passionate attachment to the concept of community and community energy. In this sense, it was tied to people coming together in the form of collective action that acted locally and cultivated a community spirit that was central to addressing global problems including climate change, carbon reduction, deforestation and shifts in the energy system.

> *"I love the notion of community; I love the notion of community energy. The most important part of the world is where you are… and global problems can only be solved locally. So, if we can start thinking what we are going to do about global warming here. What's happening, as long as you can get communities together, acting together, in a spirit of togetherness locally, it will then have an effect globally." (YPPCH3).*

Again, a participant within a community centre hub identified the centrality of defining community as bringing people together and providing mutual support and reciprocity *"we all stick together"*. The participant describes how collaborative action was embedded in a sense of belonging within community, with the hub a catalyst for supporting people within the community.

> *"Community is all about getting together, we all stick together like, the community around this area is very good, we help the church, and we help the schools, the schools used to have a concert I went to the headmaster and said wouldn't it be better for them to get on stage and do it, I said we won't charge you… community is there to help one another." (ACCH3)*

In other cases, such as YPP, belonging focused on people who lived often in close proximity and provided mutual support. This was not seen through an over romantic, historical lens through the "*world of the past*", rather pragmatic and rooted in people being embedded in a locality. Also, the meanings of community were strongly interconnected to community action, framed as having key individuals within the community.

> *"Living next to other people, helping other people, I don't think it's anything sentimental at all, it's to do with having enough people, in a way it's always have been. Not like at one time in Mr Rees Mogg (politician) world of the past we were all walking down the street and helping each other. Every time*

you have people leading and doing things, and you know a community centre doesn't spring out of nowhere does it." (PS3)

4.3.3 Multiple Communities, divisions and integration

A shareholder identified how there were multiple communities represented in the Ogwen valley: *"so many communities within a community"*. As such the shareholder surfaced the wider issue of defining community and the presence of multiple communities in a particular context or locality. In this way, diversity focused on professional, faith based or gender differences, with a broad range of social groups who represented a particular community.

> *"The word' community' means so many things…Because there is a community of professions, a community of Muslims, a community of women, a community ... there are so many communities in a community." (*YOS5)

This was reiterated by another stakeholder from AC indicated the multiple nature of 'communities' within one community, however at times this led to *"divisions and fractures"*. This centred on various villages as well as a mix of identities, relating to both language and industry, representing social divisions.

> *"Community in this area is like communities anywhere, it can be quite complicated. There's the traditional kind of Welsh-speaking villages and that part is quite a strong part here, but there's also a lot of people that moved to the area because of a mining background from the North of England or Scotland and there's also quite a lot of divisions and fractures between different villages." (ACKS1)*

Another issue that emerged as part of multiple communities was the sense of separation from being an 'incomer' having moved to the area. A stakeholder in YPP highlights the multiple nature and complexity of community, reflecting on localism and the way community may be separated amongst those anchored in community or seen or position themselves as 'incomers' and therefore outside local communities.

> *"I remember going to a community energy meeting, and people who moved to Anglesey, you still have the people you buy the newspaper from, you have local doctor and everyone has community, but they live in a box in the middle of nowhere in Anglesey, they didn't have community". (YPPKS2)*

A shareholder in AC indicated that there were multiple communities within a community focused on both people and place. As such, it was tied into the history of the local area linked to a mining. Due to the mining heritage the local community that remained, occupied closely housed communities with strong relational networks, including *"three generations"* of families and kinship ties. However, these kinship-based communities were described as insular and 'tight-knit', presenting for community cohesion when people moved into the area. In this way incomers were not seen as embedded within those communities. Rather they excluded from the interconnected and pre-existing social networks. Therefore, the meanings associated with valley-based community had both positive and negative connotations, represented as *"a light side and the dark side."* by side within these narrow valleys.

> *"The really the deep meaning of community to me means people and the place. The Afan Valley, but the way the community works is really built on the mining community. So, there's all really interconnected family connections. On the one hand, because in poor areas a lot of people leave the area. And a lot of people that are left are three generations, all living quite near to one another. Really strong sort of informal support networks. Which can be a bit intimidating for somebody coming in from the outside because obviously you're not part of them (laughs). There is a light side and the dark side if you like." (ACS3)*

In this context, the study findings resonated with the work of Walker (2011), which highlighted the problematic nature of an overtly positive and uncritical framing of community as a term applied in practice, linked to place. As such, communities should be viewed as highly relational, subject to change and transition as well as potentially fragile: *"Places and communities are not synonymous, there can rather be multiple overlapping and sometimes conflicting communities within a place"* (Walker, 2011, P778). In this way, the study findings innovatively identify the

potential for multiple communities in a place within the empirical evidence, highlighting the presence of both integration and division. This was exemplified by the relationship between incomers to a locality and established Welsh community members. Equally, Walker *et al (*2010) identified how participants narrated differing accounts of what community meant as part of examining its role in CRE. The participants views ranged from identifying a strong sense of trustworthiness in other community members and a cohesive community or a view of community as fragmented. For instance, participants differentiated between people living and working in communities, in contrast to those who only used their houses in a village at the weekends. In many respects, these narratives from the work of Walker *et al* (2010) reflect the study findings, indicating a breadth of perspectives, including the areas of division and integration.

The study findings also related to Liepins (2000) which indicated how community could be understood as social spaces where cultural identity was surfaced, negotiated and recognised. For instance, Liepins (2000) highlighted contested linguistic and cultural relations in Welsh communities. Consequently, community was viewed as a social grouping or collective at a particular scale, providing the context for connecting or conflicting identities. Importantly, the study findings suggest this social relation and space was embedded within a place and physical setting.

In the study, some shareholders identified how the retention of the Welsh language and a resistance to change were important boundaries set around community (YPPCH7). In this context, the priority was to maintain the survival of the Welsh language amongst the shifting nature of community, seen as a threat. For instance, a participant in YO considered the relevance of adapting over time, but this did not necessarily involve accepting external drivers for change and there was a need to *"keep the language as alive"* as part of the community. The benchmark was not to change the community to such an extent that the original community and its language was unrecognisable. Also, as part of this delicate and negotiated process was that change would be generated internally by the community. This was reiterated by a participant in YPPCH7.

"Well keeping the valley as it is, to look after the area, to keep the language as alive as possible, to prevent external factors whatever they may be changing things, we have to change, but not too much radical change… have to watch that people don't change us, when we don't want to be changed." (YOS1)

In a similar way, other participants in the YO case highlighted how the changing nature of community was perceived as a threat to the rootedness of the community aligned to the Welsh language and cultural way of life. This was exemplified by the following extract from an interview highlighting efforts by some within the community to defend those Welsh- cultural norms and values. In a conversation as part of the interview two shareholders reflected the perspective of some in the community that the nature of the traditional Welsh community with its historical roots was changing and consequently the *"community is dying".*

"F   In the local history, the key person in society and that's all conducted in Welsh.

M   {names} like when they form a very strong local

F   triumvirate

M   resistance against the tidal wave of English influence

F   As it is seen

M   they have the weight of history behind their feelings of how things are dying, the community is dying,

F   Changing." (YOS4)

In terms of social aspects of place and changing communities, a participant within a social community organisation hub in the Ogwen valley emphasized the importance of the Welsh language, as a crux of the community. The participant also viewed the changing nature of community with people moving into the area as changing the nature of the community, although it still retained a Welsh cultural character: *"It's a Welsh speaking area isn't traditionally like lots of places lot of people have moved in, but it's still very Welsh"* (YOCH4).

The theme of changing communities, tensions and divisions between incomers (English speaking) and local people (Welsh speaking) was reiterated across other cases linked to the changing nature of Welsh communities, as evidenced by a range of participants from a number of Community Hubs. A participant from a community centre hub in the Swansea valley, highlighted the fractures and divisions within the changing nature of community with influx of new people who were unfamiliar with the language and culture of the locality. There was also a lack of pre-existing relational networks and close social ties. Yet as part of the current changes there was a modified sense of cohesion, exemplified by the Welsh language as an indicator of strong and close personal networks and a divide between those who were Welsh speaking, and those who had moved into the community.

> *"It's changed over the years. It's gone more, not so much of a community really, but people have moved in, people don't know each other. But everyone here we know each other and speak Welsh, I wouldn't speak English to anybody. And then if you got somebody coming in from the neighbourhood that you don't know, they are speaking English and we're speaking Welsh… its changed." (ACCH2)*

In this context, the work of Haf and Parkhill (2017) also identified how socio-cultural aspects of communities were seen as gradually being reduced, with incomers impacting on local communities. For instance, Haf and Parkhill (2017) identified that more English rather than Gaelic or Welsh speaking in schools, volunteering and civic groups had an erosive effect on community identity and cohesiveness. Overall, the shift in the nature of these communities with greater diversity diminished the use of these languages and therefore had a perceived negative impact on the sense of cultural integrity in these communities.

A participant in YO echoed the perspective of established and newer communities. The participant highlighted how the Ogwen valley as a locality featured *"quite strong communities"* based on their perspective of having lived in the community for a long period of time. Yet what seemed as embedded cohesive communities were complex and identified as being composed of two distinct communities,

divided as respectively English and Welsh speaking community. As such, the locality had the potential for division as well as cohesion depending on contextual factors.

> *"It is an area I have lived in for 40-50 years and it is an area with quite strong communities. But one of the things that is rather sad in some ways is that there are two communities which don't interpenetrate each other very much."* (YOS3)

Across the cases the complexity of community and the sense of there being a multiple set of communities within a community, was a recurrent theme. However, alongside division there was integration and linkages between the more or less established parts of the community. Within the YPP case a shareholder mapped the varied nature of communities, over a longitudinal perspective extending over 25 years. The participant highlighted the distinction within the local community between those who were "*Welsh born*" and a discrete climbing community who had moved into the established community. Significantly, a mechanism for bridging between these communities was having a family with children, resulting in "*much more integration*".

> *"I've lived here since 1995. So, it's it is definitely my home now. I'm not Welsh-born and my children are growing up here, having children the community is much more important I moved here to do the rock climbing and the climbing community can definitely be a bit separate from the sort of, the born full local community. I think when you're having children, much more integrated."* (PS2)

Equally, as part of a community centre hub in the Peris valley, a participant identified the changing nature of communities and its dynamic flux. This focused on the shifting pattern of people as incomers moving into the locality amidst existing populations defined as 'locals'. In this sense the community was seen as having changed dramatically yet retained a degree of cohesion between incomers and locals. The changing nature of community, demographics and influx of English-speaking people was seen as a positive form of integration, with children being an important catalyst learning Welsh. Overall, for the participant community was

centred on Welsh language as part of identity and there was continuity despite change.

> *"You've got locals, you still one of our trustees. Well, it also sees his family lived in that house for nine generations, and I love that, people's stories and love of the place and that locals haven't been pushed out. And I think there's a respect here for the Welsh language as well. I think the new generation people who've moved here and have children here have had respect for the language and the culture. So it is, it's about identity." (YPPCH5)*

In a similar way, the community hydro bridged the gap and divisions between Welsh and English-speaking groups within the community. The shareholder highlighted how it was the project was starting to address divisions by bringing these two groups together in a shared interest in the community hydro, rather than focusing on divisive language and culture.

> *"I don't know if they have done any analysis of their shareholders, looking at their AGM and things, so they have crossed the boundary between the English speaking and Welsh speaking communities, fairly well...So that's a good sign." (YOS3)*

Another shareholder in YO highlighted how the locality included a long-standing local community but also those who had moved into the area, including the participant themselves. Yet, the shareholder indicated that they felt well integrated into the local community, without tensions or any fractious relationships:

> *"So, you have people who have lived here for generations, but you have people who have moved in and fit together quite well, maybe because I'm one of them, nobody feels that there are some big divisions." (YOS5)*

The study findings suggest that community is complex and multifaceted. As in the case of Creamer (2015), the study highlighted the importance of multiple communities within a community, which were part of place-bounded communities but included a diverse range of social groups, including the division of incomers and locals, language and culture. However, the study findings differ from the results by

Creamer (2015), insofar those engaged with the CRE projects were rooted in their respective communities as long-standing members. Although divisions were evident as a significant element across case studies within the study, in contrast to Creamer (2015) the findings highlighted there was integration blending together of different communities within communities. In addition, children attending local schools built cultural connections and rootedness in the area. In the findings, the exemplars of integration highlighted how participants moved from a focus on defining community through the lens of a shared language and experience, to having a shared sense of community belonging with an interest in the CRE project bringing those different communities together that *"crossed the boundary"* (YOS3).

4.4 Attachment to place

The study was centred on examining place attachment through the lens of stakeholders, shareholders, and community hubs, representing different constituencies and reflecting a variety of contexts across case studies. In summary, research views place attachment across a range of contexts and most recent work focuses on exploring perspectives of change or threats from renewable energy in communities. However, the study was not focused on change as a key factor, rather the study centred on understanding the meanings of attachment to place as part of the context within which CRE projects were situated. As such, it considered both the perceptions and connections to the physicality of place, as well as the meanings and social ties of place in shaping engagement (Veelen and Haggett, 2017). A key conceptual insight as part of the findings, was that the participants identified the central importance of relating to the physical and social connections with place across the case studies.

4.4.1 Physical dimensions of place attachments

The work of Devine-Wright and Batel (2017) indicate that if CRE projects are seen to reflect the nature of place then communities with attachment will tend to be supportive of its development. For instance, a tidal CRE project in Northern Ireland was congruent with the distinctive local character of place by resident communities. In a similar way, the study findings highlighted how there was a

perceived alignment between communities and CRE projects across the case studies. As such, projects augmented the localised identity of place, whether in the slate valleys of YPP and YO, the valleys of AC or the coastal landscape embedding Gower Regeneration.

The share offer documents for CRE projects surfaced examples of functional and emotional attachments to place. The narrative and visual imagery in these documents highlighted how the projects were aligned with meanings and identities socially constructed around the local landscape. This was particularly evident across YO, YPP and AC. In this way, the nature of the CRE projects and their use of local resources for local benefit was anchored in place. This was evidenced within the descriptions of the CRE projects, such as 'ynni' (energy) and 'awel' (breeze), rooted as part of Welsh identity. The AC share offer evidenced the focus on how local natural resources could be utilised as part of the CRE project, so that the *"scheme will harness the winds of South Wales"* (AC, 2017). The wind turbines were embedded within the local landscape, located on the Mynydd y Gwrhyd (Figure 41) set within the valley and its community.

Figure 41: **The turbines positioned within the landscape across the Black Mountains above Brynaman in the share offer document and artwork outside Awel Aman Tawe office**
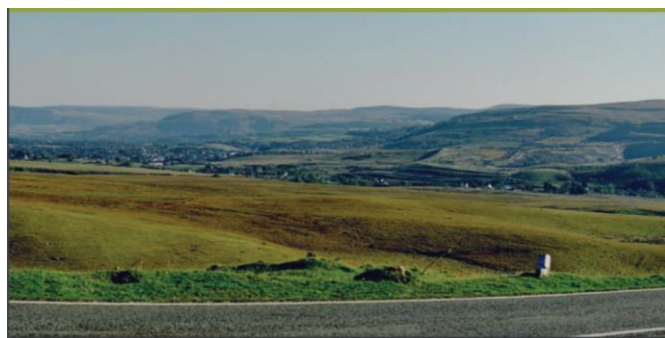
In relation YO and YPP the share offer documents surfaced the importance of the rich natural resources in their respective valleys (YO; YPP, 2016). The narrative was scaffolded through visual depiction of the landscape in terms of specific steep mountain terrain and its connection to the availably of water resources in the locality. This was seen as generating energy and income to enable the benefits to be released to the local community (Figures 42 and 43). The YO share offer document highlighted how the CRE project centred on *"utilising the natural resources of the valley"* (YO, 2016). In this way, the documents indicated the high value of the valley mountains and rivers and the potential to "*harness this energy*" to generate renewable energy for local benefit. In a similar way, the YPP share offer indicated the important sources of community assets in the form of the natural resources within the locality: "*there are untapped power sources running through our communities*" (Ynni Padran Peris, 2016). This included the plentiful rainfall as part of the mountainous nature of the area to power the community hydro. This was reinforced by the visual images of the local landscape and Afon Goch river.

Figure 42:   YO: The Carneddau mountains and Afon Ogwen embedded in the share offer document

Figure 43: Ynni Padarn Peris: The Snowdonia mountain range, Llyn Padarn and Afon Goch framing the share offer document
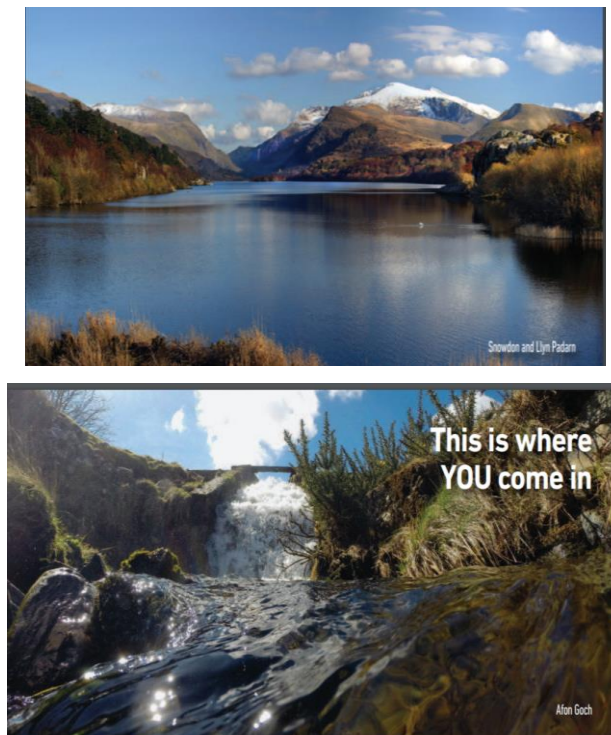
The study findings highlight the relevance of attachment to place in facilitating engagement with CRE projects. This was based on a shared belonging and relationship to specific place, leading to efforts in securing local benefits (Bomberg and McEwen, 2012; Rogers *et al.*, 2012b; Creamer *et al.*, 2018). In this way, both the study and the literature highlighted that involvement in CRE projects was associated with a reciprocal relationship and reinforcement between place and belonging, within communities (van der Horst, 2008; Haf and Parkhill, 2017).

The shareholders from YPP reiterated the importance of place centred on the characteristics of the locality representing emotional attachment that affirmed a sense of meaning as a wild area. Furthermore, the participant detailed a key connection between the mountainous landscape and the CRE project harnessing natural resources, seen as functional attachment.

> *"The nature of place, the wildness. I mean, the fact that it is a mountainous area, which makes it useful for this project." (PS2)*

Equally, a shareholder highlighted the alignment between the natural resources of the locality and its meaning as part of emotional attachment. This included a reflection on their role as part of establishing the 'Afon Ogwen River Festival'. The aim of the festival was to draw the community's attention to the river and its value. Also, the participant highlighted the CRE project as a facilitator in re-focusing the communities' attention to the river and established a connection between the river and energy generation.

> *"We started the River Festival, seeing the river as a feature of the valley that was undervalued and underappreciated, most of the people that come here don't even see it. This is energy project has taken attention back to it."* (YOS4)

In the Gower a stakeholder also identified the value of the landscape as a natural resource, rooted in a strong sense of place, aligned to functional attachment. It was underutilised in supporting local communities in terms of its development. Alongside this, the stakeholder also indicated a sense of emotional attachment to the Gower as place, focused on its meanings and aesthetic qualities.

> *"Fantastically beautiful, underappreciated, and valued natural resource. I mean the Gower is absolutely stunning, could be, developed sensibly."* (GRKS1)

In terms of landscape, a key stakeholder in YPP identified the value placed in the mountainous landscape. This was based on the landscape shaping recreational activities centred on mountaineering as part of a functional and emotional attachment.

> *"The mountains, because I'm interested in walking and climbing. This is where I do most of my mountaineering."* (YPPKS3)

An additional important feature of place attachment identified by shareholders was maintaining a quality of life, including a closeness to nature and enjoyment of the open space. For instance, a participant in YO aligned living in the valley as leading to an improved quality of life. However, there was also threats to attachment to place,

focused on potential future overdevelopment or an increased amount of tourism. This led to a sense of open space that was easily accessible, representing a functional attachment to place focused on an ability to be immersed in the landscape and have room to roam being meaningful and contributing towards emotional attachment.

> *"I think living here, it's the quality of life that is important, one of my fears if it becomes overdeveloped, with maybe tourism. One of the things that's important, is the freedom you've got, just being able to walk out your back door and have that space and not feeling trapped". (YOS2)*

Furthermore, a stakeholder in the AC highlighted how place was defined in terms of emotional attachment focused on the "*natural beauty*" of the area. It was adjacent to open woodland, representing close access to nature through countryside walks as a key feature of the local landscape, facilitating functional attachment.

> *"It's got a lot of natural beauty the area that I live in Clydach. There are houses all around me, yet I can be out walking in the woodlands within 5 minutes." (ACKS2)*

Yet the relationship to mountains, as exemplified by YPP did not result in remoteness as there was a physical proximity to two rural towns, Bangor and Caernarfon. This allowed access to employment which was vital to the local area. However, this was combined with the economic value of the local landscape to the community, as it was situated within the Snowdonia National Park. As such, it was important to maintain and conserve the area to draw in the economic benefits of visitors coming to the area. It delineated a functional attachment in relation to place focused on tourism and employment.

> *"What's important is able to get work, we are close enough to Bangor and Caernarfon, that fact that people can work here and, with the National Park, pulls in the visitors here." (PS1)*

Yet the complexity of place attachment was highlighted by a participant in the AC case, suggesting a "*double-edge sword*" in the relationship to the landscape and community energy. This focused on the visual impact of the wind turbines from the

CRE project and the value of place and its aesthetics. Even though the participant had invested in the project the wind turbines also had a visual impact on their *"views"*. In this way, there were cost and benefits of these CRE schemes and represented a threat to emotional attachment to place, that required at times a compromise.

> *"For us it's a bit of double edge sword, we moved out to where we are for the views and now obviously on one of the sides now has two great wind turbines in!" (ACS2)*

4.4.2 Social dimension of place attachment

As part of social attachment within the Ogwen Valley a shareholder highlighted how people had an interest in safeguarding each other within the community, focused on social interactions. This was exemplified in the YO case with a participant identifying a cohesiveness that included a *"kind of looking out for each other"*, reinforcing belonging, social ties and connection within the Ogwen valley.

> *"Looking out for each other… Caring, people even in terms of seeing them, and you stop and talk to them. That's nice, that's what I like in the Ogwen Valley." (YOS5)*

Across the cases shareholders identified how there were also socio-cultural dimensions interwoven into communities as part of social attachment, based on local civil society. For instance, this was illustrated in YPP with the socio-cultural aspects seen as important in constructing the social fabric of a place, identified as *"community spirit"*. Key signifiers of this were the local community *'Papur Bro'* newspaper, the eisteddfod, cultural clubs and choirs. As such, there was historical and social ties and cultural rootedness with a strong sense of Welsh identity framed within the Peris valley.

> *"And it's important that there is a community spirit, we have the local paper, the eisteddfod, and socializing with a cultural club and a choir in Llanberis. There are enough things in the community happening." (PS1)*

Equally, the importance of *"community spirit"* as part of social attachment was also exemplified by a shareholder from YO. The participant identified how culture and

language were important as part of the community in the valley as mechanisms in fostering a community spirit and pride. In this way, the Ogwen valley as place provided a deep cultural and emotional sense of belonging.

> *"On another level, I think culture and language are exceptionally important in developing local community spirit but not in a nationalistic way, in the developing of a culture that's unique to that particular area. And having pride in that." (YOS2)*

4.4.3 Mixture of Physical and Social dimensions of Place Attachment

The study findings indicated the relevance of both physical and social dimensions of place, cutting across functional, emotional, and social attachment. For instance, a stakeholder in YO highlighted the intersection between a mountainous, unspoilt landscape and the sense of community framed within the valley. The stakeholder highlighted how social attachment was pivotal, with people engaging in collective action rooted in a strong sense of place and social ties. However, there were also strong elements of emotional attachment to the Ogwen valley, with its distinctive characteristics and landscape features with these places involved a sense of affinity and meaning embedded in place.

> *"The people of the Ogwen valley which make the Ogwen valley. So, the social interaction and the groups coming together. The landscape is extraordinary, and as well it hasn't been spoilt by tourism. The Carneddau, Nant Ffrancon, Cwm Idwal, Glyderau, we live in a really special place." (YOKS1)*

In a similar way, in the Swansea valley a key stakeholder indicated that alongside the history of industrial heritage there was also the natural beauty of the local area. The mountainous Brecon Beacons and coastal features representing emotional attachment to place. Yet there were not only the physical features of place but also its social aspects, centred on a connection to place including its mining history and a sense of belonging. In this context, there was an ageing population in terms of community profiling, with young people cited as moving away especially if they gained a university degree, reflecting the challenges to social attachment and the cumulative sense of identity.

"I think the area itself is very beautiful, the Brecon Beacons to the north and then to the south the sea and there's a lot of mining history. A lot of young people kind of move away." (ACKS1)

A participant in AC identified a series of threats to the place attachment. In terms of emotional attachment, the local area was linked to a strong identity of the *"valleys."* Yet there were distinct characteristics in each respective 'valley' with issues around rural decline, representing functional attachment. It resulted in lack of opportunities and the loss of people and key community centres, leading to a *"gradual drain from the valley"*. This rural decline threatened place in terms of social attachment, focused on emotional and cultural connections, with a shift away from a vibrant locality.

"Well, there, there is a kind of idea of the valleys and they're not they're not near to Cardiff. So, I sort of feel that we're a bit neglected. And I think what's happening really is a gradual drain from the valley. I mean, the town is not as vibrant as it was." (ACS3)

Another participant in AC outlined the complexity linked to place attachment and the CRE project, involving both costs and benefits. As part of the mountain landscape the participant highlighted the costs due to the visual impact of extensive wind turbine development in the area, with their locality being *"surrounded"*. This included a variety of new types of wind turbine development at different scales and models, although clearly having a threat to emotional attachment to the landscape. Importantly, the AC wind turbine was identified as more distinctive as there were local social impacts to the community, representing benefits, as it was community-owned. In this way, the visual impact was offset by social attachment focused on the local benefit gained from the wind turbines.

"We're surrounded now! looking across Mynydd y Gwrthyd where Awel Aman Tawe is, just behind us on a Mynydd there is big wind farm park… and then the mountain behind that there is another wind … but the great thing about Awel Aman Tawe is that the money goes towards community stuff which is great." (ACS2)

The findings predominantly centred on how place attachment provided context and support for CRE projects. Yet the concept of disruption to place attachment was evident in a limited number of exemplars within the findings, where participants expressed concern around the potential tension between CRE projects and place. In the case of AC where some participants identified how the windfarms due to their strong visual impact, conflicted with the sense of nature in the upland areas.

Furthermore, a stakeholder in the GR indicated a sense of connectedness to the coast and countryside, linked to emotional attachment to place. There was a distinction between rural and urban, with urban being a source of employment and services, representing functional attachment. The Outstanding Area of Natural Beauty status was emphasised, reaffirming the emotional attachment to the landscape and its special features.

> *"It's a coastal place…lots of natural resource, yes there is a city I benefit from, with services and my place of work but more so I'm connected to the countryside, the Gower, you've got the Outstanding Area of Natural Beauty, that's pretty important." (GRKS3)*

In a similar way, a participant in YPP outlined how the community was positioned in a mountainous landscape. As such, the physical environment was populated by people and marked by social ties that were anchored within the physicality of place. This positioned the village within the valley, representing emotional and social attachment to place.

> *"It's just the place and people. The physical networks and the social networks as a community is definitely tied up in the physicality of the place, because it's quite tight valley and definitely gives us its own character and the fact that right next to the mountains." (PS2).*

Further, a shareholder from AC highlighted the relevance of both social and physical dimensions of place attachment. These were jointly seen as significant in terms of the emotional attachment rooted in the landscape focused on the Brecon Beacons National Park, but also the social attachment focused on social ties and emotional cultural connections, centred on the Welsh language.

> *"It's not necessarily part of the Welsh heartland anymore but the Welsh language, still pretty strong, fairly cohesive community, it's also on the edge of a National Park. I make the most of all the mountains all round." (ACS2)*

Furthermore, a participant from a social community group hub in the Peris valley also identified the importance of the emotional attachment to place, associated with living in a beautiful area. This was combined with social attachment linked to a strong cultural identity embedded in being able to speak the Welsh language as part of daily life.

> *"It's a beautiful area, a Welsh area. I can live my live through the medium of Welsh without having to use the English language, it's fantastic." (YPPCH1)*

4.5 Post-industrial landscape and communities

This theme highlighted the relevance of a post-industrial landscape centred on functional, emotional attachment and social attachment. Significantly, the findings indicated there was a rootedness of place and community within a historical perspective centred on coal, steelworks or slate and the exploitation of the landscape. This included the intersection between past and present patterns of usage, including post-industrial healing of the landscape but also the visibility of old buildings, quarries and industrial decline within Welsh villages. Importantly, a key analytical insight found was a discrete sub-theme centred on transitions over the shifts within place and attachments over time.

As part of social attachment to place, the community hubs identified the relevance of the post-industrial nature of the landscape and its effect in shaping communities and sense of place. A participant from a tourism-based community hub detailed how the slate industry defined the physical existence of the locality, consisting of a cluster of Welsh villages. This represented functional and emotional attachment to place, as a main source of employment and it had created communities with a strong identity linked to the quarry. Although there had been industrial decline, in terms of boom and bust, they remained a defining feature.

"Well, what's important is that we help visitors, to understand the importance of the slate industry to the Peris Valley. The slate industry has been the main employer in Dyffryn Peris with Dinorwig Quarry since 1780, but there isn't a quarry open these days. A group of communities would not exist if wasn't for the slate industry." (YPPCH2)

In a similar context, a participant from another tourism-based hub identified the importance of social attachment aligned with the slate industry in shaping a sense of place and community. This included its recognition through an application for recognition as an UNESCO World Heritage Site. The social history and industrial heritage of the area, including its visibility through the remaining industrial buildings and slate levels and lines, representing emotional attachment. This also attracted visitors to the area, as part of functional attachment but the slate museum was of broader significance to the community.

"I think, there's talk of the World Heritage sort of status, isn't it? I think it's is part of why Llanberis is here, it's the slate industry. So, I think, that should be kept alive certainly, the sort of history and the sort of links to the past again, it's another reason for people to come. You have to walk through the quarries, and you see the old buildings and the lines, and it would be a shame if it all fell down." (YPPCH4)

The participant from the Ogwen valley, within an environmental community group hub also identified the importance of industrial heritage linked to the slate quarrying villages within Snowdonia. Although the slate quarrying industry had once been a key employer it was also associated with difficulty working conditions. Yet it had fostered poetry and politics that was seen as pivotal in underpinning the Welsh language. This highlighted a strong social attachment to place focused on identity and belonging embedded in the socio-cultural framing of the valley. In this context the hub had a role in showcasing this cultural and industrial heritage, had developed a "*new slate trail project*" and also emphasised an emotional attachment to place.

"People talk about the slate quarries and the forced labour but at the same time, they were hubs for culture, creativity, poetry, music, debate, so politicised people really. Actually, someone told me in the slate museum the

*other day that if it wasn't for the slate quarries the Welsh language might
not have survived these So, we're definitely all about celebrating not just the
natural history of Snowdonia, but also the cultural history…. And we've been
very involved with the new slate trail project." (YOCH3)*

A participant from a community centre hub identified the storytelling narrative
capturing the identity of the Peris valley community in a mural within the village.
The mural was a product that centred on affirming a connection between the past
and present of the locality with the intention of *"weaving a positive identity"*
(Figure 44).

*"And whereas the mural, so weaving a positive identity was really important.
Putting a quarry worker on the on the mural, again, was really important
and got lots of attention… but basically it was pulling out how can you
celebrate the community and all the different elements from the past and
future". (YPPCH5)*

Figure 44: Llanberis mural: The Quarryman centrepiece (Fieldwork)

The community driven nature and sense of ownership of community hubs was
often founded on their social history within the locality. For instance, a participant
from the community centre hub identified how it was built by the local coal mining
community. As such the historical and cultural context behind the centre

highlighted its strong ties to the community, providing an early example of community investment on a local level. This reflected a social attachment based on an emotional and socio-cultural rootedness to place, represented by the miners' hall.

> *"Well, it's all started with the miners, it's a miners hall you see and out of their pay they paid a penny week which built these places they had a cinema in every village." (ACCH3)*

In a similar context, a participant in a community centre hub highlighted the importance of history and a shifting pattern of community. This had originally been a miner's welfare hall providing an interconnection between the past and present. It signalled the important role of the coal mining in the locality, shaping the particular nature of these Welsh communities as an integral part of everyday life. As with the slate quarries, it provided employment and supported the social fabric of the place. In this way, the participant identified how the miners' welfare hall represented an early example of community investment and collective action, based on the contribution made by the miners from their weekly wages. In the present context, there was continuity as it still provided a community hub in new way, providing community facilities. The changing nature of communities was highlighted by the participant, with chapels and mining villages being symbols and motifs of the Welsh communities in the past. In this way, there was a strong display of social attachment reflecting a cultural history rooted in the landscape and life of the colliery and its civil society.

> *"That's the old colliery down the other end of the village (pointing to old pictures on the wall), and that's the old chapel used to filled to the brim … it is all the coal mines that were here, one in every village, here in Cwmllynfell, and then in Cwmgors and Ystalyfera. And like I said welfare hall is here was because of the miners."* (ACCH2)

In this context, Llewellyn *et al (*2017a) highlighted how mining developed a strong sense of community in the valleys. Mining communities built a platform of social engagement in civic life and generated community-orientated action. This created

social organisations within the valleys, ranging from educational to recreational activities, and led to enhanced social cohesiveness and ties within communities. The study findings also identified how the industrial past and the legacy of social organisations led to the active nature of civil society. This was evidenced through diverse community hubs, in the valleys, often framed as previous 'miners halls' and still supporting communities and a spectrum of civic activities, including education and entertainment.

Equally within the Gower two participants within a community centre hub mapped the relevance of industrial heritage to a sense of place, set within the landscape, centred on coal mines and the old tramways. As such it reflected a social attachment to place with the cultural history of the community focused on being a mining village focused on coal. Furthermore, there was emotional attachment to place embedded in the physical infrastructure left behind from industry, such as old tramways that were used to transport coal. Even in the context of the community hub, its location is set on "*coal mines up here*" what used to be the main line for transportation linked to industry. Social attachment

> *"Yes, Dunvant has an interesting history there were coal mines up here, but it's the old tramway, where trains used to come down with coal. That was the main line." (GRCH3)*

The changing patterns of industry within the landscape and its influence on communities and defining place was further highlighted by a participant within an environmental organisation hub in South Wales. The participant marked how there had been industrialisation in the area in the past, linked to the development of the coal and steel industry. However, the exploitation of natural resources through industry was an emotionally charged topic, with any benefits leaked across the border. Following the period of intense industrialisation there was a recent movement towards the restoration of the landscape, as a form of "*healing*". In this way, there was also an emotional attachment to the landscape with the outdoor hub and participant actively engaging with the landscape and its sense of place with the younger generation.

216

"This whole valley was a mass of industry and the coal was high grade of anthracite., Open your eyes to the sorrow, the horrors were in this valley, the valley was plundered by people from over the border with pots of money. And then the hardships in this area were phenomenal, the steel works here. The industry has all but disappeared. I see myself as part of the community that's healing my bit of the valley landscape, bringing kids here, making them aware of this. But where do we go next? That's in their hands."
(ACCH4)

In a similar context, in South Wales a textile mural positioned in a communal café area in a community hub within the wider Gower area, displayed the theme of change and transition in the nature of community (Figure 45). The participant highlighted how the mural mapped transitions in the place and people of Dunvant, reflecting the social fabric of the community and shaped how it was shaped by the physical factors of landscape and industry.

"Its 1900-2000, that's the chapel since 1800, there's the Hall, …, I think that's the old centre that burnt down, that was the railway, then this is a bridge there that the train line went through… there's the old mines…The valley had a brickworks". (GRCH3)

Figure 45:   Dunvant textile mural

4.5.1 Using the Local Environment Over Time

Overall, across the case studies there was a strong industrial history linked to the use of local natural resources, which had changed over time and represented a transition. For instance, from coal mining to wind turbines, as well as slate quarries to hydro power and cornmill to solar power. In this way, there was functional attachment due to a dependency between the community and the local environment, including industry and tourism and within this the emerging role of CRE. Overlayed on this was the cultural and historical meanings and identity focused on how CRE was aligned with the industrial heritage of the areas.

In this context, Haf and Parkhill (2017) identified the vibrancy and cultural sustainability of communities, built on adaptation to economic circumstances with an ability to generate employment through granite quarrying in Wales or tweed-making mills in Scotland. This indicated the rootedness of communities in using natural resources and highlighted its connection to maintaining cultural sustainability, with a retained sense of identity and place by these respective communities. Significantly, the CRE projects were located within this cultural and place attachment context, retaining consistency and continuity between past and present patterns of using natural resources and community meanings. The study findings reiterated the results from Haf and Parkhill (2017), identifying the strands of continuity and cultural rootedness in place, attachment and the use of the landscape and its natural resources.

A shareholder in YO reiterated the importance of the past history of small-scale hydros in Snowdonia. There was a consequent decline once the locality was connected to the National Grid. However, the recent resurgence of small-scale hydros in the locality had shifted from individual to collective projects. In this way, the participant highlights the functional attachment to place with the use of hydros over time in the landscape, now emerging as CRE and emphasizing a sense of continuity.

> *"The Snowdonia hydro schemes back in the 20s and 30s, when they were really booming, were small scale. There was over 200 in the Snowdonia area alone. Individuals supplying their own power. Electricity came in and a lot of*

218

those systems just went to rack and ruin. Now it's coming back in with much more organised, structured local hydro." (YOS2)

In the context of Gower Regeneration, the share offer document (Gower Regeneration, 2017) identifies the continuity between past and present use of natural resources extending over 900 years. The Y Felin Ddŵr Charitable Trust centred on Park Mill which is a 12th century water-powered corn mill, co-founded the GR solar powered CRE scheme. In this way, the CRE project "*follows in these footsteps*" (Gower Regeneration, 2017).

In a similar way, the sense of "*continuity*" was exemplified by a shareholder in AC. They highlighted this interrelationship between the past and present use of the local resources of coal and wind to provide energy. As such, there was an emphasis on continuity as part of the functional attachment to place, with a narrative of change focused on the natural resource being used to generate energy, shifting from coal to renewables.

> *"I think, to me, that sort of historical background is incredibly important, there's like a continuity with the wind farms, like the coal mines, providing fuel for the nation and now the wind farms are." (ACS3)*

In the context of the Swansea valley, a participant reflected on the complex relationships between place and past industry over time and the emergence of CRE. In this way, there was an emotional attachment to place centred on the shifting pattern of using natural resources in the locality, including the damaging effects of past industry. As such there were concerns over windfarms returning the area to an industrial setting, representing a perceived threat to emotional attachment to place. Although, the sense of community ownership was seem as potentially contributing towards some greater level of trust in the project. As this was framed as community led rather than externally focused, supporting a sense of social ties and social attachment.

> *"I think there was – like some people's reactions to the windfarm was that this area has just recovered from coalmining and it's got a bit greener and then we're going to wreck it again with the wind turbines everywhere. The*

fact that past industry was dominated by external companies coming in, affected perceptions of our project. Some people could see that it was going to be community-owned and kind of trusted that and felt quite differently about it because of that." (ACKS1)

Within case studies shifts in the pattern of how natural resources were exploited had resulted in significant alterations to the landscape and the communities over time. For instance, in the AC case a shareholder identified the relevance of the "*greening of the Swansea valley*" in the post-industrial era in South Wales. As such, communities were part of a transition from heavy industrial past towards a greener future, focused on renewable energy and the closure of coal mines and the restoration of the site, signifying this change. The participant identified the centrality of harnessing of natural resources and close relationship with Welsh communities, anchored in the environment focused initially on mining and shifting to tourism and CRE. In this way, the participant indicated a transition in the functional attachment to place. This focused on CRE rather than the coal industry, based on a clear sense of dependency on the landscape to support and "*feed"* the communities within the locality.

> *"I have seen the movement away from coal and the greening of the Swansea valley and the massive environmental improvements… And we're about to see that with the closure of East Pit. I think green power and means of, we don't have much other than the environment. So, tourism and renewable energy are two means of bringing resource in that can feed the community."* (ACS5)

In the Peris valley, a participant indicated how the slate quarrying represented an important industrial past history but with less relevance for the present social fabric of the community, with associated lived experience of working in the quarries declining over time. As such the landscape was central to both past but also the present context of the Peris valley, representing a functional attachment to place. The quarry was being replaced with the new industry and role of tourism, viewed in industrial terms as a "*machine"* generating income locally. However, it was also associated with a sense of conflict in terms of activities supported by the valley as

the new industry of tourism resulted in a lack of affordable housing for local people in the village.

"But extracting slate, that's historical now. Not a lot people remember now, that was a huge industry in the valley. Tourism is everything in the valley now, and that's what generates money, that's the machine." (YPPKS1)

This was reiterated by another key stakeholder identifying the shift in industry and its social impacts, arising from transitions over time focused on a changed focused in the functional attachment to place. Consequently, there was a changing nature of meanings to place, with attachment reframed around tourism rather than quarrying.

"When I was young, my parents and my friends worked at, the main employer was a quarry. But after the quarry closed, I know there is an employment problem here, but it's just tourism that keeps the town going now, although there are a couple of industries here, like hotels and the small train." (YPPKS3)

Within the Swansea valley a key stakeholder viewed that the past industrial heritage within the area was still relevant and linked to contemporary concerns about what might sustain communities in the future. In this context, positioning the role of CRE was an important consideration, providing potential opportunities in the future linked to functional attachment.

"The wider area, it's always had very significant industrial heritage and the big question what's going to replace it? And failure for something to replace it is very significant to the people who living here. And there's some interesting questions about what is the role of renewable energy within that, certainly there's a great opportunity." (GRKS1)

With reference to coal mining, a key stakeholder in AC identified the importance of social attachment to place centred on socio-cultural connections. This centred on the social fabric of the community based on its history, with the participant highlighting how the past industrial heritage and key social events, such as the 'Miners' Strike', retained a contemporary relevance. Interestingly, the participant

221

drew parallels between the past coal companies and the contemporary commercial windfarms. Both had a sense of external stakeholders and beneficiaries.

> **"***Yes. I think it's an area we're trying to recover from the 'Miners' Strike' really, that background of coalmines having closed. There's a kind of strong tradition of large companies coming in and controlling resources and people got used to that and sometimes it's easier just to carry on with that relationship in the way that coalmines were developed and owned. Even large windfarms as well are often just owned by foreign companies."*
> *(ACKS1)*

In this context, the work of Llewellyn *et al (*2017a) provides insights into the transitions experienced in the valleys of South Wales, with the shift away from coal mining signalling industrial and economic decline. However, there was an increasing presence of wind energy at both a large scale and to a lesser extent at a community level, representing an 'evolving energy landscape'. Importantly, the work of Llewellyn *et al (*2017a) identifies how communities understand and respond to this change in the nature of energy generation in the landscape of the valleys and how natural resources are utilised. The study findings also clearly highlight what is a transitional picture in the slate and coal mining areas, representing an 'evolving energy landscape' (Llewellyn *et al.*, 2017b). Importantly, in AC the development of wind energy altered the symbolic meanings attributed to the landscape by communities. As part of this process of transition and ameliorating a damaged landscape through the 'greening of the valleys.'

This evolution within place was also reflected in fieldwork observations. For instance, the researcher was taken to view the CRE project's turbine and technical equipment at the Ogwen river by two volunteers (YOKS3). During the observation they pointed out the site of the 'Gikes' turbine house by the Ogwen river weir, associated with the historical period of the Welsh Slate's Penrhyn Quarry in 1929, positioned close to the new turbine shed. In this way, there was continuity in the use of the river as a natural resource within the valley. However, the CRE project was utilising the river not for the benefit of the Penrhyn quarry owners but for the benefit of the local community.

P1: *"Did you know there was an old hydro here before?"*

Researcher: *"No I didn't realise that"*

P2: *"Can you see the old weir there?" (pointing) It was for the compressor pumps in the Penrhyn quarry it was"*

P1: *"And that's where the water came out, so that where the weir is. So, we thought well if the quarry has done it, why can't we."* (YOKS3)

Overall, the literature suggests that support for CRE projects is built upon schemes that align with, and support a community's particular identity of place and a sense of historical narratives (Devine-Wright, 2011; Devine-Wright and Batel, 2017). Furthermore, place attachment has a particular relevance in informing support for small scale CRE projects (Devine- and Batel, 2017; Veelen and Haggett, 2017). The study findings highlighted how CRE projects were anchored into a sense of continuity across the case studies. This included viewing the CRE being within the context of a post-industrial community, with a strand of continuity between the transition from coal to wind power in South Wales, as well as the historical and contemporary use of hydros in North Wales. In this way there was a strong alignment with place attachment, focused on bridging past and present use of natural resources and sense of place. This was also reflected in the work by Devine-Wright (2011) which identified the importance of "*continuity with the past*" (P90). Furthermore, this theme was echoed by Süsser, Döring and Ratter (2017) in the German municipality of Reußenköge, which transitioned from an agricultural-focused local economy, towards harvesting the benefits of wind energy.

4.5.2 Different place attachments in Welsh communities

Overall, the study findings identified different place attachments within Welsh communities. This was framed around both physical and social dimensions, as well as their interrelationship to a post-industrial landscape and community (Tables 23 and 24). As such, participants provided thick descriptions that embedded these meanings, centred on key 'terms' and 'references' in their account, providing descriptors of functional, emotional, and social attachment in the context of these CRE case studies.

Table 23: Physical dimension - Physical and emotional attachment: case exemplars from the data

Range of Attachments		Illustrative case exemplars from data
Physical Dimension	**Functional Attachment**	• Accessing nature and recreational use of landscape (mountains, woodland and countryside, walking and climbing) • Quarrying, mining and steelworks providing main past employment • Reliance on tourism and the role of renewable energy in bridging the gap in the present and future • Continuity of using local resources over time (small scale hydros, Coal to renewables) • Abundance of natural resources and local topography of landscape has utility for CRE projects • At a distance or close to town and services

	Emotional Attachment	• Valleys as shaping the physicality of place and community identity (Ogwen, Peris and Swansea valleys)
		• Natural beauty and wildness of coastal and mountainous landscapes
		• Connection with National Parks and Area of Outstanding Natural Beauty (Snowdonia, Brecon Beacons and Gower)
		• Threats to attachment:
		    o *Visual impact of wind turbines*
		    o *Industrialisation through wind turbines*
		    o *Overdevelopment and tourism*
		• Physical infrastructure of industrialisation (coal, slate and steel – levels/lines and buildings, tramways, red ingots, Slate Trails)
		• Landscape restoration and healing from industrialisation (greening of the Swansea valley)
		• Close relationship to nature and quality of life
		• Undervalued and underappreciated natural resources:
		    o *River*
		    o *Coastal landscape*

Table 24 Social attachments – Social attachment: case exemplars from the data

Range of Attachments		Illustrative case exemplars from data

Social Dimension	**Social Attachment**	• Industrial heritage and Industrial communities - collective sense of identity linked to coal, slate and steel
		• Social history and hardship (miners strike), past external stakeholders and benefits
		• Community Renewable Energy – community led, owned and benefits
		• Cultural connections and Welsh identity:
		    o *Welsh language*
		    o *Cultural groups and events*
		• Social ties and social interaction
		• Community spirit, belonging and collective action
		• Threats to attachment:
		    o *Rural decline*

In terms of functional attachment, the participants described a post-industrial landscape focused on utility and as such *"the valley was plundered" (ACCH4)* linked to coal mining and *"extracting slate"* (YPPKS1). In this way, the landscape had been a focus of *"bringing resource in that can feed the community" (ACS5)*, so that the utility of place had enabled the community to be supported: *"sustaining the local community" (ACKS2)*. However, although the landscape had been heavily industrialised, it also consisted of a natural environment that included National Parks and countryside. This enabled different forms of utility for these communities to engage with place, supporting recreational activities such as *"walking" (ACKS2)* and *"mountaineering" (YPPKS3)*.

In the case of emotional attachment, participants described an affinity to the landscape and its characteristics, defined as centred on the *"nature of place, the wildness" (PS2).* As such, it was seen as displaying a *"natural beauty" (ACKS2)* that underpinned emotional attachment, represented as distinctive across the cases. For instance, the mountain ranges of Snowdonia*: "the Carneddau, Nant Ffrancon, Cwm Idwal, Glyderau" (YOKS1)*. Consequently, participants highlighted not only an aesthetic value but also being able to experience a sense of freedom, that framed meaning as part of their life within place*: "that space and not feeling trapped" (YOS2).* Furthermore, the topography created a sense of boundedness supporting identity: *"kind of idea of the valleys" (ACS3).* This was evident across the Ogwen, Peris and Swansea valleys and located and constructed meaning and attachment to place. In addition, participants highlighted how emotional attachment to place developed over time and responded to the restoration of landscape from its industrial past leading to *"healing my bit of the valley" (ACCH4).* Also, participants reflected on the position of CRE within that attachment to place, indicating a shift away from an industrial past to a renewable future: *"movement away from coal and the greening of the Swansea valley" (ACS5).*

In a different context, participants described how social attachment centred on a sense of community belonging as well as social ties to place, which was reinforced by its industrial heritage and cultural identity.   The area of social ties and interactions here was an embedded social attachment focused on: *"social*

networks" (PS2). As such, there was social cohesion, supported by place, with a degree of *"socializing" (PS1)* and a commitment to *"people they look after each"* *(YOS5).* A further important strand to social attachment was its underpinning by industrial heritage, leading to a distinctive cultural identity. In this way, participants described social attachment as having a shared sense of belonging: *"to celebrate the culture, history and environment" (YPPCH5).* This focused on the rich industrial past, including *"mining history" (ACKS1).* This included current facilities as hubs for social attachment, highlighting the bridge of meaning between past and present civil society: *"And like I said welfare hall here was because of the miners" (ACCH2).* However, participants also highlighted how social attachment to place reflected the shift from industrialisation to a renewed landscape: *"got a bit greener" (ACKS1).*

Overall, participants described how social attachment was centred on: *"exploring the cultural and historical heritage" (YOCH3).* As such, the cultural context of place was central, leading to a sense of community: *"there is a community spirit, we have the local paper, the eisteddfod" (PS1).* In addition, the companion to culture was the presence of the Welsh language as a form of glue within social attachment to place: *"I think culture and language are exceptionally important in developing local community spirit" (YOS2).* This was also the case where the degree of Welsh had diminished: *"it's not necessarily part of the Welsh heartland anymore but the Welsh language, still pretty strong" (ACS2).* However, in some areas there was still a strong social attachment to the Welsh language and its cultural context: *"I can live my live through the medium of Welsh" (YPPCH1).*

4.6 Summary

Overall, the findings mapped a series of analytical insights, including the multifaceted nature of communities across case studies and a range of attachments to place. The meanings constructed by participants highlighted how CRE projects seemed to be rooted in place framed as using natural resources over time. Community was understood in terms of communities of place and shared interests. Furthermore, the findings identified how community consisted of multiple communities, that included both division and integration. The community aspect of

CRE projects was important, with projects characterised as embedded in their community, being locally-led, and benefiting those communities. The relationship between communities and place framed community belonging. In this way, participants identified the physical and social dimensions of attachment to place, with a set of constructed meanings. This included the importance of physical attachment centred on mountains and valleys, but also the importance of industrial heritage, culture, and its infrastructure. In terms of social attachment, the strong social ties, belonging and Welsh identity were important facets as part of a post-industrial communities.

CHAPTER FIVE:
FINDINGS AND ANALYSIS: SOCIAL AND CULTURAL CAPITAL

5.1. Introduction

The literature highlights that social capital focused on social networks, centres on a common set of shared values, that may operate as a mechanism for collective action (Berka and Creamer, 2018; Gilchrist, 2009). As noted in the seminal work of Putnam (2000), social capital pivots on bonding as a form of internal networking within a community, and the potential bridging capital outside these interactions, as part of external networks (Putnam, 2000; Radtke, 2014). The study findings focused on Welsh community energy, with bonding capital operating *within* CRE groups, whilst bridging capital was focused on the social connections *between* CRE projects and other community energy groups. In contrast, linking capital extended the interconnections to how CRE groups relate to policymakers. Within the study the application of a social capital lens enabled the findings to address aspects of the research question: *What are the social processes driving forward civic engagement in community renewable energy in Wales?* As part of the study findings, the account of social capital also surfaced aspects of social impacts from CRE projects.

In this context, a key contribution and insight of the study focused on how CRE built a local stock of social capital, including the role of key individuals, who had strong local interpersonal trust and connections within the community (bonding social capital). Further, it also developed an understanding of benefits accrued from social capital, including the importance of building on existing or forming new relationships, allowing shared learning and partnership working between different CRE projects (bridging social capital). The study also provided conceptual clarity around the nature of the interrelationship between CRE projects and policymakers, focused on the issues of gaining access to support and seeking influence policy

(linking social capital). Therefore, as part of a within-group context the study findings highlighted the relevance of internal networks, compared to activity across and outside groups centred on external networks.

Overall, the literature has focused on social connections across *"networks within, between, and beyond communities"* (p.1913), yet there has been limited attention on the implementation of bonding, bridging and capital in practice (Pretty, 2003). In this way, a key gap recognised within the literature remains on 'how' social capital works in particular contexts. In particular, the literature suggests the presence and benefits of social capital but fails to specify in detail its operation, within the process and outcomes of CRE projects (Walker *et al.*, 2010; Seyfang, Park and Smith, 2013). As such, there is limited research in this area, with the exception of Morrison and Ramsey (2019) which examined the role of 'social entrepreneurs' within CRE projects in a rural context within Ireland and Scotland. In the study findings, a novel theoretical contribution was the identification of how social capital operated in the applied context of CRE projects in Wales, as part of series of detailed case studies. In this way, the study findings addressed the current gap in the literature, exploring the relationship between theory and practice centred on processes and outcomes linked to CRE projects.

The findings predominantly highlight the significance of social capital but also surface the relevance of cultural capital such as skills, knowledge and experience. As such the findings identify the interrelated context between social and cultural capital in the CRE sector. This focused on recognising the importance of social connections within and outside the community but also connecting-up with key individuals that possessed valuable skills or experiential assets that benefited the development of projects. This required purposeful strategies to engage and enhance particular social networks as noted by Jeannotte (2003). In this way, it is not only concerned with the scope of networks but the nature of advantage that can be gained from a social position that operates as a platform to gain from broader networks, drawing on social, economic and cultural capital to benefit an individual's own network (Baron et al, 2000). In this way, Bourdieu emphasised the

'aggregate of the actual or potential resources which are linked to possession of a durable network' (Bourdieu, 1980:2 1986, 248 cited in Field, 2003, p17).

Overall, the chapter focuses on bonding, bridging and linking social capital, with reference to exemplars of cultural capital. In this way, CRE projects draw upon both social and cultural capital, requiring different levels of social networks, skill sets and experience for groups and schemes to thrive. This is centred on, and represented, as both processes and outcomes in the context of CRE projects, rooted in exemplars drawn from the findings (Table 25).

Table 25 Building a 'local stock' of social capital and utilising cultural capital in CRE

Social capital types	CRE exemplars	CRE Actors	Overarching key aspects of social capital emerging from the data	Cultural Capital CRE Actors	Cultural capital exemplars
Bonding	Personal networks Having confidence and trust in directors	Key stakeholders Shareholders	Trust and interpersonal connections	Key stakeholders	Key individuals with specialist skills Time, Skills and Experience
Bridging	Partnership, co-operation and shared learning: - Connecting-up within the CY network - Connecting-up within a wider CRE network	Key stakeholders	Co-operation and shared learning		
Linking	Accessing National Lottery funding Accessing Welsh policy support and resources Political lobbying	Key stakeholders	Seeking influence and accessing resources	Key stakeholders	Skill set and drawing on experience in engaging and influencing policy

5.2 Processes and Outcomes of Building Social Capital in CRE context

5.2.1 Bonding

The benefits arising from different types of social capital include bonding, focused on developing cohesiveness within communities and bringing people together to mobilise collective action (Woods, 2011; Rivera, *et al.,* 2018; Firth, *et al.,* 2011). An important catalyst for social capital is active citizen involvement, underpinning the development of sustainable communities and local entrepreneurship (Yildiz *et al.*, 2015). Within the study findings such benefits were evidenced, with people being were drawn together as part of CRE projects, such as building a board of directors, engaging shareholders and embedding the scheme in local networks. However, the literature suggests that within-group relationships tend to be *"inward looking [networks that] tend to reinforce exclusive identities and homogeneous groups"* (Putnam, 2000, p,22). In the context of bonding social capital, the study findings focused on within-group relationships and having an inward focus, reflecting internal networks. In a CRE context this was akin to cohesiveness and strong social ties, aligned with collective action**.** In terms of cultural capital, within the study, having a mix of professional biographies, including engineering, law and accountancy or having previous experience with community enterprises provided a key platform for developing CRE projects.

5.2.2 Personal and social networks

The data from case studies identified the relevance of informal networks, based on pre-existing relationships which informed bonding social capital. These relationships were subsequently built upon through involvement with projects. In the case of YPP, personal networks focused on there was close social ties and roles within the community. Whereas in AC, YO and GR the personal interconnections were derived from previous social enterprises within those communities. In this way, the findings from the study and the literature both highlight the relevance of established patterns of collective action. The presence of pre-existing community-based groups and robust social capital, as a trigger to developing CRE projects, as well as leading to their successful implementation (Bomberg and McEwen, 2015; Haggett and Aitken, 2015). As such, groups that were already grounded in their

communities were able to build successful projects based on a high level of cohesiveness and a pattern of established activities (Bomberg and McEwen, 2015). In this context, trust represents an intangible resource to support CRE groups to overcome the challenges of project development (Bomberg and McEwen, 2015). For instance, the exemplars of successful CRE projects in the Highlands and Islands of Scotland indicate the importance of having established rural, land-based institutions and social networks, as a platform to enable the fast-paced adoption of CRE schemes by communities (Berka and Creamer, 2018; van der horst, 2008; Slee, 2015).

In the study, the relevance of personal networks was highlighted in the exemplar of Gower Regeneration, focused on the enabling of the siting of the CRE project through an informal network:

> *"So, I guess we were quite lucky, in that we knew someone who had a large field that was south facing, and he was interested in renewable energy which was great." (GRKS2)*

In the case of AC, GR and YO there was a history of active citizen participation within the locality focused on having established community initiatives. This was important in providing a platform of civic activity that fed into the development of the CRE projects focused on drawing on this latent social capital. Within the case of AC, a participant highlighted the importance of pre-existing personal networks and social ties, in particular associated with a previous regeneration charity:

> *"It was always people that you know, me and my wife kind of were the drivers really and then it was sort of friends locally, that we bounced the idea off and within this regeneration charity. So all those people have been carried on being involved." (ACKS)*

Another participant outlined the relevance of prior involvement in renewable projects, focused on Gower Power. In this way, the key stakeholders were rooted in the previous project and extended their involvement to Gower Regeneration.

"Yes, I knew (name) through working for Gower Power, I do the accounts for Gower Power, so I met (name) when Gower Power started up." (GRKS4)

In a similar way, a participant from YO highlighted how within the CRE project, established personal networks drawn from Partneriaeth Ogwen a previous local social enterprise. As such, these social networks were utilised as part of the CRE project. However, there were other new personal networks developed and facilitated through the CRE project. In this regard, CRE provided a setting within which bridging social capital was facilitated, representing a nuanced relationship between bonding and bridging. As such, pre-existing networks were augmented by developing new networks through participating in CRE, which thereby acted as a mechanism for establishing further bridging capital. This was illustrated in Partneriaeth Ogwen:

"So, some of the volunteers from Partneriaeth Ogwen have been part of that, but as well we had people like {name – key stakeholder} as well invited {name}, from the local fishing society and we had another individual from the community joining that group of Directors. I didn't know {name key stakeholder} beforehand, or {name fishing society}, I did know our Directors, obviously because part of it was part of the Partneriaeth." (YOKS1)

Within the context of the study findings the Gower Regeneration, YO and AC case studies indicated the relevance of building on pre-existing personal networks, based on previous local social enterprises in the area. The literature reflects the importance of personal networks as a significant factor underpinning successful developments in CRE projects (Seyfang *et al.,* 2014; Hielscher *et al*., 2013; Morrison and Ramsey, 2019). In the study findings, this centred on the role of key actors who were actively involved in community initiatives in the local area, building social capital. It was utilised to develop the CRE project and often involved the same key individuals across past and current projects. This resonates with the work of Rogers et al (2012b) and Becker *et al.,* (2016) which highlighted how a CRE project was initiated by a pre-existing community-led group within the community. Further, Radtke (2014) identified that overall CRE schemes within a German context did not create new social capital, rather they were dependent on an existing range of

networks, representing those who had an active role with local groups, institutions, and political groupings.

Within the study findings, the area of personal networks was also relevant in the context of establishing the Directors for the CRE project based on previous connections or strong social ties. For example, in YPP, the CRE directors were drawn from old friends from school, relatives, friendship networks or those with an existing role in the community. In this way, such associations represented a context for developing both bonding and bridging social capital through CRE projects:

> *"Beforehand, more or less, old school friends of (name) are three of them, one of their brothers (name) is one, a boy who was in my class at school (name), I asked (name) to come in, and I asked my father-in-law to it with me to come in and (name) was friends with (name). As he's the chairman of [name of a local community group] and think is friends with (name) more than anything else." (YPPKS1)*

As such, personal networks represented a platform for collective action, representing a broad spectrum with some relationships arising from a young age to school and having a role in the community *(YPPKS3)*. The stakeholders had an active participation on a community level as a precursor to engaging in the CRE project. In this way, setting up the project was highly relational.

> *"That's the first thing I did was call people I knew; I know most of them from school. My brother is one, (name) I was in the primary school with him. (name) a local businessman. (name), a guy from the community, [named local community group]. And then I know (name) and then (name)." (YPKS4)*

As noted earlier, in YPP personal networks were primarily centred on relational family and friends or having a role in the community. Equally, Walker et al (2007) and Radtke (2014) suggested that trustworthiness and cooperation was not only built in CRE projects but was also significantly reliant on established relationships within communities. In relation to the findings, within the case studies of YO and YPP, the stakeholders were recognised as having established civic roles within communities. These included being involved in local businesses, mountain rescue or

fishing associations. This is echoed in the literature, with the work of Morrison and Ramsey (2019) highlighting the importance of stakeholders having an active role within their communities, either through local business or volunteering. In this way, stakeholders were seen as embedded in communities associated with high esteem, as well as being catalysts for action, characterised as 'serial entrepreneurship' (Morrison and Ramsey, 2019).

5.2.3 Key individuals with specialist skills

The study findings indicated the importance of key actors having pre-existing knowledge, skills and experience prior to the CRE project across a number of case studies representing a distinct form of cultural capital. In this way, a key component was their background that brought different skills to projects, based on their profession such as engineering, law and accountancy or involvement in previous enterprises. Drawing on these experiences, key individuals in the study were able to mobilise these assets and knowledge into the development of the CRE project. Such schemes often required a wide range of technical skills in finance, legal and technical domains, as well as understanding how social enterprises worked.

In the work of Middlemiss and Parish (2010) there is a focus on how empowerment to develop CRE projects may be linked to a differing type of 'latent' capacity, respectively *'personal', 'organisational', 'infrastructural'* and *'cultural'* in communities. The findings also related to the particular importance of '*personal'* capacity for CRE projects. This refers to an individual-level capacity and capability, focused on a knowledge of energy and environmental sustainability, skill sets and the motivation to act. Indeed, Morrison and Ramsey (2019) identify that as part of a rural CRE scheme, 'Eilean Siar' in Scotland, a previous government minister, local councillor and academic working in renewable energy were on the project board. In this way, both the findings and the literature highlight that a community led initiative was successfully advanced through a small group of motivated and knowledgeable key actors rooted in their communities.

In the study, the area of pre-existing skills and knowledge was exemplified in YPP by a participant revealing a background in environmental management, including a current post at the time the scheme was being set up. As such the stakeholder represented a key individual with a strong skills-set and knowledge that was brought to CRE projects.

> *"So, I come from an environmental background and that's what my job in the day to day. I've done for 18 years, I have been building hydros for 12 years, solar PV for 15 years." (YPPKS1)*

The significance of such cultural capital was evident in the role adopted by key individuals as stakeholders in CRE projects, driving them forward based on their pre-existing skills, knowledge and experience. Within YPP other participants recognised the value of the key individual to the development of the project, such as a knowledge base on the best model to follow. As such, the years of experience in the field of CRE, and a role in environmental management was crucial.

> *"It was {name} led us on that, to be honest. He was giving us advice on what kind of models to follow. So, his knowledge of it was, in a way, essential. Without his knowledge, we never would have done it. But as he had worked on many other schemes in the past in the area or throughout Wales, he knew exactly what kind of model or type that people should follow." (YPPKS3)*

In this context, the key individuals that engaged with YPP all tended to have different repertoire of pre-existing skills, knowledge and experience that were paramount to diverse aspects of the CRE project. This was surfaced in the stakeholder interviews, highlighting how key individuals were mostly retired professionals (YPPKS5). As such they allocated both time and commitment into the community scheme, representing a 'mosaic' of different skills and background. This was a critical part of the project's success, highlighting the need for a diverse skill set and range of experiences as part of cultural capital.

> *"And we're a group of who mostly have retired, meet every Monday to carry things on. And everyone has a different talent. We are professionals, we*

were teachers, making films, accountants, one of Gwynedd's accountants, at {name} Council, so a cross section of professionals. Another one is engineer. So about six, seven of us with different talents, and it's surprising how things can come together suddenly if the right talent is available." (YPPKS4)

In YO, the CRE group also included key individuals with specialist skills and experience to support the development of the community energy project, such as finance and an understanding of technologies.

"Finding a group of people with enough skills to develop a scheme. So the kind of skills you want is, engineering is always good to have someone to understand the technology, business plan helps, I have some experience of that, and, finance, we have an accountant and our committee, which is great." (YOKS1)

Within AC a participant highlighted how community energy was often driven by key individuals with certain skill sets and a capacity to act, investing time and energy to get the projects off the ground.

"But I can understand it's maybe driven by a very small number of people within the community, who have a strong motivation and the time and ability to do it as well." (ACKS3)

This was exemplified further in AC, key individuals with a skill set and background of working in charities aligned to sustainability goals and community development assets, through collaboration in the university sector.

"My partner had a job with Swansea University and then I worked for a couple of local charities involved in woodlands. So, my partner was doing some work {name} University where they were developing local assets and local ownership." (ACKS1)

In this way, these key individuals had the capacity and expertise to apply these to the groundwork necessary for the CRE project, for example applying for funding and research projects for the initial stages of the scheme.

"So, she and I basically did a lot of work in developing the idea and then applying for funding, and finally got funding in 2000 from the government. A research project looking at different methods of community consultation which kind of in effect funded what we wanted to try and do as an idea." (ACKS1)

In the case of GR there were also exemplars of cultural capital based on key individuals and their pre-existing skills, expertise and experience. This included key individuals having previous experience in social enterprises and resultant skill sets:

"I got involved in Gower Power which sits above Gower Regeneration. Then GR was just one of the projects that came up. I thought, I can offer some skills and expertise… it was a relatively smooth ride. But I think that's just because we'd had experience of doing other ones, so that helped us learn from our mistakes." (GRKS2)

Again, another participant highlighted how key individuals with certain skills and knowledge were important as part of the CRE project, such as negotiating difficulties with contractors.

"And {name} is a lawyer by trade, so was great having him on board especially when we were arguing with contractors." (GRKS1)

The combination of skills and experience as part of cultural capital was exemplified by a participant with a specific skill set in finance and previous experience in the community sector. This included a background context of having already worked in several other sustainability initiatives in the past, as well as recently having been involved for a number of years with the GR project.

"I'm an accountant, I'm in the finance business and work for five or six different community projects in the area." (GRKS4)

Overall, in the study findings the stakeholders utilised a set of skills, knowledge and experiential learning as a platform to develop the CRE projects, that represented cultural capital across all case studies. As such, their professional and experiential

background brought diverse skills to projects, for instance technical, legal and accountancy across Gower Regeneration, AC and YO. This is also reflected in the literature, with an increasing recognition that CRE projects link into existing reservoirs of skills and expertise as well as generating learning (Berka and Creamer, 2018). However, the absence of such cultural capital and knowledge rich resources within communities represent significant barriers to the development of community led initiatives (Ruggerio *et al.,* 2014; Rogers *et al.,* 2012; Park, 2012). Significantly, both in the study findings and the literature there is a tendency for CRE projects to depend on a small number of key actors from the community with certain skill sets (Van der Horst, 2008; Walker et al., 2007; Morrison and Ramsey, 2019). Yet this may then exacerbate pre-existing inequalities or gaps within communities (Ruggerio *et al*., 2014; Johnson and Hall, 2014; Schrurer, 2016; Berka and Creamer, 2018). Consequently, although communities may have an interest in starting a CRE project, the absence of such 'practical capacity' is a key barrier (Park, 2012). This was reiterated in the study findings, which indicated how a broad spectrum of competencies was needed by CRE actors, importantly tailored to individual project contexts (Van der horst, 2008).

5.2.4 Trust and confidence

Within the study findings, across the cases, the involvement of shareholders in CRE projects was underpinned by trust and confidence in those with an active role in driving forward and managing the schemes as Directors. In this way, trust and confidence involved range of factors that built social capital. In a similar way, Pretty and Ward (2001) highlight, elevated levels of social capital in groups creates a social structure so that "*individuals are more willing to invest in collective activities, confident that others will also do so*" (Pretty and Ward, 2001, p211). Indeed, Howell and Haggett (2014) identify that the presence of trust and confidence benefited CRE projects through facilitating cooperation and having a reduced emphasis on the scrutiny of others, thereby reducing costs and time for groups.

In the study, a shareholder from AC had invested financially in the CRE project but was also investing in the key stakeholders and their ability to deliver the project,

fostering trust. This had resulted in a greater degree of commitment by the participant as a shareholder, resulting in a further investment in a new Egni Co-op project led by the same stakeholders (ACS1).

> *"Well yes we have to trust them, I have a financial stake in it, although I could have taken money out as interest, I've but it back into Egni." (ACS4)*

In this way, bonding social capital was built upon trust and confidence in the key stakeholders. This was exemplified by a participant in YPP, who highlighted the relevance of confidence in those delivering the project as a key characteristic of the scheme.

> *"The personal network is one the strengths that YPP has, that why most people, of the people invested in it, there was confidence in the individuals which ran YPP." (YPPKS1)*

Embedded within the local community

A participant in YPP highlighted how the stakeholders were drawn from the local community, shaping trust and confidence: *"And everyone is local, everyone that working in it." (PS1).* In a similar way, there was *"complete confidence"* in key stakeholders by another participant, before investing in the scheme, based on being known within local social networks. This was enhanced by *"complete trust"* in them, after demonstrating and delivering a successful CRE project.

> *"Definitely a complete confidence in them because I know a couple of them, and just very convincing, down to earth way and complete trust particularly when it all started going very well." (PS2)*

A further shareholder in YO, emphasised the importance of personal networks in facilitating trust and confidence in the stakeholders as Directors of the CRE project. For the participant, this was also based on a community led and owned approach, rather than a distanced commercial scheme.

> *"Trust the directors to make decisions? Part of it is that I know them personally. And yet, that brings us back to the thing we depend on the big*

> *companies. And you're much more willing to trust someone you know aren't you." (YOS5)*

In a similar way, a participant in AC identified the relevance of existing relationships with key stakeholders over a long period of time, as part of bonding capital. The participant highlighted a high degree of trustworthiness associated with a pre-existing relationship as part of a local community. This was aligned with the perception of CRE project being run by people in the community, as a 'bottom up' scheme.

> *"Particularly (name) and (name) we've known them for so long, as straight as they come really…and that huge part of the thing anyway, was knowing the people involved and going about the right things." (ACS2)*

In addition, shareholders in YPP and YO had trustworthiness in stakeholders, based on a familiarity with them in their communities, as well as recognising their role as part of a locally led not a large-scale commercial venture. These insights identified in the study findings were also reflected in the literature, indicating the centrality of local embeddedness of stakeholders within networks to achieving trust and confidence (Susser *et al.,* 2017; Firth *et al.,* 2011; Walker and Cass, 2007). As such, researchers suggested the importance of stakeholders being known within communities and being respected (Devine-Wright and Wiersma, 2013; Hoffman and High-Pippert, 2010; Van der Horst, 2008). A further exemplar of local embeddedness was identified by Becker et al (2016), centred on Machynlleth and the relevance of strong ties in engaging shareholders within the community, resulting in members being drawn from the locality. Walker et al (2010) suggest that trust between communities and CRE groups is a key contingency in advancing CRE projects, leading to positivity about schemes and greater involvement. Significantly, the study findings built on the work of Walker *et al.,* (2010) and further developed an understanding of the area of trust and confidence in CRE projects, from a shareholder perspective.

Effective management

A participant in YPP identified the importance of stakeholders not only as part of personal networks but also operating with a defined and democratic structure of Directors linked to the CRE project. This reinforced confidence and trust, with the option of shareholders being able to change directors if required.

> *"As far as I know, I haven't been to any of one of the committees (meetings) but I take they are doing okay job. I know most of them and so have enough confidence in them. But if we lose confidence in them, we'll sack them! (laughs)." (PS1)*

Equally, in YO and YPP (PS2), the decision-making processes had been underpinned by clear communication with shareholders prior to taking any major steps. As such the participant had confidence in the key stakeholders to complete appropriate preparatory research and viewed the CRE project as operating in a democratic manner. This sense of trust was reinforced by the small-scale context of the CRE project, facilitating building a relationship between stakeholders and shareholders over time, reinforcing bonding social capital.

> *"And I think the way it works, they if want to make some big investment into something new, I think they wouldn't do that without asking the members. But they have to do the preparation and find out how much it costs and its going to work. Then we have to trust them that they did their research properly." (YOS5)*

Also, there was trust and confidence across YPP and YO in stakeholders due to the good level of management demonstrated by stakeholders, leading to trust and confidence by shareholders. As such there was a democratic process and good communication with shareholders linked to changes within schemes. In a similar way, Radtke (2014) identified how participants in Germany viewed projects as democratic in nature, empowering them to recognise their ability to impact on decision-making within cooperative structures.

Building a successful scheme

In the YO participants highlighted how a key facet of the shareholders' confidence was anchored in the ability of the stakeholders to construct and deliver a successful scheme (YOS5). This included their capacity to overcome several substantive obstacles as part of the initial process.

> *"Yes, they overcome the biggest anxiety – are things going to succeed and go well and as time goes by you get more confident don't you. But they've done it fulfilled everything they said they were going to and everything is fine as far as I understand." (YOS1)*

As part of AC a participant also indicated how being established and a successful scheme was important in building confidence and trust in the stakeholders. The participant detailed how the key actors had set up and driven forward the project, which had required both hard work and commitment. As such, the stakeholders had developed a platform for the pioneering work and longevity of the CRE project.

> *"I think what they've achieved as a measure as well… I think, they are very committed, and they've got a clear direction. So, they've got a good chance as any business of surviving and it's definitely one to support, because its ground-breaking." (ACS3)*

In the context of YPP, a participant highlighted how engaging with the CRE project over time, had generated greater confidence by shareholders in the stakeholders as directors. In this way, confidence was built through the stakeholders raising finance to develop the project but also generating shareholders interest and income. As a result, increased trust was thought to increase the likelihood of shareholders investing in another community led project, delivered by the same directors.

> *"The shareholders I think when the interest comes out, as well as knowing we can raise money, there is confidence in us again... if you ask again, would you consider if this group came back to you with another project would you consider investing in that as well? I think high percentage quite a few would say yes." (YPPKS1)*

The work of Bauwens (2019) indicates the importance of cohesive social networks amongst cooperative members in driving forward investment in CRE projects in Belgium. Overall, the literature tends to focus on the perspective of citizens intending to engage with, or motivations to invest in CRE projects (Bomberg and McEwen, 2012; Doci and Vasileiadou, 2015; Bauwens, 2016; Holstenkamp and Kahla, 2016; Kalkbrenner and Roosen, 2016; Rogers *et al.,* 2008). However, a more detailed examination of shareholders involved with projects has received limited attention, including trust and confidence as well as internal social networks (Bauwens, 2019). The study findings focus on different aspects of engaging with CRE projects and the degree of trust and confidence in stakeholders. Furthermore, the research on CRE predominantly focuses on social capital centred on the role of bonding, capital centred on trust, civic engagement and its relevance in relation to community cohesion (Bere *et al.,* 2017; Berka and Creamer, 2018). Significantly, the study findings explicitly map the relationship between bonding capital and CRE projects, including personal networks, trust and confidence. However, the findings from the study provide additional insights and conceptual clarity by also extending beyond this position. The findings built on the evidence in the literature, contextualising bonding in relation to bridging and linking capital.

5.2.5. Bridging

Bridging capital is viewed as enabling local communities to connect with a broader range of actors, stakeholders, and groups. In this way, Putnam (2000) characterised bridging as: *"outward looking and encompass people across diverse social cleavages"* (p,22). This is reflected within the literature, facilitating access to wider resources and flow of information outside individuals or groups (Woods, 2011; Howell and Haggett, 2014; Rivera *et al.,* 2018; Field, 2003; Putnam, 2000). The evidence-base has focused on observing the significant role of trustworthy social networks in relation to intermediary organisations and local authorities, operating as knowledge brokers or facilitators for CRE projects (Hargreaves et al, 2013; Callaghan and Williams, 2014; Ruggerio *et al*., 2013; Hicks and Ison, 2011; Parag *et al*., 2013; Hamilton *et al.,* 2014; Franklin and Mardsen, 2014). However, the evidence-base has largely not framed its account as bridging social capital. In the

study, the researcher sought to address this knowledge gap building on the current literature. This included a detailed examination of how CRE groups connected across projects, which were at different stages of development, using the analytical lens of social capital. This included a focus on the bridging capital generated with the CY consortium and the wider networks that fed into shared learning within sector highlighting the importance of external networks and peer support. This led to an increased flow of knowledge and information as well as an ability to access wider resources outside of their own groups, building a local stock of bridging social capital within a Welsh CRE context.

5.2.6 Partnership, co-operation and shared learning

Overall, the study findings and literature identified the relevance of social networks in facilitating cooperation, sharing information and knowledge as well as trustworthiness in the development of the CRE sector (DECC, 2013; Warren and McFadyen, 2010; Morrsion and Ramsey, 2019; Hargreaves *et al.,* 2013; Seyfang *et al.,* 2014; Rogers *et al.,* 2012). For instance, Bird *et al.* (2013) highlight the role of the Bristol Energy Network (BEN) as a focal point for drawing in local CRE groups and organisations, based on sharing expertise and common experiences. Indeed, Becker *et al.,* (2016) cite how two CRE projects, in southern Europe created a network that fed into the wider support structure of the European energy cooperative network RESCOOP. It represented an expanding support network of over 1,500 energy cooperatives across Europe.

Connecting-up within the CY network

The CY consortium represented a detailed case, highlighting the nature of the interrelationships between CRE groups. The CY as a consortium, provided a platform to develop capacity and capability within Welsh CRE by creating opportunities for shared learning and vision across five separate projects. This built on their individual success to sustain action and maximise collective impact to support locally sustainable communities.

Shared Learning and experience

A key set of outcomes resulted from the formation of the CY consortium, focused on both shared resources and understanding, developing bridging social capital. In this way, the consortium provided a platform for discussion and space for knowledge exchange and learning in terms of setting up and taking forward community energy projects. For instance, this was exemplified by a participant, focused on: *"Sharing knowledge, sharing resources"* (CYSK2).

The collaborative nature of CY was important as part of the development process in community energy schemes. This was exemplified by the case of YO, building on informal networks, with the consortium enabling the project to formalize relationships and provide a supportive structure to connect with other CRE projects.

> *"We were working very closely with Ynni Padarn Peris. As well, we could turn to Ynni Anafon and ask for support from them. And through the Consortium we've formalised that relationship really. Hopefully like an organisation which can provide support to other people, we do provide advice for others that want to do this kind of enterprise."* (YOKS1)

In terms of bridging capital, a participant highlighted how the collaboration operating within the CY consortium provided a platform for partnership working, focused on an active process of shared learning across projects. Furthermore, this process of learning from the experience of others was being further developed by the development of formal posts within CY. These employed staff were then able to take this aspect of collaboration forward, extending beyond the limitations inherently involved with the volunteering role of stakeholders. This highlighted the importance of supporting bridging capital, with access to further support to facilitate development.

> *"Yes, we're working with other projects and we're learning…YO has started at about the same time as us…. And we're trying to share information and share experiences and, if there are problems. And the people who are*

The study findings indicated the importance of shared learning by CRE projects in two key areas. This initially focused on developing the share offer at an early stage of development to raise finance. Also, at a later stage once projects were established and engaged in the process of setting up charities to distribute income within local communities. These two exemplars demonstrate how bridging social capital was enacted within Welsh communities. For instance, bridging social capital was exemplified by two community hydros in neighbouring valleys collaborated to generate a joint share offer. In this way YO and YPP developed a crowdfunding initiative was also supported by a local rural innovation programme to assist in campaign process. The process of creating new social networks was based on common goals and shared values of using local resources for local benefit, increasing bridging social capital.

Furthermore, following on from the joint share offer, these two CRE projects, along with another three projects, formed the CY consortium. In this way, the informal networks present among CRE groups in the North Wales region were formalized into a consortium by the development of CY. This collaboration of CRE groups at different stages of development, led to shared learning and knowledge exchange. These focused on similar problems and challenges, for instance, around setting up charities.

Joint share offer

A participant highlighted the benefits of partnership working, focused on how CRE projects were able to gain from the experience of the pioneering Aber community-led hydro project. Also, YO and YPP projects were at the same stage in their development, aiming to raise finance, which allowed them to engage in collaboration. This enabled the two projects to come together to secure funding to support the development of a joint share offer. Consequently, they shared resources to develop the share offer, such as *"marketing materials".*

"We were following the pattern of Aber, the first one to an extent. And YO and YP wanted to go to share offer opportunities to the communities. We went for funding by Menter Mon a platform for raising finance. …they chose us as one example of crowdfunding… they funded lot of the marketing materials for the share offer. And I don't know whether we would have had it, if not for co-working, because the two projects are too small on their own…but together they were prepared to fund it. So that's one example of how we started working together with other groups." (YPPKS2)

Setting up charities

Within the study, the researcher completed follow up interviews to review how co-working had developed over time. The findings focused on the development and registration of charities by CRE groups based on learning from more established projects. This highlighted the enactment of bridging social capital within a temporal framework within CRE. Ynni Anafon had been the first community project to establish a charity named 'Dwr Anafon', as Charitable Incorporated Organisation (CIO). Significantly, both YO and YPP learnt from Ynni Anafon about setting up their charities through the CY Consortium.

In the case of YO, the CRE group utilised the experiences of Ynni Anafon to guide the shaping of the application for the Charity Commission (YOKS5). Equally, in the context of YPP there was a discussion with, and shared learning from, Ynni Anafon. This was beneficial as Ynni Anafon had acquired knowledge about processes and practical steps of setting up a CRE charity in the local area. This led to YPP producing their own documents around applications for community benefit fund as part of the charity. Furthermore, the participant outlined how this shared learning had provided an exemplar of how to shape the distribution of social impacts. Consequently, practical steps included the re-use of materials from other CRE groups and material to support the charity application form*: "There's nothing much original in this then"*. Interestingly, Anafon had itself gained knowledge from other Scottish CRE groups, highlighting the extent of shared learning across the CRE sector. In this way, it exemplifies a high level of bridging social capital, as there was a sharing of both learning and resources as part of community energy.

> *"And then (name) went to have a chat with Ynni Anafon charity who have set up a charity they've already done it and then we've taken on what they had. And we've generated these two (referring to booklets). The form (name) and me have done this on what's gone before, and emphasised where Anafon has done, and they have worked on what's the other schemes have done, what they've done in Scotland. So, there's nothing much original in this then*
>
> *INT: Well recycling is very environmentally friendly*
>
> *(laughs) Yes a social version of that!" (YPPKS6)*

The findings indicating how bridging capital was enacted focused on the transfer of learning and information from more established CRE projects and at projects at a similar stage. This included guidance on completing the application process for local communities to engage with a community benefit fund. This echoes what Seyfang et al, (2012) highlighted that CRE groups shared both tangible and intangible forms of support. This included concrete exemplars resources such as grant application forms, relevant key contacts and documentary material, as well as the more abstract type of support, such as being sources of inspiration and shared values. Overlap both the study findings and literature indicate the importance of such connections. For instance, Parag *et al.,* (2013) identify how developing schemes, were significant 'information receivers' within the CRE network from those that were well established and seen as high-status. Furthermore, Ruggerio *et al.,* (2014) highlighted the value of interconnections between local CRE groups, as a catalyst for developing new local projects, with established projects being viewed as exemplary cases of what could be achieved. Similarly, the study findings evidenced this pattern of facilitation, particularly the role of the Ynni Anafon project and CY consortium.

Similar challenges and barriers

A participant highlighted the key benefits for CRE projects since the formation of the consortium, focused on gaining access to shared learning and experiences with *"fellow members",* providing a foundation for a *"mutual thing."* As such, it provided a platform for CRE projects to seek guidance from other local schemes at different

stages of development. Consequently, it enabled bridging social capital as they could follow the footsteps of other more established projects.

> *"Because basically it gives me better access to them. So, I know them all and they know me and so I keep bouncing questions off them. I think that's been more useful than anything else, in terms of meeting with the fellow members, it's that kind of mutual thing… Especially when they've all done it before and we're benefiting more from their experience than the other way round." (CYSK1)*

Indeed, projects and groups faced similar barriers as part of project development. A participant described how the CY consortium was effective in sharing appropriate experiences around a core set of common issues facing CRE projects, such as raising finance and policy shifts. This included disseminating effective problem-solving strategies.

> *"Yes, it's very definitely worthwhile having a forum to engage because we do identify common problems, usually how to deal with regulatory issues, how to deal with finance raising and the impact of changes by central government policy." (CYSK2)*

In addition, the consortium reduced the difficulties encountered by projects, facing the "*same hurdles*", focused on similar barriers and obstacles. The participant highlighted the importance of the direct input and assistance provided by more established CRE groups within the consortium. For instance, in relation to shared learning from previously having set up a charity.

> *"You can share ideas and knowledge. Because we all must come up with same hurdles, like this charity set up and then in they've already done this. So, they can hopefully share some of the findings with us to make our journey a little bit pain free but then we can give our knowledge to some of the other members who are a little bit behind." (CYSK2)*

Different stages of Development

A key theme and insight from the study findings was focused on how CY enabled shared learning across CRE projects at different stages of development, with more established schemes providing guidance for developing projects. This relates to the work of Bere et al (2017) identified that the significance of bridging was not fully examined within the CRE evidence-base, despite its likely role in advancing projects. As such, bridging was particularly important as a channel for development.

> *"The development of bridging capital may well create a conduit for the sharing of knowledge and experience which is likely to be highly significant to the potential for project replication." (Bere et al., 2017, p35).*

In the study, the area of transferring knowledge and learning was identified as an important feature of collaboration within the consortium, facilitating bridging capital. For instance, YPP were able to *"share experiences"* as a project at a similar early stage to YO. Yet they were also able to connect with Ynni Anafon, which was at a later stage of development and thereby learn from their experiences.

> *"Well, I think it is useful to share experiences at the very beginning. Ynni Anafon was our role model to us because they were ahead of us, I think we know benefitted from their experience. YO was in the same position as we were, and they certainly felt that it was beneficial to share experiences. And so CY started… and we benefit from it." (YPPKS5)*

In this context the consortium had been helpful in the case of Moel y Ci project, which was at an early stage, with learning transferred from more established projects *"at different stations of development".* This focused on knowledge transfer, such as shared learning on the distribution of benefits and shareholder interest.

> *"So, it's really good to hear how other people who are further ahead than us and now sort of actually looking at dealing with how do we pay out our community dividend. But for us to actually look at their disbursing the benefits of what they were thinking about six years ago, that's great. So, it's good that we're at different stations of development." (CYKS2)*

As such, the consortium had an important role in bringing different community energy groups together at different stages of development. This was a vehicle for improving access to shared learning and experience, based on facilitating closer inter-connections between local CRE projects.

> *"With CY consortium, that's still finding its feet...but it brings community groups together. We have a much better connection with Anafon, and the other two community group projects, which haven't quite built anything yet, but at least there is goodwill there to help people out and learn from them as well." (YPPKS2)*

In the literature, the work of Morrison and Ramsey (2019) also reiterated the importance of peer-to-peer support and their trustworthiness, as part of CRE groups emphasising the significance of bridging capital. Equally, the work of Ison and Hicks (2011) identified how Community Energy Scotland (CES) had developed peer-to peer support for CRE projects. These activities enabled CRE groups to secure practical support with application forms or funding as well as broader support, such as motivation. This important form of peer support was similar to the intra-group activity highlighted within the study findings, exemplified by the CY consortium. This was exemplified by the issue of generating finance for projects, particularly with the impacts from policy changes and setting up charities.

Connecting-up within a wider CRE network

In terms of wider CRE networks, the findings from the study indicated how CRE projects made connections with a range of external CRE networks. This was focused on Scotland and regional exemplars across CRE projects, enabling shared learning across the sector and mutual benefits. For instance, the Welsh CRE projects gained from the earlier experiences of Scottish CRE schemes, demonstrating the impact of bridging capital within the sector. Equally, in the literature Bere *et al.,* (2017) highlighted how in the case example of Talybont Energy there was a connection with the Isle of Eigg in Scotland, focused on sharing their experience of developing the use of an electric vehicle as part of a CRE project. In a similar way, Haggett *et*

al., (2015) indicated the benefits gained from an exchange of knowledge, information and skills amongst Scottish CRE groups.

Within the study findings, in terms of inter-group connectivity and interrelationships, a participant from GR highlighted how community groups operated within a supportive environment. This was built on social networks with other groups and organisations, representing bridging capital. In particular, in the South Wales region AC and GR developed an increasingly close relationship. For instance, there was a degree of reciprocity as exemplified in the mutual promotion of share offers.

> *"We've got good relationships with various, other local South Wales community groups. {name} getting to know more and more. And Community Energy Wales, know {name}. It quite a small insular network of people., I know some people from Carmarthenshire Energy and there's {name} from Community Finance, that is kind of supporting different groups at different stages, they've provided support for different things. And then there's 'Renew Wales'. So, there's a quite small network of people that know each other., really positive experience of them and we try to recommend people to invest in their stuff and they're probably done the same. Also, there's SCEES as well, another one Gower Power who ran a share offer for."* (GRKS1)

As part of AC there was a linkage to the CRE sector in Scotland centred on gaining access to wider learning, including the development of a share offer. This was based on a number of Scottish examples focused on pioneering rural island communities.

> *"I think the main ones was Community Energy Scotland. Then there was an umbrella organisation but also developed their own projects as well, so we benefited a lot from that. Then on the islands, Tiree gave quite a lot of help with the share offer. "(ACKS1)*

Furthermore, a participant from YPP indicated there was also shared learning from Scottish community hydros. This included visits: "*up there talking to the people*", leading to local CRE projects adopting a "*template*" for the YPP share offer prospectus. In this way, the participant highlighted how community groups in Wales gained from sharing knowledge with more developed Scottish CRE projects.

"When we were putting up something like this, a prospectus (name)was up there talking to the people up in Scotland, we used his application them and the way they worked. But we used it like a template for us." (YPPKS3)

The findings also highlight how there was sharing of knowledge and learning within the wider CRE sector, represented bridging capital and resulting in mutual benefits. This represented a process of disseminating learning and recycling knowledge within the sector, enabling other groups to develop their own projects. In a similar way, Bere *et al.,* (2017) identified how CRE groups with similar interests of developing CRE projects engaged with each other, including project visits such as Cwmclydach and Talybont Energy schemes. As part of bridging capital activities, site visits were important mechanisms for shared learning, reducing risks for new projects by highlighting potential pitfalls (Morrsion and Ramsey, 2019; Schurer, 2016). Furthermore, the importance of knowledge sharing networks and collaborative support was reiterated by Seyfang *et al.,* (2014). In a similar way, the findings indicated how at the earlier stages of development the CRE projects tended to connect with wider UK exemplars of pioneering CRE projects, whereas as there was more established local initiatives, there was more reliance regional interconnections between CRE groups.

5.2.7 Linking

The findings from the study highlighted how CRE projects focused on internal networks within groups (Bonding) but also connected with other groups (Bridging). However, there was also evidence of linking social capital centred on external organisations and institutions. In this way, it enabled the CRE groups so as to *"influence their policies or to draw on useful resources"* (Pretty and Ward, 2001, P1913). In addition, the findings from the study identified that aspects of cultural capital were relevant, associated with having certain skill sets and experience to be able to engage and shape policy. This was reiterated in some respects within the literature, focused on an ability to access and potentially influence external networks (Morrison and Ramsey, 2019; Samson, 2018).

Overall, there is only a limited literature that utilises the lens of linking social capital in CRE, rather it largely focuses on connections and external networks. In the study findings the researcher provided a novel lens by identifying key exemplars centred on CRE projects gaining support by accessing funding, both National Lottery and Welsh Government which was essential for their development. An additional exemplar was lobbying policy changes that impacted on community groups, based on the revaluation of business tax-rates. As such, the study findings highlight the importance of high levels of connectedness enabling groups to access funding and a relate to as well as engaging a wider audience. Within a Scottish context, Callaghan and Williams (2014) indicate the importance of CRE projects connecting with wider networks such as the Highlands and Islands Enterprise and CES as well as the National Lottery. The importance of linking was reiterated by Soutar (2015) identifying how the projects did not operate in isolation, but were part of a broader local, regional and national network of organisations and institutions. In this context, the role of policymakers is complex as they provide a supportive policy environment for community groups, but also create barriers through shifting policy for CRE groups that necessitate lobbying (Ruggerio *et al.,* 2014; Bomberg and McEwen, 2012; Soutar, 2015).

5.2.8 National lottery funding

In the study findings, a process of building on informal networks among different CRE groups, led to a collaboration to generate an application for external funding. This aspect of the findings presented an original perspective in how CRE projects were able to develop beyond an individual level towards a regional movement. This enabled initial ideas by the consortium to be formalized and supported by the creation of two paid posts. In this way, the National Lottery application was a critical juncture that enabled ideas to be transformed into collective action, based on "*new schemes*".

> *"As CY we have been meeting for 12-18 months and thinking about how we are going to develop ideas and eventually it came that we did a Big Lottery application, for funding to develop the idea, that was funding for two officers and a number of benchmarks we have to meet to get success on the grant bid to develop new schemes." (YOKS2)*

A participant highlighted the opportunities facilitated by successfully gaining funding by the National Lottery grant for the CY collaboration. In this way, the paid posts and supportive infrastructure promoted local innovation (YPPKS5). This was based on the development of further renewable energy schemes, focused on a range of technologies to foster sustainable Welsh communities.

> *"Another one of our objectives was also to develop other projects in the valley. And that's still our intention. Recently we have- five Community Energy schemes in the local area have been successful in securing a quarter of a million National Lottery grant, employing two people over a three-year period. They are looking into the possibility of other schemes in the area, be it hydro, wind or solar." (YPPKS3)*

Also, another participant highlighted the importance of opportunities gained through linking social capital centered on securing funding in the case of CY. It provided a mechanism for operating as a collective, representing a *"larger critical mass"*. For instance, it provided opportunities for addressing potential gaps in providing maintenance work for the CRE project as well as future funding.

> *"Eventually it's a powerful deal, five altogether with a larger critical mass then of course, chances of getting enough funding to provide support for operational maintenance and that would be a tremendous asset, paying for an engineer". (CYSK4)*

In many respects, the funding secured through linking social capital not only consolidated developments in local CRE projects but also was able to draw these projects together. This pooled together learning and enabled a shift from being a *"disparate collection of individuals",* enabling the consortium to generate a *"community level movement".*

> *"So, having the Big Lottery fund money has been hugely helpful, because it has enabled the essential filling in of the gaps, the essential time to discuss not just what we're doing but why we're doing it and what benefit we're already getting out of it, and embedding that learning so that we can move forward. Otherwise, you're just always a disparate collection of individuals driving projects, constantly looking to reinvent themselves to get new*

projects, rather than thinking, where are we going with this as a community level movement?" (CYSK1)

Within the study findings, the CY consortium provided an exemplar of linking capital centred on gaining National Lottery funding. The development of the consortium represented a shift away from viewing CRE as centred on individual projects in the local area, towards using the informal networks involved in community groups to generate a "*large critical mass*" to formally submit a collective application for external funding. This enabled the development of two paid positions as part of the consortium to support current schemes, as well as then generating new local and renewable projects. This process was also highlighted in the exemplar of the Bristol Energy Network, with local community groups coalescing together to secure external funding as a collective, gaining access to wider support (Bird *et al.,* 2013).

5.2.9 Welsh Government support

In terms of linking social capital, the study findings highlighted the importance of accessing support and resources from sources external to the community, including the Welsh Government. Significantly, the findings indicated the need to secure a balance between 'bottom-up' community action, embedded in a local vision and being able to access 'top-down' support. In this way, linking social capital was an important part of enabling CRE projects to become established and 'get off the ground'. The study findings highlighted the crucial nature of linking social capital in addition to bonding and bridging social capital, to access external support and funding outside communities in order to generate successful CRE projects. For the larger projects such as GR and AC, the Welsh Government represented an important source of linking social capital. This facilitated access to central support and resources, in particular financial loans to enable projects to be established due to the scale of capital required. In contrast, small projects such as YPP highlighted how Welsh Government support operated at a lower scale of funding. Yet this was also a key form of linking social capital and represented an effective connection with projects at a different level of support, due to their small scale.

The key stakeholders identified the importance of a devolved context in Wales, as it provided a supportive environment for CRE projects and was associated with linking social capital. In this way, a participant highlighted the importance of a devolution in providing more consistent support, compared with an UK national policy framework.

> *"I mean obviously the Welsh Government relies on funding, but it chooses how to spend its money, so no, I think Welsh Government is actually critical. I think we'd be in a lot more hostile environment if we were in England." (ACKS2)*

Similarly, a participant in YO identified how there was a difference within the UK around the policy environment towards the CRE sector. The participant highlighted the negative approach adopted by the Westminster Government, in comparison to the more positive and enabling stance of Welsh Government. It was facilitated by the devolved context in Wales, which was an important element in enabling linking social capital for CRE projects in Wales.

> *"At least the Welsh Government want to develop and see this sector flourish. What the UK Government is doing at the minute is killing the sector completely." (YOKS1)*

In this context, a participant outlined how Welsh Government support had been critical in the successful development of the project in AC, focused on the areas of funding feasibility studies, the planning process and loans for construction. As such, the Welsh Government provided a supportive environment and framework for CRE projects, compared to the wider UK context: "*government involvement is really important*". In this way, having external networks and linking social capital was pivotal in the development of CRE projects in a Welsh context.

> *"I don't think we'd have got planning without the sort of political realisation that community energy had something to offer to Wales. And obviously the funding helped a massive amount during, sort of feasibility work that needed to be done. Then during the construction as well Welsh government basically saved the projects because they gave a loan which overall was £4.7m and that along with the money that we've raised from share offer got the project*

built. So yes, I think government involvement is really important. You've got to say that compared to the English government and have really developed a lot of very good projects right the way across the country." (ACKS1)

Furthermore, the supportive environment created by Welsh Government was indicated by a participant in Gower Regeneration. In particular, Energy Local services were crucial in facilitating the development of the CRE project at the initial phase of the project (GRKS2). This included financial support and loans but also access to appropriate "*support workers*" to provide practical assistance. As part of this facilitation, the participant highlighted the importance of a close working relationship with Welsh Government as part of linking social capital. However, it was the combination of a good rapport with the delivery of practical support that was key: "*Not just the attitude but the support*".

> *"They've been absolutely brilliant. Their local energy service that helped to explore projects just had nothing but support. And obviously the finance, the loans as well, they're basically very, very supportive lender, willing to take risks. They're completely flexible, you've got a relationship with a person and not an institution, yes got good words to say about Welsh Government attitude towards community energy… Not just the attitude but the support."* (GRKS1)

Furthermore, in terms of a Welsh policy environment, a participant from YPP also indicated the importance of a supportive infrastructure. However, the participant reflected that this support could be extended further and made more robust in practice.

> *"Investment is nice. The support is there but I was like a bit more fire there…should be more binding rather than just words, and it's quite frustrating at times. Yes, it helps of course, without them we wouldn't work at all. But there's a lot more they could do."* (YPPKS2)

In a similar way, a participant in YO identified the importance of support provided to the CRE project, including the Welsh Government officers as key mechanisms for facilitating linking social capital. The provision of funding was central in financing

feasibility studies in the initial project development stage, although the participant reflected that additional practical assistance could also be improved.

> *"We have had support from one of their officers {name} he has been great from the start, always giving advice. Definitely without the grants that we had through Ynni Fro'r. That was administered by the Welsh Government we wouldn't have had the feasibility studies early on. I do think sometimes they could provide some more hands-on advice." (YOKS1)*

Across all the case studies the findings highlighted the importance of accessing Welsh Government support to ensure development of CRE projects. As such linking capital aligned to Welsh Government was a key enabler for projects, especially in the early stages of development, facilitating them to 'get off the ground'. This linking capital focused on access to financial resources through loans and technical support, that underpinned developments of CRE projects that required substantive financial capital. The funding required varied according to the scale of projects, although some projects in North Wales highlighted that support could have been extended further. Yet a unifying theme across case studies in the study findings was the vital nature of funding through the Welsh Government, which was seen as more supportive than the UK government. In this context, Morrison and Ramsey (2019) reiterated the importance in CRE projects of not only peer-to peer support, but also external networks, framed in terms of linking social capital.

In this area, Bomberg and McEwen (2012) identified the significance of 'structural resources' in supporting CRE, associated with support from the broader political and state networks. As such, the role of CES funded by Scottish Government presented a key example, administering the Community and Renewable Energy Scheme (CARES*).* This supported CRE groups at the preliminary and risk-orientated stages of development providing sources of funding, administrative and technical assistance (Bomberg and McEwen, 2012; Markantoni and Woolvin, 2015; Ruggerio *et al.,* 2014). In the study findings, a similar position was described within Wales, focused on Welsh Government support and agencies. This was identified in the findings across all the case studies. Overall, the literature tends to narrate the way

linking capital is developed within Scottish exemplars. However, there are examples that identify a similar process of linking capital in a Welsh context (Haf *et al.*, 2018; Forman, 2017). As part of this narrative, Haf *et al.*, (2018) indicate the importance of Local Energy support service in providing financial support for CRE in Wales. These were created by Welsh Government to provide a structural framework to facilitate access to 'start-up' funding, loans, grants and support officers to guide CRE project development in Wales. In both the work of Haf *et al.,* (2018) and the study findings, there was a recognition of the valuable support provided to CRE projects by Welsh Government agencies but also participants noted that more assistance and support was required to address the challenges faced by CRE projects.

 Interestingly, Strachan *et al.,* (2015) highlight that the literature indicates a greater degree of policy and scaffolding support by the devolved nations of Scotland and Wales to the CRE sector, in comparison to England and Scotland. Significantly, this feature was also noted in the study findings across the case studies, with participants drawing parallels between policies and approaches in Wales compared to England.

5.2.10 Political lobbying

The study findings indicated how political lobbying included site visits as a mechanism for engaging with national and local politicians. For instance, in YO and YPP the profile of the projects was raised by drawing in local political figures to the launch events. Whereas GR engaged with national politicians, by aligning a site visit with the launch of a policy initiative for developing Ynni Lleol. In a similar way, within the literature Bere *et al.,* (2017) highlight how the exemplar of the Torrs hydro, illustrated the relevance of site visits from a range of political figures, ministers and policymakers developed wider links. Indeed, Morrison and Ramsey (2019) also indicated how the involvement of local politicians increased the degree of awareness and engagement by the broader community with Scottish CRE projects. This generated a cycle of widening interest from other CRE groups, support organisations and public engagement.

Site Visits

In the case of YO, two participants highlighted the impact from widening activities associated with linking capital, drawing in engagement from local politicians. This heightened interest in the CRE project and subsequently raised its profile and prominence, leading to broadening support for the scheme and the share offer. Consequently, the project was able to secure funding locally rather than require a financial loan.

> *(P1) "What I think perhaps, it got the attention of the press and so on and the local politicians were interested in the scheme so what happened because so many people were interested, they didn't have to take a loan out at all.*
>
> *(P2) We've been taking them round. But the thing is with politicians, when one comes, the others have to say they've been here too." (YOKS5)*

Furthermore, the involvement of local politicians was grounded in fieldwork observations by the researcher during the opening of the YPP project, with the researcher attending the event and completing fieldnotes indicating the key role of Sian Gwenllian as a local Assembly Member (AM) opening the hydro in 2017. Alongside this the researcher reviewed the resulting social media output which underscored the political context of the launch (Figure 46). This event also occurred at the same day as the YO project, and the researcher also reviewed the political involvement at the YO site, through a review of the social media sources ('twitter'). These highlighted the importance linked to Hywel Williams Member of Parliament (MP) opening the scheme, as with Sian Gwenllian at YPP (Figure 47). As part of these events, both the local politicians were present in person to support the launch events and engage with the schemes, but they also promoted the CRE projects through social media ('twitter'). As part of their social media feed the narrative emphasised the importance of the CRE projects being locally led community initiatives, but that they also used local natural resources. Significantly, these politicians represented both the Westminster and Welsh devolved constituencies, being MPs and AMs.

Figure 46: Opening of Ynni Padarn Peris– Sian Gwenllian AM

Figure 47:   Sian Gwenllian (Ynni Padarn Peris) and Hywel Williams (YO) 'twitter' social media feed
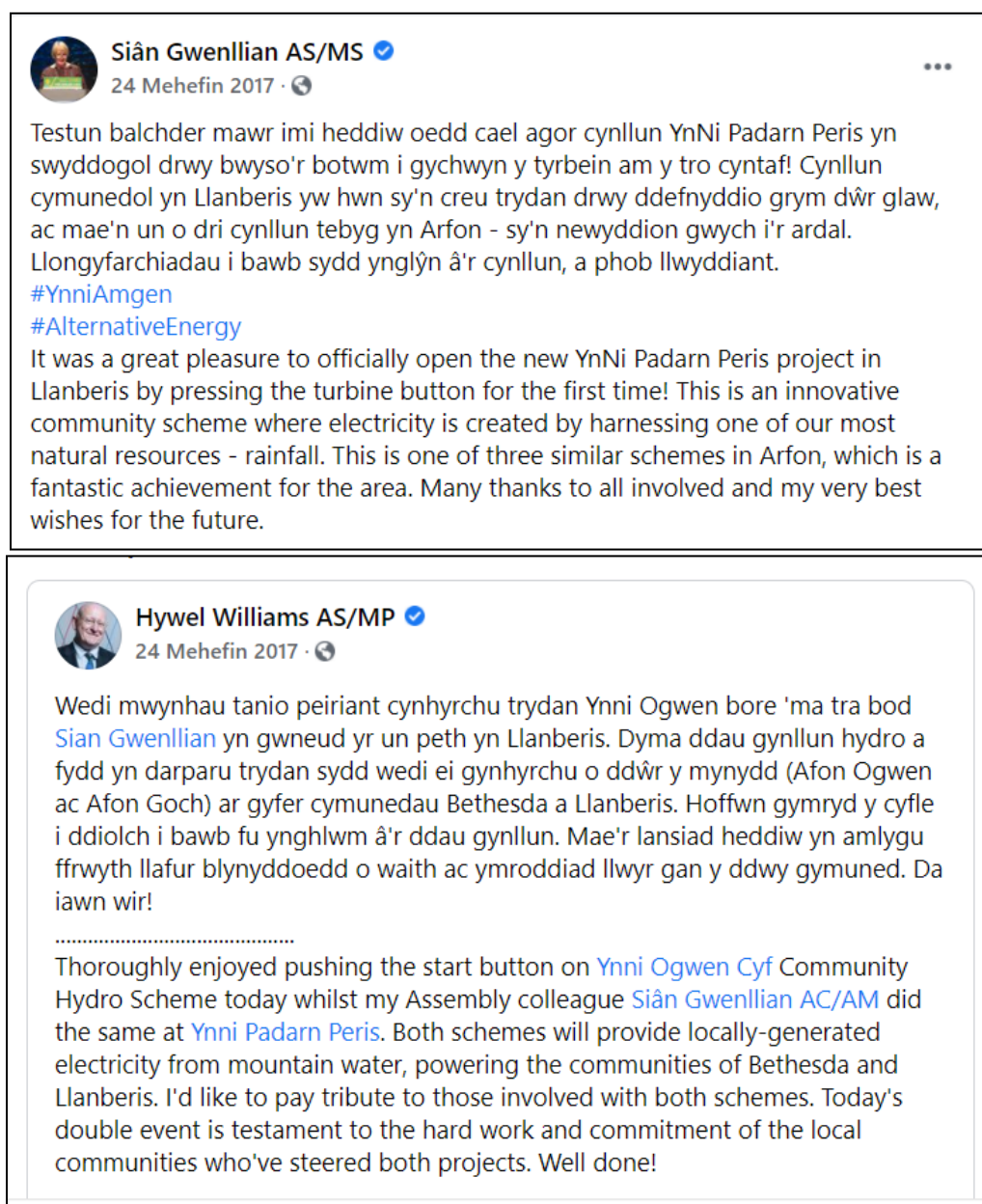
In a similar way, there was engagement with the political sphere in the GR project, aligning the scheme with the launch of the Ynni Lleol, energy Local service by Welsh Government. As such, they actively involved a key figure in the launch event focused on a site visit by a minister.

> *"The Welsh Government are launching their scheme and they're actually coming to do a site visit, so Lesley Griffith's who is the AM for Energy and Environment is coming down next week."* GRKS2)

Engaging in shaping policy

Furthermore, some stakeholders from the CRE projects were recognised as having expertise and long-standing experience of working in the community energy sector, representing cultural capital. As such this was drawn upon to shape the wider policy framework around community energy. For instance, within AC a key individual had previously been involved with the advisory contact group in the DECC and the development of the critical Community Energy Strategy. This provided a supportive a policy discourse and environment to scaffold energy schemes on a community scale.

> *"I think one of the best things the UK government did was the Community Energy Strategy, 2014. So, I was involved in that because there was a community energy contact group within DECC and so I was one of the people on that. But they had an interest in it and so that massively benefited the community energy sector."* (ACKS1)

Equally, within GR a key individual had engaged with the development of the WFG Act (2015) in Wales wider sustainable development policy enshrined in legislation. Importantly, their involvement was rooted in a recognition of knowledge and experience in the environmental sector. It highlighted the utility of cultural capital in facilitating access to and influencing policy making as part of linking capital. However, the engagement of the stakeholder within the process of developing the WFG Act provided a platform for interpreting how it could be used to support the CRE project and lobbying key organisations, such as local councils.

> *"I was involved partly in setting it up, so I know. It's a useful strategy and policy to hang the project on. Yes, so in terms of basically trying to get political 'buy in' from local Council's and so on, yes, it fits the bill, and all have got to abide by the Act. So, it is helpful to get support from local policies, local Councillors."* (GRKS2)

In the study findings, cultural capital was innovatively evidenced across two case studies with stakeholders shaping the broader policy framework due to their long-standing experience of working in the community energy sector. For instance, there

was involvement in the Community Energy strategy and the WFG Act, as part of the development of a major wider policy initiative. These key individuals in CRE projects, highlighted the potential relevance of cultural capital in enabling actors to influence policy. This was based on these key individuals having assets of expertise, experience and transferrable knowledge, combined with an ability to foster external relationships and engage in linking. This was reflected in the wider literature but not characterised as cultural capital (Samson, 2018; Middlemiss and Parrish, 2010; Bomberg and McEwen, 2012).

Lobbying shift in policy

The case example of CY highlighted the importance of addressing barriers through lobbying both Welsh Government and Westminster as part of linking social capital. A participant outlined that a particular barrier facing the community energy groups, especially the community hydro, was the re-evaluation and increase in the business rates. This resulted in a greater amount of their profit being channelled into local councils, rather than community benefit funds. In response to this, the CY consortium sought to address this issue by using a political lobbying strategy, meeting with both the AM and MP. For instance, in relation to the issue of an increase in business rates, CY acted to *"put pressure and persuade them"*. In this way, the consortium engaged with the area of policy through linking social capital, centred on effecting change, and addressing the barriers facing CRE schemes.

> *"CY are meeting with (name) AM, and (name) too MP, to discuss business rates. We were hit with quite big increase in business rates just came out of the blue, they were so bad that they threatened the viability of some of the smaller scheme like YO and Padarn. And they hit us quite badly. So, CY having a meeting with (name) our AM and (name) who is our MP to try and put pressure and persuade them to continue with some alleviation scheme for these business rates." (CYSK4)*

In a similar context, a key individual within YO highlighted the importance of lobbying activities at different levels in relation to the business tax rates. This focused on national and local government. Furthermore, there was an indication of the scope of lobbying required within this context, "t*here is quite a lot of lobbying*

work", involving a significant degree of time and commitment to lobby across the range of levels. However, there were indications that such activities benefited the CRE project, with the participant identifying how it secured a grant from Welsh Government, although there was continued uncertainty and the need for further lobbying.

> *"The stumbling blocks would carry on, even when the project is successful, everything going great. Next hurdle business rates. So, the fact that our business rates, are likely to be over 10 thousand a year, that puts a dent, it's quite a significant chunk. There is quite a lot of lobbying work around that, and as well work lobbying with the Welsh Government and as well as the county council. In recent days we have had grant to pay the business rates, by the Welsh Government. And after March next year we are not quite sure what going to happen. But this is all, a lot of work."* (YOKS1)

In a similar way, the work of Parkhill *et al.,* (2015) indicated that the degree of social capital linked to CRE groups operated within a range of fluctuating resilience. This was related to the intrinsic characteristics of the community group and the nature of external contexts that impinged on the project but was outside their control. Furthermore, the work of Parag et al (2013) in Oxfordshire suggest that linking through external networks strengthened the resilience of CRE groups, facilitating their ability to manage changes or unanticipated challenging circumstances. As such, in both the literature and the study findings, linking capital provided CRE projects with a platform to influence decision-makers or gain access to additional supportive resources. In particular, a novel exemplar in the study findings was focused on the changes to business rates for the CRE sector and the response of community groups.

In a similar context, as part of YO a participant highlighted their activity with Welsh Government and using the WFG Act (2015) as a platform for lobbying, focused on action to support for CRE in Wales. As such, the participant through lobbying highlighted the potential disparity between having the WFG Act (2015) in place, and actions that drive forward implementation in practice.

"It is something that we refer to. And when we lobby, we can say, look Welsh Government and departments, you are meant to do this, you have passed this Act, do it, that kind of thing" (YOKS1)

As part of the findings the area of lobbying as part of linking capital was surfaced by participants. For instance, a key area was the challenge presented to CRE projects by the increase in business rates, particularly community hydro schemes. As a result, the CY consortium lobbied the Welsh Government through AM and MP so as to "*put pressure and persuade them*". A further exemplar within the findings was set within the YO project, which included lobbying activity aligned to the WFG Act (2015), as a platform for the community group to influence Welsh Government to support CRE initiatives. In the literature, Bomberg and McEwen (2012) also indicate the relevance of CRE groups being able to connect with a framework of structural support, provided for the CRE sector. This connectivity is evidenced both in the study findings and the literature, centred on enabling community groups to gain access to political actors, government, and policymakers as part of lobbying activities. For instance, a study by Van der Schoor and Scholtens (2015) in the Netherlands indicated how local energy initiatives were involved in lobbying and negotiation process shaping the national energy covenant (*energieakkoord*). This form of engagement with energy policy by local CRE actors was seen as a new channel for proactive civic participation that sought to change an established energy policy stance by governments and authorities (Ison and Hicks, 2011).

5.3 Reflections on different types of social capital and utilising cultural capital in CRE

Overall, the study findings present a novel perspective that is distinct from the literature, based on the empirical evidence and analytic and conceptual insights. The findings highlighted how CRE projects contribute to the development, as well as benefiting from social capital. In this context, bonding, bridging and linking capital was present across all the case studies. Indeed, the study indicates that social capital had a key value in terms of both process and outcomes for CRE projects, with social networks being important facilitators of knowledge transfer

and shared learning. These findings indicate the novel aspects of the study which build on the initial work of Morrison and Ramsey (2019). Furthermore, in the study findings there were exemplars of cultural capital as key individuals drew upon existing knowledge, experience and expertise to develop CRE projects and link with policy contexts. This presents a key conceptual insight in framing such contributions by key actors.   Although the overall findings reflect the results of Morrison and Ramsey (2019), the study delineates clearly the pivotal role of social capital, and to a degree cultural capital, represented by a small number of key individuals that drove forward CRE initiatives. These were rooted in the local community and had discrete skill sets and connected with external links and networks.

Within the study findings, significantly bonding capital was particularly evident, echoing the initial observations by Morrison and Ramsey (2019) as a key exemplar within the literature, which examined the role of all three different types of social capital in CRE. In the study findings, as part of the case studies, the researcher identified how bonding was exemplified by trust and local embeddedness within group networks, as well as the presence of skill sets, expertise and experience by key individuals. However, the researcher's findings also provided an analytic insight based on the empirical evidence that highlighted that this on its own, this was insufficient and different types of social capital was relevant in CRE. In this context, the study findings present important conceptual insights that focus on bridging capital and its relevance for CRE projects. This focused on how connecting with other CRE groups as a network. This was viewed aspivotal, such as navigating similar challenges and shared learning. For instance, CRE projects at the same stage of development overcoming a difficulty in raising finance through a joint share offer. Furthermore, the findings indicate analytical insights centred on linking capital and how accessing external links by CRE projects was a critical feature in the case studies. This enabled CRE groups to engage with policy makers to access resources and some instances of groups influencing the broader decision-making arena of policy. In this context, aspects of cultural capital provided a platform for engagement of key individuals with policy based on their assets of knowledge and expertise. A critical area that emerged from the findings was the importance of

financial support at an early stage, from the Welsh Government to progress with feasibility studies and construction. Overall, the findings augment and add weight to the initial stance of Morrison and Ramsey (2019), emphasising the value of meshing together different forms of social capital, and to an extent cultural capital, in successful CRE projects to enable collective action.

Significantly the study findings advance the development of the literature and knowledge in the field of social capital within a CRE context. The study findings provide conceptual development and insight by the separation of social capital into bonding and bridging. It enables clarity in relation to different outcomes from these distinct forms of social capital, including a recognition that poor outcomes often result from excessive bonding without sufficient bridging (Agnitsch *et al.,* 2006). These observations by authors such as Agnitsch *et al* (2006), were not evidenced in the findings. . Indeed, due to the limited resources available to CRE projects to develop schemes it generated a good balance between bonding and bridging capital as internal and external form of networks, required to access resources and guidance. Therefore, the study findings highlighted that in CRE projects different types of social capital are recognised as relevant in the sphere of community-based action, with the need for bonding, bridging and linking to be present in order to drive forward community development, as highlighted by Putnam (2000) and Woolcock (2001). In this way, the combination of differing types of social capital promotes a commitment by communities and an enable them to take action as a collective (Agnitsch *et al.,* 2006; Patulny and Svendsen, 2007). Moreover, Gilchrist (2009) highlights how in an applied setting, the separation of different types of social capital is problematic. This is based on the complexity of societal structures and networks, often with blurred boundaries and lacking clarity. Overall, in the findings there was an overlap at the project level between bonding and bridging social capital. This was not only based on pre-existing social networks but also the creation of new social networks from involvement with CRE projects, being drawn from different civic aspects of the community. Although conceptual clarity was facilitated by a separation of bonding and bridging there were nuances and overlaps identified in the findings. There was blurring in the context of CRE, focused

on bridging occurring not only *between* projects, but also *within* projects, through the platform of the CRE projects bringing different people together. Nonetheless, having defined types of social capital provides a useful theoretical framework for understanding the scope and structure of social interrelationships within a CRE context, as applied in the study.

The study findings highlighted exemplars of cultural capital alongside social capital in CRE projects. This focused predominantly on skill sets and experience, as well as the presence of social networks in terms of making CRE work. Within the study, the researcher did not focus on cultural capital as aligned to social class or educational qualifications (Bourdieu, 1984). Rather, the concept of cultural capital was utilised to understand advantage within networks, focused on skills, expertise and knowledge and how this related to social capital. As such, social and cultural capital require skills and knowledge to access certain wider networks and an ability to achieve collective action (Jeannotte, 2003; Bourdieu, 1984, 1986; Baron et al, 2000). More recently, literature within CRE has highlighted that projects were important in building upon existing capability and capacity centred on knowledge, skill sets and expertise in their communities (Seyfang *et al*., 2014; Ison and hicks, 2011; Walker *et al.,* 2010; Schreuer, 2016). Although, Berka and Creamer (2018) suggest that the area of social capital, pre-existing capacity, and empowering communities in the context of CRE, requires further longer-term work. This would enable research to gauge the success as well as the nuances in how networks develop aligned with CRE projects and how they may have the capability to extend internal or external networks. The study findings were novel and addressed the knowledge gap in the literature, by examining primarily social capital in understanding different levels of social networks linked to CRE projects. It also focused on elements of cultural capital, centred on pre-existing skills and experience of key individuals linked to CRE projects and accessing wider policy networks.

5.4 Summary

Overall, the study findings highlighted that the different types of social capital were required to develop CRE projects and resulted from a successful community-led projects. A key novel finding was that within CRE projects, their development built on pre-existing internal networks that were local embedded in the community, generating within-group trust and bonding social capital. In terms of bridging capital, CRE projects fed into external networks centred on developing interrelationships between CRE groups. In addition, linking social capital was also critical in accessing funding to establish or extend the activities of CRE projects, and influence policy to address barriers. The findings also surfaced the relevance of cultural capital aligned to the characteristics of key individuals within CRE projects. This was based on how these key actors had pre-existing expertise and experience that allowed them to set up CRE projects, as well as influencing their capability to make connections outside their communities on a broader scale.

CHAPTER SIX:

FINDINGS AND ANALYSIS: CIVIC ENGAGEMENT IN CRE

6.1   Introduction

The chapter presents the findings centred on civic engagement within CRE, in developing energised communities. This addresses the research question: *What are the social processes driving forward civic engagement in community renewable energy in Wales?* In this way, the study findings detail the discrete stages involved in the development of CRE projects across case studies, focused on initially drawing together the community group, raising finance and building the project. Although the cases represented different stages of development, they were all established CRE projects. Significantly, the findings identified novel insights focused not only the barriers encountered by CRE projects as they were developed, but also once they were established. Furthermore, the study highlighted the mix of motivations for engaging with CRE, ranging across local and global factors. Overall, the findings surfaced how there were different modes of civic engagement with CRE, primarily identified as active key stakeholders and passive shareholder roles. The delivery of social impacts from CRE projects was framed within a BenComs structure, providing a mechanism for channelling benefits to the local community. Further, there was a particular set of interrelationships identified between the CRE project and resulting charity structure.

The literature highlights that the core characteristics of CRE projects centre on a degree of civic participation in the developmental process and the generation of community benefits (Hoffman and High-Pippert, 2010b; Bomberg and McEwen, 2012). As such, the area of CRE emerges as an increasingly important development although remains a relatively small part of the overall energy sector (Berka and Creamer, 2018). Indeed, studies suggest that CRE projects encounter a range of challenges as part of the developmental processes (Walker and Devine-Wright,

2008; Rogers *et al.*, 2012a; Haggett and Aitken, 2015). In the context of CRE projects, key barriers include the inconsistent nature of policy support and the time and commitment available by community groups to develop, deliver and maintain schemes (Hicks and Ison, 2011; Allen *et al.*, 2012). However, engaging in CRE projects provides a mechanism for empowerment within communities by generating income that can be utilised to address local priorities. Furthermore, it represents an exemplar of civic engagement not only at a local level but also global environmental concerns, driven by local people engaging in collective action (Berka and Creamer, 2018; Slee, 2020).

6.2 Development process of civic engagement in CRE

The study findings highlighted how civic engagement with CRE projects involved the identification of a three-part process of development. This included work around the initial concept of the CRE project, working on feasibility studies and planning application, then progressing towards raising finance through community share offers. Significantly, the findings delineated distinct timelines and milestones as part of the developmental process involved in the CRE projects, operating across case studies.

The development of CRE projects involved a number of processes (Figure 48) across all case studies, initially focused on people 'coming together', trying to establish the aims and business plan for the scheme, as well as raising the funds and building the infrastructure. In the study, the case studies had progressed through this developmental process and were established and generating energy and income. At the onset of the fieldwork, the CRE projects had been operational for a 1-year period. In this context, a stakeholder from YPP outlined how the process of setting up the scheme could be understood as involving three constituent parts. This was formulated as part of a process of diagramming during the interview, with the participant sketching the three processes involved in CRE project development. The stakeholder (pointing to the diagram) emphasised the final part of the process and its challenging nature, especially if the CRE group was experiencing setting up the

project for the first time. This was reflected in the figure (see Figure 48) with most activity recorded in part three of the process.

> *"I believe that community energy with a new group of people breaks down to three parts. There first one third is forming the group and getting the group to trust each other and know what they are going for… the other third, is the feasibility, initial plans and knowing what we are going to do. The final third, is building, raising finance getting agreements, getting everything into place. That are the ones that are painful (points to diagram) … building is easy but the agreements and raising finance and getting a lease and getting everything into place is bloody painful. Especially if you haven't done it before." (YPPKS1)*

It was clear in the findings that that CRE projects were developed over many years, with many obstacles encountered along the way. The majority taking over 3 years to realize, with substantive work involved in developing the initial idea to setting it up as a successful project. Although the case of AC extended over 18 years from initial concept to being energised due to a challenging set of circumstances.

In terms of the initial component, *Bringing people together and define aims*, all the case studies exemplified a process of development. This focused on gathering a group of volunteers building on existing social networks, outlining aims centred on using local resources for local benefit. For instance, in the case of AC the initial concept of a wind turbine, rather than opencast mining, was built in response to a meeting about Local Agenda 21 in 1998. However, in terms of the second component, *Developing initial plans and feasibility* there was a movement from the concept of a CRE project within community groups, towards shaping a more concrete set of proposals. This stage centred on generating feasibility studies for different technologies. For instance, in GR the feasibility study was supported by Welsh Government, including access to technical expertise by Ynni'r Fro and the Local Energy Service. As part of AC of the preparatory work, a 12-month consultation was completed leading to a community referendum to scope the acceptability of the wind turbines. This involved the local community and highlighted substantial support for the scheme. This was subsequently followed by technical feasibility studies and design work.

Figure 48: A three-part process of developing CRE projects
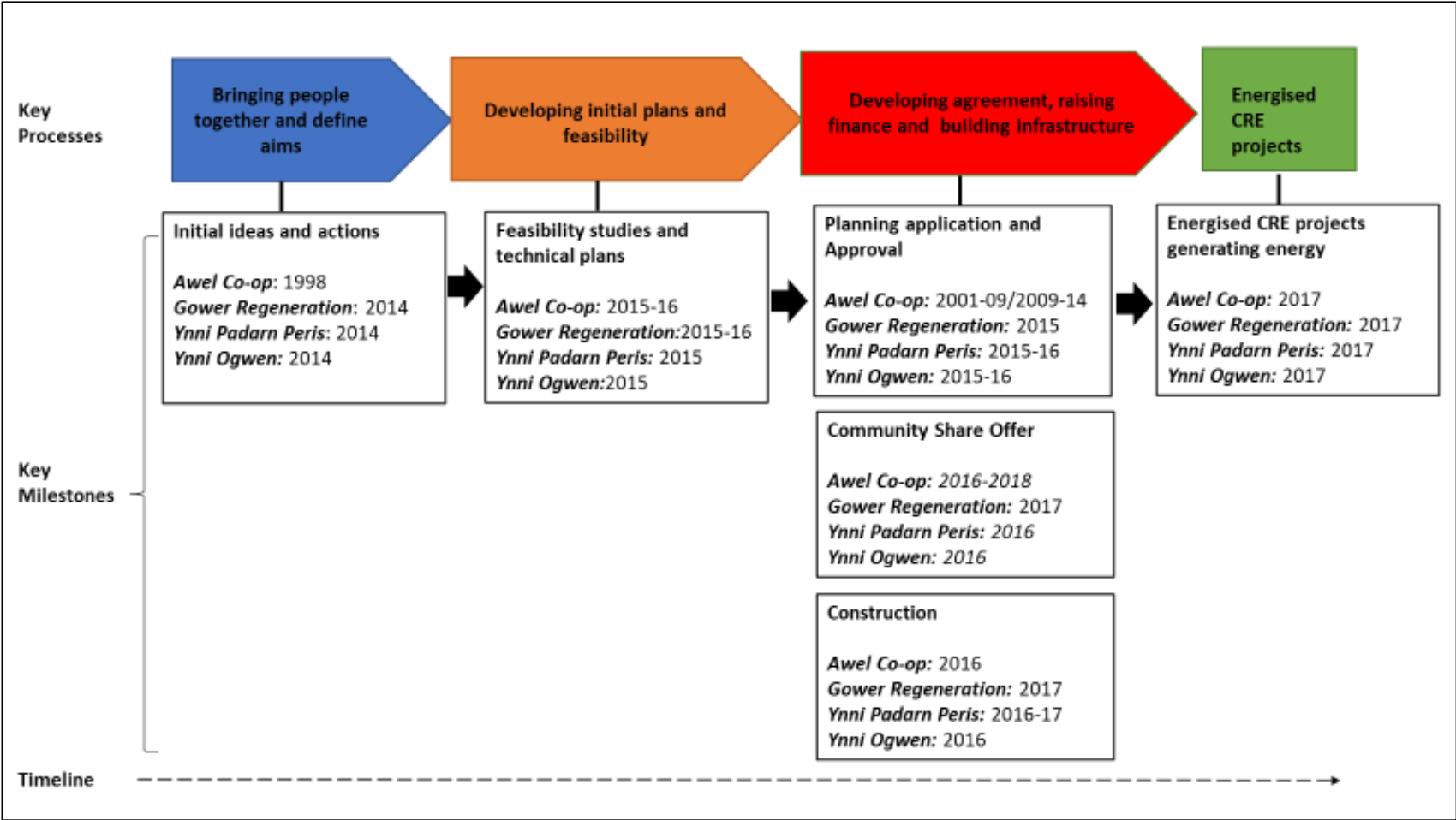
In relation to the third component, *Developing agreement, raising finance and building infrastructure,* these activities tended to occur together. This was either in quick succession or in parallel, leading to a complex process of development across case studies. This included work on funding and finance as well as construction. In the case of the smaller CRE projects (YPP and YO) the funding focused predominantly on the community share offer, whilst the larger schemes involved a mix of share offers and external funding.

For instance, in the case of YPP and YO the CRE groups engaged in a crowdfunding process that was supported by Arloesi Gwynedd Wledig. This focused on campaigns for the two community hydros, with a target of £750,000 over a two-month period for both YPP and YO (Arloesi Gwynedd Wledig, 2016). In this context, share offers have often been used within community initiatives to provide a way of funding schemes. People engage with share offers because they are motivated to invest their own money whilst being willing to wait for a longer-term return (Welsh Government, 2018).

The development of the YPP hydro project using the Afon Goch required £250,000 to be raised to fund the building of the pioneering community hydro scheme in the valley (Arloesi Gwynedd Wledig, 2016; Ynni Padarn Peris, 2016). This was facilitated by the share offer focused on the majority of the shareholders from the local area, with a potential return on their investment of up to 5% after 3 years (Ynni Padarn Peris, 2016). In a similar way, the development of the YO hydro project using the Afon Ogwen also needed £500,000 to be raised to fund the building of the pioneering community hydro scheme in the valley (Arloesi Gwynedd Wledig, 2016; YO, 2016).   This was facilitated by the share offer with a minimum of £250 focused on the majority of the shareholders from the local area, with a potential return on their investment of up to 5% after 3 years (YO, 2016). The promotional campaign for both the CRE projects used a variety of tools that included a bilingual film about the community share offer combined with a social media campaign and public meetings. Significantly, the scheme received first place in the Renewables UK National Awards in 2016 for its work in engaging the community.

In the case of GR, following on from planning approval in December 2015 and additional technical work, the project received funding from Finance Wales through a £992,000 loan to enable construction in January 2017 (Ynni Lleol, 2019; Gower Regeneration, 2017). In May 2017, a community share offer was issued to facilitate community investment, enabling the project to repay the Local Energy loan. In contrast, following on from a period of consultation the AC CRE project encountered a series of challenges focused on planning issues, including around common land consent and further consultation. This led to a modified planning proposal for two wind turbines rather than five installations, enabling construction to be completed. Following approval, the community share offer for AC was completed and generated 1m in funding combined with Welsh Government and external loans, totalling 4.5m as part of the finance package (Ynni Lleol, 2019b). In terms of the fourth component, the respective case study projects were all identified as being operational in 2017 as *Energised CRE projects*. The study findings highlight the prolonged period and complexities involved as part of these development processes.

6.3 Barriers faced by CRE groups

The theme of barriers encountered by CRE groups was evidenced in the study findings, aligned with those barriers faced during the developmental phase of CRE projects as well as once they were established. These two sub-themes consisted of a range of key areas identified across case studies (Table 26). Overall, these sub-themes identified discrete areas such as raising finance and dependency on the weather. Yet within both the sub-themes the changing policy landscape had an impact at an early stage and once projects were established due to the reduction and then removal of FITs for energy generation. Furthermore, once operational the findings suggested that maintaining the CRE projects and developing additional innovation was difficult due to time, commitment and setbacks. The study findings resonate with and build on the literature, detailing the broad range of barriers and obstacles that must be addressed by CRE projects, representing a complex developmental process (Walker, 2008b; Allen *et al.*, 2012; Seyfang, Park and Smith, 2013; Markantoni and Woolvin, 2015). These include operating with a difficult and

unpredictable policy context, securing planning, as well as accessing appropriate skill sets (Walton, 2012; Walsh, 2016).

Table 26: Barriers: Sub-themes at different stages of CRE projects

During developmental stage	Once established
Grid connection and landowners	Changing policy landscape • "Chopping of FIT" • Business tax rates
Raising finance	Dependency on variable weather
Specialist skills	Volunteering and maintenance of CRE project
Consultation and planning	Difficulty in public engagement around RE
Construction	Challenging nature of innovative development
Changing policy landscape • Reduction in FITS	

There were similarities across the findings from the study and the literature, centred on a range of areas. Overall, a key area was the capacity and skills to take forward CRE projects, navigating the planning process and engaging with landowners (Walker, 2008b; Markantoni and Woolvin, 2015). Also, CRE projects were dependent on different sources of finance within and outside of their communities for schemes to become viable (Haggett and Aitken, 2015; Walton, 2012). Further, both in the findings and the literature was the impact of the inconsistent and shifting policy landscape and the availability of support for CRE projects (Strachan *et al.*, 2015; Brummer, 2018; Robinsion and Stephen, 2020).

The literature primarily focuses on the barriers and issues surrounding the development stage of CRE projects. However, the study findings extended the literature by identifying not only the relevance of these issues moving forward over

time, but also providing a more nuanced account of these issues once projects were established. There were similarities between the literature and findings around volunteering, with the evidence highlighting burnout and maintaining projects over time (Walker, 2008b; Bere, Jones and Jones, 2015).

Furthermore, within the literature, the challenge of engaging the community with RE is framed in terms of energy justice and the need to ensure vulnerable groups are participating in, and benefiting from, a low carbon energy transition (Bird *et al.*, 2013; Berka and Creamer, 2018). Although the study findings did not adopt an energy justice lens, it indicated the difficulties in engaging communities in energy saving advice and tackling fuel poverty, particularly in the case of difficult to access groups. Importantly, the study findings extend the literature, providing insights into how community groups attempted to address these areas and the barriers encountered once CRE projects were established. This focused on the area of Energy Local clubs, representing opportunities but also presenting a challenge in practice. In addition, further development of RE innovation presented a substantive challenge for community groups. This involved a series of setbacks and a steep learning curve as part of pioneering work, which required both time and commitment by groups. For instance, centred on the development of local energy storage and establishing a closer relationship with local energy generation.

6.3.1 During developmental stage

As part of the study findings, a range of factors were relevant at the development stage. For instance, it was evident that AC had faced more barriers from the planning process during the developmental stage than other case studies. However, for YPP and YO it was raising finance that had been the greatest challenge as part of the community share offers. A changing policy landscape influenced projects across a temporal continuum, extending from their development, once established and future context.

Overall, there were often multiple barriers and aspects involved in the developmental stage although these are identified as particular areas in the findings. This is highlighted by a participant from AC. They detailed an ongoing

process of learning as part of the project development, with key areas being planning process and legal side to the project. This centres on both raising finance and generating sufficient income.

> *"I think everyone that's been involved realised there's so many different aspects to it, from the technology itself and the amount of work you need to have to back up your planning application and then land agreements, the legal side of that. Getting leases and then the commercial part of it, like just trying to figure out – is it going to make money and the share offer and returns to members". (ACKS1)*

Grid connection and Landowners

The area of grid connection was particularly identified as relevant within CRE projects. For instance, a key barrier cited by a participant in YPP was the lack of funding aligned to linking to the National Grid (YPPKS2). Furthermore, there were constraints linked to reserving the capacity of the National Grid, prior to starting the CRE project. In this way, it created difficulties for community energy projects, as opposed to larger commercial companies, that had the funding advantage linked to scale.

> *"The grid is big problem for energy as there no capacity there. The problem you've got if you don't reserve the Grid and pay for it before your project has even started…who the hell can afford that only a big company not the community." (YPPKS1)*

As a barrier, access to the Grid represented a complex arena, where CRE projects were at a disadvantage comparted to their commercial counterparts. A participant from AC mapped the challenges presented to securing a Grid connection, due to a lack of capacity and competition with commercial schemes. In this context, the participant identified the importance of policy initiatives in enabling the balancing of the system to facilitate access for CRE projects.

> *"The Grid is a major issue…What's increasingly happening is that commercial developers I think are buying it up which is preventing then the community energy getting a foothold in their local area. Not only is the Grid more difficult in terms of capacity but where there is capacity it's being taken over." (ACKS1)*

Another barrier as part of the project development phase cited by participants was negotiating and achieving agreement with landowners. As exemplified by a participant from YPP, this was often challenging with farmers themselves facing financial difficulties or lacking "*community spirit*".

> *"Talking with landowners, getting to know landowners and the challenges that arise with trying leasing land or landowners' rights which isn't easy because farmers have financial challenges… but as well there wasn't much community spirit with one or two landowners that we worked with"* (YPPKS2)

A further participant from YO identified the hidden barriers involved with securing the support of landowners for a CRE project. This included the navigation of a raft of steps and included additional costs such as utilising solicitors.

> *"So, in our case we had, two or three landowners, so getting a lease agreement. So, we, as a community group, need to find the money to pay the solicitor and the costs represent to us are quite high, just to pay for the leases."* (YOKS1)

Indeed, the work of Walker (2008) reflects these themes, indicating the barriers facing microgeneration in relation to connecting to the grid infrastructure. In a similar way, Haggett and Aitken (2015) identify the challenges of securing not only a connection to the Grid but also the initial accessibility to having land for CRE project through negotiations with landowners.

Raising finance

The area of securing finances was mostly identified as a barrier by YO and YPP as part of the developmental phase, although it was a key stage across all case studies. This was highlighted by a stakeholder from YO, noting the importance of securing financial support:

> *"Another obvious stumbling block is lack of resources, so you got to find grants and commission all these feasibilities and so on."* (YOKS1)

The barriers faced were further emphasised by a participant from YPP detailing the complex and protracted process of setting up a community hydro. This focused on raising finance to complete the feasibility work, exacerbated by having to secure license for water extraction. In this way, there were multiple "*hurdles*" for small scale projects, lacking capital whilst at the development stage.

> *"The whole process of having a scheme is a long and complicated process, a lot of hurdles on the way, how to get money to do feasibility. There are different permissions that require for extracting water and so on." (YPPKS5)*

The case of YO highlighted the hidden complexity of the developmental process. As noted by a participant, financial support was needed for feasibility studies, such as those required to underpin the solar panels building on the hydro project which required expenditure before the project started.

> *"Ogwen Hydro is a very good project giving solar panels. There is a lot of work to do to see if things will go ahead. There is a study to see if roofs are strong enough to be take the panels. All that costs money before you start the project. And then you'll need to get the money to go in. What the English call ' seed funding', just to get started." (YOKS5)*

In a similar way, in the case of YPP a stakeholder identified how securing funding was the "*biggest problem*". The participant highlighted how this barrier was addressed through a community share offer and although this was perceived to be a possible obstacle it succeeded in a short period of time.

> *"The biggest problem we saw initially was raising so much money in a small amount of time. But, amazingly, the money, a quarter of a million, was raised in a two-month period. That was then our biggest problem we had overseen." (YPPKS3)*

The difficult barriers facing CRE projects was also exemplified by YO, with a participant highlighting how it also faced the key barrier of raising of finance. However, the participant identified the importance of collaborative work with YPP in organising the share offer to address their shared barrier in securing initial

financial support in the developmental stage. At the core of addressing these barriers was volunteering as well as partnership work.

> *"An obvious barrier is raising money to build the scheme. To us we were lucky launching share offer in partnership with Ynni Padarn Peris, and we raised the whole amount of money we needed through those share offers. Nearly half a Million. That is extraordinary for a community like us, there was a lot of volunteers' time working tirelessly hard, to facilitate the share offer and to make sure that we could hit that target." (YOKS1)*

In the literature, Haggett and Aitken (2015) also reflect on the barrier of limited access to financial capital, which presented a key issue for CRE groups due to the funding required in supporting pre-planning stage of development. As such, community projects represent a greater risk compared to commercial companies. Further, CRE projects frequently require a degree of accessibility to preliminary investment, to fund initial developmental activities. These costs are significant for projects prior to the generation of income (DECC, 2013a).

Specialist skills

As part of the earlier section on cultural capital, the study findings highlighted the importance of pre-existing skills in CRE project. However, there were also gaps in specialist skills acting as barriers to support the development of community energy projects. This was exemplified by a participant from YO who identified the need for an engineering and legal knowledge-base and skill sets. The participant indicated the importance of ensuring stakeholders involved in the CRE group were able to include or draw upon actors with key specialist skills.

> *"What you find is often, the committee, people like me want to do the best for their communities, but the technology is unfamiliar. So that can be another stumbling block, finding a group of people with enough skills to develop a scheme. So the kind of skills you want is, engineering is always good to have someone to understand the technology, So on our committee we haven't got anyone with legal specialism, so there was a gap." (YOKS1)*

In a similar way, a participant from GR identified the importance of securing professional and legal expertise. As such, key individuals and a range of different skills were required to develop a successful project. The ethical investment process was managed by 'Ethex' enabling finance to be raised for the project. In this way, it was clear to the participant that enthusiasm and good will were insufficient alone in enabling the project to succeed.

> *"I suppose with a community project like this is, however, much we believe in it, and we want it to happen, very often we don't have the expertise within the people on the committee to do that without employing professionals and experts in that field. So yes, there's been quite a lot of legal and professional fees involved in setting up the shares." (GRKS4)*

In a similar way, the wide range of skills required to engage in CRE projects was also reported in the literature, building on the need for knowledge and the availability of time. These necessary skills focused on the areas of finance, managing projects, consultation and business (Haggett and Aitken, 2015; Berka and Creamer, 2018). Otherwise, gaining access to such expertise or training involved significant costs (DECC, 2013).

Consultation and planning

The barriers raised by the consultation and planning process were exemplified by the AC and YPP CRE projects. In the case of the AC scheme, it encountered a range of barriers and obstacles during its development, in particular ensuring appropriate liaison with communities, securing planning permission and addressing consent associated with common land (ACKS2, ACKS3). This resulted in several iterations in the plans which developed alongside feedback. For instance, a stakeholder mapped some the obstacles linked to consultation and associated opposition as well as navigating the planning process. These led to a protracted process of consultation and planning consent that extended over a period of time.

> *"Well, the setting up of it, it was difficult doing the consultation because it was a windfarm and certain people that were dead against it and we were the first projects like this and that was really hard– they were very active during that consultation writing letters to the press etcetera. So that was a*

challenge beginning and then we kind of went through that but then the planning process then also became a challenge when we tried to get planning starting in 2000. We formally submitted in 2004, and then got repeatedly turned down following that." (ACKS1)

In a similar way, a stakeholder in YPP project highlighted the barrier faced by the CRE group as part of planning. The project encountered a complex and lengthy process of development, linked to the navigation of the planning process. This was viewed as an area that required improvement by local government, to support CRE projects.

"The processes are quite complicated and long winded. I think they could simplify the planning process with local councils." (YPPKS3)

In this context, Walker (2008) also identified the AC wind turbine as an exemplar of initial delays in securing planning permission, highlighting potential barriers for CRE projects. It was also seen as illustrating how CRE projects may become embedded in local controversy as part of the consultation and planning process.

Construction

In terms of construction, YPP had to employ a specialist construction company due to the small-scale hydro technology rather than a local company. The lack of expertise in this area was considered a barrier by one of the stakeholders.

"There are a few things, because we gave the contract to a specialist company, in a way, we had no idea of the construction problems of the scheme." (YPPKS3)

The GR project encountered "*obstacle after obstacle*" but particularly the construction of the site, which was significantly delayed, as indicated by a stakeholder. This led to a very close deadline despite having earlier overcome the barrier of funding. However, there was lack of consensus between the construction company and the technical adviser. This led to a court case over the degree of risk involved for the CRE project, representing a key barrier to success.

"So all the way through it was obstacle, after obstacle. We got first chunk of money in January, paid the contractor, then they told us they weren't going to turn up till March. And then the construction contract was just an absolute nightmare, it got energized with two hours to spare!" (GRKS1)

Changing policy landscape

A difficulty for CRE projects was the shift in UK-based policy. This created a difficult and unpredictable environment for community renewable energy schemes as a government subsidy, Feed in Tariffs (FIT) were administered by the Energy Regulator (OFGEM) to encourage the development of renewable energy generation (Nolden, 2013). The Government's approach to FiTs represents a trajectory of change, with FiTs commenced in 2010, reduced in 2015 and included a proposed ending in 2019 (Scene connect, 2019). Within the study, this policy shift represented a barrier for the CRE projects in the case studies. For instance, as the YO project was evolving, the FITs were changed with lower returns for schemes, presenting challenges for small schemes.

In the case of YPP the reduction in FITS presented an unexpected and rapid barrier. The YPP project was impacted through a reduction in the amount of income from energy generation from the changes to FITs.

> *"We had an almost got away with it just caught out by halving the FIT overnight. We had planning permission and the leases, and then it was just a matter of quick paperwork that we would have - at that date, we were getting 16 pence per unit. And overnight it went down to 8 units."* (YPPKS4)

The shift in policy reduced support to the CRE schemes, presenting an added layer of complexity. This was exemplified by a participant in YO, highlighting how the changes to FITs impacted on the CRE project, with a reduction in income, with FITs *"slashed, slashed and slashed again"*. This was due to delays in receiving the abstraction license and resulting in missing the opportunity to maximise income through the initial FITs rate, prior to policy change.

> *"For every unit of electricity, you generate you get feed in tariff. So, this feed in tariff is assisted by the government in Westminster by Ofgem. Gradually,*

over recent years, this feed in tariff has got slashed, slashed and slashed again. In our case of YO, we came very close to getting the feed in tariff 16p per kilowatt. Unfortunately for us, Natural Resource Wales, took lot of time to assess our abstraction licence thing for us." (YOKS1)

A participant from GR exemplified how the shifting energy policy landscape posed a problem in the CRE group, as it had to adapt to policy fluctuation, punctuated by tight deadlines. There was a marked comparison made between the protracted length of time it took to develop a CRE project and the short-term nature of policy shift "*sort of overnight*". This was especially the case in the new technology of solar and the specific skillsets required for that purpose.

> *"The changes in subsidies and legislation and the sort of overnight unexpected changes are, have been a big thing to wrangle with, in planning and trying to complete a project, because obviously it takes quite a lot of time from planning stage to actually bring it through to construction and completion. The technology is still quite new. It's a very specialised thing to do, so you can't just go and get anybody to build one for you, and if suddenly the government say right the subsidy's going to end on this date, so everybody's trying to build by that date, then it certainly makes it much more complex."* (GRKS4)

6.3.2 Once established

The findings highlighted a range of issues encountered by CRE groups and projects once the CRE projects were established. Across the case studies barriers focused on the shifting policy context as well as the inherent issues around CRE focused on weather and a dependency on volunteers. There were also obstacles around local innovation in practice and engaging communities.

Changing policy landscape

Within the literature, Seyfang, Park and Smith (2013) identifies the relevance of the importance of a supportive policy framework to enable CRE projects to successfully operate within the wider energy sector. These small-scale schemes, focused on civic engagement, work alongside but differ from commercial companies. In order to support the CRE sector, an energy policy framework should have consistency and

continuity at its core. Further, the literature established the importance of political and policy contexts in both incentivising as well as constraining the development of CRE projects. This included the availability of structural resources (Bomberg and McEwen, 2012).

Significantly, the study findings indicated that policy operated as drivers for a shift in the direction of community energy, requiring CRE schemes to adapt quickly to changes and adjust their business plans (YOKS1). This was reiterated by another stakeholder in the Peris valley, identifying similar barriers in YPP centred on the area of FITs. The FITs was initially being reduced as the project was being developed and subsequently once established FITs being removed. This not only operated as a present but also future barrier in developing the scheme more widely. As such, the lack of FITS reduced surplus income from a CRE project, which could be used to invest in community benefit.

> *"The difficulty is I would like to be able to develop another scheme, but changes to FITs, is hindering us at the moment, when George Osborne changed the rules of the FIT overnight. We had to rush to get the application in by the end ... And now, the FIT has disappeared on completely hasn't it. So, it is difficult, even though you have quite a few grants to get the scheme up and running and the scheme generating enough energy as well. FITs so if you take that away it doesn't work … not that we do everything for a profit, but without the profit we can't generate community benefit."*
>
> *(YPPKS5)*

A participant from AC highlighted the key role of the FITs and the Community Energy Strategy in providing a supportive environment for CRE. Yet these advances were reversed with changes to the FITs with the shift in policy direction leading to negative consequences.

> *"Obviously the feed-in tariff was a big change and that made AC a lot more viable, the Community Energy Strategy gave lots of hooks that you could get pre-accreditation and other tangible benefits for community energy stuff. That alongside the feed-in tariff boosted it all.   Then of course it was just all changed, unfortunately." (ACKS1)*

Equally, a stakeholder in GR identified the impact of changes in policy direction. This had moved from an initial supportive stance by political parties involved in government in community energy, to a perceived lack of engagement with renewable energy policy by government.

> *"When the Lib Dems got into power with the Conservatives, it was quite a progressive community energy policy and there was a real momentum. And then of course, then there was the next election, and that was it, community energy, totally and utterly no interest whatsoever to the government."* *(GRKS1)*

In a similar way, another participant from YPP identified the sense of instability due to the role of policy shift. This led to a position of "*inertia".* with the "*chopping of FIT*" leading to a perceived halt in progress within the sector.

> *"As there is an enough movement at the minute but that will go, once the chopping of FIT happens, we will lose that, inertia completely."* (YPPKS1)

In this way, stakeholders identified how the vision of YPP as a catalytic project was damaged by political shifts in the support for renewables.

> *"We didn't want this to be just one-off and nothing else happening. I wanted it to be the catalyst for something more. There are other rivers, but the political climate. If there is no change in direction, if we don't get rid of the Tories, there is no hope for renewables, no hope."* *(YPPKS4)*

A further difficulty for schemes once they were established was the business tax rates for the micro hydros YPP and YO, centred on the challenge of a significant increase in rates due to revaluation. Consequently, the profits generated from schemes are retained by councils rather than being at the disposal of community funds for the benefit of the local area (State of the Sector Report, 2020). For instance, in the case of YPP the profit produced by the scheme for investing into the community was directly impacted by the application of business rates, leading to a reduction in the social impacts of local community initiatives. In a Wales context,

community hydro schemes have received an initial level of support with a grant scheme for 2018/19 (and retrospectively 2017/18) being offered by Welsh Government. This provided 100% relief for hydro schemes having a rateable value of £50,000, until April 2019 (Messenger, 2018; Welsh Government, 2018). However, the participant identified a degree of uncertainty around whether this was to change in the future.

> *"We've faced a problem with business rates, where we've been exempt from business rates for the current year. But we have no idea what's going to happen after April 2019. if we have to pay the taxes, over a certain amount, the money we were hoping to spend in the community, that will disappear because of the taxes. but ultimately the decisions are made in London." (YPPKS3)*

In the case of YPP, a stakeholder highlighted the problematic nature of navigating different political structures across the national, Welsh and local government levels. This was in response to the policy shift in relation to business tax rates, which were described as a cyclical process without resolution.

> *"With business tax (sighs) I would just like them to sort it out…. So, we end up paying a lot more of business tax then we would if we were wind turbine of the same scale…so it's completely bonkers. But everyone in this political sector blame each other. Yes, so there are going to charge us…you go to Welsh Government, and they say oh the Evaluation Office who's to blame, so they kick it up to Westminster. When you ask Westminster, oh no it's the Welsh Government supposed to do something about this. So, the thing just gets kicked around in a circle." (YPPKS2)*

In this context, Samson (2018) identified the centrality of FITs as part of a policy infrastructure that provided a supportive framework for the development of CRE projects and their future viability. In particular for small-scale projects, it provided a degree of certainty in the income stream from generation. However, the rapid removal and policy shift centred on FITs resulted in CRE projects becoming financially precarious. This theme was reiterated in the State of the Sector (2020) Report, highlighting the damaging impact of the policy change focused on the most prevalent CRE business model being no longer viable for community groups. As

such it generated an additional barrier for CRE projects to tackle to develop new schemes (Scene connect, 2020).

Overall, the policy context has increasingly positioned community renewables as a discrete part of the energy-mix in terms of technology and scale in the UK. As part of this process, a range of funding initiatives were developed to create a supportive environment for local community RE (Walker and Devine-Wright, 2008). However, in recent years the arena of community energy has been subject to challenges in the fluctuations in policy and funding, resulting in uncertainty and instability. Consequently, the model that initially provided the impetus for generating growth has been positioned as a challenge (Scene Connect, 2019). The findings identify how CRE projects operate within a wider policy context, presenting a trajectory of incentives and barriers for CRE projects (Figure 49). In this way, the policy development and shifts in the UK community energy sector presents a complex and changing landscape. It is punctuated by key policy documents and initiatives which represent both incentives and barriers to the development of community RE. Crucially the first phase of policy changes highlight a significant degree of incentives resulting in a 'peak' of support, whereas following the turning point in 2015 there is a 'trough' in the provision of supportive measures by the government for community RE in the UK. As such, the findings suggest that changes to the FITs, through an initial reduction then removal, alongside other changes to business tax, resulted in uncertainty as an outcome from this fluctuating trajectory.

Figure 49: Community energy policy landscape: a changing picture of incentives and barriers
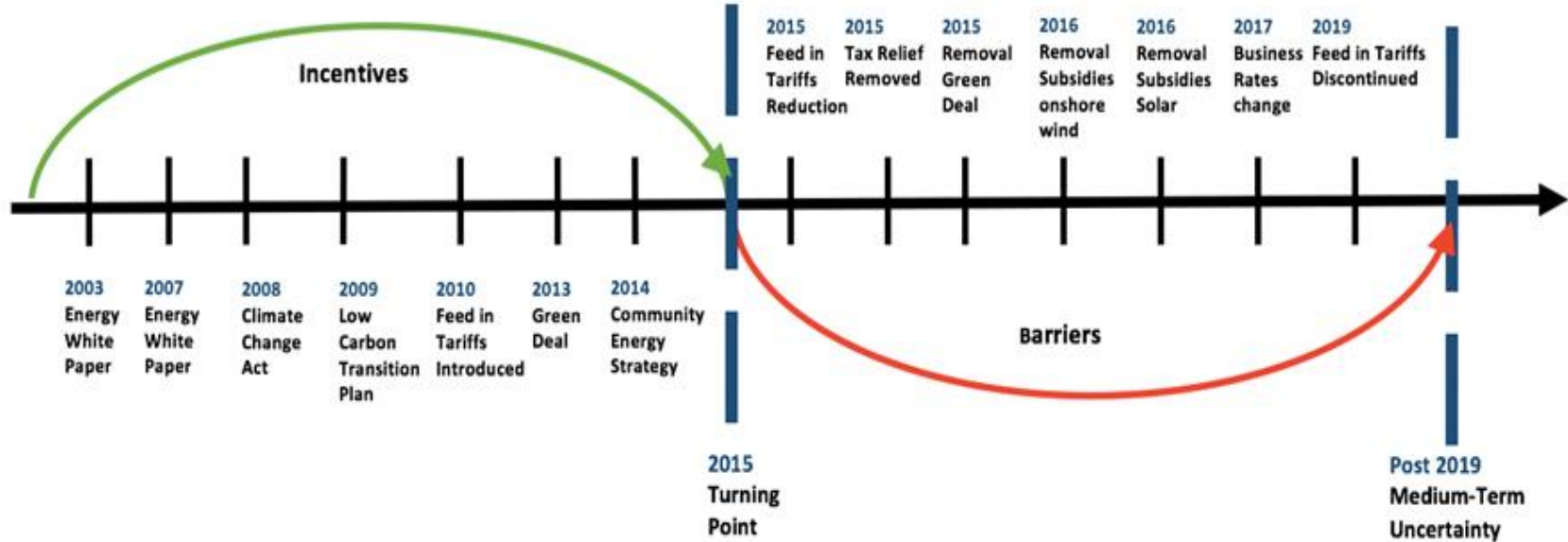
Dependency on variable weather

Another significant challenge once established, cited by participants across Gower Regeneration, YO and YPP was the barrier of renewable energy generation being subject to variability in the weather resulting in a range of peaks and troughs in generation. For instance, a participant in Gower Regeneration identified how e generation output could be highly variable over a period of months: *"May, June and July were fantastic. August not so good. September fabulous"* (GRKS1).

Further, a participant from YPP highlighted the intermittent nature of renewable energy in practice and the amount of income generated. This is dependent on the amount of energy generated, which is reliant on the amount of rainfall, which differed from year to year. In this context, too little or excessive rainfall caused difficulties in operating the hydro and had implications in the capacity to generate.

> *"And the biggest pain at the moment is we are having a good summer, not enough rain. But also, sometimes the turbine goes off, when it's raining heavily and we take a few hours to sort it, we're losing money. So, at the moment we're getting started, we're getting a pretty dry start. We were actually off I think it was almost three months we didn't generate anything. And last year we weren't off at all, it was very wet, so we had bit of luck with the weather."* (YPPKS4)

In the context of YO, a participant also emphasised the variable output, in relation to the hydro generation and its dependency on weather conditions (YOKS2).

Volunteering and maintenance of CRE project

A stakeholder from YPP adopted the analogy of a wedding, making parallels of around the initial enthusiasm and preparation for establishing a CRE project. However, it required ongoing volunteering and maintenance work. In this context, the participant outlined that following the building of a community hydro, the main barrier was ensuring a balanced and different skill set to maintain the CRE project, as well as maintaining momentum

> *"I compare developments in community energy to a wedding…the fizz and froth and enthusiasm and everything is all to do with getting ready for the wedding day. Or building something. The problem you have afterwards, is*

after building you have 50 years, you have to live with it afterwards and now we are running a business, it's a skillset completely different as well." (YPPKS1)

In the context of volunteering, a participant from YO identified how community schemes are often mostly volunteer-led. The maintenance of the CRE project required access to, and commitment by volunteers that required time and civic engagement. In the case of YO this relied on a small group of people and represented a "*burden*" for volunteers.

"Yes, actually another barrier again is lack of volunteers so not just kind of over three years, the hard work, getting to finance and building the scheme, you've got maintenance work, the volunteers go down every week to check the turbine, cleaning screens. Which great, but it's a burden … in every weather and they don't get paid. This can be another barrier again". (YOKS1)

In a similar way, the literature suggests that the ability of CRE projects to be effectively managed and maintain the technology in the longer-term after becoming operational, may be problematic. The risks focus on the potential loss of knowledge and skills by those involved in the initial period of development (Walker, 2008b; Bere, Jones and Jones, 2015). Furthermore, Callaghan and Williams (2014) highlight that volunteers may experience burnout as well as depleted time, energy and enthusiasm for the CRE project over a prolonged period of time.

Difficulty in public engagement around RE

The area of difficulties around public engagement centred on recruiting communities to participate in energy saving workshops and Energy Local schemes. For example, there were implications for hard to access groups, especially those parts of the community, such as reliant on pre-pay meters. Also, there was some lack of understanding regarding matching supply and demand, as well as confusion how works in practice at a household level.

A participant from YPP reflected on the difficulty of public engagement around issues of energy saving and encouraging people to attend energy saving workshops. This was based on the exemplar of the CY consortium.

> *"It's very difficult getting people, we all live in houses, how you get people to realise how they can save energy. Because CY have done open sessions, how to reduce energy in the home but getting people from their home to do that and listen to the advice is difficult." (YPPKS6)*

Further, a participant from YO highlighted how there was a limited response to the Energy Local initiative in the locality. This was despite a coordinated effort to engage the community through a series of events and energy wardens being directly involved with the local community to encourage participation.

> *"We had stalls in the market, I think, we worked with the energy wardens of one of the housing associations. I was there with the information and energy wardens went around the doors, knocking on doors and saying, 'If you're interested, the information is there'. There wasn't a lot of response then." (YOS5)*

A participant from YO highlighted the importance of engaging with vulnerable groups in the community. In particular, people who could least afford to pay being penalised with higher energy costs due to a reliance on electricity meters. There was a discrepancy between those who would most benefit from reductions in their electricity bills not engaging with the scheme, compared with those who were relatively financially secure that were benefitting from the Energy Local scheme.

> *"I think people who are who are buying electricity through the meters, I find that rather disturbing, as the people who can least afford it are paying the most… but they can't or won't move to a system where it's more advantageous from the financial point of view, possibly because they don't have the necessary funds or because they don't have the infrastructure in place in their household to be able to budget, and those are the people really for the local community that need to benefit most not the most privileged of us." (YOS4)*

Furthermore, a participant from Energy Local elaborated on the challenges of engaging people in fuel poverty with the scheme (YOKS5). The barriers focused on those in fuel poverty unable to take risks with energy costs and having to rely on the pre-paid meters due to the lack of significant disposable income. Although expensive, the meters represented a familiar mechanism for paying and budgeting energy costs and providing a sense of security for those in fuel poverty. This was an issue that had become increasingly clear as part of the development of the scheme for the participant.

> *"I mean, sort of what demographic and what earnings they have got so you have a spread of people, we're trying now to actually make it easier for people to maybe pay but between people in fuel poverty, we haven't actually got huge people at the moment. It's one of the things I've learned is that if you've got enough money, you've got the privilege of being able to take risks. You know if my direct debit gets stuffed up, it's not really the end of the world but if you're down to your last fiver that could be the difference between you being able to pay your rent or not? So, this is this kind of better the devil you know." (ELSK1)*

Indeed, a participant viewed the confusion around the scheme as a key factor in limiting public engagement. This was based on the complexity involved in the Energy Local scheme and its relationship to the CRE project, focused on how this was understood within the community. There was a perceived blurring between Energy Local and YO which was exacerbated by the joint promotion of the schemes and a shared group of stakeholders within the same locality. As such, this was seen as creating confusion and an additional barrier to community engagement.

> *"Do you understand what Energy Local is and what Ogwen is? A lot of people still think the two are linked. And although they want to be connected, YO is not part of it yet. A lot of people who are part of Energy Local still think they get their energy from YO…But it was also being started at the same time as YO was being built. But since Energy Local runs from the National Trust, they didn't have to wait for YO to be ready. And they were both promoted from the same stand, in the markets. So, the same people were promoting both. So, it's easy to understand why there is confusion." (YOS5)*

Equally, a participant from YO identified the complexity for users involved in the Energy Local scheme. Although the intention was to engage the community in using energy more effectively, with benefits linked to lower electricity costs it was described as "*simply quite mind bogglingly complicated".* As such, there was difficulty in understanding how best to match local supply and demand in practice by users as part of community engagement.

> *"The current system in Energy Local is designed to try and help people to use the electricity that they are using more sensibly and that the reward for that will be that they will be able to use more electricity at a lower rate, it seems to me that it is simply quite mind bogglingly complicated… and whether everyone understands what they are doing or what they ought to be doing to optimise the advantages I'm not sure." (YOS3)*

Furthermore, in the Ogwen valley the 'Green Hub shop' in Bethesda had a window monitor to promote the visible impacts of the of the community hydro to the wider community. It demonstrated how much the hydro was generating yet it was not seen as facilitating an understanding of energy generation. For instance, its framing in technical terms focused on 30kwh, which was seen as not accessible by the wider community. The participants reflected that more meaningful terms, such as money, or number of light bulbs would have been a more suitable metric to engage local people.

> P1: *"We've gone in and talked to {name} about it, we look at it with complete incomprehension basically even though it's been explained to us.*
>
> P2: *Well it doesn't really tell you much really.*
>
> P1: *If it said sort of, this powers so much this is good because we're making money or something then people might understand.*
>
> P2: *Or it tells you how much that what that amount of power*
>
> P1: *30Kwh means nothing.*
>
> P2: *Support how many light bulbs or how many cookers turning on or something?" (YOS4)*

As part of the literature, DECC (2013) indicated the potential benefits that could arise from CRE projects, such as reduced energy costs that may have particular relevance to those in fuel poverty. However, such benefits may be inaccessible due to insufficient resources to engage with RE schemes, as exemplified in the study findings. Indeed, the literature suggests that such difficult to access groups are unable to gain from RE as it requires a long-term view and economic benefit, whereas they have to prioritise short term energy need (Walker, 2008b; Gupta and Barnfield, 2013). Furthermore, the literature identifies that a poor level of knowledge around energy issues and its usage may impact on the extent to which there is a broader engagement by the community with CRE and its potential benefits (Bird *et al.*, 2013; Berka and Creamer, 2018).

Challenging nature of innovative development

Within the literature, Slee (2020) identified the major challenges facing CRE groups following the policy changes. In the study findings, , community groups have had to adapt and innovate, such as focusing on storage and local Grid balancing. These present opportunities for CRE projects, but also confront community groups with a series of difficult challenges. For instance, they require significant capacity within CRE projects and access to range of technical skills.

A participant from GR highlighted the range of challenges facing further CRE developments, in this case focused on the new solar storage scheme connected to the GR solar farm. This next stage of development centred on the recruitment stage of consumers within the local area and connecting of the local network to solar farm. However, it had required substantive work in securing funding from the Welsh European Funding Office that made the new solar storage scheme possible.

> *"We just literally just started launching the offer to consumers we have 70 people registered they're interested in becoming energy customers… The local network to connect to the PV. Yes. So that's all moving forward, that entails securing about 600,000 pounds worth of funds from WEFO (Welsh European Funding Office). We got the loan for 300 grand from the bank. That's not the half of it there is massive amount of WEFO paperwork involved, the actual project is pretty complicated but the paperwork (laughs)." (GRKS5)*

As such, the participant suggests the pioneering nature of the project focused on both selling energy but also the storage aspect as well: *"Lots of people doing storage but not a lot of people are selling to consumers as well" (GRKS5).* In a similar way, a participant from CY highlighted, *as* part of the hydro scheme in the Ogwen valley, a further initiative was being developed representing pioneering activity, involving a great deal of work behind the scenes: *"its early stages, the pilot was in the River Berthen hydro that was National Trust" (CYKS3).* Furthermore, the participant identified how the Energy Local clubs were also at an embryonic stage within the locality and region, with the first pilot in Bethesda. Yet these developments faced barriers as part of this developmental process, including the energy supplier.

> *"If we could do other Energy Clubs, building on this one in Bethesda, one in Aber and towards the Llyn Peninsula, to save money and carbon. But there are challenges with the energy supplier with that at the moment, so we not moving forward with that yet." (CYKS3)*

A participant in Energy Local highlighted the degree of work required to drive forward renewable projects and wider schemes, including overcoming barriers as part of development. For instance, finding an alternative supplier and the inevitable disruption and delays caused to users as a result. Such new developments involved problem solving and *"awful lot of just like mind bogglingly frustrating work behind the scenes"*.

> *"Let's say we had quite a few problems along the way…We're actually trying to move to a different supplier, all those things delay things … So I can wax lyrical, people think 'oh wow community energy and all that' and there was an awful lot of just like mind bogglingly frustrating work behind the scenes." (ELSK1)*

In the context of driving forward developments, the role of key individuals as stakeholders was exemplified by a participant from AC. They were characterised as *'pioneers'* and *'social entrepreneurs'*, working hard behind the scenes to overcome challenges.

"Similarly, I think its {name} from Awel Aman Tawe, works tirelessly. It takes these pioneers to go out there and understand how the system works…, they're facing new challenges all the time. To get these projects off the ground… I think those kinds of people are critical social entrepreneurs, the pioneers." (GRKS3)

6.4 Motivations

Importantly, the study findings highlighted how global and local drivers were significant motivations for civic engagement in CRE projects. However, there was also an important interplay between these two areas (Table 27), focused on the role of communities in a low carbon transition but also the importance of local investment and benefit from CRE projects. The literature and the findings from the study highlight the importance of both local or global drivers for involvement with CRE projects (Hoffman and High-Pippert, 2010b; Devine- and Wiersma, 2013; Hicks and Ison, 2018; Slee, 2020). In this context, Seyfang, Park and Smith (2013) identified a "*plurality of objectives*" (P981) aligned with UK CRE projects, extending across economic, environmental, social, political and infrastructural areas. For instance, key economic issues were reduced energy costs and creating income for communities, compared with social objectives centred on cohesion or environmental areas focused on reducing carbon. Indeed, within the literature the wide range of factors underpinning participation is reiterated across the research although at times framed differently (Becker and Kunze, 2014; Radtke, 2014). Significantly, these observations were echoed in the study findings, centred on an interplay between local and global drivers in the case studies. For instance, the areas of *Combating Climate change* and *Local income and community investment.*

Community ownership and benefits
The literature provides a good account of the motivations for key actors engaging in CRE projects however, the information on shareholders is underreported. In this context, Bauwens (2019) highlights that quantitative studies tend to explore the intention to participate in CRE projects by potential shareholders, rather than examine the motivations of those involved as part of the membership of projects. In this context, Bauwens (2019) completed a substantive survey in Flanders that

surfaced the importance of financial motivations for large initiatives whereas for potential shareholders in small communities of place, environmental and social motivators were the key drivers. In the study, the researcher built on previous research and addressed the knowledge gap linked to shareholders perspective within a Welsh context.

Table 27: Global drivers, local drivers and the interplay between these motivations for engaging in CRE

Global Drivers	Local Drivers
Increased renewable energy generation	Moving towards a community-decentralised model
Combating Climate change	Community ownership and benefits
	Local income and community investment
Interplay between local and global drivers	

6.4.1 Global Drivers

The study findings indicated the relevance of global drivers as significant motivation for involvement in CRE, focused on the shift away from fossil fuels towards renewable energy and the concerns around climate change. In particular, actors from YO highlighted the importance of a transition to renewable energy as a driver whilst climate change was highly cited in the AC CRE project. On a global level the literature identifies the key importance of motivations for involvement in CRE projects being influenced by communities seeking to address the wider issues around climate change (Rogers *et al.*, 2008; Allen *et al.*, 2012; Bauwens, Gotchev and Holstenkamp, 2016). As such, there was a focus on an increase in the provision of renewable energy generation so as to make a positive contribution to carbon reduction (Hicks and Ison, 2018). These key areas in the literature resonated with

the study findings, with participants citing global concerns as motivating factors. Furthermore, in a global context the literature highlighted the relevance of pro-environmental behaviours as a motivating factor (Rogers *et al.*, 2012a; Seyfang, Park and Smith, 2013; Markantoni and Woolvin, 2015). Although this was present in the study findings, participants reported less of an emphasis on the relative importance of pro- environmental behavioural as underpinning motivation.

Increased renewable energy generation

A strong motivation for shareholders was to produce an increased amount of renewable energy, which was perceived as "*clean*" electricity generation. For instance, a participant indicated their pre-existing environmental attitudes, leading to the use of a heat air pump system at a domestic level. Involvement in the CRE scheme in the Ogwen valley was positioned as a further step in moving away from fossil fuels. In this way, the small-scale community hydro was positioned alongside the consideration of wider global concerns.

> *"I was keen on having clean electricity because I use a lot of electricity, I got rid of the gas central heating and went for an air pump system which is entirely electrically run… so I am always looking for people to increase the amount of clean electricity such as with these small scale hydros." (YOS3*).

In a similar way, a participant highlighted their engagement with the community hydro was built on an interest in renewable energy: *"I've always been interested in renewable energy anyway, and the I am still, quite passionate about it in a kind of like a non-active way" (YOS2).* Furthermore, a participant focused on the importance of harnessing natural local resources, in stark contrast to the use of nuclear energy. As such, the participant saw the CRE project as part of relationship between increased consumption of electricity being matched by an increased supply to meet this need, drawn from local renewable sources.

> *"I've never been nuclear energy supporter and, have all this water here and it would be a complete waste not to be harnessing it. As long as we are enormous consumers of electricity, and we have to do something about ways to supply it." (YOS4)*

In a similar way, a participant identified a key motivation was moving away from fossil fuels, towards renewable energy. As such, community energy was part of the overall picture of creating different sustainable low-carbon transition technologies and models.

> *"Well, I really believe that there is so much potential for solar to be replacing fossil fuels, but it really is important. I am also interested in the role with batteries and electric vehicles and replacing petrol and diesel as well. So, community energy is part of it as well, solar schemes generally residential and commercial are also important." (ACS1)*

Combating Climate change

The area of climate change was particularly emphasised by AC, although this also present in the account of others including YO. Participants identified how engagement with CRE was a way of tackling climate change through community action on a community level. For instance, a participant identified how environmental concerns framed the motivation of involvement with YO centred on striking a balance between the environment and personal lifestyle. Consequently, activities that may have a negative impact on a global scale but could be offset by creating a positive impact on a local level.

> *"I still like to live in the 21st century, I like to have my comforts and I like a flight when I go on holiday, kind of be part of something like this and kind of balance, that was the main motivation." (YOKS2)*

In a different context, a participant from AC indicated the importance of their background as a glaciologist in underpinning their motivation in addressing climate change but through local action. Again, this reflected seeking a balance linked to researching environmental issues on a global scale but wanting to make a tangible difference on a local level, thereby addressing climate change on different scales.

> *"I was very interested in the idea of the wind farm. I'm a glaciologist. So, I spend a lot of my time looking at far flung global impact of climate change, without ever feeling that I was doing very much to combat it on a local scale, on a personal scale. So, my motivation for getting involved really was just to try and balance that out a little bit." (ACKS3)*

Furthermore, a participant highlighted there was a significant motivation based on climate-based environmental issues, with the participant self-identifying as an activist. This acted as a driver to move forward investment in the early community solar project, associated with the Awel Tawe charity.

> *"I'm involved with solar panels but also being a climate change activist and interested in what's going on, kind of surfing around and finding Egni projects which looked good and invested in that." (ACS1)*

In a similar way, another participant framed as an activist highlighted how, as a shareholder, there were strong environmentalist motivations underpinning their engagement with the CRE project. This was based on an understanding of climate science as a rationale for taking part and investing in the community energy scheme. In this way, the participant focused purely on the global context: *"I've been an environmentalist since I can remember… I therefore understand climate change and the issues behind it, it's logical" (ACS5).*

On a broader level, a participant identified how they were "*worried*" about climate change. As such, taking part and investing in the CRE scheme was a way of addressing climate change and taking practical action.

> *"I think everyone now are getting a bit worried about what's going on with the climate and wondering what we can do and this actually like a bit of no brainer really." (ACS2)*

In a similar way, a shareholder from YPP indicated the importance of renewable energy and the micro-hydro project in tackling climate change. It represented a good environmental investment, generating renewable energy over the longer term, providing a key strategy for advancing a low-carbon transition.

> *"I strongly think renewable energy is a force for saving the planet it's probably our only hope. And I think I just really liked the idea of the micro Hydros it seems like a reasonable investment to get over 100 years of basically free energy, seemed like quite a good investment to me." (YPPS2).*

Within the context of AC, the significance of 'Local Agenda 21' was identified as a relevant factor informing the motivation of stakeholders to engage with the CRE project. Although this was a negative case limited to AC it nonetheless represented a significant thread within climate change and local engagement. In this context, 'Local Agenda 21' in terms of sustainable development represented a *"catalytic event"* as illustrated by a participant. For instance, the participant highlighted how within AC, a public meeting provided the platform for the initial ideas for the CRE project. It provided a forum to discuss ideas with the participant describing the novelty and innovative nature of the wind farm at the time. A central concept and initial catalyst was 'Local Agenda 21' with local participation and ownership underpinned by sustainable development. This was described as a key motivation behind utilising the wind turbine as was a tool to generate income which would then, in turn, be fed into the community to achieve wider local and sustainability objectives.

> *"Then the idea of Awel Aman Tawe developed out of a public meeting around what was called Local Agenda 21– for the starting of sustainable development... It was a public meeting convened by the council and a couple of people were asked for ideas. But a couple of people put down wind energy. This was back in 1999 or something like that when there were hardly any wind turbines around. But a way of generating money from local resources." (ACKS1)*

6.4.2 Local Drivers

Overall, in the study findings local drivers centred on the role of communities within the energy system. This was framed by participants as focused on local ownership and localised benefits, with the retention of income as a key motivation. In a similar context, Slee (2020) identifies how frequently ensuring a secure stream of income has emerged as a dominant motivational factor for community development trusts in Scotland. These factors resonated within the findings, although they delineated some areas that were different from the existing literature. The literature focused on the local importance of CRE projects in facilitating social cohesion and reinforcing a latent sense of community, as well as language retention and providing a source of community resilience (Markantoni and Woolvin, 2015; Haf

and Parkhill, 2017; Veelen and Haggett, 2017). However, within the study findings, there was some reflection on supporting communities and resilience, but only a limited emphasis on facilitating language retention in particular communities.

Moving towards a community-decentralised model

In the study a particular motivation for some shareholders across the cases was actively supporting a shift away from a centralized model of energy provision towards adopting a decentralized approach, positioned at a local level. The early work of Walker (2008) identified the relevance of a number of incentives for participation in CRE projects. In particular, CRE projects presented opportunities for providing local income and potentially developing communities, as well as affirming local control over locally based resources, the siting of installations and the scope of development. Overall, in the study findings, communities were seen as having a more prominent role in a low-carbon transition, seen as a driving force by participants within GR and AC CRE projects. For instance, a shareholder highlighted the CRE project was an *"alternative way of doing things".* In this way, CRE projects were an alternative model that unlocked the potential to 'empowering' communities. This idea of an energy transition focused not only on moving away from fossil fuels and a decentralized model but also engaging in social change and sharing risks and assets as a collective.

> *"I think that cross the board with any community stuff, the individuals coming together, willing to make a contribution, knowing its part of a bigger whole that needs them as individuals. I guess community energy is about empowering communities, so there is an alternative way of doing things. So, you don't have to rely on the big six energy providers to generate the electricity, it's about, having shared assets. So, community energy is about exploring those alternatives, sharing risks." (GRKS3).*

 In this way, a participant from AC emphasised how the CRE project represented a more equitable and just transition, with communities having a greater role to play. This was rather than an overreliance on large scale energy companies: *"That whole sort of democratisation of energy rather than it just being controlled by large multinationals" (ACKS1).*

Indeed, the findings highlighted how community energy was connected to the idea of reinvesting and represented a positive loop where benefits of CRE projects are retained locally. This was in contrast to being "*syphoned off*". In this way, motivation was about community benefit and local impact rather than remote factors.

> "*It's generating renewable energy where the funds are being recycled back into community benefit rather than being syphoned off for some horrible multinational.*" (ACKS2)

A shareholder from YPP highlighted the importance of a shift to a decentralised energy system, as a driver underpinning involvement in the project. In this way, there was a focus on income being generated and retained within the community. As such, the CRE project was viewed as part of a shift away from control and income being retained outside communities and having a role in moving from a centralised to a decentralised model. This also focused on the development of smaller-scale community models, reducing carbon and building resilience in the energy system a whole.

> "*There was this thing about feeding off a decent pool of money back into the community every year. And that's taking that money away from the National grid, the big energy generators and giving it back to the community. The whole idea that it doesn't have to just be managed centrally. I think separating the energy supply is better than a number of ways, it doesn't centralise all profits for a start and it means that all systems more resilient, more future proof and a little carbon footprint.*" (YPPS2)

The participant developed the notion of increased empowerment and a sense of local control framed as "*energy democracy*" on a community level, as part of the move away from the commercial energy companies. The generation of energy locally was important in a vision of community energy, focused on enabling communities to gain greater autonomy and resilience.

> "*The phrase I use, which is energy democracy. Which is I'm trying to snatch the cartel of the big energy companies by actually I'm not needing them any*

more... Anything like that, that means that people and communities are disconnected from dependency, whether that's in food supply, whether it's in energy.'" (CYKS3)

In this way, the motivations of the participant were driven by a shift from fossil fuels towards a local and decentralized model. For instance, a participant recognized the importance of national infrastructure, such as the National Grid, but with an increase position for communities that "*create, use and consume locally as possible*" within the energy system.

> *"Motivation really it's you know getting away from fossil fuels, trying to and also localising as much as possible decentralising wherever possible. You need centralised systems you need things like the National Grid you need those things in place but create, use and consume locally as possible." (YOS2)*

In the context of YPP, the case of a commercial renewable project within the locality represented a particular motivation for participants to build a CRE owned project. The proposed development of a commercially owned hydro scheme in the area represented a catalytic event. This was in a disused quarry (Glyn Rhonwy) and highlighted those local resources were being leaked out of the area, rather than being used for local benefit. As noted by a participant, this initial catalyst gained traction through the mechanism of a "*rant*" by a community member in a local newspaper, leading to an accelerated motivation to act and create a community-owned project for local benefit. This was reiterated by other participants in YPP (YPPKS5; YPPKS1). A further catalytic element in the motivation was access to an external case exemplar in an adjacent valley (Aber) demonstrating that a CRE project may be feasible.

> *"So {name} the chair of the company, had a rant in the paper 'Bro' {local paper} … about the Quarry Battery Company which is going to run a storage scheme. But the root of the argument of {name} was that the income of our natural resources again going over the border or out of our communities again. And a London company was the developer, so the resources going out of the valley again so (name) phoned to say because they had recently finished the Aber scheme…if you fancy starting a community energy*

company then? Because you've had a rant about this what about doing
something worthwhile about it?" (YPPKS2)

Community ownership and benefit

Across the case studies community ownership and benefits was a key driver for motivation, such as stakeholders within Gower Regeneration, AC and YO. For instance, a participant from AC highlighted the significance of a community having a stake in the CRE wind farm project as part of local driving factors. It was also seen as a community approach to developing renewable energy projects in the future.

> *"It was the idea really, that somebody thought that a community could actually own a wind farm…was a really new idea to me. And it sounded like a really good way forward." (ACS3)*

Further, in Gower Regeneration, a stakeholder identified the importance of local benefit being nested within the interrelationship between renewable energy and community ownership. As such, it represented a mechanism for generating local benefit as a shared asset by, and for the community.

> *"To put an asset into community ownership, and another to create community benefit, and a company who could engage communities, and do something that make the most of valuable natural resource for local benefit… wider than the renewable energy side actually. It is an asset that could be appreciated and shared by people locally." (GRKS1)*

The notion of generating a "*community asset"* had an important role to play as part of involvement with CRE projects for stakeholders across cases. For instance, stakeholder in AC identified the importance of the project being community led and owned, as a key motivator.

> *"I wouldn't have wanted to get involved if it wasn't a community asset. If it was just some company I wouldn't have wanted to know, but because it was a very much, let's try and make this work for the local area." (ACKS2)*

In a similar way, in YO a participant highlighted how motivation to engage with the CRE project was based on local interest focused on local investment, centred on using local natural resources for local benefit.

> *"It's just potential to use this local resource. Quickly I realised there were people from the meeting who wanted to invest immediately. I think they're investing because of the commitment to something local, where the local community will hopefully benefit in due course." (YOKS5)*

Local income and community investment

As part of the study findings, participants across the case studies identified the importance of local ownership. This centred on investing income from CRE projects into the local community as a key motivational factor behind involvement in projects. For instance, a participant from AC reiterated the focus on local investment as a local driver for engagement in the project.

> *"So, it was could you have a wind farm which was locally owned and put all its profits into community projects." (ACKS1)*

This standpoint was reflected as part of the shareholders account in YPP and YO, with an emphasis on the importance of investment into the community hydro to generate wider benefits for the locality. This was exemplified by a participant in YO, who identified the importance of being able "*to help the community*". In this way, community benefit and local investment was better than investing money "*into English banks*".

> *"Just wanting to help the community and not put money into English banks. Because it's a type of profit and help to the community as well." (YOS1)*

As part of the findings, the overall shareholder motivations were not primarily focused on personal financial gain. Rather motivation was firmly anchored in the sense of generating community benefit. For example, the following extract from a participant in YPP identified the importance of community benefit in shaping the decision to become a shareholder. The potential for modest financial gain was rooted in a motivation that local investment had utility for the community: *"I saw*

with the YPP one, there was a return for me, I was getting money but that not what drives me, it's the community getting money" (YPPS3). Equally, in GR a stakeholder indicated the importance of investment within a local context as a key part of their motivation for involvement in the CRE project. This centred on generating energy that then created a sustainable income to support the local economy and community projects, embedded in a Community Benefit Fund.

> *"It's about investing in the green economy, keeping money in the local economy….and another big thing that attracted to me to it was the profit that's generated support new projects. Technically should be pretty sustainable model there, keep producing the energy and the money from it, so that's going to give us the Community Benefit Fund… helping the local economy and supporting the local community." (GRKS3).*

In the literature the area of local and long-term revenue from CRE projects was seen as significant and this resonated with the study findings. This was aligned to the importance for participants of having projects positioned as community-owned and securing local benefits (Rogers *et al.*, 2008; Haggett and Aitken, 2015; Markantoni and Woolvin, 2015). Again, these study findings were echoed in the literature, highlighting the significance of projects providing a reliable source of local income that could be invested into communities. As such the literature and findings from the study identified the potentially empowering element of developing CRE projects within communities, through local leadership and ownership (Hielscher, 2011; Haggett *et al.*, 2013; Hicks and Ison, 2018; Slee, 2020).

6.4.3 Interplay between local and global drivers

As part of the study findings both stakeholders and shareholders identified the importance of an interplay between local and global drivers in terms of motivations that encompassed socio-cultural, economic and environmental factors. As such, the motivations for participants investing in the CRE project was centred on the interplay between a diverse range of key factors, shaping people's decision-making processes to engage and invest in the CRE project. These focused on the coupling of local and global drivers and represented a balance between social and an environmental objective underpinning CRE projects. Further, participants

highlighted how, often, local issues were linked to social concerns, such as local resources for local benefits to retain income in their area. This was in parallel to environmental issues which related to global concerns, such as climate change and the role of communities within low carbon transition.

Indeed, the literature indicates that socio-economic impacts from CRE projects are viewed as equally important as environmental outcomes for communities, emphasising the relevance of local as well as global motivations for engaging with RE (Haggett *et al.*, 2013; Seyfang, Park and Smith, 2013; Callaghan and Williams, 2014; Creamer, Eadson, van Veelen, *et al.*, 2018). In the study, this was also reflected in the findings. However, the work of Islar and Busch (2016) Islar and Busch (2016) in Germany and Denmark provides a different standpoint, indicating the centrality of local objectives as drivers for engagement with CRE projects as exemplified by the statement: "*We are not in this to save the polar bears!"* (P311). In this way, the development of local cohesion, the community and its economy were seen as more important for communities than the wider discourse on global sustainability.   However, in the study findings there was a more balanced and nuanced approach with an interplay between these factors.

In this context, place attachment was relevant in influencing and shaping how these global and local motivations generated involvement with the CRE project. In terms of motivation at a local level, place attachment was identified in the literature and the study findings as a significant factor linked to a situational identity and emotional attachment, with community members anchored to localities and expressing a sense of meaning linked to place. As such, these factors acted as drivers for community action (Manzo and Perkins, 2006; Rogers *et al.*, 2008; Devine-, 2009; Haf and Parkhill, 2017; Süsser, Döring and Ratter, 2017; Veelen and Haggett, 2017). Indeed, the literature suggests that place attachment is significant in terms of social acceptance of renewable projects, and the importance of the relationship between a scheme and the proposed positioning within a place (Devine-Wright, 2011; Devine-Wright and Batel, 2017). Communities may oppose schemes that seem to conflict with local constructions of place, that potentially represent an industrialisation of a natural landscape (Devine- and Howes, 2010). As

such, acceptance of CRE projects, both commercial and community require it to "*maintain or promote place distinctiveness and historical continuity*" (Devine-Wright and Batel, 2017 P110; Veelen and Haggett, 2017). In a similar way, the study findings echo the early work of Manzo and Perkins (2006) which identified how at an individual and collective level, place attachment was relevant in facilitating shared community action in RE.

Yet at a broader level, communities also related to a sense of global attachment that extended outside their local context, as part of multiple forms of attachment. This may underpin engagement with CRE projects, with the global level relevant linked to tackling climate issues (Devine-Wright, Price and Leviston, 2015; Devine- and Batel, 2017). Overall, communities are able to draw on a repertoire of positions and identities to both object or support to the development of RE schemes. As such, these are framed around local and global motivations and citizenship (Devine- and Batel, 2017). In the study findings, this was strongly echoed, with the interplay between local and global drivers. For instance, community ownership and a de-centralised model resonated with a local place identity and attachment. In this way, CRE projects were viewed as contrasting with past exploitation of natural resources by external actors but also represented a mechanism of increasing renewable energy generation to combat global climate change.

A stakeholder from YO referenced the global context centred on using renewable energy as having an environmental value and using natural resources, whilst also focusing on local social impacts through community investment.

> *"So, part of the aim, was to create community benefit, so there is a pot of money that is available to reinvest into the community. The second aim, being that environmental benefit as well. So as green energy, we are looking at using energy from our River Ogwen in the community through the scheme energy local." (YOKS1)*

A shareholder in YPP detailed the key interrelationship between local and global issues, focused on local concerns being positioned alongside combating climate change and addressing global-environmental challenges. In this extract there was

an emphasis on the importance of local concerns, centred on retaining natural resources for the benefit of the local community. This was in addition to a wider contribution towards advancing renewable energy and a low-carbon transition.

> *"We have been complaining since I was a young boy that Welsh natural resources going to England. And this was one way of keeping natural resources locally …and brining some income in, for the local people in the community and I believe, in things like having renewable energy." (YPPS1)*

In a similar way, a stakeholder from GR highlighted the key motivation for involvement in the CRE project as centred on global-environmental concerns combined with the local generation of community benefit. Importantly, both social and environmental objectives were seen as mutually supportive.

> *"I'm passionate about environmental issues. The chance to get involved in creating a new scheme for renewable energy which has a community benefit front to it as well." (GRKS4)*

In the case of YPP, a stakeholder indicated the relevance of global environmental issues and economic gains to be had from renewable energy as the strong motivation and driving force behind the project. Local drivers included the way in which the CRE project brought the community together and facilitated local impacts through investment targeted towards the community. This was alongside the broader context of carbon reduction.

> *"It's a way of generating energy, that its clean energy, decreased carbon, but to us that's not the most important thing about it. Its the way it brings people together to highlight the fact that local investment can have an effect… just happened that one of the easier things for us to do was to build a hydro. But that element of bringing people together was the motivation for me to be part of it." (YPPKS2)*

Equally, a stakeholder from AC mapped how motivations balanced social and environmental factors. As such, the local context centred on local people being able to 'have a stake' in shaping the energy system, drawing a comparison between commercial and community initiatives. Therefore, community involvement had a

significant role in tackling climate change as a global concern, with CRE being a key vehicle for this low-carbon transition.

> *"I think it's around having a stake in benefiting from renewable energy and energy efficiency. That whole sort of democratisation of energy rather than it just being controlled by large multinationals. Given it just seems an increasingly good idea that if we're going to deal with climate change, we need to involve people in whatever form of renewables that we possibly can and yes, community energy is a response to that." (ACKS1)*

A key stakeholder from the CY Consortium identified important motivational factors behind involvement in community energy, bridging both global and local drivers. This stemmed from an interest in the technical aspect of renewable energy and the fact it signified a shift away from fossil fuels and a reduction in environmental impact. Alongside this, there was also a strong social motivation by the participant to engage in community energy centred on community empowerment and sense of local control.

> *"In terms of renewable energy, it's something I've always had an interest in, it's exciting to be able to make a transition to new forms of energy generation which have less environmental impact and particularly which empower families and communities to be able to take control of their own destiny. So, I've been interested not just in the renewable energy technology, I'm very interested in the socio-political impact of its delivery." (CYKS2)*

In a similar context, a shareholder in AC highlighted how the motivation to invest was "*two-fold*" linking with other shareholder interviews in the overall theme of local and global concerns seen as significant. Firstly, the project was "*fairly local*" within the South Wales region. Yet this was interlinked with wider issues of a global nature focused on tackling climate change and moving away from fossil fuels, acting as a driver. Overall, the participant re-emphasised the mix of motivations in having monetary value but also global environmental issues both influencing the shareholder decision making processes.

"Well two-fold, one as an alternative investment at the time 7% looked good, I'm not in the immediate community but I am in South Wales, so it is relatively local, and it also hits me with the environmental issues that concern me. So, it's partly investment, but it was also a clearly a good way of tackling some of the global issues I'm concerned about." (ASC4)

The motivations of some shareholders were strongly anchored in long-standing beliefs in sustainable living and supporting an increased amount of small-scale renewable energy. For instance, a shareholder in YO considered this as a catalyst in generating a shift in the energy system towards a decentralised model, without a reliance on large-scale, coal or nuclear based power stations. Another driver for the shareholder was harnessing natural local resources. Overall, the shareholder was motivated by both global factors but also local factors, emphasising the value of people making a positive contribution on a community level.

"I think it was a no-brainer, really. I was interested in things that are sustainable for a long time. And since we have the rain, why not use it? I think my main thing for me that it was environmental and community. I just like the idea that communities can do that and that you don't have to rely on big companies … And a feeling that you can change something if you believe in it." (YOS5)

6.5 Modes of civic engagement

Haggett and Aitken (2015) observe the increased significance of civic engagement in the RE sector, which has been previously dominated by large-scale commercial ventures, based on a centralised model. Importantly, Islar and Busch (2016) identify how collective involvement in "*community renewable energy projects help to enable communities to act as citizens, rather than consumers*" (P303). In this context, significantly the study findings highlight how civic engagement in RE schemes may centre on communities having a role in the energy system based on community-led and owned schemes, enabled through collective action.

Further, the study findings highlighted how a range of actors were engaged with the CRE projects focused on three levels of civic engagement. These three levels were exemplified by a stakeholder in YPP, describing the engagement of the

Directors, shareholders and the wider community: *"Who is Ynni Padarn Peris? You have the Directors, you have the shareholders and you have the community. You have three levels." (YPPKS1).* Directors had an active role driving forward and managing projects, whereas the shareholders occupied a passive role following on from their initial investment in the project. Finally, the wider engagement of the community represented a focus for distribution of benefits from CRE projects.

6.5.1 Active and passive role of key stakeholders

A particular feature identified in the literature is the tendency for CRE projects to be led by a small number of highly motivated key individuals, which in turn may lead to the broader community having only a limited role or involvement (Middlemiss and Parrish, 2010; Markantoni and Aitken, 2016; Creamer *et al.*, 2019). However, the work of Hoffman and High-Pippert (2010) suggest that there are benefits to a discrete number of key individuals being highly committed to the CRE project as they then become catalysts for the wider community, who generally prefer a marginal degree of involvement. As such, the literature highlights that CRE projects do not necessarily need to operate at the maximum level of citizenship power for community members to consider themselves engaged or gain benefits from involvement (Rogers *et al.*, 2008). In the study, the researcher's findings highlighted the degree of local participation in CRE projects, focused on the central role of key stakeholders and the more peripheral position of shareholders (Table28).

In terms of shareholders, the literature is rather fragmented with a focus on key actors but less attention on the perception and experiences of shareholders participating in CRE projects. For instance, Genus and Iskandarova (2020) explored the perspective of a range of 29 actors, from directors and investors to local authorities, involved in CRE within England. This provides insights into the range of actors involved in CRE but highlights the insufficient detailed consideration of shareholders, who may not play an active role beyond investment but are important participants in CRE (Kalkbrenner and Roosen, 2016). Importantly, the study findings delineate a passive but nuanced role by shareholders.

The seminal work of Walker and Cass (2007) identify how in the development of CRE projects on the ground there are a range of key roles evidenced as part of community involvement with schemes. These varied across being an 'active consumer' to 'project participant' or 'local beneficiary'. The study findings highlighted that after the initial engagement of investing in the CRE project through the community share offer, the shareholders occupied a passive role once the project was established. In this context, they were not involved in the day-to-day management of the projects. A key mechanism for engagement was updates through newsletters and social media focused on the key challenges facing the CRE projects, as well as the AGM. In this way, a financial investment represented their main role within the project and defined the limits of engagement.

Table 28: Active and passive roles in CRE projects: Exemplars

Active role of key stakeholders	Passive role of shareholders
In terms of the active role of Directors and Trustees, a participant from AC mapped how they were engaged as committee members. In essence, the roles focused on appropriate governance linked to the CRE project aims. *"So, what tends to happen is, if {name} got something where he needs Trustee input he'll be in touch …My role in it was basically to make sure that AAT was behaving in accordance with its aims. It wasn't just sending us all on holidays to the Bahamas." (ACKS2)* A stakeholder from YPP outlined how the core project group, focused on Directors, had weekly meetings. This was linked to reviewing any updates and general maintenance of the project. *"The Directors meet up every week…every Monday evening if there is something to discuss sometimes. To do with maintenance and what's going on." (YPPKS1)* A participant in YO indicated the relevance of gender within the existing Board of Directors, being "*top heavy with men*". In this	In the findings, the AGM was a key opportunity for engagement by shareholders with the CRE project, informing the decision-making process. For instance, a participant from YO highlighted how shareholders engaged in the overarching management of the CRE project with both an *"input and a voice"*. *"Like I was saying we collaborate closely with our shareholders, but we don't really call them shareholders really, we call them members. They have an input and a voice as say in a way that we run the organisation".* (YOKS1) A participant from YPP highlighted how the Board of Directors were democratically voted in with AGM. Yet there was limited attendance at the event by shareholders and the initial Directors had remained in post. *"We have a Board of Directors and all the shareholders get to vote those in or out. It hasn't changed since we set up the company…to tell you the truth small amount of*

context, the participant indicated the challenges of attracting new directors to take an active role within the project with greater inclusivity through the Annual General meeting (AGM).

"It is a good thing if you have new blood. Every AGM that YO holds, we ask if someone else wants to be a Director. We haven't got a new Directors this year, but we had some last year… but at the moment we only have two women. It would be nice to have some more women! It's a bit top heavy with men (laughs) (YOKS1)

Furthermore, some key stakeholders and volunteers were involved with supporting the activities around the hydro schemes of YO and YPP. The active engagement of volunteering was observed around the maintenance of the two hydro schemes by the researcher. Arguably, there was less need for regular volunteering involved with the maintenance of the wind turbines and solar farm, in contrast to the constant cycle of work to ensure successful operation of the hydro such as clearing debris or adjusting its operation during excessive rainfall. During the walking interview and observation fieldwork in YO (Memo, 2019), the researcher noted both the weekly clearing of leaves or debris around the hydro weir and the monthly checking of the turbine house by two volunteers (YOKS3).

them turn up to the AGM. Just enough for us to do quorate (laughs)" (YPPKS2)

Overall, the AGM meeting was an important mechanism of shareholder engagement for some participants, although not consistently for all shareholders. For instance, participants in the YPP highlighted a low level of active engagement in the CRE project after initially investing in the scheme. As such they adopted a passive role and had not attended any of the AGM meetings: *"I haven't been to one meeting yet. But that's how it should be run." (PS1).* Further, a participant YO highlighted how their engagement with the CRE project had changed over time. The participant indicated they hadn't been to any previous AGMs in the past. However, they had attended a recent AGM which had based on gaining more information regarding the community hydro which had subsequently heightened a sense of engagement.

"I didn't take much of an interest. But I went to this last one, and there I got more information, that's changed things for me after going to the last meeting". (YOS1).

Furthermore, as a participant from AC highlighted the AGM had a constitutional boundary as a *"necessity"* yet

"P1: To check that level of the river is okay, one of the volunteers comes here every week to make sure everything as it should be *P2: And then a check every month, which is bit more than what we do for the weekly check, to see how things are going."* (YOKS3)	the degree of influence by shareholders was limited. In this way, the AGM had limitations as it only provided a basic mechanism for engagement. However, the participant was uncertain whether they wished more active engagement, preferring a passive role. *"But it is a constitutional necessity, could I really influence much at the meeting I'm not sure, realistically but then I don't know if I would particularly want too, I just need to know it's coming along ok and that's as good a way".* (ACS1)

6.5.2 Adopting a BenComs model

The literature indicates that in a European CRE context, a cooperative rather than CBS was the dominant model (Seyfang, Park and Smith, 2013; Haggett and Aitken, 2015; van der Waal, 2020). As noted earlier, cooperatives are centred on benefiting their membership whereas CBS build on these beneficiaries and extend benefits to the wider community. The study findings highlighted how CRE projects utilised a CBS model across case studies, to facilitate the community as beneficiaries. Further, the findings from the study identified the advantages of raising finance but also disadvantages, including the exclusion of those in the community unable to engage financially as shareholders. Within the case studies, the CRE projects adopted a CBS model, leading to a subsequent stage of establishing a charity structure to enable the distribution of income generated from the CRE project, into the community. In this way, these two components were linked but also separate to ensure clear governance. The findings identified *what* was important to key stakeholders about adopting a BenComs model and *how* this related to a charity structure, related to process and outcomes (Table 29).

Table 29: Perceived key characteristics of Community Benefit Fund and Charities: Process and outcomes

	Community Benefit Society model (BenComs)	Charity structure
Process	Asset lock	Setting up a separate charity
	Registered society with financial conduct authority	Group of people to run the charity from the community
	Raising finance through community share offer	
	A type of co-operative	
	Established model	
	Challenge for those with low income able to participate	
Outcomes	Community ownership	Surplus income channelled for community investment
	Communication and delivery of community benefit	Delivery of community benefit through sustainability aims
	Surplus income available for local community benefit	
CRE Project Case Studies Exemplars	In the case of YPP a stakeholder outlined the reasons for choosing a CBS model. This was based on advice that focused on a consideration of wanting to have the status and structure of a co-operative, limited liability and having a membership with shares: "*We got advice from the co-op and we decided going for a Community Benefit Society …buying shares, limited liability and because we wanted the status of a co-operative*." (YPPKS2)	

| | In the case of AC a stakeholder identified that the CBS model was facilitating the process of development. This was especially relevant linked to the option of using share offers to raise finance for the scheme. It was also a familiar model with community energy groups in Wales. A challenge in the CBS approach was gaining the wider participation of those on lower income. Walker and Cass (2007) identify how the assumption that all communities can adopt a range of active roles may be unrealistic. As such, citizenship requires sufficient disposal income to engage with CRE projects as well as be part of its beneficiaries (Devine-, 2007; Walker and Cass, 2007): "Well, a good democratic tool for owning the project and it could do a share offer which was key to help pay for the project I think the fact that it was a well-trodden path by that point as well, and increasingly the kind of co-ops seems a better model for doing it. the challenge then is how you get people of low income engaged in that process." (ACKS1)

In the case of GR a stakeholder highlighted the advantages of a CBS model as a reliable framework. As such, it was seen as providing a straightforward mechanism to raise finance through the share offer process as well as securing the centrality of facilitating a community benefit as an outcome. A CBS model attempts to have a greater degree of collective benefits beyond membership, compared to cooperatives, and seeks to be more inclusive although still having limitations (Walker, 2008). This was reiterated in the findings, with the rationale for using a CBS model based on gaining wider beneficiaries in a particular community: "*So Its tried and tested model and it matched what we were trying to do, which is to put something into community ownership the actual process of issuing community shares. So, in terms of raising money from the public is not very arduous in terms of the compliance. Plus, Community benefit societies are designed to do what we're trying to achieve to benefit the community*." (GRKS1) | |

Interrelationship between CRE project and charity

The work of Slee (2015) highlights the lack of literature on the development of appropriate governance arrangements and its challenges, to provide the distribution of income in local communities. This requires both structural and skill-based components to manage significant revenue streams, without the development of community conflict. Significantly, this area was explored, with study findings providing insight into how CRE projects at an early stage, sought to set up charities to distribute benefits having to navigate the complexity of the process. For instance, this included establishing governance structures that ensured a connection between the aims of the CRE project and charity whilst also establishing an appropriate degree of distance between these entities. A range of issues were surfaced by the YO and YPP case studies centred on the interrelationship between CRE projects and the development of charities to distribute benefits. These projects were navigating these processes during the study period. In the context of Gower Regeneration, the CRE project was not in a position to address setting up a charity, whereas AC already had a well-established charity, framed as Awel Aman Tawe.

A stakeholder from YPP elaborated on how the relationship between CRE project and a 'charity' was at an early stage as part of a developmental process, emerging over time. A key component was the underpinning aim that community benefit was generated from the surplus income from the scheme, to be channelled into the local community. The process of delivery for community benefit was clearly defined as requiring a 'charity' structure for local benefit, with the decision-making resting with community representatives not the key stakeholder. As such, there was a degree of distance and separation between the initial CRE project and the structure for distributing community benefits.

> *"Yes, it's early days. The objectives were from the start, any money that was left over every year, we were contributing that to the community, and we are now in the process of setting up a charity in the valley so that the villages can benefit from the money we produce. But it's a fairly complicated process, and because we the Directors, we can't be members of the charity. What happens is the money is out of our hands and we have to ask again for*

> *volunteers in each village then to sit on the charity so that they can then decide where the money is distributed." (YPPKS3)*

As part of YO, a shareholder highlighted a similar process of transition and establishing a formal interrelationship between the CRE project and a 'charity' for community benefit. The developmental processes were still underway, as the CRE project were still using income to repay costs yet there was an exploration of how the charity would be established to deliver community benefit. The participant highlighted the nature of the ongoing discussion related to developing a charity within the project and the challenges involved in moving forward.

> *"Basically, once we've paid all our dues including the rent, any money left will then go into the community for one of our next tasks and the Board will set up a charity, we're all kind of lay people and trying to understand and I know nothing about how to set up a charity or what's the best way of doing it, but in principle set up a charity and that charity then works for the organisation. And then the idea is that people then come, apply and use the money for community. We haven't got to that point quite yet." (YOKS2)*

In a similar context, a stakeholder in YPP identified the developmental processes linked to the CRE project. A key aspect was the relationship between the CRE project and the charity, resulting in certain boundaries around what would be social impacts from the view of the CRE project. In this way, the new charity was focused on appropriate community benefit projects, targeting on local sustainability and engaging with local schools.

> *"We are not giving the money, spending 5 or 10 thousand on a 'Coca-Cola' lorry around Christmas (laughs) but if they decide to do a project working with the schools, about rubbish and society, about facilitating the development of wild areas, or creating places of nature in woodland, projects that engaged and connected with schools. We would be very happy to do that." (YPPKS5)*

This theme of boundaries and defining the interrelationship between the CRE project and 'charity' was reiterated by a participant in YO (YOKS5). However, a

central feature of the relationship was the alignment between the aims of the CRE project and focusing on social and environmental objectives. In YO, participants highlighted how at this early-stage key issues included navigating registering as a charity and ensuring the CRE project aims, and objectives were reflected and translated into the charity. Following on this, the participants intended to take a step back and "*will keep at arm length*". As such, the CRE project would not be involved the decision-making process behind the delivery of social impacts from the charity yet would need to relate to the overarching aims of YO. These themes were reiterated by other participants within YO (YOKS4) and YPP *(YPPKS5).*

> "*Well, as part of YO {name} and I are on the Board of YO, and but we're trying to keep at arm's length from the charity, but we've guided them and we're doing a lot of work to 'put things on the right track' and start to pulling things together, -they will probably be the trustees for the charity, and in time, {name} and I can move away from the charity as we don't want YO to be part of deciding where the money goes. But they keep within the principles, within the original prospectus." (P2)*

6.6 Summary

The chapter identified different modes of civic engagement across the respective case studies. This included identifying a three-part developmental process underpinning the emergence of CRE projects based on civic engagement. The study findings also highlighted the main challenges faced in engaging with CRE by stakeholders. In addition, the findings document what local and global factors were important in being motivated to become involved with a CRE project. Significantly, the findings highlighted how these operated across different actors and represented varying degrees of engagement with the CRE projects. Further, the findings identified the CBS model used by CRE groups as part of civic engagement that aimed to deliver benefits for local communities and supported the development of energised communities.

CHAPTER SEVEN:
FINDINGS AND ANALYSIS: SOCIAL IMPACTS FROM CRE

7.1 Introduction

The study findings indicated a number of important social impacts arising from CRE projects leading to energised communities, ranging across socio-cultural, environmental and economic aspects. Importantly, these social impacts were identified by participants involved in the CRE projects focused on key stakeholders and shareholders, as well as the wider perspective of community hubs. In this way, the findings addressed the research question focused on *What are the social impacts for Welsh communities in a community renewable energy context?* As such, it provided insights into how these social impacts were understood and perceived by a range of actors. Overall, there was an increasing range to the scale of social impacts across differing constituencies, focused on stakeholder as a core group with concentrated impacts. Whereas the shareholders had a widening, intermediate scale of social impacts arising from investment in projects, and finally the wider community with a more diffuse scale of impacts linked to community benefit.

The study reflected the stance adopted by Hicks (2018), highlighting the importance of examining the experiences of local communities, so as to understand social impacts, based on a qualitative approach. This enabled the discovery of less tangible impacts that may not be easily quantifiable, such as interrelationships between community actors that extend beyond the number of people as members or kilowatt measures of energy generated (Hicks, 2018). As such, the study built on the insights identified by the seminal work of Walker *et al.*, al (2007) and Walker and Devine-Wright (2008), identifying the need for a more considered account of impacts. This included a focus on nuanced social impacts that may spread across

time, including linkages to addressing climate change, renewable energy transition and developing local communities. At its core this required attention to project-based evaluations and a holistic lens (Walker *et al.*, 2007; van der Waal, 2020). Further, the literature has focused on the social acceptance of RE and how CRE might reduce opposition to renewables (Slee, 2020). However, the study findings moved beyond acceptance, and highlighted how communities engaged and became involved with CRE projects, thereby identifying the nature of social impacts.

Overall, the literature identified a broad range of impacts from CRE projects across economic, socio-cultural and environmental aspects (Walker *et al.*, 2010; Hicks and Ison, 2011; Rogers *et al.*, 2012a; Haggett and Aitken, 2015; Berka and Creamer, 2018; Brummer, 2018; Slee, 2020). Although, the degree of evidence on social and economic impacts are limited by the recent nature of the field, the literature surfaces the relevance of outcomes centred on increased knowledge, energy awareness, resilience, empowerment and addressing fuel poverty, as well as enhancing the local economy (Hicks and Ison, 2011; Rogers *et al.*, 2012a; Walton, 2012; Forman, 2017). In comparison, there is a significant literature on the processes and motivating factors in engaging with CRE, yet there remains a gap in the literature around social impacts of CRE beyond social acceptance. This is due to the tendency of the CRE literature to "*concentrate on the means by which CRE develops, rather on its ends*" (Creamer *et al.*, 2019, P1). Significantly, the study findings address this gap by highlighting the experiences of actors involved in projects and the perceived social impacts in Welsh communities.

Within the literature, a key review of the evidence by Berka and Creamer (2018) highlights the value of comprehending social impacts from CRE projects. This is based on gaining clarity regarding the factors underpinning impacts and their alignment to different forms of CRE projects. A key focus is on distinguishing between impacts linked to the process of developing projects and direct the project-based outcomes, in comparison to those indirect and long-term processes facilitated by income provided for local communities by CRE projects (Berka and Creamer, 2018). In this way, the schematic (Figure 50 provides a useful mapping of different pathways of impacts. The evidence-base tends to locate gaining

knowledge, skill sets, social capital, reducing energy poverty, energy literacy and awareness of renewables as aligned with processes linked to project development and direct impacts (Hicks and Ison, 2011, 2018; Walton, 2012; Haggett and Aitken, 2015; van der Waal, 2020). On the other hand, empowering communities, social and economic regeneration as well as energy literacy and pro-environment behaviour are viewed as indirect and longer-term impacts (Walker, 2011; Callaghan and Williams, 2014; Bere, Jones and Jones, 2015; Steiner and Markantoni, 2016; Slee, 2020). Importantly, indirect impacts are reliant upon the distribution of income from CRE projects to support social and environmental action and projects on a community level. However, these may not always arise from all CRE projects (Berka and Creamer, 2018; Slee, 2020).

 The study findings built on the literature examining social impacts, centred on the processes involved in the project development that led to particular outcomes. Importantly, the findings augment the evidence and highlight the emergence of direct impacts from CRE projects, whilst being cognisant of any potential long-term indirect impacts. In this way, the study findings provided analytic insights into the overall social impacts leading to energised communities.

Figure 50:   Mapping CRE project types, preconditions and interrelationship to impacts (Berka and Creamer, 2018)

333
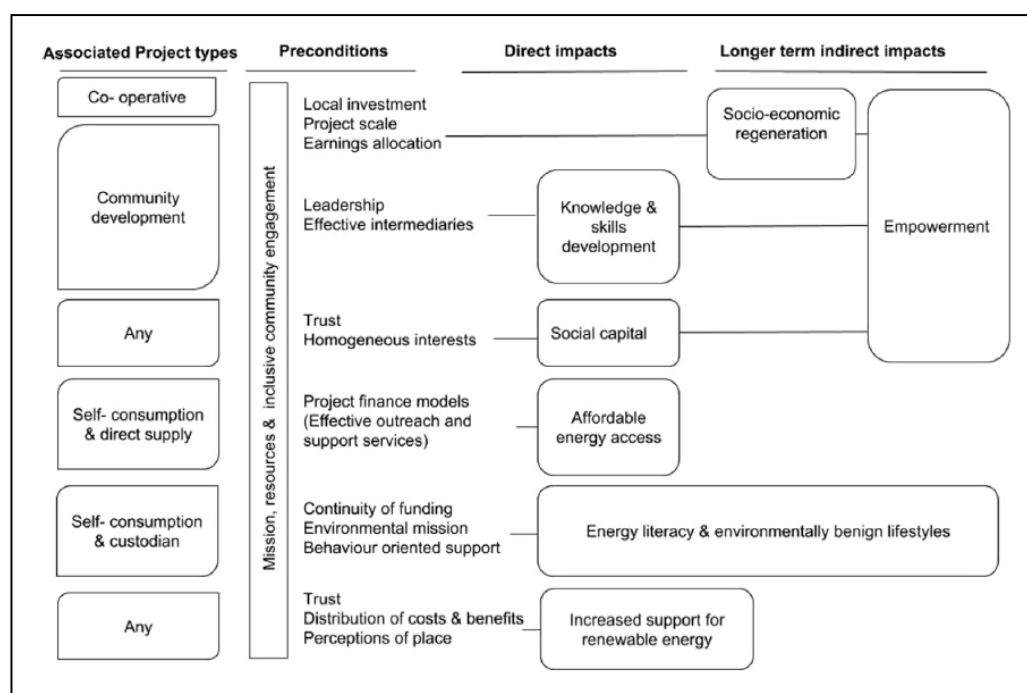
Overall, a key and novel finding from the study was that social impacts emerging from CRE projects were perceived and experienced by participants as cutting across socio-cultural, environmental and economic aspects (Table 30). Significantly, a characteristic of the social impacts was that they were centred on both a current context and anticipated future impacts, representing a temporal component.

Table 30: Findings: Overall social impacts from CRE projects

Social Impacts from CRE projects	Current and Future Impacts
Socio-cultural Aspects	• Cultivating Confidence and skills • Catalyst and Building capacity for further community projects • Making a contribution and 'Feel-good feeling' • Local decision-making and ownership • Community confidence and pride • Wider Community engagement and awareness with the CRE project • Broad range and meaningful social impacts • Balancing social and environmental impacts • Different stages of anticipating social impacts
Environmental Aspects	• Pre-existing environmental attitudes and impact on awareness of energy issues • Feeling empowered and tackling climate change • More Renewable energy and environmental projects • Renewable energy education • Perceived positive and negative environmental impacts of CRE
Economic Aspects	• Economic return on investment • Local and long-term income • Distributing income and community benefit funds • Reduced energy consumption and cost • Employment opportunities

Within the study findings, the thematic areas of socio-cultural, environmental and economic aspects indicated the significant and broad set of impacts attributed to CRE project by participants in Welsh CRE projects. Within these thematic areas, the synergy between a set of social impacts represented the key perceived social impacts of Welsh CRE projects (Figure 51). These focused on CRE projects generating both renewable energy and building long term income over time. This was retained by local communities and focused on channelling the delivery of community benefits. In addition, socio-cultural impacts were based on local ownership and decision-making, as well as subsequently balancing both social and environmental impacts emerging from CRE projects. Furthermore, the development of community engagement with renewable energy and education centred not only the CRE projects themselves, but also wider sustainability issues.

Figure 51: Findings: Mapping the key perceived social impacts in Welsh CRE projects
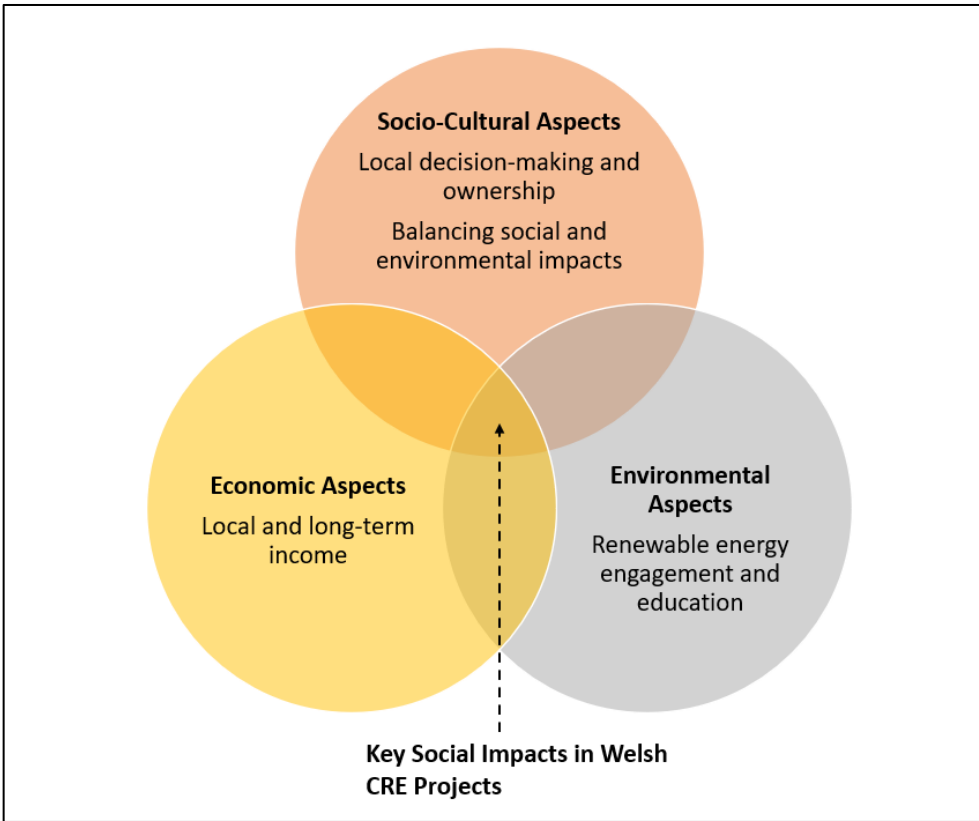
Overall the literature often adopts an uncritical approach to anticipated impacts from CRE projects (van der Waal, 2020), such as emphasising a growth in cohesive and skilled communities as well as empowerment (Walton, 2012; Seyfang, Park and Smith, 2013; Hicks and Ison, 2018). Indeed, van der Waal (2020) highlights how some of these areas are more evidenced than others within the literature, yet overall, there was a need to clarify how these areas are applied in practice and interpreted. In this way, the study findings extended the literature by developing a fuller account of how social impacts from CRE projects are experienced.

7.2 Socio-cultural Aspects of Social Impacts

7.2.1 Cultivating Confidence and skills

The literature identified how involvement with CRE projects supported the generation of skills-base and knowledge across project management, raising finance as well as increased understanding of renewable energy (Hicks and Ison, 2011; Walton, 2012; Berka and Creamer, 2018). The study findings resonated with the literature across case studies, with CRE groups emerging as more confident and knowledgeable from being active participants in schemes. In this context, Berka and Creamer (2018) highlighted the importance of both existing cultural capital in communities as well as building new knowledge. However, Bere, Jones and Jones (2015) identified how most of learning and development was centred on key individuals within CRE groups who were highly active in its development and facilitated its success. Yet this introduced potential instability to CRE groups, centred on the risk of losing the gains of both skills and knowledge, if these key stakeholders left the schemes. Importantly, these observations in the literature were also reflected in the study findings.

In the study findings, a stakeholder from YPP highlighted how there had been progress during the last five years in building confidence and a skillset in successfully setting up the CRE project. This was seen as generating both income and a surplus which could benefit the local community.

> *"Compare where we are now as a group. We have experience. We have a track record. We have a confidence now that we can set up a scheme that is profitable, and we aim to use some of that money for the benefit of the community." (YPPKS5)*

This was reiterated by another participant, identifying an increased confidence to manage funds, which was identified as a key change, fostering capacity to generate a similar type of project in the future (YPPKS1).

A stakeholder from GR identified the value of the learning process from engaging and leading the CRE project, especially when involved in its early stages. This focused on the acquisition of new skills and knowledge, particularly in the technical area of renewable energy and contractors. This was reiterated by other participants, including a focus on understanding the renewable energy sector and the energy market (GRKS4).

> *"Yes, I have to say me and {name} have learned a hell of a lot (laughs) about the whole process. I'm not technically minded, I've learned a lot about renewable energy, and I've learnt a lot about contractors as well." (GRKS1)*

7.2.2 Catalyst and building capacity for further community projects

The literature indicated that involvement with CRE projects facilitated greater capacity within key actors to develop further projects and activities (Hoffman and High-Pippert, 2010a; Rogers *et al.*, 2012b). The individual gains may not be significant, yet the overarching development of empowerment and confidence across CRE projects over time is impactful (Callaghan and Williams, 2014). Further, the literature details how CRE projects utilise and develop social capital and skills, providing a platform of capacity building acting as a 'feedback loop' that moves forward future sustainable projects through an empowering process (Walker *et al.*, 2010; Creamer, 2015). Significantly, in the study findings, the role of community energy in building capacity within communities was identified by stakeholders. For instance, participants in YPP identified the significance of generating confidence in key actors from successfully building the scheme, including a greater capacity to act on a community level. (*YPPKS2).*

"But as well community energy creates confidence in some in the community saying, gosh we can do this, and the project can do more and more and more." (YPPKS1)

In a similar way, another stakeholder from GR identified a growth in confidence and capacity to act from their involvement with the CRE project. This included knowledge of the key processes to develop new schemes, such as financial arrangements and sources of support.

"I probably did develop new skills… I could say I could run my own community project; I've certainly got an idea of its how it done. And maybe a better understanding of the financial set up that you need." (GRKS3)

In a similar way, a stakeholder identified that YO now acted as a platform for an emphasis not only on cultural projects but also on environmental schemes focused on a local context, including community transport and community food. However, these initiatives had stemmed from the growth of capability and capability from the success of the community energy scheme so that *"YO has been a catalyst"* for further community action and local sustainability initiatives.

"There is a 'can-do-mentality' now and you're talking about an area really, where the projects really have been rather cultural. So, any community green space, that we encourage people to grow their own vegetables. YO has been a catalyst, to think about more green projects. We are also looking at community transport in the valley and charging points. But the fact we have developed environmental project that have been so successful, that gives you confidence." (YOKS1)

This theme of acting potentially as a catalyst was reiterated by participants in GR (GRKS2; GRKS3). It was identified as providing a source of inspiration for future development of CRE projects.

"I know it's quite hard to do a community membership project at the moment, but hopefully inspire some others to take action themselves. Obviously, there's only so many we can do. But it would be great if there was another… obviously there are people all over the UK and all over Wales doing it, but it would be great if we could inspire some people who are already in the sector and active to do a project themselves." (GRKS2)

339

In terms of the literature, Hicks (2018) identified how the involvement of communities with CRE projects generate greater empowerment in enacting change. This was based on enhanced knowledge and skill sets and the success of setting up a CRE project (Parkhill *et al.*, 2015; van der Waal, 2020). Indeed, Middlemiss and Parrish (2010) described a cyclical process of development whereby one project led to another. Interestingly, these observations were reflected in the study findings as witnessed with YO, AC and GR taking projects forward. In the case of YPP there was the capacity and intention to take such actions forward.

7.2.3 Making a contribution and 'Feel-good feeling'

Overall, an important social impact for shareholders was a sense of making a contribution through involvement with a CRE project, taking community action through engagement. This was exemplified by a participant from YPP who highlighted how shareholders had a sense of being part of a scheme that was taking practical action. Although they occupied a largely passive role as shareholders compared to the critical role of key stakeholders, their involvement supported collective action and delivering the project.

> *"I think it's more it's more a sense of having done something and tried to express an opinion and then something practical. I think the committee members are the people bring it forward and got much more right to say this, because they've actually made it happen. But you feel like you're doing something." (PS2)*

Indeed, participants in AC and YO positioned the main outcome as having made a positive contribution in setting up the CRE scheme and the benefits that emerged from the scheme (YOS5; YOS2). In this way, the investment was viewed as potentially supporting more community renewable energy projects being energised because of the initial scheme.

> *"It was just helping to get the thing off the ground. In theory, any money made, is put back into community energy projects, but nice to be part of something that doing something good within the local community." (ACS2)*

In a similar way, a participant from AC reiterated the views of other shareholders, emphasising that there was a contribution focused on social impacts as well as the financial returns on investment from involvement with the CRE project. This centred on the development of a hub to enhance renewable energy education within the community.

> *"The educational opportunities, the schools getting to visit, the possibility of the Cwmgors school building as an Environmental Centre, it's just nice to feel like you did something towards that. But also, there's a monetary return."*
> *(ACS5)*

Also, the study findings highlighted a sense of pride and a 'feel-good feeling' from their involvement with CRE projects. This was exemplified by a participant from YO who reflected on the success of the scheme and affirmed pride as part of their involvement in developing the CRE project. This was contrasted with the initial feelings of uncertainty about the community energy group's activities, with the investment being a "stab in the dark". Overall, the shareholder viewed the investment as having been beneficial and a positive experience.

> *"Lot more positive, it's going good and proud and glad to part of it. Before I wasn't quite sure what they were doing, just 'stab in the dark' it was … but it's paid off." (YOS1)*

This sense of pride and being part of a something that made a wider contribution was reiterated across cases. For instance, in YPP a participant highlighted this important element of a seeing the investment as resulting in a positive sense of achievement "I didn't build it but I'm part of it". In this way, the participant indicated how making a contribution to the CRE project was equivalent to the sustainability actions of work colleagues but in this instance did not require a radical stance.

> *"I've said to other people more than once just saying, I have shares in a power station … I think that more than investing in something which okay, I didn't build it but I'm part of it. So, it's a good feeling, I've got friends in work, with solar panels, they are against flying, you have smaller things you can do… and in a way you don't have to be full on centre of alternative technology 'hippy' do you! (laughs)." (PS3)*

In a similar context, for a shareholder in AC there was a perceived benefit from involvement linked to a sense of pride in the community wind turbine, and its positioning in South Wales. In this way, being "inspired" by the CRE project was reinforced by attending a visit to see the wind turbines, which re-affirmed the positive work of the scheme.

> *So, I do find it really inspiring. I supposed that was reinforced a bit by the visit up there, because I hadn't actually seen the turbine before and it gave me a sense of like pride, oh that that's happening in South Wales." (ACS3)*

Within YO and AC participants identified the benefits and impacts as a shareholder focused how the dividend was a mechanism to support something worthwhile. Overall, there was a sense of satisfaction in contributing to community action, framed as the "feel good factor", on an individual level (YOS4, YOS2, ACS3).

> *"This is a really good thing. So, it's really just a feel-good factor. I had money that I could afford to put into it, and I thought was a good thing to do". (YOS4)*

In the context of Gower Regeneration, participants highlighted a similar sense of satisfaction from their contribution to the project (GRKS2; GRKS1). This resulted in a heightened sense of community with the shareholder describing this as other people experiencing "warm feeling"' from their involvement.

> *"I guess the immediate thing is that warm feeling of being part of something in your local area, is an impact for a lot of people. It reconnects people back to their area, makes them feel good about where they live". (GRKS2)*

7.2.4 Local decision-making and ownership

As part of the literature, Haggett and Aitken (2015) identify impacts centred on an enhanced sense of ownership through engaging in a community-owned project, leading to community empowerment. Although such local impacts were difficult to articulate or measure, they were seen as significant:

"More ambiguous, but no less important, success may also include an enhanced or resilient sense of community cohesion or even a feeling of ownership over the contours and characteristics of the energy system" (Hoffman and High-Pippert 2010, P7573).

Significantly, the process of drawing people with a shared goal towards a more collective form of action results in the mechanism of community empowerment, facilitating change (Seyfang, Park and Smith, 2013). Furthermore, Hoffman and High-Pippert (2010) identify that successful outcomes may include communities developing or strengthening their sense of cohesiveness, with greater resilience or a sense of control over the nature of energy systems in their localities. Within both the study findings and the literature, the area of local leadership was an important factor in shaping the development and implementation of CRE projects, based on addressing specific community contexts (Ison and Hicks, 2018).

In the context of active local decision making, the study findings extended the existing literature which focused on how CRE projects were aligned with community ownership, empowerment and confidence (Li *et al.*, 2013; Slee, 2015; van der Waal, 2020). The literature reflects on the importance of increasing local support for renewable energy, being based on the social aspects of perceived community benefits and community members being involved and owning schemes (Rogers *et al.*, 2008; Haf and Parkhill, 2017). Significantly, the study findings highlighted how through successful CRE projects, communities retained an active role and local control. This was centred on control over local natural resources and the CRE project.

In the study findings a stakeholder identified the importance of the local industrial history, focused on the external exploitation of the slate as a natural resource and lack of local control and community input in the past. This was reiterated by other participants (YPPKS4). There was a stark comparison with the CRE project moving away from this industrial history towards embedding the scheme within a local decision-making process.

> *"What you have to think is, thinking of people outsiders used the resource of slate, the decision to steal the mountain, it wasn't' local… the historical development of the large industry is something that gets done to you. You are doing yourself, and that's the biggest difference I think with community energy, which is the community makes the decision." (YPPKS1)*

In a similar way, a participant from YPP emphasised how the CRE project has raised an awareness around use of natural resources for local benefit on a both Welsh community and national level. In this way, the generation of renewable energy represented a transition away from repeating a history of an 'extractive economy' linked to both slate and coal industries with an export of capital outside the communities and outside of Wales. This was a theme reiterated by other participants (YPPKS4).

> *"It makes me realise there is lot of potential there for us as a nation to generate our own electricity, and to improve communities with small projects like ours to do more… there lots of resources in Wales, its shame that we aren't using them to benefit the people from our country… for example some of the wind schemes along areas in North Wales most of the income goes to Europe. You want some type of benefit coming back … it carries on with the extractive economy model of, to dig out of the earth selling it across the world and digging coal out of the earth and selling it across the world. Lots going out, not a lot coming back." (YPPKS2)*

In the context of local decision-making, a participant in AC identified the role of a referendum in formally engaging the community with the decision-making process regarding CRE project. The referendum involved the local community and resulted in support of the windfarm project but even if there had been a negative response, the process itself was positive as part of enabling people to have a say.

> *"So even with the windfarm, even if the referendum hadn't posted in favour of the windfarm, there would have been gains from it." (ACKS1)*

Another participant in AC perceived that there was a sense of ownership within the locality, with people monitoring how much the renewable energy scheme generated. This focused on framing a distinct sense of ownership, described as "*our turbines are*

turning" which was a shift in public opinion within the community. Interestingly, initially members of the community had voiced strong opposition, yet this had been transitioned into positive engagement as the project was established:

> *"It's the number of people who say, our turbines are turning, their doing well. Which is really nice given how many people were against it." (ACS5)*

A participant from AC detailed how a wider range of local organisation had a stake in the scheme. As such, the donation of shares acted as a mechanism for ensuring a sense of community ownership involving a range of local stakeholders.

> *"One thing we have done is kind of donate shares to local community organisations about £120,000 worth of shares that are owned by the rugby club and football club and all these sorts of groups. they do get money, from the windfarm, on the same basis as all the other members." (ACKS1)*

Further, a participant in YO identified how a sense of ownership was also associated not only generating income for local benefit but also provided a degree of social cohesion. This was seen as emerging from local communities engaging in control over their natural resources and presenting opportunities for a sustainable future.

> *"Basically, the whole ethos of the scheme YO is more than just generating this pot of money for the community, its bringing people together, as well as I was saying to use, it provides a sense of ownership to local people over their natural resources. And to an extent their future." (YOKS1)*

In a similar way, an anticipated social impact from the GR scheme was the community having ownership of a local asset. Furthermore, the outcomes from the scheme were extending further than generating renewable energy alone. This included the community getting involved with growing locally based food, contributing to the local economy and educational initiatives. In this way, there was a sense of extending local ownership, building on the platform of the benefits provided by investing in solar panels.

"There's the story about local ownership, which I think is really important. Basically, the opportunity for people to own some infrastructure and own part of where they live and be able to invest in that. I guess some of the benefits and where the money is going to be spent afterwards, all about local ownership of things which are doing good for that area, whether it be renewable energy, food, education, money." (GRKS2)

A participant identified how a key part of GR was to enable communities to gain ownership of energy and building a closer relationship with local energy sources. Furthermore, it attempted to provide an opportunity for communities to invest in the solar storage project and engage in balancing local supply and demand.

"To provide grid balancing services. To give people access to locally produced energy, and so that they develop a stronger affinity of how their energy is generated." (GRKS5)

In a similar context, a stakeholder in YO identified how moving towards a local energy model which focused on local grid balancing, promoted *"that real strong link"* between local communities and local generation.

"So Energy Local, it's kind of the next stage after just the community energy idea with local people buying shares, CRE doesn't make that real strong link between you using power and you're generating. we call that local balancing, so if you find a way of encouraging Mrs. Moss to use power when it's been generated locally." (ELSK1)

Further, a participant identified how an outcome from the AC project was the social impact of the community making connections with, and having a closer relationship with, local energy. In this way, there was a greater sense of local ownership and heightened sense of awareness.

There will be looking into the longer term, and we'll be able to have a Grid that allows us to use our energy locally. I'll be real benefit and an even greater feeling of ownership in the community because they will be able to buy our energy. So just that understanding awareness and feel." (ACS5)

Yet, for some community hubs the CRE project were not perceived as community-owned, rather they were described as either a privatised company or a separate enterprise. For instance, a participant from a community litter group as an environmental community group hub identified the distanced position of the CRE project from the community within the Peris Valley. There was no sense of being a community-owned project, even from the beginning. There had been some leaflets in a recruitment drive for shareholders and information about the scheme in its early stages, however, subsequently the CRE project "*went very quiet*" once established. Rather than being positioned as generating benefits for the wider community, participation in the CRE project centred on shareholders to underpin the project. It was not seen as locally embedded and community-owned but restricted to the shareholders.

> "*They put some stuff through letter boxes throughout the village suggesting if you wanted to become a shareholder… but they're very quiet about it now because obviously have achieved what they wanted and they wanted so many shareholders to just get the money to run it. They seem to have created it and closed in as a group. So, in terms of a community project, it's not owned by community it seems to be owned by only by the shareholders.*" (YPPCH6)

Similarly, a participant from a community centre on the edge of the Gower Peninsula also viewed GR as separate compared to other initiatives and not embedded as a community enterprise. As such, it was not seen as community-owned energy but identified as a "*private thing*". The process was framed as linking in with the National Grid and "*wanted money*" as the main driver for the community share offer. It was clear that the host community were "*sceptical*", and the impression provided by the CRE project was seen as "*sketchy*" in terms of the delivery of impact. This was exacerbated by the suggestion of focusing alongside the project to generate local produce, which was seen as unsustainable due to the quality of land. Overall, the participant highlighted the wider local host community perception focused on uncertainty and "*lot of scepticism*".

> "*A private thing. Their intention is to put it through the National Grid. They wanted people to sign up. And a lot of people were sceptical and also quite*

sketchy as to what they were going to do, they were talking about using part of the land for self-produce, grow your own food and sell it. Realistically, if you know the village history, then that land was stripped by a property developer. So it's not good soil, there was a lot of scepticism." (GRCH3)

Overall, the literature highlights exemplars where renewable projects had heightened social acceptance if associated with community involvement and fairness, yet this did not consistently eliminate local opposition (Warren and McFadyen, 2010). Equally, if benefits from CRE projects were seen as located only with some parts of a community, this led to community division over a scheme. As such, projects were not seen as legitimately community-owned (Walker *et al.*, 2010). In this context, some CRE projects were "*locally divisive and controversial*" (Walker and Devine-Wright, 2008, P499). This point was reiterated by MacArthur (2016), identifying how CRE projects may not either engage or impact upon most of the community members within a locality. Indeed, Berka and Creamer (2018) identified how some schemes represent a local controversy and lead to community division not cohesiveness especially if there were doubts over motivational factors. Significantly, in the study findings, these themes resonated with some participants within the case studies, who viewed particular schemes as not community-owned and lacked trust in the schemes.

7.2.5 Community confidence and pride

Within the literature, the study by Haf and Parkhill (2017) indicated the growth in confidence generated by the CRE project in Tiree through the securing of income, leading to support for the cultural context of the Scottish island community. Equally, Callaghan and Williams (2014) identified how having community ownership of schemes facilitated enhanced confidence, although challenging to measure. Indeed, although the literature signals the sense of pride, confidence and empowering effects of CRE projects there is limited evidence to support such assertions (Hicks and Ison, 2011; Berka and Creamer, 2018). Importantly, these themes resonated in the study findings, with participants highlighting a sense of pride and building confidence from involvement with community-led and owned projects, channelling income into community benefits. However, some participants were uncertain about whether the

confidence and pride extended beyond the immediate CRE group, into the wider community.

The generation of community pride, as well as energy from the CRE projects, was highlighted by a participant from YO. This centred on the processes of setting up the project and drawing-in local investment into the community hydro. This was particularly relevant as Bethesda represented a deprived area, with the active engagement from local people being an important component. Yet, pride was difficult to measure as a social impact, representing an important although intangible local impact in the community. Further, pride was associated with clearly tangible delivery of community benefits (YOKS1).

> *"I hope that there is an element of deep pride, with YO we've been producing over a period of time. So, we are trying to raise awareness to people that it is generating most days. So, I think it's a deprived area, but a lot of people are part of the scheme the shares have come from the people. I'd like to think that there's a pride there, which is not something you can do in terms of cheques. And that is the second element ' you have pride, but you too, you hope, quite practically, that this scheme support community-based activities." (YOKS5)*

In a similar way, a participant from AC highlighted the emergence of pride as an impact over time. As such, the participant identified a changing picture of social impacts facilitated by an increased community awareness and pride towards the community energy scheme. This focused on outcomes being directed towards community benefit involving a wide range of community organisations, from the income generated in the scheme. In this way, the theme of being able to shift away from the initial strong opposition, to be replaced with pride.

> *"It's awareness its increasing awareness as things develop, if I think we can try and we can promote it as a source of community pride. People forget they were against it. And you can sort of say we did this even though it wasn't you, it was us but we did this, and look, how many organisations it's benefiting." (ACS5)*

In a similar context, a participant from YPP re-emphasised how generating confidence was a key social impact. As there was a sense that confidence had been

eroded slowly over time within the community since the closure of the quarry. Yet being involved and setting up a community hydro through 'bottom up' action had an empowering effect in the community.

> *"The confidence, it's hard to create confidence in community because, the quarry closed 1969, decades of no money knocks you down. And you want a grant, but the minute you can prove well we can do these things, doesn't matter if it's a hydro, or housing or whatever it is." (YPPKS1)*

7.2.6 Wider Community engagement and awareness with the CRE project

The literature suggests that the evaluation of impacts by CRE projects tends to focus on specific direct impacts on a project level, rather than attempt to understand the wider impacts to host communities (Walton, 2012; DECC, 2013; Bere, Jones and Jones, 2015). In the study findings, there was attention at the project level impacts and scoping-out the wider awareness and perceived impacts to the local community, from CRE projects. Importantly, he findings from the study highlighted the wider perspective of the community through the lens of mostly community hubs, with the majority of hubs reporting a high awareness but a lack of involvement. Where there was involvement, the findings indicated this centred on community buildings, with the installation of solar panels on roofs. Within the study findings, the participants did not formally represent the views of the hub, rather their accounts represented a novel lens to explore the positioning of the CRE project within a wider community context.

Indeed, van der Waal (2020), identifies the importance of assessing who are the beneficiaries from CRE projects and the relevance of examining the perceptions. This included a cross-section of the wider community rather than focusing exclusively on core members of the CRE group, to gain a more robust and valid account. This enabled a more nuanced perspective, avoiding an overtly positive emphasis on impacts based on the sampled participants (van der Waal, 2020). Furthermore, the literature highlights how developing a community project generates inter-connections within communities, establishing relationships between different community members, organisations and a sense of place (Hicks, 2018; Kilpatrick,

2007; Bere, Jones and Jones, 2015). In this sense, wider community engagement inherently involves social capital and the development of an empowering sense of ability to act collectively "*through increased and strengthened network connections between individuals*" (Middlemiss and Parrish, 2010, P7560). Crucially, the observations in the literature resonated within the study findings, focused on bridging social capital associated with community hubs having awareness and a degree of involvement. Significantly, this was seen as being present across community hubs aligned to the early stage of CRE project development within communities, which may subsequently develop over time.

In the study findings, the area of 'awareness' detailed a complex mix of factors that were reported by participants, in terms of being aware of the CRE projects, their activities and impacts. Overall, this ranged from low, partial to high levels of awareness and understanding across the CRE projects. As such, there were differing levels of awareness and understanding across the continuum in relation to each of the CRE projects (Table 31). A particular feature that emerged was the high awareness and detailed understanding linked to all the CRE projects, especially linked to participants within community centres and Merched y Wawr but also across diverse settings such as outdoor centres and litter picking groups. However, there were exemplars of partial awareness and some understanding among these constituencies. There were only a few examples of low awareness and understanding linked to YPP and GR CRE projects. Overall, there was a positive awareness and an understanding of the CRE projects within community areas, as part of participants within hubs.

Table 31: Awareness and understanding continuum across CRE project community areas

CRE Projects	Community Hubs	High awareness with detailed understanding	Community Hubs	Partial awareness with some understanding	Community Hubs	Low awareness with limited understanding
Ynni Padarn Peris	**Community centre** **Community centre** **Museum** **Merched Y Wawr**	A high level of awareness by community hubs was associated with a detailed understanding of the CRE project and its context in the community.	**Faith based** **Conservation charity** **Litter picking group**	Across the cases there were some community hubs with only partial awareness and understanding of the CRE projects embedded in some understanding of the schemes and the wider context.	**Outdoor centre**	Across the cases there were only a few exemplars of community hubs having a limited awareness or understanding of CRE projects.
Ynni Ogwen	**Merched Y Wawr** **Community centre** **Conservation charity** **Litter picking group**	This was exemplified by a participant from a community centre in the Peris valley who not only noted a high degree of awareness of YPP but also contextualised the scheme w+ithin a		However, other than knowing its location a participant from a community centre on the edge of the Gower Peninsula		In the context of AC a participant considered there was a general lack of awareness in the wider community about the CRE project from "people on the street". The

Gower Regeneration	Community farm	broader understanding of the sector. The participant indicated the position of CRE project as part of an increasing number of micro-hydros in the local area. "I told the guy that owned the place about 15 years ago they should be doing something with reservoir then runs into the Afon Goch. There are two hydrso at Llanber. There's one by the waterfall isn't it and then there are seven at Nant Peris" (YPPCH7) Furthermore, another participant in a social community	Community centre Environmental centre	identified a lack of detailed awareness, for instance being uncertain if the scheme was operational. "But we don't know if it's operational. So, we don't really know a great deal about it other than they put it there." (GRCH3) In the Peris valley there was also exemplars of community hubs with only a partial awareness of the CRE project. For instance, a participant within a faith-based hub highlighted how	Women's institute	participant identified the need for greater publicity and awareness within the broader community in the area, to address what was seen as this key facet of social impact. "I would say one of the major benefits ought to be the community engagement and people feeling like they are involved, and don't know whether that's happened here really. There is space for more PR almost, in explaining what's is actually happening,
Awel Co-op	Community centre Community Centre Environmental centre Merched Y Wawr		Outdoor centre			

353

| | | organization, 'Merched Y Wawr' in the Ogwen Valley outlined a broader awareness of other CRE groups in the area and the impact of policy changes. The participant was also aware of other schemes within the local area and outside of the valley initiatives. These were perceived as part of positive force for change. "I don't think the UK government has helped much, have pulled away the tariffs and so on and the amount of projects there is then…But think thing this (YO) is one of 3 or | | they knew of the micro-hydro and its position within the area but were unaware that it was community-owned: "I knew it was there on the Afon Goch but didn't realise it was community-owned." (YPPCH3) | | and how much good is being done" (ACS2)

"I think people I've spoken to with friends who still live in Deinolen, this is something really cool. But again, it's still quite niche." (PS3) |

		4 projects in the area. I think it's a good thing" (YOCH4)				

Involvement

In addition, the study findings highlighted how community hubs indicated that at times there was an extension of awareness to involvement as part of interconnections within civil society. In this way, the area of 'Involvement' centred on a continuum that described a range of engagement by communities in CRE projects. The degree of involvement across communities reported by participants was largely at a low level with the majority highlighting a lack of involvement (Table 32). However, close involvement was a feature of community centres across the communities aligned to CRE projects. which was linked to CRE solar panels being placed or on the centre roofs by the CRE projects or in another instance related to educational activities. There were examples of some involvement across environmental type hubs focused on litter picking, conservation and a community farm.

Within the literature Callaghan and Williams (2014) identified how CRE projects increased the provision of adequate heating in community hall improved energy efficiency and community networking. Again, the study findings, identified not only how CRE groups connected with each other, but also how they related and were positioned to civil society networks in their communities. This included enhancing the linkage within and between community groups and facilities. In terms of 'close involvement' the current findings indicated an emerging connection with the CRE project, for instance through the installation on community buildings of solar panels, as the main exemplar. In relation to 'some Involvement', there were exemplars in the development of educational activities within a community centre and an environment centre advertising a share offer. Overall, despite the presence of awareness this often did not translate into involvement between the CRE projects and the wider community, due to their early stage of development.

Table 32: Involvement continuum across CRE project community areas

CRE Projects	Community Hubs	Close Involvement	Community Hubs	Some Involvement	Community Hubs	Lack of Involvement
Ynni Padarn Peris		Some of the community hubs identified 'close' or 'direct involvement' with the CRE projects. For instance, two participants from Swansea and Aman Valley within a community centre identified not only awareness but also involvement in Awel Aman Tawe focused on having solar panels on the centre's roof. Furthermore, the two participants were also aware that the same actors and CRE group had wind	**Community centre Conservation charity**	A number of individuals within community hubs indicated a level of some involvement, aligned with a more distanced position from the CRE projects. For instance, a participant from a conservation charity, as an environmental community organisation also highlighted that despite not having a close working relationship with the CRE scheme in the Ogwen valley, there had been some co-working. This was focused on their	**Outdoor centre Litter picking group Merched y Wawr Museum Faith based**	Some community hubs identified not only a limited degree of involvement with CRE projects but a lack of involvement. For instance, a participant in a community litter group, environmental community hub highlighted that they had no contact with YPP within the Peris Valley. However, there was an awareness of other environmental community groups in the locality, including the woodland group: "Not that group just
Ynni Ogwen	**Community centre Litter picking group**				**Merched y Wawr**	
Gower Regeneration			**Community farm**		**Community centre Environment centre Women's Institute**	
Awel Co-op	**Community centre Community centre**		**Environment centre**		**Outdoor education Merched y Wawr**	

| | | turbines as part of Awel Aman Tawe community energy charity aligned with AC. As such there was a good level of understanding of the different technologies that the community energy schemes were running within the community. "There were windfarms Awel Aman Tawe weren't they (P1) we got solar panels on our roof, only for water though isn't It (P2)" (ACCH3)

This form of involvement was also reiterated in the Ogwen valley linked | | presence as part of a discourse with "partner meeting" with a representative from the YO group being present. Although, it was not extensive there was some community group interconnectedness. "I have certainly been to partner meetings a representative from YO that's been there, so we are in dialogue with them. Whether we actively help them I'm not sure, but certainly we work together at least at meeting level." (YOCH3)

Within the context of Gower Regeneration, a participant from an environmental | | the other ones the Woodland group and the tidy group" (YPPCH6).

Equally, within an outdoor education centre, environmental community organisation hub, a participant identified there was no contact with Awel Aman Tawe within Swansea and Aman Valley. The participant suggested that there were challenges in establishing involvement and building connections across different hubs and groups with only a certain degree of interaction possible |
|---|---|---|---|---|---|

| | | to a community centre, reflecting on the close connection between community buildings. The participant highlighted how the community centre was working with YO on a new community solar panels project. They were one of the initial community buildings taking part in the new project to build local sustainability on a community level: "We are waiting to hear back if we get the solar panels on our roof… we have put in an application we should know by the end of the year." (YOCH1) | | community group hub highlighted how there was some involvement through an 'information hub'. This provided information in the community about a broad variety of sustainable initiatives, from biodiversity and a reduction in plastic. In terms of energy, the participant identified Egni Co-op as an example of local renewable energy solar project with the availability of leaflets about the new share offer. Yet, this represented a distanced form of involvement as the information hub was seen as a space for | | on a community level: "You can spend your life talking to people. At some point you have to draw a line in the sand" (ACCH4). |

		A participant from an environmental group hub indicated extensive and in-depth knowledge and awareness of YO based on being one of the CRE project Directors. The participant highlighted an understanding not only of current activities but also how YO was established: "Well, YO got set up by Partniaeth Ogwen, then one of the first projects that the partnership did was YO and I'm one of the Directors and we have raised 450,000 through		bringing together different initiatives, not only the CRE project. "Here's the information hub here (walking interview) got up what we're doing and what other environmental and community events are happening in the local area and here too leaflets (pointing out). For example, about going plastic free- plastic free Swansea, and here some information on another renewable energy project happening in the Swansea valley solar project Egni Co-op, about the new share offer" (GRCH4)		

		community contributions." (YOCH2)		In a similar way, a participant from a community hub identified how there was initial involvement with the CRE project. Although the same stakeholders were involved in both schemes there was only some involvement in the hub, representing a distanced relationship with the initial support being transitional. The participant considered it crucial to establish a distinct identity as a community farm set apart from Gower Regeneration. "But they did support us in the beginning in terms of getting set up and things, given us		

				lots of contacts, posting in public meetings and the website was through them, but I wanted us to have our own identity" (GRCH1). For instance, a participant from a community centre within the Peris Valley highlighted some involvement with both the CY consortium and YPP although this was at a distance. The participant reflected on a cross-over between the work of CY with the community centre {name} centred on community engagement, linking community art with renewable energy		

				education. Importantly, the participant had heard of the community hydro through working directly with the CY consortium and had an awareness it was part of the network. "I'm trying to think is CY, because Ynni Padarn Peris is part of it because one lady came and we were setting up a project to talk to kids about renewable energy so we'll get then to make things like wind power or water power." (YPPCH5)		

Benefits-Disbenefits

In the study findings, the community hubs identified a dynamic relationship between benefits-disbenefits in relation to the CRE projects. As such, they highlighted a range of both positive and problematic areas around the impacts from CRE projects, across hub types. This was evidenced by participants drawn from faith-based, outdoor centres and conservation charity hubs (Table 33). Overall, there was a difference in relation to individual CRE projects. Participants reported greater benefits across hubs in YPP and YO whilst participants reported both benefits and disbenefits aligned to AC. In contrast, GR was seen as having more disbenefits.

Table 33 Benefits-Disbenefits across CRE project community areas

CRE Projects	Community Hubs	Benefits	Community Hubs	Disbenefits
Ynni Padarn Peris	Faith based Museum Outdoor centre Community centre Community centre Merched y Wawr	• **Local income and empowerment** As part of benefits, participants across hubs identified the importance of local income that was generated from the CRE projects, as well as it being retained within the locality. Furthermore, there was the generation of local community empowerment by channelling community benefit from the income, in order to address community needs. In this way communities were able to:	Litter picking group Faith based Outdoor centre	• **Private company not community owned** The participants from some hubs highlighted an issue around ownership focused on CRE projects being perceived as privately rather than community owned. In this way, ownership and benefits were centred on shareholders as individuals not the community as a collective. As such, this was seen as a "private thing" (GRCH3) and "owned by only by the shareholders" (YPPCH6).
Ynni Ogwen	Litter picking group Merched y Wawr Community centre	" decide where the profit is spent locally" and community action on the grassroots level moving away from centralized model, "taking power back from these big energy corps" (YOCH3).	Conservation charity	• **Lack of trustworthiness** In the case of some community hubs there was a perceived lack of trustworthiness in CRE projects being able to deliver community benefits as impacts. For instance, in the Gower the

	Conservation charity	**• Cheaper electricity** An identified benefit by community hubs was the provision of cheaper electricity. In some instances, there were exemplars of community hubs with solar panels fitted to hub buildings. This was seen as resulting in reduced electricity costs: "solar panels on generate more electric and heating in here for us" (ACCH2). Furthermore, there was also a perception by some community hubs that using locally sourced CRE would provide cheaper energy for the local community and alleviate fuel poverty, enabling: "people who live in fuel poverty to buy electricity in their own communities" (YPPCH2). **• Low carbon footprint and renewable energy** The community hubs perceived that the CRE projects provided benefits in moving towards a low-carbon transition. This focused on an increasing role for CRE in extending		project aiming to generate local produce alongside the CRE installation but positioned on poor quality land. This led to the community expressing a "lot of scepticism" (GRCH3). **• Negative Environmental impacts** For some community hubs CRE projects raised concerns about environmental impacts, such as ecological disruption linked with hydros and damage to wildlife with wind turbines "they affect the birds" (ACCH1). Furthermore, in the case of hydros some hubs identified particular thresholds for what was acceptable in balancing benefits and disbenefits based on past exemplars: "rivers were getting properly diverted and dried up" (YPPCH4) with threats to "nationally important ecological sites" (YOCH3).
Gower Regeneration	Community farm		Community centre Environmental centre Women's Institute Community farm	
Awel Co-op	Community centre Community centre		Outdoor education Merched y Wawr Community centre Community centre	

		renewable energy generation and capacity. The hubs identified how CRE projects were perceived as "green energy" (YPPCH3) and having a "low carbon footprint" (YPPCH2), as they were "not burning fossil fuels" (YOCH3). As such there were opportunities for supporting the shift to a low-carbon future: "Better for the environment obviously, not relying on burning fossil fuels" (YOCH3).		

7.2.7 Broad range and meaningful social impacts

The study focused on addressing the gaps in the literature by exploring what was meaningful to participants and examining the nature of CRE project impacts. In this way, the study findings extended beyond what was easily quantifiable as CRE impacts. As such, the findings highlighted how CRE projects represented a balance of social and environmental impacts in communities. Furthermore, the findings identified the relevance of a temporal dimension to impacts from CRE, with projects at different stages of distributing income in the community and effecting a wider social impact.

In the findings, there was an emphasis by participants on generating meaningful impacts for the community, although these were viewed as difficult to quantify and were often intangible in nature. For instance, such impacts involved a broad range of areas, including support for community-based energy efficiency, EV and local renewable generation. Efforts were seen as centred on seeking to achieve genuine community impacts, for instance tackling fuel poverty or long-term investment in community projects or activities.

The literature also highlights how social impacts from CRE projects are best understood as involving actions and impacts that address community priorities and its value-base, reflecting the experiences of community members (Berka and Creamer, 2018). In this way, social impacts need to be viewed and captured in a different way to other outcomes, such as economic impacts.

> *"CRE projects are variably motivated by a range of different (private and) public values that are contested, negotiated and reproduced through social processes, therefore, social impacts cannot be conceptualised in the same way as economic impacts in the form of fixed and measurable stocks of value held by individuals"* (Berka and Creamer, 2018, P3403).

The literature suggests difficulties in mapping impacts judged to be meaningful by communities over time (Vanclay, 2012; Howell and Haggett, 2014). Consequently, there is a need to underpin the benefits credited to CRE with a holistic framework that extends beyond the standard boundaries of what may be seen as tangible and quantifiable impacts (Walker *et al.,* 2007). The study findings address this area in a

novel manner by surfacing the complex and nuanced range of social impacts from CRE projects, based on what is meaningful for addressing the needs of communities. This built on the approach advocated by Vanclay (2012) by a *"focus on what counts, not on what can be counted"* (P153).

In the context of community investment, van der Waal (2020) highlights the wide range of impacts arising from CRE projects. This includes a focus on cultural aspects, local regeneration and the development of local facilities, as well as health and social care investment. Although the CRE projects were at a preliminary stage, the findings present an outline of how investment might be framed to achieve local social impacts.

Overall, participants identified the difficulty in measuring and pinpointing social impacts from CRE projects, involving a broad range of initial and potential impacts. As such, a participant from GR had difficulties in framing the social impacts from the CRE project, with the participant identifying them as intangible in nature.

> *"I don't know it's hard to say really. they're quite intangible … And there is of course lots of broad benefits, they're quite hard to pin down." (GRKS1)*

Yet, a participant outlined the broad range of social and environmental initiatives potentially viewed as actions from YPP. Although the setting up of the CRE project and charity for community impact was an ongoing process. Also, the participant identified how the relationship between the community hydro and the charity were linked to the overall aims underpinning the project. In this context, the Community Benefit Fund was not to be targeted towards transient initiatives such as seasonal decorations. Rather the aim was to focus on actions at a community level that addressed environmental objectives, such as energy conservation and reducing energy use, tackling fuel poverty and further renewable energy generation at a community scale.

> *"When setting up the charity, we as producers will have to be clear what the charity's aims are. We don't want the charity to spend on Christmas trees or spend on flowers around Llanberis. The aim would be - broadly to do with*

energy reduction, the alleviation of fuel poverty and the development of any
additional energy generation schemes." (YPPKS5)

Equally, another participant from YPP identified the range of potential local
sustainability projects, seen as social and environmental impacts from the scheme.
These involves a spectrum of initiatives from addressing fuel poverty, further
renewable projects, improvement of community and leisure facilities. Significantly,
the participant highlights that the discourse not just environmental objectives but
also those that had a community focus.

> *"The type of project, I'm going to be bit vague now, something*
> *environmental, educational with {local school}, with saving energy, taking*
> *care of the environment, developing paths in nature, it will come in the*
> *future, that's the hope." (YPPKS6)*

In contrast, as part of an environmental group community hub a participant
identified a detailed range of benefits associated with income being generated by
the CRE project. The participant identified how benefits were channeled through
'Partneriaeth Ogwen' into a 'Green Valley Project'. In addition, there was the
provision of charging points for EV and the development of capacity and capability
within sustainability in the Ogwen valley by building skills in the green industry. This
was seen as underpinning and reinforcing future local sustainability initiatives,
aligned with the 'Green Valley'. A dominant theme emphasized by the participant
was the importance of community space, place and buildings. In particular, EV and
training linked to green industry was highlighted as a clear example of delivering
community benefit.

> *"The first thing we are giving £10,000 of profit towards community benefit and*
> *that goes back to Partneriaeth Ogwen towards the Green Valley project, like*
> *charging points for electric cars and training available for skills in the green*
> *industry." (YOCH2)*

Overall, as part of exploring the perspective of shareholders on wider community
benefits it was evident that there were multiple perspectives and a temporal
aspect, focused on the social impact from the CRE project currently and in the

future. As with community hubs, participants had difficulties mapping the differing visions of what community benefit might 'look like' from a shareholder's perspective. As such, their response tended to be quite open and how they might be envisioned over time. They also sought detailed exemplars. However, for shareholders the community aspect of community energy was always the driving force: *"it helps the community" (YOS1).*

Significantly, shareholders identified how a key community benefit was long term income being retained within the local community. A participant in YPP highlighted how the income generated for the community had a potential impact in supporting other local initiatives, although based on a *"small community projects"*. This was imagining future projects that could be supported through a constant income stream in the locality. For instance, supporting Welsh-medium children's nurseries as well as physical and environmental action, including tree planting. As such the benefits were diverse across a range of areas achieving social impacts.

> *"So hopefully the benefit will be a steady stream of money into small community projects I think in the village like the 'Cylch Nursery', just improving the area like tree planting." (PS2)*

In a similar way, a participant in YO highlighted the role of the charity in supporting local development. This included solar panels, electric cars, exploring ways to alleviating fuel poverty and reducing electricity bills within the community. Yet the participant acknowledged how delivering local sustainability within the community was challenging in practice. Furthermore, implementing local sustainability initiatives on the ground to benefit the community and have social impact was a long-term project. For instance, as part of the community hydro work, there was expansion into a 'Green valley' initiative, incorporating a broad range of sustainability project work.

> *"Solar panels or more electrical equipment to charge cars. You look at ways to help energy poor at the moment and could benefit from cheaper energy and these are all quite sustainable, energy goals. putting them in place and in practice is more difficult but those things don't happen overnight. And it's not just YO, but the Green Valley at the end of the day, looking at the*

different sources, how to attract money into the community, how to support community activities in any way possible. And YO has a made a contribution ... and over a time that's going to happen." (YOKS5)

A participant from AC indicated that social impacts may potentially focus on the development and rehabilitating of community assets such as derelict school for the community. This was underpinned by the local ownership with range of local organisations having share involved in the scheme.

> *"Yes, so there are kind of benefits because of the number of local organisations now that own shares in it and a derelict school is being bought and hopefully something interesting done with it." (ACKS1)*

In a similar context, a stakeholder reflected on the emerging process of addressing a broad set of impacts, with a mix of social and environmental impacts. This was seen as developing with time, requiring careful consideration of how best to distribute the income and therefore achieve a community impact. Providing support for Christmas lights were not seen as legitimate impacts. The participant highlighted the need to prioritise meaningful impacts, such as the insulation of houses or addressing fuel poverty. The participations stated the need to enhance the impact from the CRE project beyond the parameters of the shareholders.

> *"I don't really want the money to go to paying for the Christmas lights in the village…it would be easier for me to see if going to pay for projects insultation, so there is benefit bit more significant than just nice lights, something that going to save money outside to just generating income to people with enough money to invest in it." (YPPKS2)*

7.2.8 Balancing social and environmental impacts

In the study findings, there was a mix of social and environmental impacts from CRE projects. In this respect, the findings relate to the theme of motivations linked to CRE, centred on local and global issues. In this way, participants focused, not only on renewable energy and environmental action to facilitate a low carbon transition, but also support for local community development. For instance, CRE generated

income being used to facilitate a broad range of community facilities and groups. Furthermore, Hicks and Ison (2011) indicated how CRE project income was used to fund a combination of social community facilities and environmental activities to address wider low-carbon projects. The literature suggests that CRE projects that don't focus exclusively on pro-environmental behaviour but also address the development of local priorities tend to generate "*locally relevant co-benefits*" (Bain *et al.*, 2016 cited in Berka and Creamer, 2018, P3409). For instance, case studies in England and Wales highlighted the key importance of addressing local issues and facilities, such as the installation of heating systems for a school and renovating a village hall rather than an emphasis on global environmental issues (Walker *et al.*, 2010).

In the study findings, a participant in AC mapped how the main aims and vision of impacts from the CRE project focused on a range of potential initiatives, including a mix of social and-environmental projects. For instance, educational initiatives and increased renewable energy generation through the Awel Aman Tawe charity.

> *"Develop new centre in Cwmgors and educational and training hub. We have a number of larger energy projects in development, and we'd like to expand Egni with subsidy free solar." (ACKS4)*

Equally, a participant from YPP outlined how impacts as a set of the broad objectives were documented in a booklet. They highlighted a breadth in scope as a potential agenda for community impacts, addressing a wide range of social impacts alongside environmental initiatives.

> *"So, this is type of projects (referring to the booklet) we are talking about… you have sustainable projects, clean energy projects. The plans we have on the whole are grants of couple of hundred perhaps to improve facilities, mother circle and pram, a shed… not just something environmental but something which helps and improves the community." (YPPKS5)*

This was echoed by a participant from YO, highlighting how this notion of sustainability built on social and environmental benefits, could be enacted at a

community level through the CRE project. As such, it could deliver a broad range of impacts based on the income from the scheme, addressing renewable objectives and seeking to develop ways of using the energy locally.

> *"The aims been for community development and green energy. So the benefit will, come through the money that we generate, and environmental benefits through generating renewable energy and third being trying to use that energy in our community." (YOKS1)*

Equally, a participant from AC highlighted how social and environmental objectives underpinned the scheme as a *"double benefit"*. The participant viewed them as mutually supportive in terms of local regeneration and global CO2 reduction, with outcomes operating at different scales.

> *"I suppose to improve the lot of the area, but also doing it in a way that has global benefits, albeit a small reduction of CO2 emissions. It's a double benefit really, isn't it?" (ACKS3)*

This was reiterated by a participant in an environmental group hub. They indicated how the impacts from the YO CRE project focused on a reduced carbon footprint and surplus income being channelled into community benefit. This combination of both social and environmental value from the scheme emphasized the broad set of opportunities to support community impacts.

> *"We are now looking at another project of putting solar panels on a number of community buildings, like rugby, cricket, the library and so on. So, to reduce our carbon footprint in the valley even further. And give more income of course which is available to community benefit. All the income from YO gets used in the future for community benefit." (YOCH2)*

Further, a participant from a tourism-based community hub in the Peris valley identified the importance of CRE income being retained locally but based on a local decision-making process. This focused on decisions about distributing benefits being positioned within the community, therefore seen as driven by the community, for the community. An additional benefit of CRE projects was seen as

its contribution to an overall benefit as an environmental project, with a "*low carbon footprint*". In this way local benefits also extended towards global impacts.

> *"And then when profit comes back to these local projects, I want local people then to have opportunities to decide where the profit is spent in their locally and also decide what should be the local benefits. And of course, because they are environmental projects, they have a low carbon footprint."*
> *(YPPCH2)*

In a different context, a participant from AC identified how a long-term income stream from the CRE project facilitated a sense of autonomy to create local impacts, creating certainty in financial terms. This was compared to the instability and challenging economic environment operating in setting up the project. Alongside this, local employment highlighted was identified as another key outcome from the project. As with other CRE projects and charity development, the scope of envisaged activity was set within broad parameters, not restricted to environmental projects but also including potential social projects such as support for young people and their sports club.

> *"We can look at recycling some of that money into community benefit and that doesn't necessarily have to be about greenness stuff. It could be about providing a local kids club with a new sports equipment; it could be anything as long as it's community benefit."* *(ACKS2)*

7.2.9 Different stages of anticipating social impacts

The study findings mapped the importance of a temporal dimension linked to the CRE projects. In this context, recent literature has also focused on case studies at different stages of development. For instance, some CRE projects were at the planning or construction stage, whilst others are operational (Haf and Parkhill, 2017). Importantly, the social processes and social impacts involved in CRE projects may evolve over time and reflect different stages of development (van der Waal, 2020). Nonetheless, there are exceptions which have focused on examining the social impacts from established CRE projects. For instance, Hicks and Ison (2018) and Bere, Jones and Jones (2015) explore established CRE projects which were expected to generate socio-economic impacts after becoming operational. The

literature identifies how evaluation of CRE projects tends to focus on direct impacts evident in the initial period of development. As such, the long-term impacts of schemes as well as the potential outcomes for the wider community are not sufficiently analysed (DECC, 2013a). Significantly, the findings extend this evidence-base but also importantly provide a novel perspective by highlighting both the direct impacts of CRE projects and explore the current and future impacts across the broader community.

In the study, all the CRE projects were established but represented early stages in the distribution of income into their communities. As part of the findings, AC was the most advanced project in relation to setting up a charity, whilst YPP and YO were developing and establishing the registration of charities. In contrast, GR did not have a charity established and the process was in development. Furthermore, the findings indicated how CRE projects were developing BenComs as a mechanism for distribution of income and navigating the process for delivering social impacts in their respective communities. In this way, impacts may be nuanced, distributed over time or be cumulative in nature (Walker *et al.*, 2007); van der Waal (2020). The study findings identified how each project were at different stages in the development of charities, ranging from currently not being able to distribute surplus income, to those engaged in the process of registration as charities or identified as having established charities.   As part of the development of the CRE projects a certain amount of income was ring-fenced to enable a return on investment to shareholders and maintenance work of renewable energy schemes. Any surplus income was subsequently channelled into community benefit within the local area, through the development of charities (Table 34).

The participants across cases often commented on or were quite clear in describing what they didn't want as part of any Community Benefit Fund. Equally, they were clear on how future funds from the charity should be spent but were unclear about what social impacts they would like to see, in terms of outcomes from the charity. This was often influenced by the early stage of development of CRE projects.

Table 34: Different stages and anticipated social impacts

Stage	Early stage and not embedded	Setting up and registering as a charity	Established charity
CRE Projects	Gower Regeneration (GR)	Ynni Padarn Peris (YPP) and Ynni Ogwen (YO)	Awel Co-op (AC)
Description	In the case of GR had not yet transitioned through the process and were still having to pay back loans that had financed the CRE project. In this way, GR were not at the stage of enacting the delivery of community benefit as an outcome of the CRE project (GRKS2). For instance, a stakeholder from GR described how the CRE project was centred on delivering community benefit once the loans had been repaid. As such, there was a timeline of events for delivering community benefit to enact social impacts through a community benefit fund in the near future.	In the case of YPP and YO they were both positioned as being in the process of setting up a charity, centred on the outcome of generating community benefit. This involved the transitional stage of navigating the processes requited in achieving this aim, including registering as a charity. For instance, a participant from YPP reflected on the difficulty of the processes involved in setting up a charity, highlighting how the CRE project was at an early stage in the implementation of wider social benefits. This was after 3 years of generating both electricity and income. However, the stakeholder outlined a sense of accountability as well as alignment between the aims of	In the case of AC, the CRE project had already transitioned towards achieving the outcome of delivering community benefit. It had already moved through the process of setting up a charity by establishing Awel Aman Tawe in 1998. Nonetheless, the participant highlighted the complexity of the transition. Yet, even though in AC, which had established a charity there remained issues about distributing benefits to achieve impacts within communities. In this context, a participant identified that a pivotal role of the windfarm was its ability to provide an income which then tied-in to the wider community benefit. However, this raised the issue

	the CRE project and providing social impacts as part of community benefit. The original prospectus not only highlighted the CRE project aims but also stated it would set up a charity, with part of the profit being retained within the local community.

In a similar way, participants from YPP (YPPPKS2) highlighted how the community hydro still remained in the early stages, although generating energy for a year. As such, the CRE project had delivered impact with a return on investment and produced a surplus available for community benefit. However, a key consideration was how best to deliver that community benefit, and what that might focus upon, with, social impact on a community level was seen as the next step. | around the distribution of funds and benefits and their delivery in the community. A key starting point at this stage of development was asking local organisations and clubs how best to meet the need of the community. |
| **Exemplars** | *"None of this stuff is happening. There's no direct results, the solar farm is just paying off its debts, all* | *"It was in the original prospectus Ynni Padarn Peris we said that we would set up a new charity so to give part of the profit into the community and we* | *"Yes, they overlap. Both are managed by Awel Aman Tawe which also has a development role for both co-ops –* |

these wider benefits they are all eventually funded by the profits but … we are on good course to clear all our. Then we'll have got a Community Benefit Fund then to distribute." (GRKS5)	*haven't made much progress with it and it's been three years since we've been operational now" (YPPKS5)* *"It's a very young scheme. We managed to raise the money we need and we've had a very successful first year because there has been a lot of rain. So we generated the money that we said we would. And we've paid back the investors 3%, like we promised. And we have money in the account to spend in the community. And the only problem we have at the moment is deciding how and where to spend that." (YPPKS4)*	*once projects get to a point of delivery, they are transferred to one of the co-ops which then funds them. Awel Aman Tawe delivers the wider community projects as it is the only one to employ staff. Profits can be transferred with no corporation tax from the Co-ops to Awel Aman Tawe as it's a charity." (ACKS4)* *"The wind farm is a really neat way of generating cash we can then go back to the community and say, well, we've got this money, what would you like to use it for and we've already started like getting in touch with local clubs and organisations and saying, how can we help you?" (ACKS2)*

7.3 Impacts

7.3.1 Environmental Aspects of Social Impacts

The study findings identify how contributing to environmental action was a discrete component of social impacts, particularly in seeking to generate greater understanding of environmental issues and creating the platform for further projects. The literature highlights that lowering carbon emissions and tackling climate change may be an underpinning factor for involvement in CRE and a resulting outcome. This was also reiterated in the study findings across case studies, with participants indicating the relevance of taking practical action at a community level to tackle climate change as both an aim and potential outcome. However, CRE schemes tend to be small-scale compared to commercial projects and therefore the overall contribution to a low carbon transition and national targets is modest and contextual (Walker, 2011; Bere *et al.*, 2017). Therefore, the most significant feature of CRE projects is not often their contribution, rather it's their potential to improve energy awareness and promote pro-environmental behaviour within communities (Walker *et al.*, 2007; Hicks and Ison, 2011).

Importantly, in the study findings, there was a complex picture with cases demonstrating pre-existing environmental attitudes and awareness regarding energy issues in developing energised communities. For instance, key stakeholders and shareholders already described having pre-existing environmental attitudes about tackling climate change as well as understanding of energy issues. They had a background and knowledge in renewable energy, and often already utilised heat source pumps or solar PV on a household level. In this way, involvement in the CRE project had some impact through heightened awareness and understanding of the renewable sector and community ownership, as well as generating some energy use behaviour change, and prompted sustainable lifestyle changes. Yet this impact was limited in scale and scope.

7.3.2 Pre-existing environmental attitudes and impact on awareness of energy issues

The literature indicates an assumption that being involved in CRE projects enhanced participants' knowledge of renewable energy and greater acceptance of further RE initiatives. Further, this included communities engaging in reduced energy consumption and a more sustainable lifestyle, such as through the uptake of household efficiency measures and use of renewable technologies (Walker and Devine-Wright, 2008; Hoffman and High-Pippert, 2010a; Rogers *et al.*, 2012a; Berka and Creamer, 2018; van der Waal, 2020). However, the study findings indicated a more nuanced picture that focused on pre-existing environmental attitudes. In the findings, participants highlighted mostly positive pre-existing attitudes and understanding towards renewable and environmental issues prior to involvement with the CRE project. However, there was some impact with an enhanced understanding of the wider renewable energy sector as well as some influence on energy use behaviours, focused on engaging with the Energy Local model. Rogers *et al., (*2012) indicated in their work that there was significant increased understanding and uptake of the CRE technology, wood fuel heating, by communities as an impact from the scheme. Yet the findings identified how impacts were focused on greater awareness of the sector rather than at the level of the particular technology, due to a pre-existing understanding by CRE groups. Yet there was a varying degree of environmental social impacts based on differing levels of engagement, awareness and understanding (Figure 52).

Figure 52: 'Ladder' of differing environmental social impacts

High

Varying levels of social impact: environmental	*High levels of engagement with energy issues (Limited impact)*
	Heightened awareness and understanding of CRE sector (Some impact)
	Increased understanding of energy issues and awareness (Some impact)

Varying levels of Engagement – awareness and understanding

Low
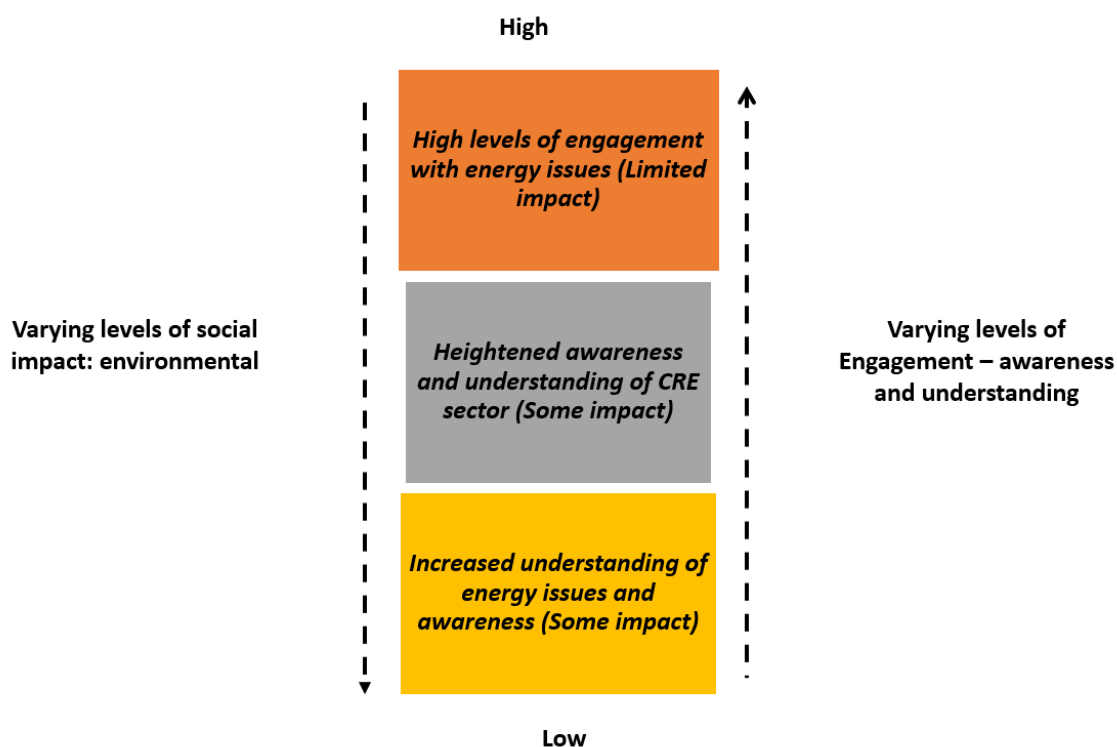
Pre-existing high levels of engagement with energy issues (Limited impact)

The findings indicated some participants in the CRE projects already had pre-existing environmental attitudes and a high level of understanding and engagement with renewable energy, prior to their involvement with the respective schemes. For instance, a stakeholder from YPP highlighted a prior environmental behavioural action at a household level, including energy efficiency measures and rooftop solar PV. As such, the participant had a degree of understanding about the renewable energy sector which was rooted in their vocational background. This was reiterated by several other participants (YPPKS3; YOS3).

> *"I've got a PV at home through and through external cladding across the house. Triple glazed. So, no it I hasn't changed my thinking at all because I understand the sector, that's my job."* (YPPKS1)

Further participants in AC (ACS5) had a high level of engagement prior to investing in the project, focused on carbon reduction behaviour across transport, energy use and renewable energy technologies.

> *"We've got our own solar panels on our house and think quite a lot about my own personal habits, that I don't fly. We don't use a lot of energy, an electric car that we're charging up at home, trying to use the energy from the solar panels." (ACKS1)*

In a similar way, two participants in YPP identified how their involvement with the CRE project was built on their pre-existing use of renewables at a household level. Previously they had solar panels and a hybrid car, but also had a heightened awareness and understanding of hydros due to a large scale pumped-hydro storage project within the local community.

> *"We are trying to be green in that sense we have solar panels on the house, and we have a hybrid car… and another reason was that we see how things were working in Dinorwig, on a bigger scale." (PS1)*

Overall, participants had not fundamentally changed their approach and attitudes towards renewable energy and environmental issues. For instance, a participant from AC was already actively concerned and engaged in tackling climate change.

> *"It's always something we have thought about the planet getting hotter. We were already concerned which Is why we got involved really." (ACS2)*

Heightened impact from awareness and understanding of CRE sector (Some impact)

The findings highlighted that although some participants already had pre-existing awareness of environmental issues and renewable energy, they still gained from engagement with the CRE project. This centred on a heightened awareness and understanding of the CRE sector and how CRE projects worked in practice. For instance, a participant from YPP identified how they had learnt a great deal about

the community energy sector despite already possessing pre-existing knowledge around technical aspects of renewable energy.

> *"I don't think it's changed the way I think, I've had an interest in renewable energy since the 80s. And I've written a few feasibility studies to communities who are off-grid …so I had some idea of measuring energy before I started this but I'm a lot more familiar with the energy sector now." (YPPKS2)*

Further, a participant from AC indicated they already had a pro-environmental attitude and background. Yet involvement in the CRE project increased their awareness of what was involved in setting up a community energy project in practical terms.

> *"It hasn't changed that because I was already sort of committed to the cause if you like, but I understand a lot more about the problems of making these things happen. It's, not at all straightforward." (ACKS2)*

In a similar way, a participant from YPP indicated they already had a significant interest and understanding in renewable energy prior to involvement with the scheme. Rather the shareholder identified how involvement with the CRE projects had developed a greater understanding and a consolidation of established patterns of behaviour. This focused on how small-scale community-owned projects were feasible and represented a successful model for collective action.

> *"No, I think it was something I'm sort of doing more and more interested in at the moment… it's made me realise that the small projects are viable, and funding is achievable for them it's made sort of smaller projects like that feel more within reach." (PS2)*

Increased understanding of energy issues and awareness (Some impact)

The findings also indicated how, for a number of participants, some impact was generated by increased energy awareness through involvement with the CRE project. For instance, a participant from YO noted a shift in behaviour by taking

greater notice of any weather changes and how this may in turn influence both a domestic (solar PV) and community (hydro) level.

> *"Yes, it has made me think about it a bit more. I've got solar panels on my house and I'm involved in the turbine, so there's something good either way."* (YOKS2)

Another participant in YO reiterated how their previous awareness of energy was heightened since taking part in the scheme. Consequently, the participant had become more "*vocal*" about publicizing the community hydro both in person but also online. Also, on a household level they had reduced energy usage and therefore costs (Energy Local), including no longer using a car for transport.

> *"I've become much more aware. And I think I've become more vocal about it to when, I post on my Facebook page. Oh, look how much the hydro is generating, I have reduced my energy costs quite a lot. I've given up on my car quite recently."* (YOS2)

In a similar context, a participant in YO also highlighted how they had pre-existing environmental attitudes and an understanding of energy issues, trying to reduce energy consumption. Yet since taking part in the Energy Local scheme their knowledge of energy issues had become more nuanced and more conscious, i in terms of time of energy use (off peak) as part of demand management.

> *"I thought a lot about before about how I save energy. But what has changed with Energy Local is that I think more about the times of the day… that we want to come off the peak times."* (YOS5)

Equally, a participant in AC outlined how they already had a pre-existing awareness and engagement with wind power as a technology. However, taking part and investing in the community energy scheme had heightened the improved their understanding of the role and benefit to communities of a low carbon transition.

"I think it did open my eyes to the fact that a community could do this so it made it more real to me, it has contributed to a sort of basic understanding of the benefits of wind farms." (ACS3)

7.3.3 Feeling empowered and tackling climate change

The work of Berka and Creamer (2018) highlight how community involvement with CRE projects generate a broader engagement with global issues, such as environmental challenges around a low-carbon transition. This builds on the earlier study of Hoffman and High-Pippert (2010) indicating the empowerment created by community-based action in CRE. In this context, Seyfang, Park and Smith (2013) identified how tackling climate change was an emerging area of concern for communities becoming involved with CRE projects, reflecting a wider trend in society. Indeed, the literature suggest that local and civic driven CRE projects are advantageous, in creating empowerment to address global environmental challenges. As such, local projects create a belief in community members on a collective level that their behaviour can make a difference and therefore they adopt responsibility for action (Berka and Creamer, 2018). In this context, the study findings indicate how the participants across case studies described the importance of taking practical action on a community level, in tacking climate change within the context of the CRE project. Significantly, this resulted in energised communities focused on enacting change in both local and global issues.

In the study, the empowerment of the shareholders from engagement with the CRE projects was significant outcome. A participant from GR indicated how this emerged directly from investing in the project, facilitating shareholders to have a sense of contributing in a practical way to tackling climate change on a local level. This was, despite its overwhelming scale as a global problem, being frequently framed in a distant and abstract terms.

"The members that came to the AGM feel quite empowered by being able to put some money into a local project and make it happen to make difference, with climate change it seems so upsetting and demoralising, the scale of it, and you think what on earth can I do to make a difference? Well, you have, by investing in GR." (GRKS4)

In a similar way, participants from YPP and AC highlighted how the CRE scheme itself had the potential to promote a social impact through generating interest in the area of renewable energy and possible future renewable energy projects, within a local context *(ACS4)*. They emphasised the value in providing exemplars of CRE projects, demonstrating the utility of local and tailored models.

> *"Like when I was growing up the only place talking about these types of things the centre for alternative technology, there are hippie people aren't they (Laughs) I think there is need to break into the mainstream, these (schemes) all work, they've done it." (PS3)*

Another participant based in AC exemplified the importance of how being involved with the CRE project had an outcome of demonstrating a way forward in tackling climate change on a community level. The participant identified the need to have social action on climate change, set within the wider political context of inaction and an increase in climate change denial.

> *"We all the need to do something about this global warming and more urgent than ever, so this is good as far as it shows what can be done. There is probably more needed when it was being originated, especially with politicians making a living of climate denial." (ACS4)*

Further, a participant in AC identified how viewing the wind turbine in place had underlined the impact of the scheme. For the participant, the CRE project represented collective action on a community level to tackle climate change, representing a *"like a little candle"* it was nonetheless a significant and positive form of community action. This was in stark comparison to the "*gloomy"* lack of action on environmental issues on a governmental level. As such, there was a sense of empowerment being involved with the project as community energy was paving the way in terms of climate change action.

> *"It's tangible you see it and you meet some of the people, that idea that people are putting a lot of effort into this to make this happen, it really boils me up about climate change and, our government are not really doing*

anything about it…. It's like a little candle! You think things are gloomy and then you think hang on, somebody doing it." (ACS3)

This was reiterated by a participant from YO, who viewed taking part in the community projects as a way to tackle global issues on a community scale. Consequently, involvement as a shareholder in the CRE project was linked to a sense of satisfaction and empowerment by making a positive contribution in moving away from fossil fuels.

"Undercurrent of people realising what the effects of our energy usage with fossil fuels. A lot of people feel unempowered to do anything about it, so community projects like this are really worthwhile, they feel you're doing something positive it's a small step. But it's something that is cumulative contribution." (YOS2)

7.3.4 More Renewable energy and environmental projects

The literature highlights how CRE projects at times utilise the income from schemes to develop energy efficiency initiatives, as well as additional micro CRE schemes to generate a low carbon future (Walton, 2012).   As such, they provide a mechanism for decreasing CO_2 emissions at the local scale, because of the associated engagement by community members in other beneficial actions, such as energy efficiency in addition to generation (Scene Connect, 2018).

The study findings focus on how successful CRE projects led to further renewable energy and environmental schemes. For instance, in the case of AC, there was the development of Egni solar which was rolled out across community buildings in a wider range of areas within Wales, as well as future plans for solar battery storage. Further, the YO CRE project generated the 'Heuldro' scheme centred on solar panels, as well as the Dyffryn Gwyrdd initiative, including EV cars and tackling fuel poverty. In the case of YPP there was a clear aim to develop further CRE projects in the future. Equally, GR focused on local supply with storage of solar panels centred on local innovation. This is reflected in Armstrong (2015) which identifies the innovation created by CRE projects as an opportunity to test and develop renewable technologies in a community context, at a small scale, including battery

storage, smart meters and demand management In the findings , participants across cases identified that a key aim was to utilise the current CRE project as a platform to then develop further renewable energy schemes within communities. In some instances, this was an anticipated objective whereas in other cases initial steps had been to take to realise this ambition.

In the findings, a participant within GR highlighted the centrality of the Community Benefit Fund as a vehicle for wider distributed benefit from the scheme. This centred on developing further projects to increase the provision of renewable energy in the area driven by sustainable aims.

> *"I think the Community Benefit Fund is at the heart of it, and that initial investment in innovation…to help new things happen, of course with GR we are looking at more renewable sustainable projects, projects with sustainability at their heart." (GRKS3)*

In a similar way, a participant from YO indicated how they were seeking to develop more CRE projects, building on the first small scale hydro model. This was constructed in fulfilling environmental objectives to underpin future projects.

> *"Things like hydro with YO it's a quite good initiative. The sort of things like to see would that are more community energy projects. I think the projects have to be something to do with the environment." (YOKS5)*

In the case of AC, a participant indicated the importance of local engagement with renewable energy as part of the CRE project. As such increasing environmental projects within the local community was seen as a key future objective.

> *"For the profits to go into local regeneration, mainly energy efficiency and renewable energy projects. Other kind of environmental projects." (ACKS1)*

Equally, another participant from AC highlighted the dynamic nature of community energy with the new Egni co-op project aiming to have solar panels projects on community buildings across Wales. This was seen as a larger scale project with the potential to have significant social impacts.

> *"It has enormous potential the Egni share offer going out now, it's just spreading the net wider and wider." (ACS5)*

Further, a participant in YO identified the significant development of a new solar project, 'Ynni Heuldro' building on their successful hydro. extending the reach of CRE within communities. This is focused on solar panels on community buildings and the office of Hwb Gwyrdd. Other shareholders were also aware of these developments (YOS3; *YOS1*).

> *"Then Ynni Ogwen is doing a new project 'Heuldro', putting solar panels on community buildings like our office in the 'Hwb Gwyrdd' (Green Hub), the library, Caban Gerlan (bunkhouse), Neuadd Ogwen (community centre) and the rugby club and cricket club, I think six in total. The solar panels, reduce carbon but also less costly for them." (CYKS3)*

A participant within CY identified the importance of developing future projects, for instance the linking of a local supply with demand model associated with an Energy Local Club in the Ogwen valley. This included a range of technologies including solar, anaerobic digestion as well as wind in the Anafon Valley, building on the original hydro project.

> *"One major outcome for us we hope one that is already in train, is the delivery of this new renewable generation scheme based on solar, anaerobic digestion and wind which could be as much as 230 kw." (CYSK4)*

In this context, a stakeholder from YPP highlighted how an underpinning objective of the community hydro was imagining a sustainable future through the development of further renewable energy schemes. The CY consortium had provided a facilitation role in bringing different community groups together to explore the potential of using a broad range of technologies, to be developed moving forward.

> *"Another one of our objectives was also to develop other projects in the valley. we have- five Community Energy schemes in the local area are looking into the possibility of other schemes in the area, be it hydro, wind, solar." (YPPKS3)*

A key development identified by a stakeholder with YO, over time, was the development of the Green Valley initiative (Dyffryn Gwyrdd). This included the Hwb Gwyrdd which provided a hub for different environmental and renewable energy projects in the Ogwen valley. These initiatives were built on the platform of YO hydro as the initial community led CRE project in the valley. As such it had enabled the widening of environmental projects in the valley, including tackling fuel, transport and rural poverty through trials of EV and energy insulation. A theme reiterated by other participants, especially developing local EV transport *(CYSK3; YOCH4).* In this way, YO funded the Dyffryn Gwyrdd coordinator role from 2019-20 and was part of the collaboration within Partneriaeth Ogwen that submitted a National Lottery Grant to support the Green Valley initiative.

> *"Not just generating electricity but hoping to create a sustainable valley in a wider sense in the future, to provide support towards rural poverty, from different aspects. Reducing energy and have more insulation, transport with the electric 'Carwen' for the year used Afon Ogwen so comes back to YO and comes back to this idea of having a sustainable valley." (YOKS4)*

In the case of both AC and GR there was also a focus on developing further CRE work centred on a future solar storage and supply project. A participant from AC identified a future plan for battery-based solar storage scheme alongside the windfarm.

> *"I suppose another thing with the windfarm, just in terms of looking into the future is that we're applying for a mountain solar scheme up there, the planning will be for like 2.2 MW of solar and then also potentially 5 MW of battery storage up there." (ACKS1)*

A stakeholder from GR highlighted how local innovation also focused on a local energy storage and supply project. This focused on building storage facility to their

existing solar farm to provide local generation and supply of energy. As such, this was seen as having added value in generating local interest in community energy and its benefits and a natural progression from the current CRE project.

> *"I think we're aware that there is that people would like to take it further, with the storage projects so that we might actually be able to supply the electricity locally." (GRKS4)*

7.3.5 Renewable energy engagement and education

Within the literature CRE projects are identified as not only having a role in carbon reduction but also having a potential to improve energy awareness and promote pro-environmental behaviour within communities (Walker *et al.*, 2007; Hicks and Ison, 2011; 2018; DECC, 2013). In this way, it may provide enhanced energy literacy and education as well as an awareness of climate change (van der Waal, 2020; Buckland-Jones, 2019). Indeed, Berka and Creamer (2018) indicate that CRE highlights the relevance of environmental action as part of daily life for citizens, of otherwise what might be otherwise abstract and global environmental concerns. CRE project are reported as representing effective mechanisms for developing environmental sustainability, due to its local focus and small-scale RE (Seyfang, Park and Smith, 2013; Hicks, 2018). This is seen as enabling community engagement and tailored projects that match local concerns (Haggett and Aitken, 2015).

Significantly, the study findings indicated there was attention to renewable energy engagement and education as an impact from the CRE projects. This included engagement through recruitment of local households as part of Energy Local in the Ogwen valley, seeking to develop a closer connection between energy use and local generation and developing behaviour change. Furthermore, YO utilised a window meter to facilitate local engagement with the local hydro.

On a wider level, the CY consortium had developed a number of local community events centred around energy saving advice, as well as workshops and using heat camera events for local groups. As part of AC there was also a focus on engagement through site visits to the scheme and with the physical presence of the

wind turbines acting as a catalyst. In relation to education, the case studies consistently worked with local schools and utilised the CRE project to bridge wider energy issues, including tackling climate change primarily through site visits. In this way, across the case studies engagement and education was part of developing energised communities.

Community Engagement

The literature highlights the importance of trust and interpersonal networks in developing pro-environment awareness and behaviours, as well as tackling energy poverty from CRE projects (Walker *et al.*, 2010; Rogers *et al.*, 2012; Berka and Creamer, 2018). In this context, CRE projects were seen as more trustworthy than governmental or other organisations with greater accessibility (Berka and Creamer, 2018). This focused on the provision of community-based activities that built on existing social networks, providing a platform for engaging communities with RE at the local level (Hicks and Ison, 2011; Hamilton *et al.*, 2014; Simcock, Willis and Capener, 2016).

In the study findings, the case of YO highlighted a focus on engaging local communities in energy usage behaviour change and involvement with new energy local models. In this way, YO assisted with the community engagement process focused on the pilot of the national trust hydro scheme, recruiting the first 100 households and using the strapline of *'Use local power, cut your bills'*. This was augmented by a series of outreach events centred on 'drop-in' sessions.

A participant from the first Energy Local club in Bethesda identified the utility of using a smart meter as part of the Energy Local project in engaging the community with renewable energy. It provided a catalyst for a greater understanding regarding energy use on daily basis.

> *"Well, everybody has a smart meter which is a half hourly meter…. but you have look at that 'dashboard.energylocal.org.uk'… it is amazing actually how interested people get about this when you show them their energy use and they are like oh that's my washing machine, when I have a cup of tea."*
> *(ELSK1)*

A participant from YO also identified how 'bottom up' community action encouraged energy saving and a shift in energy demand behaviour. In this way, it was perceived as more trusted within the community as it was embedded in the community   compared to a 'top down' initiative.

> *"I think if people learn from it from the from the roots up about how things being used and what the what the impacts are then they're much more open to being persuaded to change their energy habits than being told to either by government or by a corporation. They don't trust either." (YOS2)*

Further, a shareholder in YO outlined how in a window shop on the high street in Bethesda was used to facilitate community engagement with the CRE project. This focused on an interactive and visual 'window meter' (Figure53) that provided a constant source of information for the local community that demonstrated how much the community micro hydro was generating in terms of energy. This was reiterated by other participants *(CYKS3).*

> *"On the high street, the Siop Ogwen there's a display of the hydro and how it's generating out on the window. People are much more open to be persuaded visually, when you see things and when people start to think about it". (YOS2)*

Figure 53: Window hydro monitor: Siop Ogwen (Field visit)

Equally, a participant in AC highlighted how the successful completion of the wind farm had major repercussions for community engagement. Consequently, the participant highlighted there was a visible impact which could be used to foster engagement. With large number of people quoted seeing the turbines first-hand.

> "*I think having two massive great wind turbines. Oh God, those things are actually up. I think a lot of people, about 600 people, have been to see them.*" (ACKS1)

In a similar way, a shareholder from AC indicated the importance of the physical and visual presence of the wind turbines within the local landscape as a mechanism for engaging the community. As such, the participant visited the wind turbines with the Pony Club and utilised the opportunity to engage people in promoting an increased awareness of community-owned renewable energy.

> "*The biggest benefit, in terms of people, living with it, visiting it. I have great joy in in leading a group from Pony Club for a visit to the wind turbines, going up to me to find out what it's all about because they've been given shares.*" (ACS5)

Equally, a participant in CY identified how the consortium acted as a mechanism across localities with CRE projects in North Wales to engage in wider energy initiatives. The consortium set up activities within communities, centred on sustainable housing and energy advice events. This included a 'Sustainable Housing Viewing Event' held by CY as part of an 'Open Doors Fortnight' in October 2018. This focused on the communities of Abergwyngregyn as well as the Ogwen and Peris valleys, discussing household renewable activities such as solar PV, ground source heat pump and biomass boiler.

> "*We've got open days for people to look at houses that have been built sustainably. And a drop-in session now for giving advice on energy saving*". (CYKS4)

Furthermore, the field visit to CY (Memo, 2019) highlighted the use of workshops to raise community awareness of energy issues and promote behaviour change. This, focused on increasing energy saving and reduce costs, based on workshops that had been held in Abergwyngregyn, Llanrug and Llanberis between 2018-19 in community halls and cafes. The workshops delivered advice on energy saving, energy tariffs, benefit entitlements and practical measures for tackling energy reduction. In this context, a participant indicated how the consortium and CRE projects had completed substantive work in increasing energy awareness and providing information and advice on energy saving measures within the community. Further, heat camera events were used for the younger generation to provide a visual illustration of where buildings lose heat.

> *"So, we've tried to do workshop session at Y Festri about reducing energy, just having resources and information available, how to try and make things less expensive, small things, where likely to find drafts, LED bulbs like energy awareness. And as well with these heat cameras showing where is red, where the heat comes out have done that with scouts with the kids arts and crafts club." (CYKS3)*

In a similar context, a participant from YPP indicated the importance of building on existing initiatives about energy saving from other CRE projects within the consortium to underpin the future work from the YPP charity. The CY consortium engaged in energy efficiency assessment and advice on a local community level and bringing in a specialist advice.

> *"Actually, one of the projects they are doing {Ynni Anafon} is having an energy saving specialist in, about reducing waste in houses and did a sample of different houses in the village, this is what you can do and this is the cost, and the benefit to you. So that's one environmental project that they have funded. I'm sure we will too." (YPPKS6)*

In terms of more immediate impact and wider community benefit a participant referred to the activities and aims of Awel Aman Tawe and the recent Egni Co-op, focused on solar panels being installed on community buildings. For the participant engagement was viewed as a key area, centred on involving the community and

engaging local people in raising awareness about climate change issues and how this related to their energy use.

> *"Hopefully different organisations will get cheaper electricity. And hopefully they get a sense of being involved and being a bit greener. And the schools and people generally once they got stuff on their roof or they start to think a little bit more about the energy they use and about the climate." (ACS2)*

Another participant based in YO indicated the significance of contact and communication with members of the community through the activities related to the CRE project. As such, it provided a platform for discussing and raising awareness of wider sustainability issues.

> *"So, we have over 300 members which are open then to further discussions around sustainability issues, not just the aspect of generating electricity on water of the River Ogwen but aspects of energy efficiency through our newsletters, we are trying to promote other projects which are doing sustainability in the area of members." (YOKS1)*

In a similar way, a participant in GR highlighted how generating energy was a tangible impact, measured in kilowatts. This was seen as being easily communicated to the wider membership.

> *"The impact is we are generating power now, so we can send to our shareholders information about how energy being generated. So you can have nice pie chart or graph. To say hey this how well solar doing." (GRKS3)*

Renewable energy education

As part of the literature, a number of studies identify one of the potential benefits of CRE projects as being the provision of education for wider members of the community. In particular, there was a focus on children and young people to raise awareness about energy use and RE (Walker and Cass, 2007; Rogers *et al.*, 2008). In the findings, these observations were reflected in the case studies, centred on activities and visits with local schools and colleges. This focused on highlighting technical aspects, addressing climate change and delivering local socio-economic

benefits. Further, as evidenced in the literature there was engagement with children to promote an early understanding of RE, facilitated by the accessibility and local context of CRE projects.

A field visit to CY (Memo, 2019) highlighted how it engaged in a particular set of educational activities across a wide range of age groups, involving primary and secondary school pupils as well as higher education students. These focused on the areas of energy and climate. The work with local schools centred on developing initiatives such as in Llanberis the 'Eco Clubs' and the youth group combining energy with their community artwork. Furthermore, geography students from the local secondary schools and Bangor University visited the CY office in Bethesda, accessible within the community, to discuss the work of CY in the area. In the Ogwen valley area a participant highlighted the exemplar of a film night in partnership with local primary schools. This centred on creating videos that provided a platform for showcasing the concern of local children regarding environmental issues.

> *"With the schools we did a film night about what is important to you about the environment, like energy, clean air, plastic." (CYKS3)*

The participant highlights educational aspect is key aspect of Awel Aman Tawe in engaging energy and climate change issues. With classroom activities but also site visits to the wind turbine as tool for renewable energy education, recently as seen in Moon report, interactive sessions with Egni Co-op about the fragility of the atmosphere were recent climate change and arts initiatives.

> *"In terms of educational aspects what activities does Awel Aman Tawe works with local schools, both classroom-based and they fieldtrips to see the wind turbines and there's Moon report which involved lots of schools." (ACKS4)*

Building on this, arising from field visit to AC (Memo, 2019), the Egni Co-op was seen as having the capacity to expand its education and climate awareness-raising

programme. This included a £2.9 m source of funding to engage with schools and colleges to develop learning around these key areas.

A participant from GR highlighted how the new solar storage scheme was also a platform to build on the renewable energy education and relationship with the neighbouring school. The importance of this work with the local school was reiterated by other participants (GRKS2; *GRKS1*).

> *"We have done that a couple of times actually, doing a school assembly they loved it…I have to go in and do a talk to them about the supply scheme." (GRKS5)*

Further, participants from YO identified the role of education activities as part of the CRE project. *(YOKS2; YOKS5; YOKS1)).* In particular, site visits were viewed as an educational tool with school children and provided reinforcement of learning about the hydro and renewable energy. This was seen as potentially influencing families as part of promoting awareness within the wider community.

> *"Schools are another big influencer, primary schools talking to children when they go out into to see the hydro and their eyes light up, if they're learning these things at a really early age, and then their parents become involved." (YOS2)*

In a similar way, a participant from YO highlighted that the community scheme had an impact on education around renewable energy, focused on guided tours by volunteers (Figure 54). This involved a range of different groups that sought to learn about the scheme, including local schools. As such, the CRE project was viewed as being a catalyst for promoting renewable energy.

> *"Very often, we take groups down to the river … so coming back about the community and societal benefit that the scheme is of interest to social groups, like schools, institute of mechanical engineering, restoration society, so YO is educating and a being an advocate for and about the community energy sector." (YOKS1)*

Figure 54   Wider education and awareness by Cyd Ynni (Datlbygiaud Egni Gweledig, 2021)

An example of the potential impact of educational activities was illustrated by a participant from Gower Regeneration. It centred on a pupil and peers from the local school being able to have a guided site visit. This was seen as providing potential inspiration for engagement with renewable energy by a younger generation. Although the success of such visits and a connection with the CRE project was difficult to measure but had an inherent value.

> *"One example, we had a parent contact us, saying my son has been so, so interested in this solar farm, and please if there any chance of visit from the school? And that kid was totally chuffed. He walked around and I explained all the different things., He may become an amazing engineer as a result of having been inspired by something positive in his early years. So, it's hard to measure things like that." (GRKS1)*

7.3.6 Perceived positive and negative environmental impacts of CRE

In the literature, CRE projects are identified as representing more sensitive schemes linked to local context and scale, in comparison to commercial models which tend to be aligned with community opposition (Rogers *et al.*, 2012). Also, the importance of existing community attitudes to renewables and sustainable development, as well as place attachment and the siting of schemes, in balancing potentially

controversial projects (Vanclay, 2012; Bere, Jones and Jones, 2015). In addition, the impact on wildlife such as birds were seen as particularly relevant in wind turbines (van der Waal, 2020). Importantly, the literature resonates with the study findings as the CRE projects were seen as mostly locally appropriate and having a role in moving away from fossil fuels. However, significantly some areas of concerns were expressed by participants in ecologically sensitive landscapes and the potential for some damaging effects, especially in terms of the wind turbines and wildlife.

Overall, the study findings highlighted perceived positive and negative environmental impacts of CRE across projects. The community hubs provided insight into the wider perceptions of the community regarding the CRE projects.   As part of a community centre hub, a participant in the Peris valley identified the positive benefits of CRE projects in using natural resources in an appropriate manner. The main argument focused on moving away from traditional infrastructure such as "*pylons*", based on supporting smaller-scale initiatives generating smaller amount of electricity but less environmental impacts.

> *"What's good about these, there are no big pylons, they are small. They don't generate that much electricity, but it's important to have that as many as we can, it's a good thing." (YPPCH7)*

In a similar way, a participant within a social community organisation hub articulated a positive perception of renewable energy at both a household and community level. At an individual level, the participant was receptive to these ideas around renewable energy as they had some pre-existing solar panels on a household level: *"Yes, anything like that, I've got solar panels on my roof!" (YPPCH1)*

These benefits of the CRE project, were echoed by a participant in the Peris valley, based in a faith and tourism-based hub (YPPCH4). The main concern of the participant was the positive impacts of CRE generation in a global sense. The benefits were focused on moving away from fossil fuels to more "green energy", within a low carbon transition.

> *"I'm a passionate believer in green energy so whatever we can do to switch from fossil fuels to renewable resources. We should be doing it."* (YPPCH3)

Across the AC, YPP and YO cases other community hubs identified concerns over the environmental impacts of the CRE projects. This focused on damage to the local hydrology ecology, wildlife and the use of concrete. For instance, a participant from a tourism-based Community Hub mapped the complex range of issues linked to environmental impact and drew on a number of illustrative case examples. Although the participant was supportive of renewable energy, there were also concerns about damaging the local environment through its developmental stages, such as changes to hydrology as well as the aesthetics of the landscape.

> *"I like the idea of renewable energy. I know there's talk of Fairy Glen Hydro scheme that would have been a disaster, +so if rivers were getting properly diverted and dried up, then I would find that would be more unsavoury."* (YPPCH4)

In a similar context, a participant in a conservation charity as an environmental organisation community hub within the Ogwen valley outlined how the organisation had previously opposed a proposed micro hydro project on environmental grounds. The participant highlighted support for CRE in principle, but that on a case-by-case basis.

> *"We actually spearhead a campaign against a community energy project the Conway Falls, we're not against renewable energy because obviously it's good for the environment. But I think it's very context specific… that was a controversial one, because that was in a nationally important ecological."* (YOCH3).

There were similar concerns expressed by some community hubs linked to wind turbines. A participant within 'Merched y Wawr' a social community organization hub within Swansea and Aman Valley highlighted the negative environmental impacts and disbenefits. The participant was opposed to wind turbine technology due to its detrimental effect on wildlife, focused on damage to birds.

> *"I don't really agree with wind turbines because they affect the birds. They are birds on the top of the mountains."* (ACCH1)

7.4 Economic Aspects of Social Impacts

The study findings indicated how there were economic aspects to the social impacts from the CRE projects. This extended beyond the financial return on investment by shareholders and included the provision of long-term income accessible to local communities through the mechanisms of Community Benefit Funds. In this way, the participants identified the importance of income from CRE projects as the enabler for social impacts to generate local benefit and energised communities. As such, there was a greater sense of autonomy as communities were not dependent on grants due to the long-term income, as well as local decision-making about how to distribute income, leading to enhanced civic empowerment. In addition, there were potential impacts that may provide more immediate social impacts, related to reduced energy use and costs. Within the literature, studies have focused on economic impacts primarily in isolation, whereas the findings include a broader and more nuanced perspective. This centres on how these economic aspects are experienced, perceived and contextualised within communities.

7.4.1 Economic return on investment

Overall, in the study findings the stakeholders and shareholders across the CRE projects indicated that direct impacts related to a return on an investment into the scheme. As part of these low carbon projects, although the initial driver for many community members was financial gain, a 'sense of community' was reported as the most significant motivating factor once the CRE project was established (DECC, 2013; Armstrong, 2015). In this way, the literature suggests that participants in community-led and voluntary CRE projects tend to be driven by anticipated community-based not personal benefits or outcomes (Hoffman and High-Pippert, 2010). Significantly, the study findings reiterated these observations, with participants highlighting the importance of a financial return to investors with a good rate of interest, but this was also seen in the wider context of a social return on the investment due to the community impact.

In the findings, the financial return of the shareholders' investment was highlighted as an element of involvement with the GR project. The development of an initial impact, with some tangible monetary return.

> *"I think in the fairly immediate future, there's going to be some returns to investors as well, so some monetary returns." (GRKS2)*

Yet, there was an acknowledgement by shareholders that even though there was some financial return on their investment, it was modest, as part of the overall impact of their involvement with the CRE projects. For instance, in YPP shareholder noted that there was a degree of a return from their investment in the CRE project.

> *"There's a tiny financial reward in there. I guess it depends how you put in just definitely worthwhile. It's better than doing nothing with your money." (PS2)*

Yet shareholders identified the relevance of having a financial outcome alongside other factors. For instance, in YO and AC participants (YOS1; *ACS5)* echoed other shareholders perspective, identifying that the CRE project had a 3% return on investment, which was perceived as a good return.

> *"You know that we get 3% and then that's what we are getting at the moment, which is better than anywhere else." (YOS1)*

A participant in YO highlighted how the project provided a particularly good return on investment, combined with a social investment leading to a "*feeling of virtue*".

> *"Ah a feeling of virtue…. and also, the money. They give a rather good rate of interest … It was a worthwhile thing to put my money into."* (YOS3)

As such, shareholders identified that the financial benefit of investment in the CRE project represented a different type of share. For instance, a participant in AC highlighted the issues noting it was different from an ISA in terms of financial return but also that the nature of the share had a social impact.

"I have to say as well as the returns are often better than you get from putting money into an ISA. I don't think people invest for that reason... I mean we haven't got too many shares, so I suppose it isn't a financial thing!" (ACS1)

In as similar way, a shareholder from YPP indicated the importance of investing in the CRE project not only to gain financially but also make a social investment. As such, the type of investment was different to traditional shares. Importantly they stressed what makes the difference was the impact of investment in building the CRE project within the locality.

"Everyone who has invested in it want to make a bit of money, but that's the secondary concern, I've helped to build this." (PS3)

In a different context, a stakeholder from YO identified the importance of local support for the share offer to develop the CRE project. This resulted in the income generated by the scheme as a return on the investment being retained in the community and supporting the local economy.

"So local money, 85% of membership were local people, so local money has gone into building the scheme, and we have just agreed to give them an interest payment of 3% to them... so those interest payments is staying locally as well, so we are recycling the money, so sustainability once again, locally." (YOSK1)

7.4.2 Local and long-term income

The study findings reiterated the observations in the literature centred on long-term income generation and local distribution, especially in a rural context (Bere, Jones and Jones, 2015; Markantoni and Woolvin, 2015; Slee, 2015). Furthermore, in the study findings an important economic impact for communities was the generation of an income stream from CRE. This facilitated greater local resilience by reducing dependency on outside grant-based funding (Haggett and Aitken, 2015; Slee, 2020). In this way, projects provided enhanced local control and independence through longer-term revenue (Walton, 2012; Haf and Parkhill, 2017).

A participant in YPP identified how the community hydro had been established successfully and had been operating for a year, providing a vehicle for income generation: *"We've had a good first year. It's all money end of the day. We have 40 thousand in the bank. So, it's been successful." (YPPKS4).* Further, participant in YO and YPP (YPPKS1) citing how a movement away from grants generated a sense of empowerment and a locus of control for communities as well as generating energy.

> *"What they're doing is creating pot of money that isn't dependent on grants from Europe, or the Welsh Government or Westminster government. But provides a communal sense of power. YO is a lot more than just generating green energy." (YOKS1)*

Moreover, the income generated from CRE projects such as AC and YO created a sense of being self-sustaining schemes through the development of long-term income *(ACKS3; YOS2)*. A participant identified the potential future impact of the AC project in providing the platform for further community projects, building sustainability.

> *"Well, I hope it will be a positive impact if we can use the income generated by the turbine to help kick off community projects and develop things that are self-sustaining, that impact, it can be stronger." (ACKS3)*

In a similar way, a participant from GR identified that a significant outcome emerging from the project was the financial benefit being retained locally which could then be utilised to fund local projects. This was seen as of critical importance, linked to a backdrop of difficulty in accessing funding for other community project in the past.

> *"The fact that the money stays locally and then can be used for local projects, is really important, its needed otherwise those local community projects, you just find it so hard to get funding nowadays." (GRSK4)*

Overall, the study findings indicated how CRE projects were distinctively sustainable, in comparison to other community groups and hubs in their local

community. This centred on CRE projects being able to generate income and consequently move beyond the cycle of short-term grants and its uncertainty. As such, they were able to have a greater sense of stability and engage in more planning and develop a platform for current and future community activities. In the broader context of local civil society, there was a degree of vulnerability in securing funding to support community activities centred on the hubs, addressing community needs.

The importance of income from renewable energy being retained within communities was reiterated by another participant in YO. They identified the significance of the wider community benefit accrued from the CRE project income remaining locally. This was seen as a key community benefit to be used by local people, also reiterated across project such as YPP (*YPPKS3;* YPPCH2*).*

> *"Like I said I hope that there will as much community benefit and income as possible which can be used for the people of Bethesda." (YOS1)*

The significance of CRE projects contributing to local income was emphasised by a participant in a community centre, identifying how Awel Aman Tawe had impacted on the locality of Swansea and Amman Valley. This was in the form of shares to community ventures, which ensured there was a direct benefit held within the locality from community shares, such as *"£500 a year"*. There was an anticipated rolling out of benefits linked to the Egni Co-op initiative connected to Awel Aman Tawe, which was setting up solar panels on community buildings, and providing increased impacts as well as sustainability for the community hub.

> *"The wind turbines, a company Awel Aman Tawe. what they've done is they've given shares to all community ventures, so we have shares here, I think its 20,000 shares so I think here we get £500 pounds a year off them. Which is great. It's not sort of big venture but what they want to do eventually is solar panels, so they asked if they could rent a roof space off us and then they would put the solar panels on generate more electric and heating in here for us."* (ACCH2)

Overall, in the study findings CRE projects focused on long term social impact emerging from the income generated by the schemes, creating sustainability in terms of income generation. For instance, a participant from YPP indicated that although small-scale, the CRE project was important to the local community due to its long-term income, and sustainable impact extending over time.

> *"Only a small scheme so not a lot of money but difference being that is long term income. And impact Is going to be when us seven aren't here!" (YPPKS3)*

In a similar way, a participant from YPP outlined how different levels of funding for different projects were to be available to the community, providing a local focus for using surplus income from the CRE project. In this way, it was envisaged the income would support longer term projects in the community in part, such as £500 grants towards costs. As part of the CRE project the amount of surplus income being allocated to the charity as a mechanism for distributing local benefit was £10,000 a year, with already £20,000 available.

> *"It depends on what comes from the community. The support for projects less than £500 one off that's it. Then there are projects over a longer term, maybe funding a project that takes 5 years and we give 500 pounds a year… so there is different levels… the charity will be starting off with 20 thousand which is quite a bit of money isn't it." (YPPKS5)*

7.4.3 Reduced energy consumption and cost

The literature highlights the relevance of addressing fuel poverty and justice dimensions as part of moving to a low carbon transition (Creamer *et al.*, 2019). Although this was not explored in-depth in the study, the findings surfaced the issues of energy costs and consumption, with projects engaging in the early stages of aiming to tackle fuel poverty, for instance energy efficiency and adopting the Energy Local model. In the study findings, the case studies indicated that CRE projects aimed to deliver greater impact in the local community, over the long term. Importantly, the findings indicated how participants viewed schemes as developing an evolving set of aims and social impacts over time. These focused not

only on generating energy and income, but also having an important role in reducing energy consumption and costs within their communities. Indeed, this was positioned as the "*holy grail*" of renewable energy as noted by CEW (2019).

> *"The holy grail of community energy is enabling local energy consumers to benefit directly from renewable energy generation and storage assets, not only by sharing profits but also by reductions to their bills."*

A study by Armstrong (2015) highlighted how CRE projects innovated through the local balancing of supply and demand, as exemplified by the Wadebridge CRE group (WREN). Further, Berka and Creamer (2018) identify a limited range of exemplars in the literature, of CRE projects providing a direct supply of energy to communities. This was seen as restricted by regulatory and administration costs. Where this has been achieved, they centre on CRE projects being able to innovate through demand management. Significantly, the study findings highlight evidence of innovation in this area as part of the early development of the CRE case studies. This was centred on how energy use and costs could be reduced by communities. For instance, Energy Local scheme was seen as supporting the alleviation of fuel poverty in the community and addressing reduced electricity bills through closer connections between energy supply and demand.

> *"So, we are at the stage now, actually, looking at using energy in people's houses. So, in a way alleviate fuel poverty or at least help homes to lower their electricity bills … we have done from Bethesda, a previously pilot, Energy Local... So, we recruited 96 of homes. With that scheme, people were paying 7.2 pence per kilowatt hour for the energy from the hydro scheme. And then, they had time of use tariff, it meant using energy that has been generated in this area." (YOKS1)*

The Bethesda Energy Local club represented the innovative model of matching locally supply and demand. As a pilot scheme, it was based on the National Trust 100kw hydro on involving 100 households in an energy local club. There has been an attempt to increase more local hydro generation initially involving the centred on YO, as well as an extended membership. Aim to encourage behaviour change by connecting household members to tailor their usage, linking in local renewable

energy generation and off-peak times. In a similar context, the developments in the case of GR focused on solar battery supply and storage. As a result, community energy generation aims to provide electricity for 300 households and businesses in the Swansea area. Equally, AC was at an early stage of planning to establish solar and battery storage at the wind turbine site. In this way, both Awel and Gower CRE projects were involved in the emerging developments of using battery storage within the renewable energy sector, highlighting how these projects were continuing to adapt and innovate over time and respond to initiatives and policy.

A participant from YPP highlighted how poverty was a feature of local Welsh communities. In this context, the community energy scheme was well positioned to tackle fuel poverty within the local area. Although, a small-scale scheme it was seen as generating income that could be retained within the local community, alleviating some fuel poverty within the local community as social impact from the scheme.

> *"I think it's important that we try to help people who are in fuel poverty …The hope in looking ahead is that the community will benefit from the scheme. I know there is poverty in the area, although it's a small scheme at the end of the day." (YPPKS3)*

In terms of both YO and the charity there was an aim to deliver social impacts focused on tackling fuel poverty and reducing electricity bills for the local community. This was centred on the energy local model and energy insulation.

> *"But if we talk about charity, they can identify some people who are disadvantaged and can help them through local energy for more to receive cheaper electricity supply, or maybe insulate their homes. YO is quite supportive of because it is one of our principles." (YOKS5)*

In a similar way, a participant from GR identified how project aims developed over time. As such, the participant identified that there were opportunities to enhance the positive impacts from the CRE project through selling energy locally. This was seen as a future objective, addressing the local demand for renewable energy but

leading to economic benefits being retained locally rather than benefiting companies outside communities.

> *"We always wanted to sell electricity locally, but it was never what we set out to do, but we've discovered along the way now, that would be an extra bonus. Because that's what people want, to buy cleaner electricity locally that benefit their local community through their purchasing rather than all their money go off to profit margins of big corporates." (GRKS1)*

Further, a participant from AC (*ACS1)* highlighted the importance of benefits carrying out loft and cavity wall insulation as part of energy efficiency. These provided both carbon reduction but also the reduction of cost on a household level. Energy efficiency was a part of the mandate of Awel Aman Tawe focused on both of households and community buildings taking part in large energy efficiency initiatives. This was reiterated in the literature, as exemplified by the Abergwyngregyn scheme, highlighting how CRE projects facilitate the reduction of energy costs within local communities through households' energy efficiency measures (Walton, 2012).

> *"They were a lot of people to get grants for loft and cavity wall insulation. So they were kind of, huge kind of carbon savings from that and cost benefits to those households and we do energy efficiency reports on community buildings." (ACKS1)*

Overall, the literature suggests the importance of accessing energy at a reduced cost as a commonplace motivating factor for investment in CRE projects. Yet, CRE projects do not represent core parts of policy infrastructure to tackle UK-based energy affordability (Berka and Creamer, 2018). Rather CRE projects have centred on supporting broader energy efficiency and energy saving advice. However, Berka and Creamer (2018) indicate the lack of research about the impacts of CRE projects and relevant measures centred on energy poverty, enhanced wellbeing of participating communities or energy efficiency. This was reiterated in the study findings, importantly highlighting the difference in tackling fuel poverty between

perceived aims of CRE projects and exemplars of how this may be applied in practice.

Within an environmental organisation Community Hub in the Peris and Ogwen valley, a participant highlighted the economic as well as social and environmental benefits linked to the CRE project. This was focused on a decentralised model, with reduced energy bills and alleviating fuel poverty. Underpinning this shift was the importance of communities gaining a sense of ownership of their local natural resources. The key benefit indicated by the participant was the focus on income generation, with an expressed hope to address future benefits of providing reduced costs to energy. However, the CRE project was at an early stage in developing a local source of cheaper energy.

> *"So many benefits to get taking the power back from these big energy corps back to local grassroots level. So, in that sense, it's really good because it's gives people ownership of resources that are all around them. Better for the environment obviously, not relying on burning fossil fuels, so many benefits, socially. I think people often it's cheaper as well for people who are experiencing fuel poverty, knowing that the energy is coming from a source locally. What's not to like with the social benefits, the environmental benefits are quite clear." (YOCH3)*

A participant from a tourism-based community hub in the Peris valley, highlighted the incremental scope of escalating benefits linked with the expansion of CRE schemes. This included building capacity and increased local benefits. The main impacts were again framed through local energy, cheaper energy bills to alleviate fuel poverty, as part of a decentralized model. The participant viewed the role of the CRE project as being community orientated and marking a departure from buying electricity from larger commercial models. However, the participant from within the community hub displayed some confusion regarding the uniform role of CRE projects, such as YPP in being able to address fuel poverty by selling electricity. Unlike the Energy Local model in the Ogwen valley linking supply and demand, YPP operated as a different model focused on selling electricity to generate income to be channeled into local projects.

412

"Well, I would like to see community energy schemes expand to start with. We need more of them, so there is more capacity, more developments, more benefit. More, local people getting the opportunity to buy energy produced locally cheaper, more opportunity for people who live in fuel poverty to buy electricity in their own communities so there don't have to buy from large external companies." (YPPCH2)

Another participant from 'Merched Y Wawr' a social community organization hub in the Ogwen Valley also highlighted the benefits from YO in terms of local income that was generated for use in local community projects. However, in this instance there was clarity, as the participant identified how YO was not providing cheaper electricity for the community "*at the moment*". Yet the generated income was retained within YO and the benefits were distributed within community-based projects in the locality.

"I think there is a benefit because the money comes back to the projects. I think lots of local people think it means they get cheaper energy but If I understand it correctly it's not at the minute anyway. But there is money that comes back to YO which can get shared between local projects." (YOCH4)

7.4.4 Employment opportunities

The work of Haf and Parkhill (2017) identified how CRE projects generated specific posts to support schemes, such as the 'Windfall Fund' in the Tiree Trust being used to employ a member of staff focused on facilitating island cultural initiatives. This was a repetitive theme in the literature, which highlighted how CRE projects generated a limited number of posts from their income stream to support CRE project management (Van der Waal, 2020). However, Callaghan and Williams (2014) suggest that such employment is often short-term in nature and initially part funded by grants prior to the broader ambition to fund from CRE project income. The study findings reiterated the observations in the literature, exemplified by the development of posts facilitated by CY and resonating across case studies.

In the Ogwen valley, the new initiative of Dyffryn Gwyrdd included tackling rural isolation and supported a number of employment opportunities to deliver this innovative sustainability programme.

> *"If that goes through okay, we will have jobs like environmental and wellbeing officer, volunteer manager and things to help us deliver that."* (YOKS4)

Equally, a participant from CY suggested that potential outcomes included future opportunities for employment aligned to the CRE projects. These centered on maintenance as part of project groups pooling their resources.

> *"We went into it hoping that we could get some benefits for sharing resources in the future like there's the operational side and the maintenance and what have you, and we thought if it's not a full-time job for anybody, but maybe if we got three or four hydros, that could be a full-time job for somebody locally to look after those."* (CYSK4)

The development of supportive posts was important due to the limitations of time and capacity of relying on volunteering. For instance, a participant from CY identified how the efforts of volunteers needed to be supplemented by employed posts as part of a supportive structure to maintain enterprises and ensure that the work inputted into projects were both sustainable and successful.

> *"Well, with all of these things, capacity constraints are usually the killer. We all do as much as we can over and above our day jobs to try and commit time and effort, writing things and lobbying, collaborating, to making stuff happen. You cannot get away from the fact that without some resource that's paid, because there is a shrinking pool of, not goodwill, but volunteer time. But it's the stuff like investing in a coordinating officer for a group like this that can join the dots and connect everybody up."* (CYKS2)

In this way, two paid posts in CY had allowed support of current and future community energy projects. This was reiterated by a participant from YPP, indicating how these posts provided initial support to CRE groups to reduce volunteer burnout. This was reiterated by other participants, highlighting how such posts facilitated future development (YOKS2).

> *"We are now employing two people; we have received Lottery funding to have an officer and a half with us in the hope that that will reduce the burden and they can take some of the strain."* (YPPKS5)

There was a focus on employment opportunities beyond CY, including the initial building and management work. For instance, in YO the community scheme supported the local economy, such as employing local contractors for the building work and project manager.

> *"So there was element of employing local companies from Gwynedd did the building work for us. And as well employing project manager during the period of building, local boy he was, so this idea of economic sustainability."* (YOKS1)

This sense of connecting with the local economy was also echoed by a participant from AC, with the wind farm project involving a local installer: "*So I think, the benefits from it was a Welsh company installed it" (ACKS1).* In a similar way, AC had generated opportunities linked to its energy efficiency work. This had enabled the scheme to employ and upskill people as well: *"So we employed three, four people to go out and do energy efficiency surveys." (ACKS1).* Equally, the participant emphasised that two new posts were due to start as a direct result of the wind farm being in operation. The availability of employment was not only an example of tangible benefits but used as a benchmark, in terms of making a difference and an impact.

> *"We got these two new jobs as well starting, which is kind of match funded a bit from the windfarm. So yes, there are tangible local benefits now that weren't there before." (ACKS1)*

7.5 Social impacts: Relationship between process and outcomes in Welsh CRE projects

The study findings indicated a relationship between the motivations underpinning the process of CRE development and how this related to current and anticipated social impacts. For instance, in terms of the motivations the CRE groups aimed to develop a community-owned model and once the scheme was established, this represented having a sense of community ownership and local control as an impact. Further, several CRE projects aimed to increase renewable generation within their

communities, and this was achieved by developing further schemes or activities, mostly solar projects.

In addition, the findings surfaced unexpected social impacts not envisaged initially as part of the schemes, highlighting the dynamic nature of CRE projects and their evolving aims over time (Table 35). For instance, there was an initial focus by CRE projects on generation but increasingly there was an emphasis on supply and demand, as well as storage. This represented a shift in vision for local CRE groups with social impacts focused on reduced energy costs alongside energy generation and income, a sense of pride and a 'Feel-good feeling.'

Table 35: Findings: Motivations translated into social impacts

Motivations translated into current and anticipated social impacts		
Motivations		**Current and anticipated social impacts**
Community ownership and benefits **Moving towards a community-decentralised model**	→	**Local decision-making and ownership**
Local income and community investment	→	**Local and long-term income** **Distributing income and community benefit funds**
Increased renewable energy generation	→	**More Renewable energy and environmental projects**
Interplay between local and global drivers	→	**Balancing social and environmental impacts**
Combating Climate change	→	**Feeling empowered and tackling climate change** **Renewable energy engagement and education**
		Unexpected social impacts (Current and anticipated)
		Cultivating Confidence and skills **Catalyst and Building capacity for further community projects** **Making a contribution** **'Feel-good feeling' and pride** **Reduced energy consumption and cost** **Community confidence and pride** **Wider Community engagement and awareness**

The seminal work by Walker and Devine-Wright (2008) highlighted the importance of process in CRE, based on the character of CRE as based on some degree of community involvement and focused on delivering community benefits as outcomes (Rogers *et al.*, 2012). Indeed, Hicks and Ison (2018) highlight how initial motivations frequently transfer into outcomes and impacts through the developmental processes of CRE projects. In this way, respondents report a blending of motivations and outcomes, such as in local ownership and reduced emissions were consistently represented across both areas in their case studies. Significantly, the study findings echoed these observations in the literature, with motivations transitioning into outcomes as exemplified by *Community ownership and benefits* and *Local income and community investment*.

In addition, there were also unintended outcomes, with not all motivations realised as outcomes, equally not all outcomes were initially motivating factors. For instance, tourism was cited by a single case as motivator yet an impact for six cases. The study findings reiterated these results, in particular the emergence of a broad range of unanticipated social impacts, such as *Catalyst and Building capacity for further community projects* as well as *Reduced energy consumption and cost*.

Overall, the transition from motivations to outcomes develops within a negotiated process and an interplay of complex factors, with CRE projects balancing context and differing motivations (Hicks and Ison, 2018). Indeed, Walker *et al (*2007) indicate the importance of assessing the conditions that generate outcomes in CRE projects, requiring a more detailed consideration than usually reported in the literature. In this context, a range of contingent factors aligned to process, influence the social impacts from CRE projects. For instance, the nature of the scheme, its siting and the community setting as well as underpinning motivations, the degree of community engagement and project developmental processes (Berka and Creamer, 2018; van der Waal, 2020). In the study findings, the case studies focused on projects that adopted a BenComs model, with an embedded mission of delivering wider community impacts from surplus income from the schemes. In this way, the findings provided a novel lens and highlighted a range of initial and potential indirect social impacts from CRE projects, based on this model.

Further, Berka and Creamer (2018) emphasised the highly contextual nature of CRE projects and the factors impacting on motivations and outcomes, with a diverse range of project characteristics. The study findings echoed the observation by Berka and Creamer (2018) with the case studies representing different Welsh communities yet also having a shared background as based in post-industrial settings. In this context, the case studies shared similar social-environmental motivations that addressed local priorities as well as global issues. As such, there were consistent outcomes from these CRE projects which balanced both social and environmental impacts.

The key difference between CRE projects in North Wales (YO and YPP) and South Wales (AC and GR) was the scale of the schemes, impacting on the amount of energy generated and consequently income that was available for community benefit. In this way, the larger projects in South Wales were able to deliver outcomes at greater scale. For instance, in the context of educational outcomes there was a broader range of activity supported by the scale of the projects in the case of AC and GR. Equally, YO implemented a solar project in the valley whereas AC delivered a solar project across Wales.

In relation to outcomes, Creamer *et al (*2019) identify how some outcomes do rely on the processes delivering them. Shared social impacts are viewed as the most significant elements that contribute value to communities from CRE projects. These emerge from the interaction with communities, such as civic participation leading to civic empowerment. Importantly, these require community involvement as part of the process to deliver such outcomes. In the study findings, this was evidenced across the case studies, for instance in the early stages of the CRE projects, groups were developing charities. This involved navigating how to channel the income into delivering community benefit. Crucially, Creamer *et al (*2019) highlight the need for further research into the complex and co-dependent interrelationships between process and outcomes in CRE projects. Significantly, in the study findings this focused on mapping the nuances and reciprocity across process and outcomes in the case studies.

Furthermore, Creamer *et al., (*2019) identified how CRE projects evolved over time, representing temporal transitions. Importantly, n the study findings community hubs positioned in the wider community reported primarily having an initial degree of awareness and some involvement of the CRE projects within Welsh communities. However, as the CRE projects transition and community funds become more established, it may enable charities to support other community groups and further CRE projects within communities. As such, there may be a greater degree of wider community involvement over time, moving beyond awareness as a social impact.

7.6 Summary

 Overall, in the findings of the study, identify the experienced and perceived social impacts from CRE projects and the key themes focused on social, environmental and economic aspects. Significantly, the findings represented a temporal dimension as part of social impacts, with CRE projects including aspects that were currently relevant but also focused on the future. In addition, a novel perspective in the findings identified how social impacts centred on a relationship between process and outcomes in Welsh CRE projects. This included the relatedness between the motivations driving the process of developing CRE schemes and current and anticipated social impacts. In summary, the researcher built on, extended and augmented the existing work of key authors (Berka and Creamer, 2018, Callaghan and Williams, 2014, Slee 2020, Van der Waal, 2020). The study findings provide important substantive insights that focus on social impacts of CRE, as well as the processes and contingencies underpinning potential impacts.

CHAPTER EIGHT:
SYNTHESIS AND RECOMMENDATIONS

8.1 Introduction

The chapter initially identifies the main novel contributions detailed in the thesis, prior to a synthesis of the key aspects of the findings Importantly, the contribution detailed in the thesis focuses on a substantive degree of empirical evidence which draws together the perspectives of a range of actors. This focuses on the complex and discrete nature of social impacts, as well as the interrelationship between process and outcomes in CRE. Further, the robustness of the findings is underpinned by a fine grain analysis of the data from detailed case studies, augmented by a blending of empirical data with theoretical insights. Innovatively, the study contributes to the field by understanding CRE through the lens of bonding, bridging and linking social capital as well as cultural capital. In addition, the relevance of community and place attachment is identified, mapping key relationships with CRE project development, context and meaning. Further, the work also identified the significance, and interrelationship between local and global impacts emerging from CRE projects. Overall, the contribution reflects on the core findings related to the areas of *community and place,* the *social processes* driving forward CRE and its *social impacts*, set within the framing of the literature. Further the chapter details a series of recommendations centred on policy, research and practice. The final section of the chapter considers some final concluding remarks.

8.2 Overall thesis contribution

Overall, the aim of the study was to map *what* was important for people involved in driving forward CRE projects, in addition to *what* impacts emerged from CRE projects. This focused not only on generating RE within a low-carbon transition, but also in terms of social impacts within communities. In this context, the findings

provided a substantive novel contribution, with the study addressing the key research questions and the research gaps:

- ***What is the role of 'Community and place' for Welsh communities in a community renewable energy context?***

The evidence-base has predominantly framed place attachment around the areas of community opposition and acceptance in relation to RE. In contrast, the study provided an original conceptual contribution by providing a detailed account and insights of *how* place attachment represented both the context for and informed the engagement of communities with CRE, which extended beyond acceptance. Further, the study addressed the research gap and presents a novel contribution by detailing *how* place and CRE projects related to post-industrial communities. In this way, the study innovatively added to the sparse evidence-base around CRE in communities previously dependent on the slate and coal industries. As such, the study presents a novel account distinct from the literature which focused on understanding rural, post-industrial communities and *how* they used natural resources over time and how CRE projects were positioned by communities within such a context.

The study focused on CRE projects primarily embedded in placed-based communities, although some cases extended beyond an immediate, and geographically bounded community and had elements of communities of interest. In this way, the study built on and extended the literature, thereby challenging the assumptions that 'community' was always aligned to a positive viewpoint. As such, the study highlighted *how* communities could be understood as representing both integration and division, with consequent impacts on CRE. Importantly, the study findings provided a novel and conceptual lens that indicated how CRE projects were situated within multiple communities within a community.

- ***What are the social processes driving forward community renewable energy in Wales?***

The evidence-base reflects the emerging nature of the CRE sector in the literature, with research primarily focused on the processes of CRE development, and the barriers encountered. However, the study built on and advanced the existing literature and detailed the challenges within the development stage. Importantly, an original and analytical contribution of the findings from the study centred on also highlighting the key issues experienced by CRE projects once they were established. Furthermore, the literature centred on motivations for engagement in CRE projects focused predominantly on either local or global concerns. In this context, the study provided a novel contribution by identifying the relevance of the combination of both local and global factors in shaping community engagement in CRE projects.

The scope of the evidence in the literature tended to focus on the active role of stakeholders in developing CRE projects as part of the social processes driving forward schemes. A key original contribution was that the study addressed a substantive research gap by not only focusing on the role of key stakeholders in developing and maintaining CRE projects, but also highlighted the perspectives, position and role of shareholders in CRE. Significantly, this was largely characterised as passive but represented an important role through the process of investing in the project. As such, the study illuminated the nature of shareholder engagement and *how* it enabled CRE project development. Therefore, a key contribution and substantive insights focused on how the study generated a wealth of empirical evidence, which included a range of perspectives and experiences of civic engagement in CRE.

Interestingly, the evidence in the literature described processes for distributing benefits from CRE projects to communities through the lens of Development Trusts, in Scotland and cooperatives in Europe. In Wales and England, a BenComs model has been increasingly adopted but remains an under-researched area. Importantly, the study provides an original contribution and key insights by addressing this

research gap. The findings present an account of Welsh CRE groups in the sector that utilised a BenComs model. As such the study presents a highly novel perspective on the rationale for using BenComs but also details its implications for CRE projects and communities in terms of channelling social impacts.

Overall, previous literature in the area of CRE projects had focused on the relevance of bonding social capital, also with some work on networks between CRE groups and local government. A significant original conceptual contribution in the study addressed this research gap by framing social connections in CRE not only on bonding but also bridging capital. In this way, it focused on both within (bonding), and between CRE group (bridging) connectivity as part of social capital. This included a novel and analytical perspective which indicated the complexity of social capital in CRE, focused on a nuanced view that recognised how CRE projects also acted as containers for bridging social capital. This centred on CRE projects drawing together different people, thereby building social ties through project participation. In addition, the study. also detailed the social networks between CRE groups and policy makers, representing linking social capital In this context, the study provides a key original contribution as it addressed a substantive research gap by detailing the operation of bonding, bridging and linking capital in CRE. Innovatively, the study provides a novel lens as it identified *how* CRE projects contributed to the development, as well as benefiting from social capital. A further novel contribution centred on how the study also built on the existing literature and identified the relevance of cultural capital in CRE. Importantly, in this context, the study extended beyond the descriptive account in the literature of pre-existing skills and knowledge emerging from CRE. In contrast, the study innovatively contributed to advancing the literature by detailing *how* cultural capital involved key individuals drawing upon existing knowledge, experience and expertise to develop CRE projects and link with policy contexts.

- ***What are the social impacts for Welsh communities in a community renewable energy context?***

The existing literature on socio-economic impacts of CRE is focused particularly on the area of economic impacts in CRE projects. As such, it fails to adequately account for the less quantifiable social impacts arising from CRE projects and its meanings for communities. A substantive original conceptual contribution from the study findings was how it addressed this research gap by providing novel insights. These extended beyond the limits of financial returns and the study findings highlighted the diverse and nuanced social impacts. Significantly the study innovatively represented how these were perceived and experienced by those involved in the project and the wider community. Furthermore, the literature tended to characterise social impacts as less tangible, compared to economic impacts. However, a significant original contribution in the study was how it provided a detailed account and better purchase on the relevance of key social impacts emerging from CRE projects. In particular, this included the key areas of empowerment, building community capacity and sense of ownership as well as social capital. In this way, the study presented a substantive original contribution by addressing a significant research gap by detailing *how* social impacts were understood by key actors and communities. Importantly, the study presents a highly novel perspective by addressing the imbalance in the literature which predominantly emphasised the significance of economic impacts rather than providing an equal standpoint on social impacts.

The study also presents an original contribution to the evidence base by a detailed analysis of *how* CRE projects developed added value through social impacts. The study findings innovatively highlight the relevance of gaining a sense of ownership over local natural resources and being able to subsequently mobilise these for local benefit. Furthermore, an important original contribution centred on study findings provided insight into *how* developing a long-term income from CRE projects, created a sense of stability and autonomy for communities.

Importantly, the study presents a further original contribution as it addressed a research gap by illuminating *how* CRE projects facilitated local engagement with climate change issues. Significantly, the study detailed the social impacts of making changes at a local community level and its consequent effect on broader global environmental issues. Therefore, the study detailed a novel account of *how* CRE projects were a catalyst for change, generating a sense of empowerment towards tackling climate change for those involved in the CRE projects. On a wider community level, the study presents a significant contribution as it identified *how* projects developed awareness and education about renewable energy and global environmental issues, framed in a locally relevant manner.

Overall, in the literature the evidence-base predominantly focuses on the process of CRE development, as an emerging field of inquiry. Importantly, a key original contribution was how the study addressed this research gap in the field, by focusing not only on the processes of development but also on social impacts as outcomes from CRE. Furthermore, it innovatively detailed through methodological novelty how these social impacts operated across the multiple actors of key stakeholders, shareholders and community hubs. In this way, the study provided a novel lens to discern social impacts from different perspectives and experiences, including those closely involved in CRE projects and those occupying a more distant position. Significantly, this included a highly original contribution that highlighted the perceived benefits and disbenefits of CRE projects by community hubs as part of local civic society.

8.3 Energised Welsh communities: Synthesis of the findings

Overall, the findings innovatively highlighted how CRE projects developed 'energised' Welsh communities. This centred not only on their capacity to generate renewable energy but also, through utilising local natural resources, to deliver social impacts within their communities for local benefit. The findings from the study resonate with the early seminal work of Slee (2015), which identified how CRE produces energy, in terms of energy 'power' but also creates the platform for civic empowerment. In this way, Slee (2015) maps the main drivers are the

generation of income from local resources that enables communities to consider and engage in decisions about local community benefit. In the study findings, this was reflected by a shareholder from YO, CRE projects were defined *"as not just being in electrical power, it's got to be the energy of people as well" (YOS2).* As such, the empirical findings identified that this form of 'energy' focused on people within the local community coming together to develop community led and owned CRE projects. Although the study was grounded in a Welsh context, the developmental processes of CRE projects and their social impacts as themes may be transferrable to other wider contexts and settings. This was facilitated by the study using an explanatory case approach (Yin, 2014) thereby it provides insights into how other 'energised' communities may be facilitated through CRE.

Within the evidence-base, van der Waal (2020) highlight the presence of 'blind spots' and 'bias' that remain in the contemporary literature. For instance, van der Waal (2020) suggest that context-specific characteristics shaping outcomes as well as the diversity and nuances of outcomes, are not fully surfaced in the literature. Further, within the broader literature there remains insufficient exploration of the relationship between processes and outcomes within CRE as well as the diversity of impacts, beneficiaries and long-term implications. In the study, the findings have 'unpacked', in part, some of the complexity and hidden areas of CRE through the lens of exploring the relevance of 'community and place', the social processes around developing and establishing CRE projects, the social impacts arising from CRE projects. Furthermore, the study includes a novel account that further explored the taken for granted assumptions that social impacts emerge from CRE projects. As such, it provided substantive insight from the perceptions and experiences of those involved with CRE projects, across different case studies. In this way, the study moves forward the call by van der Waal (2020) to map and understand how such terms are applied, their meanings and impacts within applied settings. This includes reference to social connectivity, empowerment and capacity building. As such, the study addressed the 'blind spots' and 'bias' of the literature signalled by van der Waal (2020).

Significantly, the study identified the overarching interrelatedness between the areas of *place attachment* and *social capital*, as well as *process* and *outcomes* in the contexts of CRE projects. Although in isolation *place attachment, social capital, process* and *outcomes* represent distinct frameworks in understanding CRE projects. Within the study, a contribution focused on an exploration of their interconnection that provided further insights into the arena of CRE projects in Welsh communities. In this way, *place attachment* and *social capital* represent the basic social connections that provide the platform for CRE projects within a particular place, with inherent physical and social attachments. However, at the same time the findings highlight how they also represent a key set of drivers for people engaging with CRE projects and their development, representing key building blocks for CRE projects. In the context of the interrelationship between *process* and *outcomes*, the study findings indicate the processes involved in developing CRE projects also translated into outcomes for communities. In addition, the social structures developed from these processes, such as the charities arising from CRE projects, also had further implications regarding the nature and scope of social impacts.

A key conceptual original contribution in the study was the relatedness between *place attachment and social capital,* centred on bonding and bridging capital. In terms of bonding there is a focus on place as the context or 'container' of social networks and ties within CRE projects embedded in their local communities. For instance, the importance of place as the locale for bonding capital to occur and develop, centred on bringing people together, building on previous social networks within communities. This included the generation of community connectedness, mutual ties and trust, representing place-centred relationships provide a key platform for developing CRE projects. In the case of bridging, there was a relationship beyond specific communities and their rooted place, representing a network that stretched outwards between different CRE groups in a different range of places. As such, in the study findings the position of place also set limits on CRE project and their flourishing. At its core, only by extending beyond the limits of place can CRE projects access the resources and networks required, to generate successful projects and overcome barriers. In this way, CRE projects had different

types of social capital around community energy in Wales focused on a common set of interests and involving mutual aid, as well as shared learning, with social capital representing a traded commodity. Also, the study innovatively highlighted how CRE projects demonstrated the utility of linking social capital to access external funding and technical support, extending even further beyond the limits of place towards a policy landscape.

Importantly, the study findings indicate that both *place attachment* and *social capital,* have a rootedness in the situatedness and dynamics of a 'place'. As such, a significant conceptual contribution of the findings from the study is that place represented a key driver as part of the motivation for engagement in CRE projects combined with being the contextual 'container' for community involvement with projects. For instance, motivation was based on people having an emotional attachment to place, with an embedded sense of identity aligned to place that acted as a driver to become involved in community projects framed around community benefit. In this way, the cases of YPP, YO, AC and GR represent empirical case studies that demonstrate the reciprocal interrelatedness between *place attachment* and *social capital*. Overall, the findings provide a novel conceptual standpoint which emphasise the importance of examining CRE projects through this lens of an interrelatedness of *place attachment* and *social capital*, based on blending the respective area of theory to the applied context of CRE.

In the study, a substantive conceptual contribution was that it surfaced empirical evidence that there was a key relatedness and interrelationship between *process* and *outcomes* in CRE projects across case studies. Furthermore, the study findings highlighted innovatively that the relatedness between *process* and *outcomes* was also exemplified by the area of motivations of actors engaging in CRE projects. In this way, significantly motivational factors as part of the processes driving forward involvement in CRE projects were also then subsequently translated into outcomes. For instance, the motivations to increase renewable energy generation also led to a developmental cycle of more local renewable energy and environmental projects emerging as outcomes. Further, an additional example was the interplay between

actors having local and global motivations as drivers of involvement in CRE projects, then leading to the outcomes of actors balancing social and environmental impacts.

A distinctive feature of CRE projects is the significant involvement by local people in communities to initiate and develop a project as part of the process, and often having an emphasis on local ownership in terms of outcomes (Walker and Devine-Wright, 2008; Seyfang, Park and Smith, 2013).These process and outcomes are interrelated, focused on the extent to how social and economic benefits have a local impact, being largely dependent on the process of decision making, involvement and ownership model in place (Creamer *et al.*, 2019). For instance, in the study findings across the case studies, a BenComs model was adopted as part of the developmental process of CRE projects, leading to more meaningful and local impacts over the long term for the community.

Importantly, in the study findings the relatedness between *process* and *outcomes* are highlighted by the key area of local ownership and local control over the decision-making processes, focused on having a say and a stake in the CRE project. In this way, the processes as part of civic involvement with CRE projects, provided a sense of enacting change. This was evidenced in the study at both a local level with impacts centred on community benefit, but also globally focused on tackling the climate challenge. However, it was evident that not all members of the community were equally involved and empowered to act. This pivoted on the degree of involvement, centred on actors having the necessary skills, time, capacity and/or resources to participate in CRE projects. This related to different modes of civic engagement, focused on the active key stakeholders, investing shareholders or those involved or being recipients of benefits as part of the wider community. As such, a novel contribution of the study findings highlighted how social impacts were dependent on the nature of involvement with CRE projects, acting as a shaping the relationship between *process* and *outcomes*.

Overall, the study highlights the need to be attentive to how CRE projects are experienced and perceived differently within Welsh communities. Importantly communities are not homogenous and although CRE projects are embedded within

a community they are not necessarily representative of those entire community. As such, participation and benefits from a low-carbon transition might not be equally distributed across the community as a whole, with the study highlighting the presence of multiple communities within a community, and multiple actors engaging or benefiting from CRE projects.

8.4 Recommendations

The findings provide the platform for a series of recommendations centred on policy, research, and the applied practice of developing CRE projects. In this section the relevant aspects of the findings are contextualised within appropriate policy or literature contexts in outlining a way forward in the CRE sector.

8.4.1 Policy

- *Supportive policy infrastructure*

A particular finding from the study was the policy-based barriers facing CRE groups at the stage of development as well as subsequently once established, arising from a changing policy landscape. In this way, a key policy recommendation is the development and maintenance of a more consistent, long-term, and supportive policy environment for the CRE sector within the UK, providing clarity about financial support and alignment with national energy policy objectives.

- *Impacts and policy*

The findings highlighted the need to develop a clearer account of social impacts within a policy context that extends beyond quantifiable metrics, identifying areas of community benefit. In this way, the findings highlight the need to capture the multifaceted nature of added value emerging from CRE projects as part of a policy environment, focused not only on generating RE but also discrete social impacts. This includes areas such as CRE generating income which supports a community sense of autonomy over the long term, underpinning further community developments and contributing to impacts around energy efficiency and healthier communities.

Further, study findings highlight how CRE social impacts are linked to building and extending social networks, contributing to the WFG Act (2015) policy focus on cohesive and well-connected communities. In addition, aligned with CRE projects there was a sense of empowerment as an impact focused on actions on a local and global level. This centred on generating RE and tackling climate change, but also delivering community benefit and bringing people together for collective action, important in developing sustainable communities. These points were reiterated in the literature, focused on the range of social impacts but also the limited research that detailed outcomes from CRE van der Waal (2020). Such evidence was a key requirement for further support and investment in the CRE sector by policymakers (Berka and Creamer, 2018).

The IWA (2019) report explored the perspective of local and community organisations on the development of RE projects within Wales. Interestingly, the IWA Report (2019) cited the researcher's study as one of the few examples in Wales of initial research work that sought to understand social impacts in CRE across a range of settings and contexts:

> *"With the one exception of a (Welsh Government supported) doctorate (PhD) work in progress at Bangor University based on four case studies of the social impact of community renewable energy". (IWA, 2019; P43)*

A key recommendation is the need for a greater emphasis on the value of social impacts from CRE projects, as well as developing a more nuanced approach to integrating social impact as experienced and perceived by communities within a policy context. Significantly, the WFG Act (2015) in Wales presents an opportunity for developing such an approach in the context of the CRE sector, providing a framework for linking impacts within a clear policy infrastructure that acknowledges a range of impacts cutting across social, economic, environmental, and cultural well-being. Therefore, it provides a good framework for capturing social impacts, although the WFG Act (2015) is at an early stage of implementation. A recommendation is that building a sustainable future requires a focus across different levels and scales. In this context, tackling climate change and a low-carbon

transition requiring engagement not only on a governmental level and involving Public Bodies but also by communities and individuals.

Furthermore, the study echoes the conclusions of the IWA (2019) highlighting the relevance of building RE and energy efficiency as a key part of addressing the Well-being goals. However, there is a need for a greater emphasis on including an account of the progress of RE schemes and energy saving and efficiency initiatives by Public Bodies and Public Service Boards. In this context, , a recommendation centres on signalling the importance of the WFG Act (2015) as a template in the national UK policy context. It could provide the infrastructure for a more unified approach to representing complex impacts across multiple areas arising from CRE projects, represented by the Well-being goals as well as linking to processes represented by the Ways of working.

8.4.2 Research

- ***Mapping social impacts over time***

The study highlights the importance of viewing CRE projects over a longer period of time in order to understand processes and outcomes at different stages of development of CRE projects. Indeed, previous research has focused on the early stage of development or initially established CRE projects. However, future research work needs to include a focus on more long-standing schemes, as social impacts may change over time. In particular, there is a need to explore future processes and outcomes of CRE projects (in a variety of case study settings and contexts) that explore impacts that extends over the lifetime of CRE projects. This may range from 10-20 years in different local communities. In this context, the study focused on the development of schemes and the impacts once they were established at an early stage, but also uncovered insights into future aims that may emerge over time and would require further consideration. These points were reiterated in the literature, such as an early recommendation by DECC (2013) for a greater focus on a longitudinal perspective.

In this way, a key recommendation focuses on developing more longitudinal studies on CRE projects, centred on 'unpacking' social impacts over time, across a range of

case study contexts. As such, a particular focus is required on social impacts that emerge, and may continue to develop, once projects are established, mapping the ongoing development of impacts as a dynamic process within communities. In this way, it is important that future research recognises that CRE projects are not static, rather: *"individual projects themselves evolve and transform temporally"* (Creamer et al, 2019).

- ***Utilising qualitative lens***

The findings highlighted the utility of using a qualitative lens to understand the complex and hidden aspects of social impacts in CRE projects. As such a more nuanced view emerged of CRE projects that extended beyond the limitations of a reliance on quantifiable data. Within the Study, a case study approach was used, highlighting the utility of an in-depth examination of particular case studies enabled the researcher to understand the importance of context within which social impacts are produced.

The study also identified the importance of research which adopts a comparative approach, focused on across-case analysis around social impacts of CRE projects across a range of settings. Indeed, Creamer et al (2019) identifies the importance of a research gap centred on a lack of studies that connect-up the findings from specific cases, in order to explore their interrelationships and broader impacts, as well as building on each other. These points were reiterated in the literature, for instance, Berka and Creamer (2018) identified the need for research work to extend its scope, beyond the limitations of quantifying impacts.

A key recommendation based on the study findings is the development of qualitative research approaches in examining CRE projects and examining social impacts, moving beyond a reliance on easily accessible quantifiable data or indicators of impacts. Importantly there is a need to use a variety of approaches and methods to engage with those involved with CRE projects in understanding their viewpoints and experiences. As such a range of qualitative approaches and multiple methods could be used to develop research in the area of social impacts in CRE projects. For instance, in addition to the utility of case study designs, the

adoption of an ethnographic approach may be beneficial in surfacing the relevance of context in CRE projects and communities. This would facilitate the exploration of within and between group dynamics as well as the influence of cultural norms and values, in addition to the relationships between community, place and CRE.

- ***Extending the scope of inquiry***

The findings from the study not only focused on sampling key stakeholders involved in CRE projects and shareholders, but importantly also sought the perspectives of the broader community. This enabled key areas to be surfaced and unpacked from a variety of perspectives. This was operationalised through engagement with a range of local community hubs, enabling the researcher to access a wider viewpoint from the local members of civic society. Moving forward this area of inquiry in examining CRE and social impacts could be greatly increased with a shift away from a focus on stakeholders.

Furthermore, as noted by Creamer *et al (*2019) research, policy and practice has tended to position CRE as resulting in positive impacts without sufficient critical appraisal. In the study the work, by including a broader set of viewpoints by including with community hubs, identified both benefits and disbenefits aligned to CRE projects. Importantly, the overarching aims of BenComs are focused on ensuring benefits are provided for local communities. In this context, the study started to explore and develop insights around awareness, involvement, and perceived benefits through community hubs, but this requires further development. As such, research needs to examine the ongoing social impacts that may emerge from BenComs working within communities to create benefits, as these impacts may be dynamic, cumulative and extend over a 10–20-year period linked to the income from CRE projects.

A key recommendation is the development of a wider scope by research studies in examining the initial and longer-term social impacts of CRE projects within communities, focused on a broad range of community groups and organisations. This includes using community hubs as a starting point as they provide a scaffolding for sampling the viewpoints of constituencies, with identifiable civic roles and

positions. In this way, future research studies require a more detailed scoping of how other community groups and organisations relate to CRE projects, particularly over a longer period of time.

In addition, further research is required to explore the range of not only benefits but also disbenefits linked to CRE projects. Although the study focused on community hubs there is a need to draw upon the viewpoints of local residents within communities in future research. In this way, multi-methods could be utilised to explore their perspective, such as using focus groups and surveys, as well as interviews.

- ***Expanding the theoretical toolkit for understanding CRE***

The study findings highlighted the importance of applying a theoretical lens to understanding CRE projects that included social capital, cultural capital and place attachment theory. In this context, this area requires further development in the field of CRE studies, focused on relating it to these key theoretical strands as a potential toolkit for researchers in interpreting both the social processes and impacts operating within CRE projects.

The findings indicated the importance of social capital in CRE projects, across bonding, bridging, and linking capital. It provided a valuable toolkit for understanding the discrete social capital processes involved in schemes, and the resulting impacts arising from CRE projects. Although social capital may be referred to in studies, it is rarely grounded as a theoretical lens to understand CRE and is detached from the existing body of work on social capital more widely (Bere, Jones and Jones, 2015). As part of the literature on CRE, further research is required in bridging and linking social capital, focused on an exploration of how projects connect with broader community constituencies and engage with a wider set of policy actors. A key recommendation is that future research should frame further studies of CRE projects within the theoretical context of both bridging and linking, as well as bonding social capital.

The study findings identified the relevance of cultural capital within the context of CRE which highlighted the importance of established pools of skills and expertise

within communities in enabling the development of CRE projects. The study built on a wider evidence-base that identified the relevance of skills, knowledge and expertise in the operation of social networks, and its conceptualisation as part of cultural capital (Park, 2012). Yet, in the area of CRE research, there is a limited focus on cultural capital as a frame of reference to understand how pre-existing expertise relates to the development of schemes. A key recommendation from the findings is that further work is required to utilise cultural capital as a theoretical lens to understand the areas of skills, expertise and knowledge and its relationship to mobilising cultural capital in CRE contexts. The findings provide a starting point, but additional work is required in this area.

Furthermore, Berka and Creamer (2018) highlight the potential risks of CRE accentuating inequity within local communities, centred on potential engagement being limited to a discrete section of the community, based on educational capacity and disposable income. In this way, future research is required to identify more clearly who are able to participate in a low-carbon transition and in what conditions, as well as be its beneficiaries.

The findings in the study highlighted the importance of place attachment in the context of CRE projects. The work of van Veelen and Haggett (2017) identified the lack of research on the role of place attachment in relation to community-led projects, in contrast to the emphasis on place in evaluating responses to larger scale RE projects. A key recommendation from the study findings is the need for further work that examines the role of place attachment theory in understanding the relationship between communities and CRE projects. In this way, future research should extend beyond a narrow focus on the positioning of place as underpinning opposition but also its multiple meanings for engagement with CRE projects.

8.4.3 Practice

- *Regional consortium*

A particular finding from the study was the utility of a regional approach in North Wales to support CRE development through the CY consortium. In this way, its

formal structure and employed support staff facilitated shared learning across schemes, a growth in local CRE projects working across the local area and further potential innovation, such as the Energy Local clubs. The study highlighted how the collaborative partnerships of the consortium benefited both YO and YPP. The South Wales case studies represented pioneering projects, centred on GR and AC, yet the spread of learning was based on informal networks.

A key recommendation is the development within Wales of a more formal regional consortium like CY, operating across different areas to support CRE projects, such as newer schemes benefiting from the experience of more established projects. As such, a greater number of regional consortiums could be developed to build upon local informal networks and arrangements, as part of a national scale infrastructure framed around Community Energy Wales.

- ***Moving towards extending impacts***

A particular finding from the study was the need to recognise how CRE projects built on the achievements of generating energy and providing local benefits through income from CRE schemes. They were also part of a recent movement towards more diverse and innovative community models, centred on changing aims and conditions. This centred on an increased focus on energy demand and supply, EV transport and energy efficiency and energy saving advice. This reflects the way in which CRE groups focus on extending the breadth of community projects and innovation, whilst the generation of RE as a business model remains difficult (Regen, 2021b). As such, CRE sector would be aligned with more immediate impacts for communities focused on reduced energy consumption and costs, as well as added benefits beyond energy use.

Indeed, the State of the Sector Report (2021) highlight the importance of innovation in CRE and generating extended social impacts for communities. For instance, the Report cites the need for a supportive approach to extend pilot projects such as the local energy demand and supply initiative centred on the Energy Local club in the Ogwen valley and the Gower Power solar and storage project (Regen, 2021a). A key recommendation is to consider how social impacts

and CRE projects are dynamic, requiring an approach that is attentive to the flux and changes in the sector.

8.5 Concluding Remarks

In conclusion, the study focused on exploring the role of communities in a low carbon transition centred on CRE projects in Wales. At its core, the study 'unpacked' the social impacts of community owned renewable energy projects based on a qualitative case study design. A strength of the study and its key contribution was its grounding in an overarching view of the current understanding of CRE and surfacing key research gaps around social impacts. It involved an explanatory multiple case approach (Yin, 2018) focused on four CRE projects and a consortium. The study centred on mapping *what* was important for people involved in driving forward community projects, as well as *what* came out from CRE projects, not only to generate renewable energy as part of a movement towards to a low-carbon society but also produce social impacts within their communities.

The study was embedded in a growing literature and an increasing interest in CRE projects, which indicated its potential role in delivering a wide range of environmental and socio-economic benefits for local communities. However, there was a research gap in the literature, with limited empirical evidence and a lack of detailed understanding of social impacts, as well as the context and contingencies involved in such impacts. The literature has tended to prioritise an account of the technical aspects of moving towards an increase in RE generation, with less attention on the social dimensions of CRE and the opportunities and challenges presented by this energy transition for community-owned or led projects.

Significantly, he findings provide a detailed and novel account of the complex nature of social impacts from CRE projects, across a range of settings and context based on substantive empirical evidence. As such, it indicates the importance of community and place in understanding CRE projects in context, as well as the social processes operating in their development and once established. Further, a key conceptual contribution in the study focused on the relevance of pre-existing

cultural capital and the importance of different types of social capital across bonding, bridging and linking capital.

Overall, the study presents not only a detailed but highly novel viewpoint, set within an emerging literature and evidence-base, reflecting what is a relatively new CRE sector. Nonetheless, with the increasing emphasis on global climate change and the urgency of a low-carbon transition, the area of CRE and community-owned energy more broadly is set to remain an area of future policy and applied practice that will require further, ongoing research. In particular, a focus will be required on the perceived and experiences of social impacts of CRE at a local level but also its wider societal implications for enacting change around environmental global issues.

REFERENCES

AditNow. (2021) Cwmllynfell Colliery & Tip. Available at:
https://www.aditnow.co.uk/Photo/Cwmllynfell-Colliery-Tip_58519/ (Accessed 11
November 2020).

Agnitsch, K., Flora, J. and Ryan, V. (2006) 'Bonding and Bridging Social Capital: The
Interactive Effects on Community Action', *Community Development*, 37(1), pp. 36–
51. doi: 10.1080/15575330609490153.

Aiken, G. T. (2014) 'Common Sense Community ? The Climate Challenge Fund ' s
Official and Tacit Community Construction Common Sense Community ? The
Climate Challenge Fund ' s Official and Tacit Community Construction', *Scottish
Geographical Journal*, 0(0), pp. 1–15. doi: 10.1080/14702541.2014.921322.

Aiken, G. T. and Aiken, G. T. (2015) '(Local-) community for global challenges :
carbon conversations , transition towns and governmental elisions', 9839. doi:
10.1080/13549839.2013.870142.

Allen, J. *et al.* (2012) 'Community-based renewable energy in the Lake District
National Park – local drivers , enablers , barriers and solutions', 9839. doi:
10.1080/13549839.2012.665855.

Allen, M. (2017) The SAGE Encyclopaedia of Communication Research Methods.
https://dx.doi.org/10.4135/9781483381411

Angrosino, M.V. and Mays de Perez, K.A. (2000) 'Rethinking Observation: From
Method to Context', in Denzin, N.K. and Lincoln, Y.S. (eds.) Handbook of Qualitative
Research, 2nd edn, Sage, Thousand Oaks, pp. 673-702.

Arloesi Gwledig Gwynedd (2017) Trialling Crowdfunding platforms to raise money
for community projects. Available at:
https://www.arloesigwyneddwledig.cymru/en/prosiectau/cyllid-torfol-ynni-
cymunedol/ (Accessed: 1 October 2018).

Armstrong, H. (2015) 'Local Energy in an Age of Austerity', (December).

Awel Co-op (2017) Awel co-op - Your invitation to invest in community wind energy. Share offer document. Available at: http://awel.coop/wp-content/uploads/2017/04/AWEL-SHARE-OFFER-DOCUMENT.pdf (Accessed: 1 September 2018).

Bain, P. G. *et al.* (2016) 'Co-benefits of addressing climate change can motivate action around the world', *Nature Climate Change*, 6(2), pp. 154–157. doi: 10.1038/nclimate2814.

Bauwens, T. (2019) 'Analyzing the determinants of the size of investments by community renewable energy members : Findings and policy implications from Flanders', *Energy Policy*, 129(February), pp. 841–852. doi: 10.1016/j.enpol.2019.02.067.

Bauwens, T., Gotchev, B. and Holstenkamp, L. (2016) 'What drives the development of community energy in Europe? the case of wind power cooperatives', *Energy Research and Social Science*, 13, pp. 136–147. doi: 10.1016/j.erss.2015.12.016.

Baxter, P. and Jack, S. (2008) 'Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers', *The Qualitative Report*, 13(4), pp. 544–559. doi: 10.46743/2160-3715/2008.1573.

Bazley P. (2013) Qualitative data analysis- practical strategies. London: Sage.

Becker, S. and Kunze, C. (2014) 'Transcending community energy: collective and politically motivated projects in renewable energy (CPE) across Europe', *People, Place and Policy Online*, 8(3), pp. 180–191. doi: 10.3351/ppp.0008.0003.0004.

Bell, D. *et al.* (2005) 'The " Social Gap " in Wind Farm Siting Decisions : Explanations and Policy Responses The " Social Gap " in Wind Farm Siting Decisions : Explanations and Policy Responses', 4016. doi: 10.1080/09644010500175833.

Bennett, T., Savage, M., Bortolaia Silva, E., Warde, A., Gayo-Cal, M. and Wight, D. (2009) *Culture, Class, Distinction*. London: Routledge.

Bere, J., Jones, C. and Jones, S. (2015) 'The economic and social impacts of small and community Hydro in Wales', pp. 1–39. Available at: http://regenwales.org/upload/pdf/071015091201Impact of Small and Community Hydro in Wales.pdf.

Bergman, N. and Eyre, N. (2011) 'What role for microgeneration in a shift to a low carbon domestic energy sector in the UK?', *Energy Efficiency*, 4(3), pp. 335–353. doi: 10.1007/s12053-011-9107-9.

Berg, B.L. (2004) Qualitative Research Methods for the Social Sciences. 5[th]edn. Boston: Pearson Education.

Berka, Anna L and Creamer, E. (2018) 'Taking stock of the local impacts of community owned renewable energy : A review and research agenda', (October 2016).

Berka, Anna L. and Creamer, E. (2018) 'Taking stock of the local impacts of community owned renewable energy: A review and research agenda', *Renewable and Sustainable Energy Reviews*, 82(July 2017), pp. 3400–3419. doi: 10.1016/j.rser.2017.10.050.

Birbili, M. (2000). Translating from one language to another. Social Research Update, 31. Available at: https://sru.soc.surrey.ac.uk/SRU31.html (Accessed 20/2/2018).

Bird, C. *et al.* (2013) 'Maintaining Momentum in Bristol Community Energy', (June), pp. 1–37. Available at: http://www.bris.ac.uk/media-library/sites/law/documents/Maintaining Momentum project report June 2013.pdf.

Bomberg, E. and McEwen, N. (2012) 'Mobilizing community energy', *Energy Policy*, 51, pp. 435–444. doi: 10.1016/j.enpol.2012.08.045.

Bourdieu, P. (1980) The Logic of Practice. Stanford: Stanford University Press.

Bourdieu, P. (1984) Distinction: A Social Critique of the Judgement of Taste. Harvard: Routledge and Kagan Paul Ltd.

Bourdieu, P. (1986) 'The Forms of Capital', in Richardson, J.G. (eds) Handbook of theory and research for the sociology of education. New York: Greenwood Press, pp. 241–58.

Bratich, J. (2017) 'Observation in a surveilled world', in Denzin & Y. S. Lincoln (eds.) 5th ed. Handbook of qualitative research. Thousand Oaks, CA: Sage Publications, pp.526-545.

Braunholtz-Speight, T. *et al.* (2021) 'The long term future for community energy in Great Britain: A co-created vision of a thriving sector and steps towards realising it', *Energy Research and Social Science*, 78, pp. 1–40. doi: 10.1016/j.erss.2021.102044.

Brinkmann, S. (2018) 'The interview', in Denzin & Y. S. Lincoln (eds.) 5th edn. Handbook of qualitative research. Thousand Oaks, CA: Sage Publications. pp.576-599.

Bristow, G., Cowell, R. and Munday, M. (2012) 'Windfalls for whom? The evolving notion of "community" in community benefit provisions from wind farms', *Geoforum*. doi: 10.1016/j.geoforum.2012.06.015.

Brounen, D., Kok, N. and Quigley, J. M. (2013) 'Energy literacy, awareness, and conservation behavior of residential households', *Energy Economics*, 38, pp. 42–50. doi: 10.1016/j.eneco.2013.02.008.

Brummer, V. (2018) 'Community energy – bene fi ts and barriers : A comparative literature review of Community Energy in the UK , Germany and the USA , the bene fi ts it provides for society and the barriers it faces', 94(June), pp. 187–196. doi: 10.1016/j.rser.2018.06.013.

Buckland-Jones, S. (2019) Community and local ownership of renewable energy in Wales: politics and policy. Available at: https://www.iwa.wales/agenda/2019/03/community-and-local-ownership-of-renewable-energy-in-wales/ (Accessed 13 September 2019).

Bulkeley, H. and Fuller, S. (2012) 'Low carbon communities and social justice', *Joseph Rowntree Foundation Viewpoint*. Available at: http://www.jrf.org.uk/sites/files/jrf/low-carbon-communities-summary.pdf.

Burgess, E.G. (1984) Field Research: A Sourcebook and Field Manual. London: Allen & Unwin.

Burningham, K., Barnett, J. and Walker, G. (2015) 'An Array of Deficits: Unpacking NIMBY Discourses in Wind Energy Developers' Conceptualizations of Their Local Opponents', *Society and Natural Resources*, 28(3), pp. 246–260. doi: 10.1080/08941920.2014.933923.

Bryman, A. (2016) Social research methods. 5th edn. Oxford: Oxford University Press.

Callaghan, G. and Williams, D. (2014) 'Teddy bears and tigers: How renewable energy can revitalise local communities', *Local Economy*, 29(6–7), pp. 657–674. doi: 10.1177/0269094214551254.

Carly Mclachlan (2009) '" You don " t do a chemistry experiment in your best china ': Symbolic interpretations of place and technology in a wave energy case', *Energy Policy*, 37(12), pp. 5342–5350. doi: 10.1016/j.enpol.2009.07.057.

Cass, N. and Walker, G. (2009) 'Emotion , Space and Society Emotion and rationality : The characterisation and evaluation of opposition to renewable energy projects', *Emotion, Space and Society*, 2(1), pp. 62–69. doi: 10.1016/j.emospa.2009.05.006.

Catney, P. *et al.* (2014) 'Big society, little justice? Community renewable energy and the politics of localism', *Local Environment*, 19(7), pp. 715–730. doi: 10.1080/13549839.2013.792044.

Claridge, T. (2018) 'Dimensions of Social Capital – structural, cognitive, and relational', *Social Capital Research*, (January), pp. 1–4.

Cooney, K. and Lynch-Cerullo, K. (2014) 'Measuring the social returns of Nonprofits and Social enterprises: the promise and Perils of the SROI'.

Committee on Climate Change (2018) Reducing UK emissions: 2018 Progress Report to Parliament. Available at: https://www.theccc.org.uk/publication/reducing-uk-emissions-2018-progress-report-to-parliament/ (Accessed 20 December 2018).

Community Energy Wales (CEW 2017) Call for evidence: locally owned renewable energy. Available at: http://www.communityenergywales.org.uk/en/latest (Accessed: 10 September 2020).

Community Energy Wales (CEW, 2019) £610k EU grant awarded to innovative Swansea-based clean local energy supply partnership. Available at: http://www.communityenergywales.org.uk/en/latest/gbp-610k-eu-grant-awarded-to-innovative-swansea-based-clean-local-energy-supply-partnership (Accessed 10 January 2020).

Community Energy Wales (CEW, 2021) About us, what do we do? Available at: http://www.communityenergywales.org.uk/en/about-us#:~:text=Community%20Energy%20Wales%20is%20a,flourish%2C%20and%20communities%20to%20prosper (Accessed: 14 October 2021).

Community Energy England (CEE, 2021) People and communities are missing in UK energy: climate change and recovery policy. Available at: https://communityenergyengland.org/news/missing-in-policy (Accessed 8 February 2021).

Community Research Unit (2011) Exploring schools as community hubs: investigating application of community hubs model in context of the closure of Athabasca school, Regina, Saskatchewan, Canada and other small schools. University of Regina. Available at: https://ourspace.uregina.ca/bitstream/handle/10294/3397/Community%20Hub%20Final%20Report.pdf (Accessed: 14 October 2018).

Community Shares (2020) The Community Shares Handbook, Available at: https://www.uk.coop/sites/default/files/2020-11/community_shares_handbook.pdf (Accessed: 12 September 2020).

Creamer, E. (2015) 'The double-edged sword of grant funding: a study of community-led climate change initiatives in remote rural Scotland', *Local Environment*, 20(9), pp. 981–999. doi: 10.1080/13549839.2014.885937.

Creamer, E., Eadson, W., Pinker, A., *et al.* (2018) 'Community energy : Entanglements of community , state , and private sector', (May), pp. 1–16. doi: 10.1111/gec3.12378.

Creamer, E., Eadson, W., van Veelen, B., *et al.* (2018) 'Community energy: Entanglements of community, state, and private sector', *Geography Compass*, 12(7), pp. 1–16. doi: 10.1111/gec3.12378.

Creamer, E. *et al.* (2019) 'Community renewable energy: What does it do? Walker and Devine-Wright (2008) ten years on', *Energy Research & Social Science*, 57(January), p. 101223. doi: 10.1016/j.erss.2019.101223.

Creswell, J.W. and Creswell, J.D. (2003) Research Design - Qualitative, Quantitative, and Mixed Methods Approaches. 5th edn. Thousand Oaks, CA: Sage Publications.

Creswell, J.W. (2013) Qualitative Inquiry and Research Design. Thousand Oaks, CA: Sage Publications.

Creswell, J.W. (2014) Research design, qualitative, quantitative and mixed methods. 4th edn. Thousand Oaks, CA: Sage Publications.

Creswell, J.W. and Poth, C.N. (2017) Qualitative Inquiry and Research Design: Choosing among Five Approaches. Fourth Edition. Thousand Oaks, CA: Sage Publications.

Datblygiau Egni Gwledig (DEG, 2021) Cyd Ynni. Available at: https://www.deg.wales/prosiectau/cyd-ynni/ (Accessed: 1 September 2021).

Dan Van Der Horst (2007) 'NIMBY or not ? Exploring the relevance of location and the politics of voiced opinions in renewable energy siting controversies', 35, pp. 2705–2714. doi: 10.1016/j.enpol.2006.12.012.

Davidson, J. (2020) Futuregen: lessons from a small country. London: Chelsea Green Publishing.

DECC (2013a) 'Community energy: Call for evidence', *Decc*, (June). Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/207920/community_energy_call_for_evidence.pdf.

DECC (2013b) 'Consumer futures community energy in the UK: A review of the evidence', *Decc*, (June). Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/205218/Community_Energy_in_the_UK_review_of_the_evidence.pdf.

DeFilippis, J., Fisher, R. and Shragge, E. (2006) 'Neither romance nor regulation: Re-evaluating community', *International Journal of Urban and Regional Research*, 30(3), pp. 673–689. doi: 10.1111/j.1468-2427.2006.00680.x.

Department for Transport (DTI, 2003) Energy white paper: our energy future-creating a low carbon economy. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/272061/5761.pdf (Accessed 20 October 2018).

De Vaus, S. (2014) Surveys in social research. 6th edn. Abingdon, Oxon: Routledge.

Devine-, P. (2007) 'Reconsidering public attitudes and public acceptance of renewable energy technologies : a critical review', (February).

Devine-, P. (2009) 'Rethinking NIMBYism : The Role of Place Attachment and Place Identity in Explaining Place-protective Action', 441(November 2008), pp. 426–441. doi: 10.1002/casp.

Devine-Wright, P. (2011) 'Place attachment and public acceptance of renewable energy: A tidal energy case study', *Journal of Environmental Psychology*, 31(4), pp. 336–343. doi: 10.1016/j.jenvp.2011.07.001.

Devine-Wright, P. (2013) 'Think global, act local? The relevance of place attachments and place identities in a climate changed world', *Global Environmental Change*, 23(1), pp. 61–69. doi: 10.1016/j.gloenvcha.2012.08.003.

Devine-, P. and Batel, S. (2017) 'My neighbourhood , my country or my planet ? The in fl uence of multiple place attachments and climate change concern on social acceptance of energy infrastructure', *Global Environmental Change*, 47(November 2016), pp. 110–120. doi: 10.1016/j.gloenvcha.2017.08.003.

Devine-, P. and Howes, Y. (2010) 'Disruption to place attachment and the protection of restorative environments : A wind energy case study', *Journal of Environmental Psychology*, 30(3), pp. 271–280. doi: 10.1016/j.jenvp.2010.01.008.

Devine-Wright, P., Price, J. and Leviston, Z. (2015) 'My country or my planet? Exploring the influence of multiple place attachments and ideological beliefs upon climate change attitudes and opinions', *Global Environmental Change*, 30, pp. 68–79. doi: 10.1016/j.gloenvcha.2014.10.012.

Devine-, P. and Wiersma, B. (2013) 'Opening up the " local " to analysis : exploring the spatiality of UK urban decentralised energy initiatives', 9839. doi: 10.1080/13549839.2012.754742.

Egni-coop (2020) Invest in community solar power across Wales. Available at: https://egni.coop/wp-content/uploads/2019/05/EGNIShareOfferDoc.ENG_.pdf (Accessed 15th January 2020).

Esposito, N. (2001) 'From meaning to meaning: The influence of translation techniques on non-english focus group research', *Qualitative Health Research*, 11(4), pp. 568–579. doi: 10.1177/104973201129119217.

Field, J. (2003) social capital, Routledge: London

Finlay, L. and Gough, B. (2003) Reflexivity: A Practical Guide for Researchers in Health and Social Sciences. Oxford: Blackwell Science.

Firth, C., Maye, D. and Pearson, D. (2011) 'Developing "community" in community gardens', *Local Environment*, 16(6), pp. 555–568. doi: 10.1080/13549839.2011.586025.

Flick, U. (2014) The SAGE Handbook of Qualitative Data Analysis. Thousand Oaks, CA: Sage Publications.

Flyvbjerg, B. (2006) 'Five Misunderstandings About Case-Study Research', *Qualitative Research Practice*, pp. 390–404. doi: 10.4135/9781848608191.d33.

Fontana, A. and James. H. F. (2003) 'The interview; from structured questions to negotiated text', in Denzin, N. K. and Lincoln, Y.S. (2003) Collecting and interpreting qualitative materials. 2nd (eds). Thousand Oaks, CA: Sage Publications, pp61-106.

Forman, A. (2017) 'Energy justice at the end of the wire: Enacting community energy and equity in Wales', *Energy Policy*, 107(April), pp. 649–657. doi: 10.1016/j.enpol.2017.05.006.

Fudge, S., Peters, M. and Woodman, B. (2016) 'Local authorities as niche actors: The case of energy governance in the UK', *Environmental Innovation and Societal Transitions*, 18, pp. 1–17. doi: 10.1016/j.eist.2015.06.004.

Future Generations Commissioner (2021a) Developing a UK Well-being of Future Generations Bill. Available at: https://www.futuregenerations.wales/news/pressure-mounts-on-uk-government-to-follow-welsh-government-and-back-the-well-being-of-future-generations-bill/ (Accessed 15 September 2021).

Genus, A. and Iskandarova, M. (2020) 'Transforming the energy system? Technology and organisational legitimacy and the institutionalisation of community renewable energy', *Renewable and Sustainable Energy Reviews*, 125(February), p. 109795. doi: 10.1016/j.rser.2020.109795.

Gerring, J. (2017). Case Study Research: Principles and Practices. 2nd Edition. Cambridge: Cambridge University Press.

Gibbs, G.R. (2007) Analyzing Qualitative Data - The SAGE qualitative research kit. London: Sage.

Gillard, R., Snell, C. and Bevan, M. (2017) 'Advancing an energy justice perspective of fuel poverty: Household vulnerability and domestic retrofit policy in the United Kingdom', *Energy Research and Social Science*, 29(February), pp. 53–61. doi: 10.1016/j.erss.2017.05.012.

Gilchrist, A. (2009) The well-connected community: a networking approach to community development. 2nd edn. Bristol: Policy Press.

Gordon, L.E. (2016) Real Research- Research methods sociology students can use. London: Sage

GOV, UK (2021). UK enshrines new target in law to slash emissions by 78% by 2035. Available at: https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035 (Accessed: 13 March 2021).

Gower Regeneration (2017) Gower Regeneration Solar Farm. Share offer document. Available at: https://gov.wales/sites/default/files/inline-documents/2019-09/gower-regeneration-solar-farm.pdf (Accessed: 1 February 2020).

Gower heritage centre (2020): Gower heritage centre. Available at: https://www.gowerheritagecentre.co.uk/ (Accessed 15th January 2020).

Gram-hanssen, K. (2013) 'Efficient technologies or user behaviour , which is the more important when reducing households ' energy consumption ?', pp. 447–457. doi: 10.1007/s12053-012-9184-4.

Gross, C. (2007) 'Community perspectives of wind energy in Australia : The application of a justice and community fairness framework to increase social acceptance', 35, pp. 2727–2736. doi: 10.1016/j.enpol.2006.12.013.

Guba, E. G., & Lincoln, Y. S. (1985). Naturalistic inquiry. California: Sage Publications.

Guba, E. G., & Lincoln, Y. S. (1989) Fourth generation evaluation. California: Sage Publications.

Guba, E. G., & Lincoln, Y. S. (1994) 'Competing paradigms in qualitative research' in N. K. Denzin & Y. S. Lincoln (eds.) Handbook of qualitative research. Thousand Oaks, CA: Sage Publications, pp. 105–117.

Gunderson, K. and Watson, A. (2007) 'Understanding place meanings on the Bitterroot National Forest, Montana', *Society and Natural Resources*, 20(8), pp. 705–721. doi: 10.1080/08941920701420154.

Gupta, R. and Barnfield, L. (2013) 'Evaluating the impact of low carbon communities on household energy behaviours', *Mediatum.Ub.Tum.De*, (September), pp. 10–12. Available at: https://mediatum.ub.tum.de/doc/1169291/file.pdf.

Gwynedd PSB, Local Wellbeing Plans, (2018) Gwynedd and Anglesey Well-being plan.. Available at: https://www.llesiantgwyneddamon.org/en/ (Accessed: 1 September 2021).

Haf, S. *et al.* (2018) 'Distributing power ? Community energy projects ' experiences of planning , policy and incumbents in the devolved nations of Scotland and Wales', 0568(May). doi: 10.1080/09640568.2018.1453490.

Haf, S. and Parkhill, K. (2017) 'The Muillean Gaoithe and the Melin Wynt: Cultural sustainability and community owned wind energy schemes in Gaelic and Welsh speaking communities in the United Kingdom', *Energy Research and Social Science*, 29, pp. 103–112. doi: 10.1016/j.erss.2017.05.017.

Haggett, C. *et al.* (2013) 'Community Energy in Scotland: the Social Factors for Success'.

Haggett, C. and Aitken, M. (2015) 'Grassroots Energy Innovations: the Role of Community Ownership and Investment', *Current Sustainable/Renewable Energy Reports*, 2(3), pp. 98–104. doi: 10.1007/s40518-015-0035-8.

Halpern, D. (2005) Social Capital Key concepts. Cambridge: Polity Press.

Hammersley, M. (1992) What's wrong with Ethnography? Methodological explorations. London: Routledge.

Hamilton, J. *et al.* (2014) 'Scaling up local carbon action: The role of partnerships, networks and policy', *Carbon Management*, 5(4), pp. 463–476. doi: 10.1080/17583004.2015.1035515.

Hammersley, M. (2006) 'Ethnography: problems and prospects', *Ethnography and Education*, 1(1), pp. 3–14. doi: 10.1080/17457820500512697.

Hargreaves, T. *et al.* (2013) 'Grassroots innovations in community energy: The role of intermediaries in niche development', *Global Environmental Change*, 23(5), pp. 868–880. doi: 10.1016/j.gloenvcha.2013.02.008.

Herbert, S. (2010) 'A taut rubber band: theory and empirics in qualitative geographic research', in DeLyser, D., Herbert, S., Aitken, S., Crang, M. and McDowell, L. (eds.) The SAGE Handbook of Qualitative Geography London: Sage, pp. 69-81.

Hernandez *et al.* (2007) 'Place attachment and place identity in natives and non-natives', 27, pp. 310–319. doi: 10.1016/j.jenvp.2007.06.003.

Hicks, J. and Ison, N. (2011) 'energy (CRE): Opportunities for rural Australia', 1656. doi: 10.5172/rsj.20.3.244.

Hicks, J. and Ison, N. (2018) 'An exploration of the boundaries of " community " in community renewable energy projects : Navigating between motivations and context', (June 2016).

Hicks, J. (2018) Community Power: Understanding the outcomes and impacts from community owned wind energy projects in small regional communities. Available at: https://www.unsworks.unsw.edu.au/primo-explore/fulldisplay/unsworks_50964/UNSWORKS (Accessed 10 August 2019).

Hidalgo, M. C. and Hernández, B. (2001) 'Place attachment: Conceptual and empirical questions', *Journal of Environmental Psychology*, 21(3), pp. 273–281. doi: 10.1006/jevp.2001.0221.

Hielscher, S. (2011) 'Community Energy in the UK A Review of the Research Literature', p. 63. Available at: www.grassrootsinnovations.org!

HM Government (2017) The clean growth strategy: leading the way to a low carbon future. Available at :https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf (Accessed 20 October 2018).

Hobson, K. and Mayne, R. (2016) 'Monitoring and evaluating eco-localisation : Lessons from UK low carbon community groups'. doi: 10.1177/0308518X16640531.

Hoffman, S. M. *et al.* (2013) 'Public values and community energy: Lessons from the US and UK', *Sustainability (Switzerland)*, 5(4), pp. 1747–1763. doi: 10.3390/su5041747.

Hoffman, S. M. and High-Pippert, A. (2005) 'Community energy: A social architecture for an alternative energy future', *Bulletin of Science, Technology and Society*, 25(5), pp. 387–401. doi: 10.1177/0270467605278880.

Hoffman, S. M. and High-Pippert, A. (2010) 'From private lives to collective action: Recruitment and participation incentives for a community energy program', *Energy Policy*, 38(12), pp. 7567–7574. doi: 10.1016/j.enpol.2009.06.054.

Holstein, J.A. and Gubrium, J. F. (2003) Inside Interviewing- New Lenses, New Concerns. Thousand Oaks, CA: Sage Publications.

van der Horst, D. (2008) 'Social enterprise and renewable energy: emerging initiatives and communities of practice', *Social Enterprise Journal*, 4(3), pp. 171–185. doi: 10.1108/17508610810922686.

Howell, R., and Haggett, C. (2014) 'An overview of social impact assessment: Working paper to inform Marine Scotland Work on social impacts' School of Social and Political Science, University of Edinburgh.

Islar, M. and Busch, H. (2016) '" We are not in this to save the polar bears !" – the link between community renewable energy development and ecological citizenship', 1610. doi: 10.1080/13511610.2016.1188684.

Institute of Welsh Affairs (IWA, 2018) Re-energising Wales: A Framework for Action: Next steps for Regulatory and Policy Powers over Energy in Wales. Available at: https://www.iwa.wales/our-work/work/re-energising-wales-a-framework-for-action-next-steps-for-regulatory-and-policy-powers-over-energy-in-wales-report/ (Accessed 10 May 2018).

Institute of Welsh Affairs (IWA, 2019) Re-energising wales: how to protect, promote and achieve scale in community and local ownership of renewable energy in Wales. Available at: https://www.regen.co.uk/wp-content/uploads/IWA_Energy_WP4.1.pdf (Accessed 17 June 2020).

IPCC Report (2021) Climate Change 2021: The Physical Science Basis, the Working Group I contribution to the Sixth Assessment Report. Available at: https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/ (Accessed: 12 September 2021).

James, M. (2018) Being a volunteer can transform your life – but not enough people know that yet. Available at: https://www.theguardian.com/voluntary-sector-network/2018/jan/03/volunteer-transform-life-charities-councils (Accessed: 1 October 2020).

Jeannotte, M. S. (2003) 'Singing alone? The contribution of cultural capital to social cohesion and sustainable communities', *International Journal of Cultural Policy*, 9(1), pp. 35–49. doi: 10.1080/1028663032000089507.

Kaiser, K. (2009) 'Protecting respondent confidentiality in qualitative research', *Qualitative Health Research*, 19(11), pp. 1632–1641. doi: 10.1177/1049732309350879.

Kalkbrenner, B. J. and Roosen, J. (2016) 'Citizens' willingness to participate in local renewable energy projects: The role of community and trust in Germany', *Energy Research and Social Science*, 13(2016), pp. 60–70. doi: 10.1016/j.erss.2015.12.006.

Keirstead, J. (2007) 'Behavioural responses to photovoltaic systems in the UK domestic sector', *Energy Policy*, 35(8), pp. 4128–4141. doi: 10.1016/j.enpol.2007.02.019.

Kilpatrick, S. (2007) 'Building social capital in groups: Facilitating skill development for natural resource management', *Rural Society*, 17(3), pp. 248–257. doi: 10.5172/rsj.351.17.3.248.

Kingsley, J. Y. *et al.* (2007) '" Dig In " to Social Capital : Community Gardens as Mechanisms for Growing Urban Social Connectedness " Dig In " to Social Capital : Community Gardens as Mechanisms for Growing Urban Social Connectedness', 1146. doi: 10.1080/08111140601035200.

Kvale, S. (2007) Doing interviews - The SAGE qualitative research kit. London: Sage.

James, M. (2018) Being a volunteer can transform your life – but not enough people know that yet. Available at: https://www.theguardian.com/voluntary-sector-network/2018/jan/03/volunteer-transform-life-charities-councils (Accessed: 1 October 2020).

Lewicka, M. (2011) 'Place attachment : How far have we come in the last 40 years ?', *Journal of Environmental Psychology*, 31(3), pp. 207–230. doi: 10.1016/j.jenvp.2010.10.001.

Li, W. *et al.* (2013) 'Transitioning to Community-owned Renewable Energy: Lessons from Germany', *Procedia Environmental Sciences*, 17, pp. 719–728. doi: 10.1016/j.proenv.2013.02.089.

Liepins, R. (2000) 'New energies for an old idea: Reworking approaches to "community" in contemporary rural studies', *Journal of Rural Studies*, pp. 23–35. doi: 10.1016/S0743-0167(99)00042-X.

Lin, C. C. and Lockwood, M. (2014a) 'Assessing sense of place in natural settings: A mixed-method approach', *Journal of Environmental Planning and Management*, 57(10), pp. 1441–1464. doi: 10.1080/09640568.2013.811401.

Lin, C. C. and Lockwood, M. (2014b) 'Forms and sources of place attachment: Evidence from two protected areas', *Geoforum*, 53, pp. 74–81. doi: 10.1016/j.geoforum.2014.02.008.

Llewellyn, D. H. *et al.* (2017a) 'Corrigendum to "Evolving energy landscapes in the South Wales Valleys: Exploring community perception and participation" [Energy Policy 108 (2017) 818–828](S0301421517302537)(10.1016/j.enpol.2017.04.028)', *Energy Policy*, p. 403. doi: 10.1016/j.enpol.2017.08.003.

Llewellyn, D. H. *et al.* (2017b) 'Evolving energy landscapes in the South Wales Valleys: Exploring community perception and participation', *Energy Policy*, 108(April), pp. 818–828. doi: 10.1016/j.enpol.2017.04.028.

Mabry, L. (2008) 'Case study in social research', in Alasuutari. P., Bickman, L. & J. Brannen, J. (eds.). The SAGE handbook of social research methods. London: Sage, pp. 214-227.

MacArthur, J. L. (2016) 'Challenging public engagement: participation, deliberation and power in renewable energy policy', *Journal of Environmental Studies and Sciences*, 6(3), pp. 631–640. doi: 10.1007/s13412-015-0328-7.

Maier, F. *et al.* (2015) 'SROI as a Method for Evaluation Research: Understanding Merits and Limitations'.

Manzo, L. C. and Perkins, D. D. (2006) 'Finding common ground: The importance of place attachment to community participation and planning', *Journal of Planning Literature*, 20(4), pp. 335–350. doi: 10.1177/0885412205286160.

Markantoni, M. and Aitken, M. (2016) 'Getting low-carbon governance right: learning from actors involved in Community Benefits', *Local Environment*. doi: 10.1080/13549839.2015.1058769.

Markantoni, M. and Woolvin, M. (2015) 'The role of rural communities in the transition to a low-carbon Scotland: A review', *Local Environment*, 20(2), pp. 202–219. doi: 10.1080/13549839.2013.834880.

Martiskainen, M. (2017) 'The role of community leadership in the development of grassroots innovations', *Environmental Innovation and Societal Transitions*, 22, pp. 78–89. doi: 10.1016/j.eist.2016.05.002.

McGrath, C., Palmgren, P. J. and Liljedahl, M. (2019) 'Twelve tips for conducting qualitative research interviews', *Medical Teacher*, 41(9), pp. 1002–1006. doi: 10.1080/0142159X.2018.1497149.

McLaren Loring, J. (2007) 'Wind energy planning in England, Wales and Denmark: Factors influencing project success', *Energy Policy*, 35(4), pp. 2648–2660. doi: 10.1016/j.enpol.2006.10.008.

Messenger, S. (2018) In jeopardy' community hydro power schemes given help. Available at: https://stedmood.ru/news/uk-wales-43073001 (Accessed 19 June 2019).

Middlemiss, L. and Gillard, R. (2015) 'Fuel poverty from the bottom-up: Characterising household energy vulnerability through the lived experience of the fuel poor', *Energy Research and Social Science*, 6, pp. 146–154. doi: 10.1016/j.erss.2015.02.001.

Middlemiss, L. and Parrish, B. D. (2010) 'Building capacity for low-carbon communities: The role of grassroots initiatives', *Energy Policy*, 38(12), pp. 7559–7566. doi: 10.1016/j.enpol.2009.07.003.

Miles, M.B., Huberman, A.M. and Saldana, J. (2014) Qualitative Data Analysis A Methods Sourcebook. 3rd edn. London: Sage

Miles, M.B., Huberman, A.M. (1994) An expanded sourcebook. 2nd edn. California: Sage Publications.

Mills, P. (2012) 'Community Energy Projects – 2012 Impact Survey Summary report Communtiy energy scoltand', (July).

Morrison, C. and Ramsey, E. (2019) 'Power to the people : Developing networks through rural community energy schemes', *Journal of Rural Studies*, 70(July 2018), pp. 169–178. doi: 10.1016/j.jrurstud.2018.07.006.

Musall, F. D. and Kuik, O. (2011) 'Local acceptance of renewable energy — A case study from southeast Germany', *Energy Policy*, 39(6), pp. 3252–3260. doi: 10.1016/j.enpol.2011.03.017.

Neath Port Talbot PSB, (2018) Well-being Plan 2018 – 2023. Available at: https://democracy.npt.gov.uk/documents/s36073/Local%20Well-being%20Plan%20Draft%20V10.pdf (Accessed: 1 September 2021).

van Nes, F. *et al.* (2010) 'Language differences in qualitative research: Is meaning lost in translation?', *European Journal of Ageing*, 7(4), pp. 313–316. doi: 10.1007/s10433-010-0168-y.

Nicholls, J. *et al.* (2009) 'A guide to Social Return on Investment', *Development*, 3(January), p. 55. Available at: http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:A+guide+to+Social+Return+on+Investment#6.

Nolden, C. (2013) 'Governing community energy-Feed-in tariffs and the development of community wind energy schemes in the United Kingdom and Germany', *Energy Policy*, 63, pp. 543–552. doi: 10.1016/j.enpol.2013.08.050.

Okkonen, L. and Lehtonen, O. (2016) 'Socio-economic impacts of community wind power projects in Northern Scotland', *Renewable Energy*, 85, pp. 826–833. doi: 10.1016/j.renene.2015.07.047.

Owen, M., Thomason, J,. Chambers, R., (2019a) Llanberis Community Destination Plan. Available at: https://prawf.llechi.cymru/sites/default/files/2021-09/Llanberis%20Community%20Destination%20Plan.pdf (Accessed 15 September 2020).

Owen, M., Thomason, J,. Chambers, R., (2019b) Bethesda Community destination plan. Available at: https://prawf.llechi.cymru/sites/default/files/2021-09/Bethesda%20Community%20Destination%20Plan.pdf (Accessed 25 September 2020).

Parag, Y. *et al.* (2013) 'Network approach for local and community governance of energy: The case of Oxfordshire', *Energy Policy*, 62, pp. 1064–1077. doi: 10.1016/j.enpol.2013.06.027.

Park, J. J. (2012) 'Fostering community energy and equal opportunities between communities', 9839. doi: 10.1080/13549839.2012.678321.

Parkhill, K A *et al.* (2015) 'ScienceDirect " We are a community [but] that takes a certain amount of energy ": Exploring shared visions , social action , and resilience in place-based community-led energy initiatives', *Environmental Science and Policy*, 53, pp. 60–69. doi: 10.1016/j.envsci.2015.05.014.

Patulny, R. V. and Lind Haase Svendsen, G. (2007) 'Exploring the social capital grid: Bonding, bridging, qualitative, quantitative', *International Journal of Sociology and Social Policy*, 27, pp. 32–51. doi: 10.1108/01443330710722742.

Peters, M. *et al.* (2012) 'Carbon management, local governance and community engagement', *Carbon Management*, 3(4), pp. 357–368. doi: 10.4155/cmt.12.41.

Pretty, J. (2003) 'Social Capital and the Collective Management of Resources', *Science*, 302(5652), pp. 1912–1914. doi: 10.1126/science.1090847.

Putnam, R. D. (2000) Bowling Alone: The Collapse and Revival of American Community. New York: Simon & Schuster.

Radtke, J. (2014) 'A closer look inside collaborative action : civic engagement and participation in community energy initiatives', pp. 235–248. doi: 10.3351/ppp.0008.0003.0008.

Regen (2021a) Community Energy in Wales State of the Sector Report 2021: Working together towards net zero. Available at: http://www.communityenergywales.org.uk/ycc-login/resources/wales-sots-2021.pdf (Accessed: 13 October 2021).

Regen (2021b) Community Energy State of the Sector Report 2021: Working together towards net zero. Available at: https://communityenergyengland.org/files/document/523/1624438045_UKSOTSReport.pdf Available at: (Accessed: 13 October 2021).

Rivera, M. *et al.* (2019) 'The Role of Social Capital in Agricultural and Rural Development:Lessons Learnt from Case Studies in Seven Countries', *Sociologia Ruralis*, 59(1), pp. 66–91. doi: 10.1111/soru.12218.

Robson, C. (1993) Real world research a resource for social scientists and practitioner-researchers. Oxford: Blackwell

Robinsion, S. and Stephen, D. (2020) 'COMMUNITY ENERGY State of the Sector Report'.

Rogers, J. C. *et al.* (2008) 'Public perceptions of opportunities for community-based renewable energy projects', *Energy Policy*, 36(11), pp. 4217–4226. doi: 10.1016/j.enpol.2008.07.028.

Rogers, J. C. *et al.* (2012a) 'Social impacts of community renewable energy projects: Findings from a woodfuel case study', *Energy Policy*, 42, pp. 239–247. doi: 10.1016/j.enpol.2011.11.081.

Rogers, J. C. *et al.* (2012b) 'What factors enable community leadership of renewable energy projects? Lessons from a woodfuel heating initiative', *Local Economy*, 27(2), pp. 209–222. doi: 10.1177/0269094211429657.

Rubin, H.J. and Rubin, I.S. (2012) Qualitative interviewing, the art of hearing data. 3rd edn. Thousand Oaks, CA: Sage Publications.

Rudolph, D., Haggett, C. and Aitken, M. (2014) 'Community Benefits from Offshore Renewables : Good Practice Review', *ClimateXChange*.

Rydin, Y., Turcu, C. and Austin, P. (2013) 'Planning and the challenge of decentralised energy: a co-evolution perspective', pp. 1–39.

Samson, H. (2018) 'Bringing local energy benefits to deprived communities'.

Santos, H. P. O., Black, A. M. and Sandelowski, M. (2015) 'Timing of translation in cross-language qualitative research', *Qualitative Health Research*, 25(1), pp. 134–144. doi: 10.1177/1049732314549603.

Sarantakos, S. (2013) Social research. 4th edn. New York: Palgrave Macmillan.

Scene Connect (2018) 'Community Energy: State of the Sector 2018. Annual Review of Community Energy in England, Wales and Northern Ireland. Full report. Report prepared on behalf of Community Energy England and Community Energy Wales', (June), pp. 2–44.

Scene Connect (2019) Community energy state of the sector report 2019: insights, opportunities and challenges in a changing community energy landscape. Available at: https://communityenergyengland.org/files/document/316/1561207690_StateoftheSectorReport2019-FullReport.pdf (Accessed 19 August 2019).

Scene Connect (2020) Community energy: state of the sector 2020. Available at: https://communityenergyengland.org/files/document/484/1615989181_CommunityEnergy-StateoftheSector2020Report.pdf (Accessed 11 July 2020).

Schoor, T. Van Der and Scholtens, B. (2015) 'Power to the people : Local community initiatives and the transition to sustainable energy', *Renewable and Sustainable Energy Reviews*, 43, pp. 666–675. doi: 10.1016/j.rser.2014.10.089.

Van Der Schoor, T. and Scholtens, B. (2015) 'Power to the people: Local community initiatives and the transition to sustainable energy', *Renewable and Sustainable Energy Reviews*, pp. 666–675. doi: 10.1016/j.rser.2014.10.089.

Schwandt, T.A. (2007) The SAGE Dictionary of Qualitative Inquiry. 3rd edn. Thousand Oaks, CA: Sage Publications.

Seyfang, G. *et al.* (2014) 'A grassroots sustainable energy niche? Reflections on community energy in the UK', *Environmental Innovation and Societal Transitions*, 13, pp. 21–44. doi: 10.1016/j.eist.2014.04.004.

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), pp. 381–400. doi: 10.1068/c10222.

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

Shklarov, S. (2007) 'Double vision uncertainty: The bilingual researcher and the ethics of cross-language research', *Qualitative Health Research*, 17(4), pp. 529–538. doi: 10.1177/1049732306298263.

Shucksmith, M. (2010) 'Disintegrated rural development? Neo-endogenous rural development, planning and place-shaping in diffused power contexts', *Sociologia Ruralis*, 50(1), pp. 1–14. doi: 10.1111/j.1467-9523.2009.00497.x.

Silverman, D. (2000) Doing Qualitative Research. Thousand Oaks, CA: Sage Publications.

Simcock, D. N., Willis, R. and Capener, P. (2016) 'Cultures of {Community} {Energy}'. Available at: https://www.britac.ac.uk/sites/default/files/CoCE_International Case Studies_online_1.pdf.

Simcock, N. (2016) 'Land Use Policy Procedural justice and the implementation of community wind energy projects : A case study from South Yorkshire , UK', *Land Use Policy*, 59, pp. 467–477. doi: 10.1016/j.landusepol.2016.08.034.

Slee, B. (2015) 'Is there a case for community-based equity participation in Scottish on-shore wind energy production? Gaps in evidence and research needs', *Renewable and Sustainable Energy Reviews*, 41, pp. 540–549. doi: 10.1016/j.rser.2014.08.064.

Slee, B. (2020) 'Social innovation in community energy in Scotland: Institutional form and sustainability outcomes', *Global Transitions*, 2, pp. 157–166. doi: 10.1016/j.glt.2020.07.001.

Smith, A., Fressoli, M. and Thomas, H. (2014) 'Grassroots innovation movements: Challenges and contributions', *Journal of Cleaner Production*, 63, pp. 114–124. doi: 10.1016/j.jclepro.2012.12.025.

Soutar, I. (2015) From local to global value: The transformational nature of community energy. PhD Thesis, University of Exeter. Available at: https://ore.exeter.ac.uk/repository/handle/10871/21861 (Accessed: 1 February 2018).

Stake, R.E. (1995). The Art of Case Study Research. Thousand Oaks, CA: Sage Publications.

Stake, R.E. (1998). 'Case studies', in Denzin, N.K. and Lincoln, Y.S. (eds.), Strategies of Qualitative Inquiry. Thousand Oaks, CA: Sage, pp. 86–109.

Stake, R.E. (2000). Case studies. In Denzin, N.K. and Lincoln, Y.S. (eds.), Handbook of Qualitative Research. Thousand Oaks, CA: Sage Publications, pp. 236–247.

Stake, R.E. (2005). Qualitative case studies. In Denzin, N.K. and Lincoln, Y.S. (eds.), The Sage Handbook of Qualitative Research. Thousand Oaks, CA: Sage Publications, pp. 443–466.

Steiner, A. and Markantoni, M. (2016) 'Unpacking community resilience through capacity for change', *Community Development Journal*, 49(3), pp. 407–425. doi: 10.1093/cdj/bst042.

Strachan, P. A. *et al.* (2015) 'Promoting Community Renewable Energy in a Corporate Energy World', *Sustainable Development*. doi: 10.1002/sd.1576.

Süsser, D., Döring, M. and Ratter, B. M. W. (2017) 'Harvesting energy: Place and local entrepreneurship in community-based renewable energy transition', *Energy Policy*, 101(October 2015), pp. 332–341. doi: 10.1016/j.enpol.2016.10.018.

Swansea PSB, developed Local Wellbeing Plans (2018) *Swansea Public Services Board Local Well-being Plan, working together to build a better future*. Available at: file:///C:/Users/hss042/AppData/Local/Temp/Local_Well-being_Plan_full_statutory_version.pdf (Accessed: 1 September 2021).

Swansea Council (2020) RDP leader 2014-2020 Swansea Council Local development strategy (LDS) May 2020 delivering the RDP leader programme in Swansea. Available at: file:///C:/Users/sopaa0/Downloads/RDP_LEADER_rural_local_development_strategy_2014-2020.pdf (Accessed 12 November 2020).

Taylor, S. and Spicer, A. (2007) 'Time for space : A narrative review of research on organizational spaces', 9(4), pp. 325–346. doi: 10.1111/j.1468-2370.2007.00214.x.

The Future Generations Commissioner (2021) Developing an UK Well-being of Future Generations Bill.   Pressure mounts on UK Government to follow Welsh Government and back the Well-being of Future Generations Bill. Available at:

https://www.futuregenerations.wales/news/pressure-mounts-on-uk-government-to-follow-welsh-government-and-back-the-well-being-of-future-generations-bill/ (Accessed: 1 September 2021).

Thomas A Schwandt and Emily F gates (2018) 'Case study methodology', In Denzin, N. K. and Lincoln, Y.S. (eds.) The Sage handbook of qualitative research. 5th edn. Thousand Oaks, CA: Sage Publications, pp.341-358.

UKERC (2017) UK energy research centre: review of energy policy 2017, A UKERC policy briefing. Available at: https://d2e1qxpsswcpgz.cloudfront.net/uploads/2020/03/ukerc_review_of_energy_policy_2017.pdf (Accessed 20 October 2018).

UK Department of Energy & Climate Change (DECC) (2014) 'Community Energy Strategy: Full Report', (January), pp. 1–108.

UNESCO (2021) The Slate Landscape of Northwest Wales. Available at:

https://whc.unesco.org/en/list/1633/ (Accessed 11 November 2020).

Vanclay, F. (2012) 'The potential application of social impact assessment in integrated coastal zone management', *Ocean and Coastal Management*, 68, pp. 149–156. doi: 10.1016/j.ocecoaman.2012.05.016.

 van Veelen, B. Van (2018) 'Negotiating energy democracy in practice : governance processes in community energy projects Negotiating energy democracy in practice ':, *Environmental Politics*, 27(4), pp. 644–665. doi: 10.1080/09644016.2018.1427824.

van Veelen, B. and Haggett, C. (2017) 'Uncommon Ground: The Role of Different Place Attachments in Explaining Community Renewable Energy Projects', *Sociologia Ruralis*, 57(November 2017), pp. 533–554. doi: 10.1111/soru.12128.

 Venables, D. *et al.* (2012) 'Living with nuclear power: Sense of place, proximity, and risk perceptions in local host communities', *Journal of Environmental Psychology*, 32(4), pp. 371–383. doi: 10.1016/j.jenvp.2012.06.003.

van der Waal, E. C. (2020) 'Local impact of community renewable energy: A case study of an Orcadian community-led wind scheme', *Energy Policy*, 138(October 2019), p. 111193. doi: 10.1016/j.enpol.2019.111193.

Walker, G. *et al.* (2007b) 'Harnessing Community Energies Harnessing Community Energies: Explaining and Evaluating Community- Based Localism in Renewable Energy Policy in the UK', *Global Environmental Politics*, 7(2), pp. 64–82. doi: 10.1162/glep.2007.7.2.64.

Walker, G. (2008a) 'Decentralised systems and fuel poverty: Are there any links or risks?', *Energy Policy*, 36(12), pp. 4514–4517. doi: 10.1016/j.enpol.2008.09.020.

Walker, G. (2008b) 'What are the barriers and incentives for community-owned means of energy production and use?', *Energy Policy*, 36(12), pp. 4401–4405. doi: 10.1016/j.enpol.2008.09.032.

Walker, G. *et al.* (2010) 'Trust and community: Exploring the meanings, contexts and dynamics of community renewable energy', *Energy Policy*, 38(6), pp. 2655–2663. doi: 10.1016/j.enpol.2009.05.055.

Walker, G. (2011) 'The role for "community" in carbon governance', *Wiley Interdisciplinary Reviews: Climate Change*, 2(5), pp. 777–782. doi: 10.1002/wcc.137.

Walker, G. and Cass, N. (2007) 'Carbon reduction, "the public" and renewable energy: Engaging with socio-technical configurations', *Area*, 39(4), pp. 458–469. doi: 10.1111/j.1475-4762.2007.00772.x.

Walker, G. and Devine-Wright, P. (2008) 'Community renewable energy: What should it mean?', *Energy Policy*, 36(2), pp. 497–500. doi: 10.1016/j.enpol.2007.10.019.

Walsh, B. (2016) 'Community: A powerful label? Connecting wind energy to rural Ireland', *Community Development Journal*, 53(2), pp. 228–245. doi: 10.1093/cdj/bsw038.

Walton, M. (2012) 'Social and Economic Benefits of Community Energy Schemes', *Clore Social Leadership Programme*, pp. 1–13. Available at: http://www.sharedassets.org.uk/wp-content/uploads/2013/10/Report_-Social-and-Economic-Benefits-of-Community-Energy.pdf.

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), pp. 204–213. doi: 10.1016/j.landusepol.2008.12.010.

Well-being of Future Generations (Wales) Act (2015) The Essentials 2nd Edition May 2015. Available at: https://www.futuregenerations.wales/wp-content/uploads/2017/02/150623-guide-to-the-fg-act-en.pdf (Accessed: 1 September 2018).

Welsh Government (2012): The 'Energy Wales: A Low Carbon Transition. Available at: https://gov.wales/sites/default/files/publications/2019-07/energy-wales-a-low-carbon-transition.pdf (Accessed: 1 September 2018).

Welsh Government (2016) How to measure a nation's progress? National indicators for Wales National Indicators for Wales as required by section 10(1) of the Well-being of Future Generations (Wales) Act 2015. Available at: https://gov.wales/sites/default/files/consultations/2018-02/160322-wg-response-en.pdf (Accessed: 1 September 2018).

Welsh Government (2018) Welsh Government Call for Evidence: Summary of responses Locally owned renewable energy. Available at: https://gov.wales/sites/default/files/publications/2019-06/181213-summary-of-responses-locally-owned-renewable-energy (Accessed: 16 June 2018).

Welsh Government (2019b) Welsh Index of Multiple Deprivation. Available at: https://gov.wales/welsh-index-multiple-deprivation-full-index-update-ranks-2019 (Accessed 20 September 2019).

Welsh Government |2019a) 100% business rate relief to continue to flow for community hydro projects. Available at: https://gov.wales/100-business-rate-relief-continue-flow-community-hydro-projects (Accessed 18 July 2020).

Welsh Government (2019c) Energy local, Gower regeneration solar farm. Available at: https://gov.wales/sites/default/files/inline-documents/2019-09/gower-regeneration-solar-farm.pdf (Accessed: 1 February 2020).

Welsh Government (2019d). Awel co-op: Mynydd y Gwrhyd wind farm. Available at: https://gov.wales/sites/default/files/inline-documents/2019-09/awel-co-op-mynydd-y-gwrhyd-wind-farm.pdf (Accessed: 1 February 2020).

Welsh Government (2021a) Welsh Government response to the Climate Change Committee's 2020 Progress Report: Reducing Emissions in Wales. Available at: https://gov.wales/sites/default/files/publications/2021-06/reducing-emissions-in-wales-welsh-government-response.pdf (Accessed 12 August 2021)

Welsh Government (2021b) Well-being of Future Generation (Wales) AcT 2015: the essentials guide. Available at: https://gov.wales/sites/default/files/publications/2021-06/well-being-of-future-generations-wales-act-2015-the-essentials-2021.pdf (Accessed 30 August 2021).

WCVA (2018) The Ways of Working of The Well-being of Future Generations (Wales) Act 2015 – Acting to improve the well-being of Wales – now and in the future. Available at: http://wcva.cymru/wp-content/uploads/2020/03/The-Ways-of-Working-of-The-Well-being-of-Future-Generations-Wales-Act-2015.pdf (Accessed: 1 September 2019).

WCVA (2020) The Goals of The Wellbeing of Future Generations (Wales) Act 2015 Acting to improve the well-being of Wales – now and in the future. Available at: https://w001.benade.co.uk/wp-content/uploads/2021/01/VWG-Intro-to-WBFGA.pdf (Accessed: 1o September 2020).

Woods, M. (2011) Rural. London: Routledge.

Woolcock, M. (2001) The place of social capital in understanding social and economic outcomes, Canadian Journal of Policy Research 2 (1), pp 1-35. http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.463.2107

Wolsink, M. (2006) 'Wind power and the NIMBY-myth : institutional capacity and the limited signi ® cance of public support', 21, pp. 49–64.

Yildiz, Ö. *et al.* (2015) 'Energy Research & Social Science Renewable energy cooperatives as gatekeepers or facilitators ? Recent developments in Germany and a multidisciplinary research agenda', *Energy Research & Social Science*, 6, pp. 59–73. doi: 10.1016/j.erss.2014.12.001.

Yin, R.K. (2014). Case Study Research Design and Methods. 5th edn. Thousand Oaks, CA: Sage Publications.

Yin, R.K. (2018). Case Study Research and Applications: Design and Methods. 6th edn. Thousand Oaks, CA: Sage Publications.

Ynni Ogwen (2016) Share offer video. Available at: https://en-gb.facebook.com/YnniOgwen/videos/ynni-ogwen/1030959260295538/ (Accessed: 1 October 2018).

Ynni Padarn Peris (2016) Share offer video. Available at: https://www.facebook.com/Ynni-Padarn-Peris-1584823911764145/videos/ynni-padarn-peris/1689087191337816/ (Accessed: 1 October 2018).

APPENDICES

APPENDIX 1: CYD YNNI STAKEHOLDERS PIS AND CONSENT

Energised Welsh communities: Exploring the development and social impacts of community energy in Wales

PARTICIPANT INFORMATION SHEET

CYD YNNI

Introduction:

You are being invited to take part in a PhD study at Bangor University being completed by Sioned Page Williams who is looking at *how* community-led and owned projects in Wales develop, *what* happens in shaping their success and their social impacts. During the study four case studies will be explored with two in North Wales and two in South Wales representing different characteristics, so as to get a holistic picture of community energy developments in Wales. As part of this work the study also examines wider support infrastructure and networks such as Cyd Ynni.

Before you decide whether or not to participate, it is important for you to understand why the study is being done and what it will involve. Please take the time to read the following information and discuss it with relatives and/or friends if you wish.

What is the purpose of the study?

This study seeks to:

1. What are the *processes* involved in driving forward and engaging participation in Welsh community renewable energy context?
2. What are the resulting *outcomes* for local communities of being involved in community energy?
3. What are the interrelationship between *processes* and *outcomes* in community energy?
4. What is *'community'* and its application within *'community energy'*?
5. What are the interrelationships between policy infrastructure, in particular the Future Generations Wellbeing Act and applied practice in renewable community energy?

Why have I been chosen?

You have been asked to take part in the study because of your connection to Cyd Ynni, either as an employee or a project lead. Cyd Ynni is an important part of the support for generating community energy in North West Wales and provides a exemplar of Local Energy initiatives. As part of the study it is important to understand how Cyd Ynni emerged to provide a platform for developing community-led and owned initiatives and identify any challenges and facilitators it encountered. Cyd Ynni involves a number of projects and as part of the study it is important to understand the perspective of the project leads and how they relate to Cyd Ynni.

Do I have to take part?

It is up to you to decide whether or not to take part. Your decision will not affect your relationship with Cyd Ynni. If you decide to take part you should contact the Sioned Page Williams at Bangor University by completing the consent form and returning it in the freepost envelope. Please remember to keep this information sheet.

What will happen if I decide to take part?

You are invited to take part in one **confidential** interview to talk about your experiences with Cyd Ynni. The study is also focused on gaining a wider understanding of how Cyd Ynni has developed and its impact on generating community projects.

Sioned will come to see you at a mutually convenient time at an agreeable alternative venue. The interviews will take about 45 minutes.

There are no right or wrong answers and the interviews can be completed in Welsh or English. The interview may be recorded, with your consent, or alternatively, the interviewer will take some written notes.

Will my taking part in this study be kept confidential?

Yes. Your contact details will be stored on a confidential database. The information you share will be treated in confidence. However, since Cyd Ynni is a relatively small network and the field of renewable energy is also a small area with a particular group of people involved it is likely that you may be identifiable, so it may be difficult to guarantee anonymity. Please me mindful of this as part of your involvement in the study. You will not be identified in any reports or publications without your consent.

What will happen if I don't want to carry on with the study?

You are free to withdraw from the study at any time without giving a reason. If you decide to withdraw, your decision will not affect any relationship with Cyd Ynni or Bangor University.

What will happen to the results of the study?

The findings from this study will inform the development of Cyd Ynni and support for community renewable energy in North Wales.

Who is organising and funding the research?

The project is funded by the KESS 2 programme and managed by the School of Social Sciences at Bangor University.

What happens if I have any concerns about this project?

If you are concerned about any aspect of this project and would like to speak to someone please contact Dr Corinna Patterson the lead PhD supervisor. Her email address is c.patterson@bangor.ac.uk and her telephone number is 01248 382798

Contact for further information:

If you would like more information, please contact **Sioned Page Williams by telephone (01248 382961**) or by email (Sopaa0@bangor.ac.uk).

Next steps:

If you decide that you would like to take part, please complete and return the enclosed consent form to Bangor University in the freepost envelope provided. You do not need to use a stamp.

Thank you for kindly taking the time to read this information.

Bangor University's 'Code of Practice for the Assurance of
Academic Quality and Standards of Research Programmes' (Code
03) https://www.bangor.ac.uk/ar/main/regulations/home.htm

COLLEGE OF ARTS & HUMANITIES

Participant Consent Form

Study Title: Energised Welsh communities: Exploring the development and social impacts of community energy in Wales

Cyd Ynni

Researcher's name …Sioned Page Williams

The researcher named above has briefed me to my satisfaction on the research for which I have volunteered. I understand that I have the right to withdraw from the research at any point. I also understand that my rights to anonymity and confidentiality will be respected.

I agree to having the interview/discussion recorded. (delete if not relevant)

Signature of participant ……………………………………………………………………

Date ……………………………………………………………………

This form will be produced in duplicate. One copy should be retained by the participant and the other by the researcher.

APPENDIX 2: STAKEHOLDERS PIS AND CONSENT

Energised Welsh communities: Exploring the development and social impacts of community energy in Wales

PARTICIPANT INFORMATION SHEET
Stakeholder Interview

Community Renewable Energy Case Studies

Introduction:

You are being invited to take part in a PhD study at Bangor University being completed by Sioned Page Williams who is looking at *how* community-led and owned projects in Wales develop, *what* happens in shaping their success and their social impacts. During the study four case studies will be explored with two in North Wales and two in South Wales representing different characteristics, so as to get a holistic picture of community energy developments in Wales. Also as part of the preliminary work, the study examines exemplars of wider support infrastructure and networks focused on Cyd Ynni.

Before you decide whether or not to participate, it is important for you to understand why the study is being done and what it will involve. Please take the time to read the following information and discuss it with relatives and/or friends if you wish.

What is the purpose of the study?

This study seeks to:

1. What are the *processes* involved in driving forward and engaging participation in Welsh community renewable energy context?

2. What are the resulting *outcomes* for local communities of being involved in community energy?

3. What are the interrelationship between *processes* and *outcomes* in community energy?

4. What is *'community'* and its application within *'community energy'*?

5. What are the interrelationships between policy infrastructure, in particular the Future Generations Wellbeing Act and applied practice in renewable community energy?

Why have I been chosen?

You have been asked to take part in the study because of your connection to {NAME HERE} either as a project lead, project team member or part of the community group.

Do I have to take part?

It is up to you to decide whether or not to take part. If you decide to take part you should contact Sioned Page Williams at Bangor University by completing the consent form and returning it in the freepost envelope. Please remember to keep this information sheet.

What will happen if I decide to take part?

You are invited to take part in a **confidential** interview to talk about your experiences with {NAME HERE}. The study is also focused on gaining a wider understanding of how {NAME HERE} has developed and its impact. Sioned will come to see you at a mutually convenient time at an agreeable alternative venue. The interviews will take about 45 minutes.

There are no right or wrong answers and the interviews can be completed in Welsh or English. The interview may be recorded, with your consent, or alternatively, the interviewer will take some written notes.

Will my taking part in this study be kept confidential?

Yes. Your contact details will be stored on a **confidential** database. The information you share will be treated **in confidence**. However, since {NAME HERE} is a relatively small project and the field of renewable energy is also a small area with a particular group of people involved it is likely that you may be identifiable, so it may be difficult to guarantee anonymity. Please me mindful of this as part of your involvement in the study. You **will not** be identified in any reports or publications without your consent.

What will happen if I don't want to carry on with the study?

You are free to withdraw from the study at any time without giving a reason. If you decide to withdraw at any stage, your data will not be used in the study.

What will happen to the results of the study?

The findings from this study will inform the development of {NAME HERE} and support for community renewable energy in North Wales.

Who is organising and funding the research?

The project is funded by the KESS 2 programme and managed by the School of Social Sciences at Bangor University.

What happens if I have any concerns about this project?

If you are concerned about any aspect of this project and would like to speak to someone please contact Dr Corinna Patterson the lead PhD supervisor. Her email address is c.patterson@bangor.ac.uk and her telephone number is 01248 382798

Contact for further information:

If you would like more information, please contact **Sioned Page Williams by telephone (01248 382961**) or by email (Sopaa0@bangor.ac.uk).

Next steps:

If you decide that you would like to take part, please complete and return the enclosed **consent form** to Bangor University in the freepost envelope provided. You do not need to use a stamp.

Thank you for kindly taking the time to read this information.

COLLEGE OF ARTS & HUMANITIES

Participant Consent Form

Study Title: Energised Welsh communities: Exploring the development and social impacts of community energy in Wales

Community Renewable Energy Case Studies

Researcher's name …Sioned Page Williams

The researcher named above has briefed me to my satisfaction on the research for which I have volunteered. I understand that I have the right to withdraw from the research at any point. I also understand that my rights to anonymity and confidentiality will be respected.

I agree to having the interview/discussion recorded. (delete if not relevant)

Signature of participant   ……………………………………………………………………

Date   ……………………………………………………………………

This form will be produced in duplicate. One copy should be retained by the participant and researcher.

APPENDIX 3: SHAREHOLDERS PIS AND CONSENT

Energised Welsh communities: Exploring the development and social impacts of community energy in Wales

Shareholders

PARTICIPANT INFORMATION SHEET

Community Renewable Energy Case Studies

Introduction:

You are being invited to take part in a PhD study at Bangor University being completed by Sioned Page Williams who is looking at *how* community-led and owned projects in Wales develop, *what* happens in shaping their success and their social impacts. During the study four case studies will be explored with two in North Wales and two in South Wales representing different characteristics, so as to get a holistic picture of community energy developments in Wales. Also as part of the preliminary work, the study examines exemplars of wider support infrastructure and networks focused on Cyd Ynni.

Before you decide whether or not to participate, it is important for you to understand why the study is being done and what it will involve. Please take the time to read the following information and discuss it with relatives and/or friends if you wish.

What is the purpose of the study?

This study seeks to:

1. What are the *processes* involved in driving forward and engaging participation in Welsh community renewable energy context?

2. What are the resulting *outcomes* for local communities of being involved in community energy?

3. What are the interrelationship between *processes* and *outcomes* in community energy?

4. What is *'community'* and its application within *'community energy'*?

5. What are the interrelationships between policy infrastructure, in particular the Future Generations Wellbeing Act and applied practice in renewable community energy?

Why have I been chosen?

You have been asked to take part in the study because of your connection to {NAME HERE} either as a project lead, project team member or part of the community group.

Do I have to take part?

It is up to you to decide whether or not to take part. Your decision will not affect your relationship with {NAME HERE}. If you decide to take part you should contact the Sioned Page Williams at Bangor University by completing the consent form and returning it in the freepost envelope. Please remember to keep this information sheet.

What will happen if I decide to take part?

You are invited to take part in one **confidential** interview to talk about your experiences with {NAME HERE}. The study is also focused on gaining a wider understanding of how {NAME HERE} has developed and its impact. Sioned will come to see you at a mutually convenient time at an agreeable alternative venue. The interviews will take about 45 minutes.

There are no right or wrong answers and the interviews can be completed in Welsh or English. The interview may be recorded, with your consent, or alternatively, the interviewer will take some written notes.

Will my taking part in this study be kept confidential?

Yes. Your contact details will be stored on a confidential database. The information you share will be treated in confidence. However, since {NAME HERE} is a relatively small project and the field of renewable energy is a discrete and emerging area, it may be difficult to guarantee anonymity. You will not be identified in any reports or publications without your consent.

What will happen if I don't want to carry on with the study?

You are free to withdraw from the study at any time without giving a reason. If you decide to withdraw, your decision will not affect any relationship with {NAME HERE} or Bangor University.

What will happen to the results of the study?

The findings from this study will inform the development of {NAME HERE} and support for community renewable energy in North Wales.

Who is organising and funding the research?

The project is funded by the KESS 2 programme and managed by the School of Social Sciences at Bangor University.

What happens if I have any concerns about this project?

If you are concerned about any aspect of this project and would like to speak to someone please contact Dr Corinna Patterson the lead PhD supervisor. Her email address is c.patterson@bangor.ac.uk and her telephone number is 01248 382798

Contact for further information:

If you would like more information, please contact **Sioned Page Williams by telephone (01248 382961**) or by email (Sopaa0@bangor.ac.uk).

Next steps:

If you decide that you would like to take part, please complete and return the enclosed consent form to Bangor University in the freepost envelope provided. You do not need to use a stamp.

Thank you for kindly taking the time to read this information.

COLLEGE OF ARTS & HUMANITIES

Participant Consent Form

Shareholders

Study Title: Energised Welsh communities: Exploring the development and social impacts of community energy in Wales

Community Renewable Energy Case Studies

Researcher's name …Sioned Page Williams

…………………………………………………………………………..

The researcher named above has briefed me to my satisfaction on the research for which I have volunteered. I understand that I have the right to withdraw from the research at any point. I also understand that my rights to anonymity and confidentiality will be respected.

I agree to having the interview/discussion recorded. (delete if not relevant)

Signature of participant   …………………………………………………………………

Date   …………………………………………………………………

This form will be produced in duplicate. One copy should be retained by the participant and the researcher.

APPENDIX 4: COMMUNITY HUBS PIS AND CONSENT

School of School of History, Philosophy and Social Sciences

Energised Welsh communities: Exploring the development and social impacts of community energy in Wales

PARTICIPANT INFORMATION SHEET

Community Renewable Energy Case Studies

Local Community Hubs Interview

Introduction:

You are being invited to take part in a PhD study at Bangor University being completed by Sioned Page Williams who is looking at *how* community-led and owned projects develop in Wales, also *what* shapes their success and social impacts. During the study four case studies will be explored with two in North Wales and two in South Wales representing different characteristics, so as to get a better picture of community energy developments in Wales.

Before you decide whether or not to participate, it is important for you to understand why the study is being done and what it will involve. Please take the time to read the following information and discuss it with relatives and/or friends if you wish. The study has been approved by the College of Arts and Humanities Ethics Committee, Bangor University.

What is the purpose of the study?

This study seeks to find out:

1. What are the *processes* involved in driving forward and engaging participation in Welsh community renewable energy context?
2. What are the resulting *outcomes* for local communities of being involved in community energy?
3. What are the interrelationship between *processes* and *outcomes* in community energy?
4. What is *'community'* and its application within *'community energy'*?
5. What are the interrelationships between policy infrastructure, in particular the Future Generations Wellbeing Act and applied practice in renewable community energy?

Why have I been chosen?

You have been asked to take part in the study because you are part of a community organisation or group. This part of the study explores what community activities are in the area, how they are connected and in what way local community energy projects are linked to their communities. Your perspective and experiences will help to understand how the different organisations and groups work within your community and the role of community energy.

Do I have to take part?

It is up to you to decide whether or not to take part. If you decide to take part you should contact Sioned Page Williams at Bangor University by e-mail: Sopaa0@bangor.ac.uk to arrange a convenient date for an interview. Please complete the consent form which will be collected by Sioned Page Williams prior to the interview commencing. Please remember to keep this information sheet.

What will happen if I decide to take part?

You are invited to take part in a **confidential** interview to talk about your experiences. Sioned will either come to see you at a mutually convenient time at an agreed venue or arrange a conversation over the telephone. The interviews will take about 15-20 minutes.

There are no right or wrong answers and the interviews can be completed in Welsh or English. The interview may be recorded, with your consent, or alternatively, the interviewer will take some written notes.

Will my taking part in this study be kept confidential?

Yes. Your contact details will be stored on a **confidential** database. The information you share will be treated **in confidence**. Your organisation or group will only be described in general terms within the locality of specific community energy projects (such as a rugby club or primary school) but not named within the research work. Individual participants will be anonymised. However, as the community projects are relatively small projects within an area, it is possible that you may be identifiable, so it may be difficult to guarantee anonymity. Please me mindful of this as part of your involvement in the study. You **will not** be identified in any reports or publications without your consent.

What will happen if I don't want to carry on with the study?

You are free to withdraw from the study at any time without giving a reason. If you decide to withdraw at any stage, your data will not be used in the study.

What will happen to the results of the study?

The findings from this study will inform the development and support for community renewable energy in Wales. The information from the study will be used in a PhD thesis in Bangor University, reported in peer-reviewed journals, a final report for the funder (KESS) and in a summary report for participants.

Who is organising and funding the research?

The project is funded by the KESS 2 programme and managed by the School of Social Sciences at Bangor University.

What happens if I have any concerns about this project?

If you are concerned about any aspect of this project and would like to speak to someone please contact Dr Corinna Patterson the lead PhD supervisor. Her email address is c.patterson@bangor.ac.uk and her telephone number is 01248 382798

Contact for further information:

If you would like more information, please contact **Sioned Page Williams by telephone (01248 382961**) or by email (Sopaa0@bangor.ac.uk).

Next steps:

If you decide that you would like to take part, please contact Sioned Page Williams at Bangor University by e-mail: Sopaa0@bangor.ac.uk to arrange a convenient date for the focus group.

Thank you for kindly taking the time to read this information.

COLLEGE OF ARTS & HUMANITIES

Participant Consent Form

Study Title: Energised Welsh communities: Exploring the development and social impacts of community energy in Wales

Community Renewable Energy Case Studies

Local Community Interview

Researcher's name Sioned Page Williams

The researcher named above has briefed me to my satisfaction on the research for which I have volunteered. I understand that I have the right to withdraw from the research at any point. I also understand that my rights to anonymity and confidentiality will be respected. The information from the study will be used in a PhD thesis in Bangor University, reported in peer-reviewed journals, a final report for the funder (KESS) and in a summary report for participants.

I agree to having the interview/discussion recorded. (delete if not relevant)

Signature of participant   ………………………………………………………………

Date   …………………………………………………………………

This form will be produced in duplicate. One copy should be retained by the participant and the other by the researcher.

494

APPENDIX 5: STAKEHOLDERS INTERVIEW GUIDE

Energised Welsh communities

'Cyd Ynni' Stakeholder Interviews

Semi-structured Interview Guide

Background

Aims of the study

Reaffirm consent on tape

Structure of the interview

1. Exploring how the projects were set up and the role of Cyd Ynni
2. Why did you become involved with Cyd Ynni
3. Examining what the projects were hoping to achieve
4. Identifying the outcomes to date

---

1. **Exploring *how* the projects were set up and the role of Cyd Ynni**
- **To start with could you tell me a little about how the project was set up?**

Probe

How long have you lived in the area?

What would you describe as your occupation?
How long have you been involved in community energy?

- **How would you describe the role of Cyd Ynni as part of the process?**

Probe

How was Cyd Ynni involved?

What would you say the main contribution of Cyd Ynni was in the process?

Who was involved from Cyd Ynni?

What was the impact of Cyd Ynni's involvement?

2. Why did you become involved with Cyd Ynni

- **To start with could you tell me why you became involved with Cyd Ynni?**
Probe

How did you become involved with Cyd Ynni?

What were the benefits of getting involved with Cyd Ynni?
How long have you been involved with Cyd Ynni?

3. Examining what the projects were hoping to achieve

- **How would you describe the main aims of the project at the outset?**
Probe

How were they developed?

Did Cyd Ynni provide guidance/advice?

Did the aims change during the development process? If so how?

4. Identifying the outcomes to date

- **How would you describe the outcomes to date from the project?**
Probe

What have been important factors in moving forward or holding back the projects?

What would you say are the priorities for the future?

How will these be taken forward and who?

Any other comments   **Thank you**

Version 1 2018

Energised Welsh communities

Stakeholder Interviews

Semi-structured Interview Guide

Background

Aims of the study
Reaffirm consent on tape
Structure of the interview
1. **Tell me about you**
2. **Looking at the idea of community, place and community energy**
3. **The project – how it was set up and how it works**
4. **Impacts and looking back**
5. **Looking at the role of policy**

1: Tell me about you

- **To start with could you tell me a little about you?**
Probe
    How long have you lived in the area?
    What would you describe as your occupation?
    How long have you been involved in community energy?

2: Looking at the idea of community, place and community energy

- **How would you describe your community?**
Probe
Why?
What would you say the word 'community' means to you?

- **Could you tell me what comes to mind when you think about this area?**

Probe
Is the people and the place?
Has it has changed over time?

- **Would you say the history of this area (Insert local context of slate/coal/ other) has relevance today?**

Probe
What?
Why?
How links to community energy today?

- **What does 'community energy' mean to you?**

Probe
What would you say is different about community energy?
Is having a say in the project important or is it local impacts?

3. The project- how it was set up and how it works

- **If the community energy project wasn't in {place here} would you still have become involved?**

Probe
Why?
Was it because it had impact on your local community? Or other reasons?

- **What motivated you to get involved?**

Probe
What was the most important reason for getting involved?
Did you discuss getting involved with anyone to make up your mind?

- **How did your involvement with the project come about?**

Probe
When did you get involved?
How did you hear about the project?
Did you talk to someone specifically, was it online or a video or newspaper?

- **What for you stands out as the <u>aims of the project</u>?**

- **What do you think were the reasons for choosing the model for the project {insert here model type e.g Community Benefit Society}?**

Probe
How are the benefits shared using this model?
Any problems you've experienced with this model?

- **Who was responsible for setting-up the project?**

Probe
How was this decided?
Do you have a role(s) or responsibilities in the project?

- **Who would you say are the active members in the project?**

Probe
Why?

- **Did you know the people involved in the project before?**

Probe
How?

- **Were there any obstacles when the project was set up?**

Probe
If any how were these overcome

- **How do you keep in touch with what's going on with the project?**

Probe
Do you have regular meetings?
Is there information given to people taking part - a newsletter or Facebook page?

4: What are the local impacts from the project

- **Do you think the aims of the project have been achieved?**

Probe
What are the local benefits?

- **What impacts came out of the project for you?**

Probe
Did you develop new skills or knowledge?

500

Was there a sense of trust with others in the project?
How are these distributed?
Were the effects financial or social or other?

- **What impacts came out of the project for the wider community?**

Probe
How are these distributed?
Were the effects financial or social or other?

- **Do you think you have met different people because of the project?**

Probe
Has the project has brought people together?

- **Thinking about the project from the beginning to now, what is the most important change?**

Probe
Was any change linked to the way the project was developed?
Was any change linked to working together or a shared vision?

- **Did you connect with any other community groups?**

Probe
Did they provide any information/guidance?

- **Did you connect with other agencies or organisations or companies at any time?**

Probe
Was this helpful?

- **Have you changed the way you think about energy in everyday life after being involved in the project?**

Probe
What have you done?
Why was that?

5: Looking at the role of policy

- **Do you think Welsh Government policy is important in developing projects like yours and community energy?**

Probe
Why?
Role of WAG- type of support?
How can it be improved?

- **Do you think UK government policy is important in developing projects like yours and community energy in general?**

Probe
Why?
How can it be improved?

- **Have you heard of the Future Generations Wellbeing Act?**

Probe
Has this had an effect on what you do?

Any other comments   **Thank you**

APPENDIX 6: SHAREHOLDERS INTERVIEW GUIDE

Version 1 2018

Energised Welsh communities

Semi-structured Topic Guide

Shareholders

Background

Aims of the study
Reaffirm consent on tape
Structure of the interview

1. **Process - How did you get involved in the project and how was it set up initially?**

2. **Outcomes - What do you think are the key impacts from the project now, and in the future?**

3. **Any other comments**

1. **Process:**

How did you get involved in the project and how was it set it up initially?

Probe:

- **How did you hear about the project?**
Probe
Did you talk to someone specifically, was it online or a video or newspaper?

- **What motivated you to get involved?**
Probe
What was the most important reason for getting involved?
Was it because it had impact on your local community? Or other reasons?
If the project wasn't in {place here} would you still have become involved?

- **How do you keep in touch with what's going on with the project?**

Probe
Do you have regular meetings?
Is there information given to people taking part - a newsletter or Facebook page?

2. Outcomes:

What do you think are the key impacts from the project now, and in the future? Write down relevant words that for you focus on impacts and put down on 'posts-its' s under the following headings:

Economic

- **Do you think the economic aims of the project have been achieved?**
Probe
Was there an option of an income stream being kept in the community or locally?

Social

- **Can you think of any social impacts that came out of the project?**
Probe
What about any new skills or knowledge?
Has the project has brought people together?
What social impacts came out of the project for the wider community?

Culture and Heritage

Is the history of the industrial past (slate or coal) important in the area?
Probe
Is it important that local people benefit from local resources?
How does this link to community energy today?
Is doing community activities bilingually important?

Environmental

- **Were there any benefits from an environmental point of view?**

Probe
Have you changed the way you think about energy in everyday life after being involved in the project?
Was renewable energy or climate change important to you?

Any other comments Thank you

APPENDIX 7: COMMUNITY HUBS INTERVIEW GUIDE

Semi Structured Interview Guide

Community Renewable Energy project: Representatives of 'Community Hubs'

Reaffirm consent

Introduction

- The interview focuses on your perspective about a local community energy project {name} and explores issues around your community, its *activities*, any *awareness* around the project and its aims, any *involvement* with the project and what you think may be the possible *benefits or impacts* may be from the project.
- There are also some background questions, including about what community means to you.
- It should only take about 20-30 minutes to complete
- The topic areas that will be covered will be:
  - Background questions
  - Mapping community activities and organisations
  - Knowing about the project
  - Anticipated benefits
  - Local area and community

1. **Background Questions**

I have a few background questions:

- How long have you been involved with {organisation/group name}?
- What would you say are main aims behind (organization/group name)?

2. Local area and community

I have a few questions about your views on the local area: and what community means to you:

- **When you think about the local area what is important to you?**
Probe

  - Is the industrial history important?
  - Is it the people or place that's important?

- **Could you tell me what the word community means to you?**

3. Mapping Community activities and organisations

I have a few questions about what's happening as community activities and organisations:

- **Are there many community organsations and activities within this area?**

Probes:

  - How do they link in with the local community and with whom?
  - Have these been well established or are they new?
  - Are these activities or organisations connected in any way?

- **Do you think these activities or organisations have an influence or impact on the local community?**
Probes:

  - How?
  - Is this a positive or negative impact/influence?
  - Why?

4. **Knowing about the Project**

I have a few questions about what you know about the {name} project:

- **Have you heard of about the {name} project?**
- **How did you find out about the {name} project?**

Probes:

- When was this? (early in its development or later?)
- Was this through a public meeting about the {name} project? When?
- Was is through word of mouth or leaflets or Facebook and social media?
- How could awareness be improved in the future do you think?

- **Have you or the {organisation name} had contact with or been involved with the {name} project?**

Probes:

- Why?
- How did this come about?
- Has this continued?
- How could involvement be improved in the future?
- What are the potential benefits or opportunities for greater connection?

- **Have you shared any resources or information?**

Probes:

- If so why and what?

5. **Anticipated benefits**

I have a few questions about the possible benefits from {name} {or community energy more widely if not heard of the scheme}:

- **What do you think are the possible benefits?**

Probes:

- What do you think these may be for you in the organisation or group?

- What do you think these may be for particular groups within the local community?

- **What type of benefits would you like to see for the wider community in the future?**

Probes:

- Financial, environmental or social priorities?

Any Other comments   Thank you

APPENDIX 8: PARTICIPANT LOG AND NUMERICAL CODING

Key stakeholder Participants	
Community renewable energy (CRE) projects and Consortium	**Numerical coding**
Energy local	ELKS1
Ynni Ogwen	YOKS1
	YOSK2
	YOKS3
	YOKS4
	YOKS5
Ynni Padarn Peris	YPPKS1
	YPPKS2
	YPPKS3
	YPPKS4
	YPPKS4
	YPPKS5
	YPPKS6
Awel co-op	ACKS1
	ACKS2
	ACKS3
	ACKS4
Gower regeneration	GRKS1
	GRKS2
	GRK3
	GRK4
	GRK5
Cyd Ynni	CYKS1
	CYKS2
	CYKS3
	CYSK4

Shareholder Participants	
Community renewable energy (CRE) project	**Numerical coding**
Ynni Ogwen	YOS1
	YOS2
	YOS3
	YOS4
	YOS5
Ynni Padarn Peris	YPPS1
	YPPS2
	YPPS3
Awel Co-op	ACS1
	ACS2
	ACS3
	ACS4
	ACS5

Community Hubs Participants	
Community renewable energy (CRE) project	**Numerical coding**
Ynni Ogwen	YOCH1
	YOCH2
	YOCH3
	YOCH4
Ynni Padarn Peris	YPPCH1
	YPPCH2
	YPPCH3
	YPPCH4
	YPPCH5
	YPPCH6
	YPPCH7
Awel Co-op	ACCH1
	ACCH2
	ACCH3
	ACCH4
Gower Regeneration	GRCH1
	GRCH2
	GRCH3
	GRCH4