Towards a methodology for the assessment of the social impacts of community-owned renewable energy projects: A wind of change for Shapinsay?

Author: Esther Christina van der Waal

Master's thesis for European and Environmental Spatial Planning (ESEP)

Nijmegen School of Management

Radboud University Nijmegen

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Author: Esther Christina van der Waal

Student number: 4153200

Primary supervisor: Dr. Mark Wiering

Secondary supervisors: Dr. Emily Creamer & Anna Harnmeijer M.Sc.

Internship organisation: Sustainable Community Energy Network (SCENE) consulting

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The rising hills, the slopes,

of statistics

lie before us.

The steep climb

of everything, going up,

up, as we all go down.

In the next century

or the one beyond that,

they say,

are valley, pastures,

we can meet there in peace

if we make it.

To climb these coming crests

one word to you, to

you and your children:

stay together

learn the flowers

go light

- For the Children, Gary Snyder

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List of abbreviations

CARES	Community and Renewable Energy Scheme
CORE	Community-owned Renewable Energy
CES	Community Energy Scotland
CPO	Community Power Orkney
DECC	Department of Energy and Climate Change
EU	European Union
FiT	Feed-in-Tariff
HIE	Highlands and Islands Enterprise
ICCR	International Centre for Critical Realism
MW	Megawatt
OREF	Orkney Renewable Energy Forum
RE	Renewable energy
REIF	Renewable Energy Investment Fund
RO	Renewable Obligations
ROC	Renewable Obligation Certificate
SDT	Shapinsay Development Trust
SIA	Social Impact Assessment
SRL	Shapinsay Renewables ltd.
SWAP	Shapinsay's Way Ahead Programme
UK	United Kingdom

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Abstract

Based on an in-depth literature and case study, this research develops a methodology to assess the social impacts of community-owned renewable energy (CORE) projects. As community members' perspective on outcomes was found missing in social impact assessment of CORE, the methodology is designed to give an overview of the outcomes that community members experience in their day-to-day lives. The research assess the impacts of the 900 kW CORE wind project on the community on the Scottish island Shapinsay to inform the design of a threefold methodology. The case study is aided by insights from Social Impact Assessment literature and the structuring mechanism of impact pathway analysis. Data were collected by a literature review, interviews, an exploratory survey and focus groups. Data collection and analysis were guided by Vogel's approach to impact pathway analysis. By creating an initial version of a social impact assessment methodology for CORE projects, the research contributes to narrowing the gap between the broadly recognised assumptions and the small evidence base on the social impacts of CORE.

Dit onderzoek ontwikkelt op basis van een diepgaande literatuurstudie en een casus een methodologie om de sociale invloed van gemeenschapsenergieprojecten te evalueren. Aangezien uit de literatuurstudie bleek dat het perspectief van de leden van de gemeenschap ontbrak, is er een methodologie ontworpen die een overzicht kan geven van de uitkomsten die de leden van de gemeenschap in hun dagelijks leven ervaren. Het onderzoek beoordeelt de impact van de 900 kW gemeenschapsturbine op de gemeenschap op het Schotse eiland Shapinsay om een driedelige methodologie te ontwikkelen. Het casusonderzoek wordt ondersteund door inzichten uit de Social Impact Assessment literatuur en gebruikt impact pathway analysis als structurerend mechanisme. Data zijn verzameld door middel van literatuur review, interviews, een verkennend survey en focus groepen. Dataverzameling en –analyse werden geleid door Vogel's benadering van impact pathway analysis. Door het ontwikkelen van een eerste versie van een sociale invloedsanalyse voor gemeenschapsenergieprojecten draagt dit onderzoek bij aan het verkleinen van het gat tussen de breed erkende aannames en het beperkte bewijs op het gebied van de sociale invloed van gemeenschapsenergie.

Chapter 1. Introduction

to assess the social impacts of community RE projects

Recently, the future development of the community energy sector got threatened with Scottish government support mechanisms for renewable energy being announced to change. Besides a loss of income for renewable energy generators, much more seems to be at stake. Member of the Scottish Parliament Rob Gibson stressed during his recent visit to Community Energy Scotland that community energy projects have been very successful as mechanism for community regeneration and social change (CES, 2015):

"Community empowerment needs community energy to be vibrant, because social benefits are essential for all our communities to thrive in the longer term"

This research will look into these social outcomes of community-owned renewable energy projects and designs a methodology to assess them. The first chapter of the dissertation starts with an introduction of the central problem that is addressed in this research, the research aim and question, its academic and societal relevance, and an overview of the further structure of the dissertation.

1.1 Research problem statement

Starting from a few scattered pioneers in the 1990's and early 2000's, Scotland's community-owned renewable energy (CORE) sector is booming with a growth rate of almost 30% a year (Slee & Harnmeijer, in press). The sector spans a broad range of technologies with projects ranging in scale from small installations in village halls to co-ownership of multi turbine wind farms. Currently, CORE represents just under 4% of Scotland's onshore renewable energy production (ibid.), corresponding in 2013 to 360 projects and generating roughly 30 MW of installed capacity (Haggett et al., 2013).

This rapid CORE development cannot be seen in isolation from Scotland's favourable policy and funding climate of the recent years (Slee & Harnmeijer, in press). The introduction of the 2002 UK Renewables Obligation, introducing the Renewables Obligation Certificates (ROCs), and later on also the 2010 Feed-in-Tariffs (FiTs) opened a window of opportunity by making renewable energy generation a financially rewarding undertaking. The Scottish Government saw the availability of these subsidy schemes as a chance to expand its community empowerment agenda to renewable energy and encourage communities to take up CORE projects to create a significant capital injection in their local economy by generating an independent income stream (ibid.). To lower the barriers for

communities to develop a CORE project, the Scottish Government has gradually expanded its support for CORE, financing project development advice as well as financial support mechanisms, such as the flagship Community and Renewable Energy Scheme (CARES) and the Renewable Energy Investment Fund (REIF).

Thus, as well as contributing to Scotland's drive to replace fossil fuels and cut carbon emissions, renewable energy technologies are assumed to have a potential to play 'a vital role in strengthening communities' by building local 'capacity' and giving communities 'financial autonomy' to prioritise and address their own needs (HIE, 2015a, p.3). Especially for many relatively undiversified rural economies, participation in CORE is expected to simultaneously strengthen social and economic capital of a community (Slee & Harnmeijer, in press).

All this recent attention for CORE in Scotland evokes the question, what is 'distinctive [and more beneficial] about community renewable energy projects' compared to commercial renewable energy developments? (Walker & Devine-Wright, 2008, p.497). Current conceptualisations of CORE focus on differences in the process and outcome dimensions of CORE projects. Analysis of the heavily cited work of Walker and Devine-Wright (2013, p.978) and Seyfang et al (2008, p.497) suggests that the community element creates a potential for an 'open and participatory' process including local 'ownership and control', enabling CORE projects to deliver more 'local' and 'collective' benefits than their commercial equivalents . Thus, more and greater benefits for the people in the direct vicinity of a renewable energy project are attributed to CORE's distinctive social arrangements and practices.

Economic impact studies prove that CORE is much more profitable for a local economy than a comparable commercial equivalent (Allan et al., 2008; Slee, 2015). In concrete terms, a commercial windfarm would bring in a community benefit fund[1] of around £3000-4000,-/MW to compensate the local community and about £10.000,-/MW rent for the landowner, whereas a community scheme can generate over £100.000-150.000,-/MW per annum (Slee & Harnmeijer, in press, p.16). This already huge disparity gets even bigger when taking into account that co-ownership keeps more money in the local economy, while external ownership results in a high share of the revenues leaking away (ibid.).

However, whilst measuring the growth in turnover can serve as a 'crude proxy' for social outcomes, it cannot demonstrate the 'nature' of the social impact (HIE, 2015b, p.2). According to Vanclay et al. the social impact of a project consists of all issues related to a planned intervention that 'affect or concern people, whether directly or indirectly' (2015, p.2).

[1] In the UK wind developers are by law required to make a community benefit payment to the community near their project to share the benefit with the local community and internalise some of the negative externalities.

Many Scottish CORE organisations are social enterprises (Local government group, 2011; Energy Archipelago, 2015). Just like other social enterprises, CORE organisations have a social purpose at heart and reinvest their profits in their communities to deliver that purpose (HIE, 2015b). Such local reinvestment of revenues can take place in broad range of areas including health and social care, local regeneration, culture and heritage, local services and amenities, poverty mitigation, social inclusion, sport and recreation, and renewable energy and recycling (ibid.). As community needs, and thus investment areas, differ, also social outcomes are likely to vary considerably among CORE projects. Hence, by generating a significant income that gets reinvested in social purposes, the impact of CORE should extend much further into the community than effects on its direct participants and socio-economic effects only (Van der Horst et al., 2008; Walton, 2012; Walker et al., 2013; NEF, 2012). However, holistic assessment that goes beyond economic effects, such as employment and diverse other income generation effects, is missing.

The community energy literature is generally positive about the potential social outcomes of CORE for the wider community, suggesting that involved communities tend to be, amongst others, more empowered, cohesive, skilled, and resilient than before (Walton, 2012; Hicks & Ison, 2015; Gubbins, 2010; Slee, 2015; NEF, 2012; Seyfang et al., 2013). Nevertheless, CORE should not be taken as an instant recipe for success as negative outcomes are sporadically reported as well. CORE has been found to be 'locally divisive and controversial' (Walker & Devine-Wright, 2008, p. 499), and, although the community element has been reported to ease opposition and create support, for some community members, CORE wind projects remain a disturbance of the beauty of the landscape (Warren & McFayden, 2010).

However, despite the positive outcomes of CORE on their communities being widely lauded, in few cases are such assertions more than a presumed causal relationship based on the hypothesis that particular activities or investments of CORE groups have certain effects on the community. For instance, investment in transport services or financial support for community groups is readily connected with outcomes such as accessibility and social cohesion. Yet, hardly ever social impacts are systematically evaluated at the level of the people who are supposed to experience them: the community members. Thus, although some evidence and indications are present, more solid proof is needed.

According to Walker et al. more systematic and larger scale evidence of social impact needs to be constructed, as it is unlikely that current government support will continue just taking the acclaimed social outcomes of CORE as an 'article of faith' (2007, p.78). Therefore, the need for 'more holistic evaluative frames' has been stressed (ibid.). There is a need to prove whether or not 'small-scale,

localised energy projects can add up to more than the sum of the small parts of renewable energy generation and carbon reduction' (ibid.).

At present, evaluations that establish which social outcomes are being achieved and under what conditions are lacking (Walton, 2012). Existing evaluations of the social impact of CORE are very sparse and the ones that have been carried out are confined to assessment of the socio-economic dimension (e.g. Allan, 2012; Allan et al., 2008; Entwistle, 2014; Okkonen & Lehtonen, 2015) or focus on assessment of one or a few specific social outcomes (e.g. Walker et al., 2010; Musall & Kuik, 2011).

However, it is not surprising that systematic and comprehensive assessment of the more subtle and qualitative aspects of the social dimension is still in its infancy. To create the desired 'sensitive and in-depth' type of assessment, extended project-scale evaluation is required (Walker et al., 2007, p.78). Besides being an onerous task, there are several hurdles to overcome before such an assessment can be done. The boundaries of 'the social' are unclear and should be defined (Chadwick, 2002). Also influence of external conditions should be taken into account as social impacts can hardly ever be attributed to one project alone (Ilsekog, 2008). Furthermore, impact pathways are rarely single cause-effect relationships (ibid.). Besides, there is little conceptual clarity on definitions of the outcomes that are widely recognised within the CORE literature. Finally, there are few examples of holistic social impact assessment in other fields, as impact assessment has always had strong links to policy making and had to satisfy budgetary timescales and show tangible outcomes (Walker et al., 2007).

This research comes in at the gap between the assumptions and the evidence of social outcomes of CORE. First, it contributes to the evidence base on the social outcomes of CORE by a case study of the social outcomes of the wholly community-owned 900 kW wind turbine that is since 2011 operated by the Shapinsay Development Trust (SDT) and its trading subsidiary Shapinsay Renewables ltd. The organisation is highly committed to maximising the positive outcomes of the turbine's revenues for all residents of Shapinsay and is running several services such as an Out-of-Hours ferry and a community bus. Members CORE group and the wider community have enabled a better understanding of social outcomes of the turbine project on their community by participating in interviews, an exploratory survey and focus groups.

Second, based on literature review and the case study material, the methodological gap in social impact assessment is addressed through the development of a methodology for evaluating CORE projects that takes into account residents' perspectives and recognises the complex nature of social reality.

The following sections will outline the research aim and questions, its relevance for academia and society, and the further structure of the dissertation.

1.2 Research aim and research question

As described in the research problem statement this research has two principal aims: to identify the key social outcomes of the wind energy project owned by the community of Shapinsay, and to develop a methodological framework to assess the social impact of CORE in a comprehensive way that is sensitive to complex aspects of social reality, such as multi cause-effect relationships, feedback loops, and the interaction between project and context.

The main research question is:

How can we develop a theory-based monitoring and evaluation framework for assessing the social impacts of CORE projects on community level that can capture the complexity of local social dynamics and alternative causal pathways based on a case study of the turbine project on the island of Shapinsay?

The following sub-questions are used to answer the main question:

1. What is the context for a new type of social impact assessment of CORE?
    a. What is CORE?
    b. What are the assumptions about outcomes of a community-led approach to RE?
    c. Why is there currently so much policy attention for community energy in Scotland?
    d. Which social outcomes of CORE have been identified in the CORE literature?
    e. What are the limitations of the existing ways of social impact assessment for getting an in-depth insight in the social impacts of CORE projects
    f. What are the challenges of doing in-depth social impact assessment?
2. How can insights from Social Impact Assessment literature help to assess the social outcomes of CORE?
3. How can impact pathway analysis help to structure the processes that are part of the complex social reality a CORE project is shaping and shaped by?
4. What are the key social outcomes of Shapinay's CORE wind project for its community and which processes contribute to these outcomes?
5. How could the social impacts of community renewables projects be assessed in a systematic way while recognising the complexity of the social reality?

1.3 Scientific and societal relevance

This section explains the academic and societal value that increasing the evidence of the social outcomes of CORE, and developing a methodology to assess these systematically during further research, have for academia and wider society.

Societal relevance:

First, an evaluative framework of the social impacts of community energy projects is arguably most valuable to those involved in CORE projects. Insight into the impacts of the project could contribute to keeping up commitment amongst participants in the longer-term. Besides, community groups can use the information from the assessment to optimise the impacts of existing and future projects.

Second, if developed further and systematically applied on a large sample of CORE projects, an evaluative framework can be valuable to find patterns between projects' approaches and their impacts on the community (NEF, 2012). Such information could be used to maximise social impacts in existing and future projects.

Third, insight into the social impacts of CORE projects can help demonstrate whether there is an 'accumulative, larger-scale and longer-term significance' of government support for CORE projects (Walker et al., 2007, p.78). It has been argued that future government support for CORE will rest substantially on how the '"big scene" of contested energy politics' plays out over the next couple of years, but will also depend on how current government support initiatives are evaluated (ibid.). A key question is whether or not the outcomes of CORE can add up to more than the 'sum of the small parts of renewable energy generation and carbon reduction' (ibid.) Therefore, insight into the outcomes of CORE can be used to inform the policy and funding environment for community-owned renewables.

Finally, in the growing field of social investment, measurement of social impacts makes community renewables more attractive to investors that are looking for social return on investment besides financial return (Walton, 2012). If evidence of social benefits of CORE is found, this can make social investors more willing to lend to CORE groups.

Scientific relevance:

As of yet the role that such CORE projects might play in the 'general fabric of civic life' is not well understood (Hoffman & High-Pippert, 2005, p.387). With claims on social impacts jumping from undertakings of CORE groups to conclusions about outcomes, evidence of the social impact of CORE as experienced by involved communities themselves is missing. There is a need to bring the

perspective of the very people that are reported to reap the benefits from CORE better into the picture in the CORE literature.

Furthermore, there is very little formal measurement of an overall social impact of CORE projects. Tools to systematically construct an evidence base on the impacts are lacking, because of the methodological challenges (Chadwick, 2002; Ilsekog, 2008), and the novelty of the need to have evidence of social impacts in the only recently government subsidised field of CORE. This research can contribute methodologically by furthering the understanding of how social impact can be demonstrated.

1.4 Structure of the dissertation

This research project is structured in the following way:

Chapter 2 presents a review of community energy literature and previous social impact assessment of CORE, and identifies the gap in existing knowledge and methodologies that this research helps to narrow. Furthermore, it introduces Social Impact Assessment (SIA) and impact pathway analysis as the theoretical foundation of the research.

Chapter 3 is the methodological chapter. It explains why a case study design is most useful to develop a social impact assessment methodology for CORE projects, outlines the case study selection criteria, and further introduces Shapinsay's 900 kW community wind project as case study. It also addresses how validity, reliability and ethics are taken into account in this research.

Chapter 4 explores both the current context of the project and the historical context in which the project has developed, examining how these factors influence the social outcomes that are experienced by Shapinsay's residents.

Chapter 5 presents the social impact assessment that was carried out. It presents the findings of the case study and explains how the fieldwork data were used to identify the project's key social impacts. The chapter operationalises the identified key outcomes on the basis of these findings to generate practical working definitions to assess them. Furthermore, in this chapter, the findings are also used to identify key inputs, activities and external factors that have an important effect on the observed social outcomes. These should be monitored as well to be able to build evidence on how practices and externalities determine outcomes.

Chapter 6 builds on these findings and uses them to design a new impact assessment methodology. The chapter explains how the extensive logic model with impact pathways in chapter 5 is used to

structure the designed social impact assessment methodology. The methodology itself is included as appendix 1.

Chapter 7 concludes the research with a critical discussion of the iterative processes of developing a CORE social impact assessment methodology. It answers the research questions and reflects on the findings. As a single research project is never a final answer or all solving, the final section of this research identifies starting points for future research based on questions that this research could not answer and further questions that arose during the research.

Chapter 2. Literature review and theoretical embedding

to assess the social impacts of community RE projects

The first section of this chapter presents a review of the relevant previous work to further introduce the concept CORE projects and discuss the concept of community. Subsequently, it describes how Scottish community energy has experienced its current upswing supported by a favourable policy and funding climate. Afterwards, it gives an overview of the social impacts of CORE as reported in the community energy literature, and the way in which they are currently assessed. Finally, from this review, the need for another, more comprehensive and more people oriented kind of social impact assessment is identified.

The second section of the chapter consists of an introduction to the theoretical approach taken in this research and outlines the theoretical assumptions underlying SIA. Impact pathway analysis is introduced as framework to break down complex social processes and structure them. This framework and the systems thinking behind it are used as a lens to get a clearer overview of the causal pathways from the inputs and activities of CORE groups to the outcomes they create for the community.

2.1 Literature review

This literature review introduces the concept of CORE, the underlying assumptions of the community energy discourse, the Scottish policy context for CORE, an overview of the social impacts that are reported in the community energy literature, the way they are currently assessed, and finally the need for another type of social impact assessment.

2.1.1. Defining CORE

As this research develops a methodology to assess the social impacts of CORE projects, an exploration of the very concept of community energy is made to start off with. So what is community energy? Academia nor policy making has a clear definition of the multi-faced concept community energy. It has been proven difficult come to a clear delineation of the field (Walker & Devine-Wright, 2008), because 'one of the most notable features [of the sector] is the diversity of forms associated with the term', encompassing 'different technologies and scales of deployment in a range of ownership structures and policy contexts, involving many actors and their various motivations' (Hicks & Ison, 2015, p.2). CORE projects range from off-grid micro-renewables on remote Scottish islands, to wind guilds in Denmark, to bio-energy villages in Germany, to small-scale behind the meter solar in Australia, and are also starting to be taken up by communities outside the Western world (ibid.; Block, 2011).

In connection to this observation, Hicks and Ison state that a 'singular definition is unlikely to be possible or even useful'. However, particularly since funding and other support is involved, failing to set boundaries right also poses a risk, as a too narrow definition can constrain the CORE sector's adaptability to 'develop in contextually appropriate ways, sensitive to the needs and desires of local communities', whereas a too broad one 'leaves openings for charlatans to take advantage of the community brand, when in reality the community element might be little reflected' (2015, p.1)

The two descriptions that are most often cited in the contemporary community energy literature, and offer some conceptual guidance, are those of Walker and Devine-Wright (2008) and Seyfang et al. (2013). Both influential works do not set clear boundaries, but aim to progress the understanding of the distinctive "community" element of community energy.

Walker and Devine-Wright suggest that it is the 'processes' and 'outcomes' that differentiate community projects from commercial projects (2008, p.497). Accordingly, the uniqueness of the sector would not be defined by the technology, but by the particular 'social arrangements through which a given technology, irrespective of its scale or cost, is being implemented and made useful' (ibid., p.498). Process refers to 'who a project is developed and run by, who is involved and has influence' (ibid.). Outcome is concerned with 'how the outcomes of a project are spatially and socially distributed – in other words, who the project is for; who it is that benefits particularly in economic or social terms' (ibid.). They indicate that proper community projects are the projects that are 'open and participatory' on the process dimension and 'local and collective' on the outcomes dimension (ibid.). Figure 2.1 displays three viewpoints on community energy resulting from different positions of projects along the process and outcome axes (ibid.). Walker and Devine-Wright found that some see a project as community energy if local residents participate (A), some when the benefits are distributed locally, and some are not really concerned with a precise definition as long as a project is somewhere in the circle of C (ibid.).

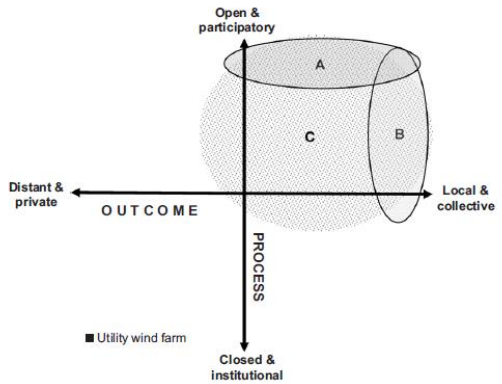

Figure 2.1 Understanding CORE in relation to process and outcomes dimension (Walker & Devine-Wright, 2008, p.498).

Seyfang et al. also offer some grip on the slippery concept. Following Walker and Devine-Wright's lead, they also point at the process and outcome dimensions of community energy, defining the sector to include projects 'where communities (of place or interest) exhibit a high degree of ownership and control, [and are] benefiting collectively from the outcomes' (2013, p.978).

Thus, analysis of the definitions of Walker and Devine-Wright and Seyfang et al. suggests that the community element creates a potential for an 'open and participatory' process including local 'ownership and control', enabling CORE projects to deliver more 'local' and 'collective' benefits than their commercial equivalents (ibid.; 2008, p.497).

It is noteworthy that the two definitions of community energy include both supply-side projects, such as, a community wind turbine, and demand-side management projects, such as, community insulation schemes. This research focusses on a smaller subset of projects within the community energy sector and solely addresses community groups that are generating energy. Therefore, in line with Hicks and Ison it uses the term community-owned renewable energy and its acronym CORE, stressing both the 'technological side' and the 'ownership element' of the endeavour (2015, p.6). As this research designs a methodology to assess the effects of efforts of local actors on the community they are part of, it limits its scope to projects in 'geographically defined communities, […] which are wholly or partially owned by a community organisation' (Gubbins, 2010, p.3). This definition differentiates 'communities of place, geographically bounded communities, from 'communities of interest', being communities with a similar type of interests in a development, sometimes including local people but often not (Entwistle, 2014, p.6). Consequently, cooperatives, being primarily communities of interest, are outside the scope of this research. So returning to the process and outcomes dimension as operationalised by Walker and Devine-Wright (2008), the projects that are the focus of this research are the type B projects in figure 2.1.

2.1.2. Underlying assumptions of the community aspect of CORE

The term community energy embodies 'implications and assumptions about the nature and quality of relationships between people and organisations' that are part of the community (Walker et al., 2010, p.2655). Especially within the contemporary discursive politics of governance, the community label is 'much used' and 'readily attached' to projects and policies to give them a warm glow and increase public support (ibid., p.2657).

Also within academia such positive assumptions are part and parcel of the community energy discourse. The widely cited work of Walker and Devine-Wright (2013, p.978) and Seyfang et al. (2008,

p.497) shows an indisputably coloured view on community energy by classifying CORE as ‘open and participatory’ processes that bring ‘ownership’ and ‘control’ and lead to more ‘local and collective’ ‘benefits’ .

Walker et al recognise that such narratives and claims ‘are clearly predicated on the basis that communities can and do exist, in an unproblematic form and within many of the positive qualities with which they are readily associated’ (Walker et al., 2010, p.2657.). However, during their research the authors found that ‘communities’ were not always experienced as places where people are ‘willing to support and work for the common welfare and good’, and where ‘people live together in harmony with different cultures and interests’ (ibid.). More sceptical views on community showed that people felt that communities either ‘are not really existing’, or were not as inclusive as they might seem. Whilst appearing inclusive, a community was also found to be potentially ’deeply exclusionary’ and ’marginalising those who are seen as not fitting’ (ibid, p.2657).

Therefore, community energy researchers should ask themselves who the community is, how inclusive it is, how it is involved in a community energy project, and how it benefits (Adams & Berry, 2008, p.3).

Furthermore, while addressing communities of place it is important not to assume that communities and places necessarily coincide (Craig, 2007, p.337). There can be ‘multiple overlapping communities in a place and extended and constructed communities of interest that transcend physical delineations’ (Walker et al., 2010, p.2657).

Given these observations, it is important that a researcher critically asks him- or herself what the community of place is and where its boundaries are. A good starting point for researchers doing impact assessment on geographically defined communities could be to investigate what the CORE project sees as its target area and group.

Finally, it is important to recognise that a community is ever-changing, rather than cast in stone. As Walker et al. state, ‘communities can be transient and dynamic and fracture as events unfold and relationships evolve’ (2010, p.2658). For this reason, it might be valuable to repeat social impact assessment regularly to get insight in how impacts of a CORE project evolve over time.

2.1.3 CORE development in the Scottish policy context

The rapid development of Scotland’s CORE sector cannot be seen in isolation from the current favourable policy and funding climate (Slee & Harnmeijer, in press), which has enabled CORE to make

an upswing at the intersection of two policy fields: UK and Scottish energy policy addressing climate change and the Scottish community empowerment agenda.

On the one hand, from the early 2010s, the UK's renewables policy provided a potential for high rates of return on renewables investments through the Renewable Obligation Certificates, and subsequently also the through the Feed-in-Tariff mechanism (ibid.). These subsidies for renewable energy generation are put in place to help the UK progress towards the EU climate target of provision of 15% of domestic energy demand from renewable sources by 2020[2] (DECC, 2009). They highly increase financial attractiveness of renewable energy development, enabling generators to earn over £100.000,- net profit per MW per annum from a good resource[3] (Callaghan et al 2012; Cowell et al 2012; Entwistle et al., 2014).

On the other hand, the uptake of CORE projects ties in with a much older Scottish policy discourse of regional development through community empowerment (Slee & Harnmeijer, in press). After the Second World War, cases of underuse and misuse of rural land by absentee landlords led to reinforcement of a community-based land reform movement, culminating in the 2003 Land Reform (Scotland) Act (ibid.). This act gives communities the first choice to buy if land the land within their community comes up for sale, and as well allows crofting communities[4] to buy the land they live and work on (UK Government, 2003).

Communities that had acquired their land either prior to or after the Land Reform Act, realised that delivering positive socio-economic outcomes from traditional land use was often very challenging, as properties frequently concerned remote pieces of land with a poor quality (Slee & Harnmeijer, in press). However, many of these locations had a high technical potential for renewable energy production (ibid.).

When the UK government introduced the 2002 Renewable Obligations (RO) and incentivised deployment of renewable energy through ROCs and later also FiTs, the Scottish Government, saw CORE as a way to empower communities to create regional development. Accordingly, the government's Renewables Action Plan states that the Scottish government aims 'to maximise the benefits for rural communities from renewable energy, not only in terms of access to locally produced low carbon energy but also in terms of social cohesion and economic development' (Scottish

[2] The 2009 European Union Renewable Energy Directive (2009/28/EC) requires the UK to achieve 15% of its energy consumption from renewable sources by 2020 (DECC, 2009).
[3] Sources refer to revenues from wind projects.
[4] A crofter is somebody who 'occupies and works a small landholding known as a croft' (Scottish Crofting Federation, 2015). A crofter is normally a tenant, paying rent to the landlord of the croft (ibid.). However, today many others have purchased their crofts and are owner-occupiers.

Government, 2009, p.48). This commitment got consolidated in the Scottish Government the target of 500 MW[5] community-owned and local energy generation by 2020 that was added to the ambitious target of 100% of electricity demand from renewable sources by the same time[6] (Scottish Government, 2014).

To facilitate the development of community and local energy the Scottish Government founded Community Energy Scotland through its economic and development agency Highlands and Islands Enterprise (HIE) to offer governance and technical support. First limited to the Highlands and Islands Region and later Scotland wide. In 2011 financial support was increased by the launch of the Community and Renewable Energy Scheme (CARES) and later in 2012 also the Renewable Energy Investment Fund (REIF). Aiming to offer broad support the CARES scheme offers both advice and start-up grants to help towards the costs of feasibility studies, community consultation and other preparatory, non-capital costs (Scottish Government, 2014). Furthermore, the scheme offers pre-planning loans with the favourable condition of repayment being dependent on planning approval. REIF builds on this early stage support by offering a flexible lending service for communities that have advanced to the delivery stage but still have funding gaps (ibid.).

Thus, as well as contributing to Scotland's drive to replace fossil fuels and cut carbon emissions, the Scottish Government assumes renewable energy technologies to have the potential to play 'a vital role in strengthening communities' by building local 'capacity' and giving communities 'financial autonomy' to prioritise and address their own needs (HIE, 2015, p.3). The UK renewables subsidy mechanism inspired the Scottish Government to add CORE to its community empowerment agenda, which can be seen as a 'quintessentially Scottish take' on the UK Big Society discourse (Harnmeijer & Slee, in press, p.1). In times of shrinking public budgets community empowerment is seen as a way to encourage especially rural and remote communities to create means bridge gap between needs and reduced public expenditures (ibid.). Although policy architecture such as planning regulation remains less enabling than it might be (ibid.), the Scottish CORE sector has clearly reaped the benefits of the favourable policy and funding climate of the last years.

[5] A critical not has to be made: As the target also includes local production without community-ownership and such local ownership, by for instance farmers, constitutes the major part of the energy generation, it can be argued that the community label is mainly used to give the target a warm glow and brand local ownership in general (Slee & Harnmeijer, in press).

[6] Most of the energy issues are reserved to the UK government, but some have been devolved to the Scottish government. Devolved responsibilities include encouraging the development of renewable energy technologies at the regional level (Allan et al., 2008).

2.1.4 Social impacts of CORE and their past assessment

This section gives an overview of current knowledge on the social impacts of CORE as identified in the community energy literature. Social impact is for this initial scoping exercise understood as the impact on people, differentiating it from economic impact assessment that focuses on financial impacts on economies, and environmental impact assessment that has the natural environment at the centre stage.

2.1.4.1 Defining social impacts of CORE

Much of the work that has been carried out on community energy includes reference to one or more social outcomes of CORE projects (e.g. Walker et al., 2010; Musall & Kuik, 2011). However, only four contributions are found which attempt to give a comprehensive and exhaustive overview of the expected social impacts of CORE, namely, Gubbins (2010), Walton (2012), Slee (2015), and Hicks & Ison (2015). The outcomes on the community of CORE as outlined in these publications are subsequently discussed.

In a Community Energy Scotland report Gubbins describes how CORE projects can help to build 'resilience' and increase the 'support for wider behavioural change to address climate change' (2010, p.7). He understands resilience as an umbrella concept constituted of communities' confidence, capability, resources, knowledge and skills to address a wide range of factors affecting their cohesion and development, such as energy cost spikes, rural depopulation fuel poverty, urban deprivation, unemployment, and ageing populations (ibid.). Building of such a resilience is attributed to the provision of an independent revenue stream, offering the prospect of change on community level. He sees such change occurring through CORE projects' contribution to acquisition of transferable skills; volunteering and strengthening community groups; and promoting wider awareness of energy related and climate change issues (ibid.).

Walton also gives an overview of the social outcomes of CORE in his report on social and economic benefits of community energy schemes (2012). He refers to increased autonomy by providing long term income and local control over finances; empowerment by improving skills, confidence, and self-determination; resilience through energy efficiency; opportunities for education by connecting people to the source of their energy, and offering opportunities to develop RE related skills and knowledge; impact on the sense of place through making available funds for local culture and language protection, and through improvement of social cohesion by the collective endeavour of project management and development; increase in tourism by attracting CORE visitors; and local economic effects by providing local employment opportunities and a locally owned revenue stream (ibid.).

Similarly, Slee presents a list of social outcomes by arguing for the added value of community ownership and co-ownership of renewable energy (2015). In pleading for a shift towards greater community empowerment he states seven arguments that refer to particular social outcomes of CORE (ibid.). These seven arguments in favour of CORE are (ibid., p.545): reduction of opposition of people within the recipient community to on-shore wind; more significant economic benefits as compared to commercial developments, giving opportunities to diversify and strengthen local economies; providing environmental justice by giving local communities affected by a wind farm a share in the benefits; communities have an independent local source of electricity, and may as well commit themselves more strongly to climate change and other environmental issues; communities are provided with funds that can be used to address local issues; communities have an income stream to their disposal to plug the gap that has arisen from reduced public expenditures as a result of the tight financial situation; and finally local ownership is linked to community resilience.

Finally, recent work of Hicks & Ison gives probably the most extensive and comprehensive collection of the benefits and motivations of CORE projects available at present, basing their overview on 26 case studies using a STEEP framework (differentiating between social, technological, environmental, economic, and political factors) (2015). As social outcomes they identify increased support for or reduced opposition to renewable energy; future proofing and resilience; increased environmental values and behaviour; regional development and income diversification; community asset; renewable energy education and training; empowerment and skills development; community building and volunteering; and local ownership and decision making (ibid.).

Table 2.1 presents an overview of the identified social outcomes.

Table 2.1: Identified social outcomes

- Capacity building (Gubbins, 2010): capacities, skills and knowledge development/ skills development and empowerment (Hicks & Ison, 2015)
- Social cohesion (Gubbins, 2010): increasing volunteering and strengthening community groups / community building and volunteering (Hicks & Ison, 2015)
- Behavioural change to address climate change (Gubbins, 2010) / increased environmental values and behaviour (Hicks & Ison, 2015) / increased uptake of other projects to address climate change and other sustainability issues (Slee, 2015)
- Awareness of energy related and climate change issues (Gubbins, 2010)
- Self-determination through independent resources (Gubbins, 2010) / future proofing and resilience (Hicks & Ison, 2015) / Autonomy (Walton, 2012)
- Confidence (Gubbins, 2010; Walton, 2012)

- Reduction of fuel poverty (Gubbins, 2010) / resilience through energy efficiency (Walton, 2012)
- Service level (Gubbins, 2010)
- Community asset (Hicks & Ison, 2015)
- Demographic effects (Gubbins, 2010)
- Local ownership and decision making (Hicks & Ison, 2015)
- Increased support for/ reduced opposition to renewable energy (Hicks & Ison, 2015; Slee, 2015)
- Regional development and income diversification (Hicks & Ison, 2015) / Local employment and economic effects (Walton, 201; Slee, 2015)
- Renewable energy education and training (Hicks & Ison, 2015)
- Sense of place (Walton, 2012)
- RE tourism (Walton, 2012)
- Environmental justice (Slee, 2015)
- Improved energy independence (Slee, 2015)

Analysis of this overview shows that there is a wide range of potential social impacts to be assessed, but that there are some methodological and conceptual hurdles to be taken before the actual design of a social impact assessment methodology can be started.

2.1.4.2 Measuring social impacts of CORE

First, the scope for the methodology should be set. However, getting a grasp of what is meant by social impact, and defining where the lines should be drawn for this particular methodology, is not a straightforward task. There appears to be little agreement on what does and does not constitute social impact. Some conceptual confusion exists about the scope of social impact and whether or not "social" includes also socio-economic and socio-environmental effects (Chadwick, 2002; Ilsekog, 2008). Especially, social and economic impacts are many times so intertwined that it is hard to separate them. Chadwick points out that many social impacts 'arise as an indirect result of primary economic impacts, giving the example of direct employment generation that is of particular importance for socio-economic effects such as migration to the area and associated changes in pressure on services and community character and cohesion (2002). Also environmental and social impacts are closely related as infrastructure development can have a number of effects that affect the quality of the natural environment, not the least the perceived quality of the living environment (ibid.). In itself this is no surprising finding as people obviously interact with and are affected by economic developments and changes in the environment. However, these interactions blur the boundaries between the social and

the other dimensions. The operationalisation of social impact for this research is included in section 2.2.1 describing Social Impact Assessment.

Second, social impact does not only cover a broad area, but is also dependent on and influenced by wider societal developments, and can quite often not be one-on-one related to the assessed project alone (Ilsekog, 2008). Therefore, a way should be found to attribute outcomes to the researched RE project and take into account internal as well as external processes. This research does so through impact pathway analysis, which will be further introduced in section 2.2.2.

Third, not only are social impacts mediated by many factors external to the project, they are rarely singular cause-effect relationships (Vanclay et al., 2015). Often multiple different factors contribute to an impact, leading to 'complex patterns of intersecting impact pathways' (ibid, p.3).

Fourth, there is little conceptual clarity concerning recorded outcomes such as resilience, empowerment, and capacity building, so before outcomes can be measured this research should operationalise them. The definition should be close to the day-to-day meaning to increase practical value, which will be realised by operationalisation of outcomes through grounded theory analysis of respondents' understanding of outcomes. The application of grounded theory will be outlined in section 3.2.2 of the methodological chapter.

Finally, the exercise of doing social impact assessment is complicated by the fact that there are few examples of impact assessments that assess the more subtle, qualitative, uncountable aspects of social impact. As in many other fields, such as Environmental Impact Assessment, evaluation of the social aspects is generally confined to countable socio-economic issues such as population data, employment opportunities and community infrastructure (Chadwick, 2002; Howell & Haggett, 2015).

Although this research goes further than such classic performance indicators, some previous reports provide a valuable starting point. Highlands and Islands Enterprise's Social impact report 2010-2014 gives a list of indicators that can be used for a quick scan of the social and community enterprise sector, including indicators as temporary jobs supported, trainees, new income generating assets, new services and amenities, and new volunteers (HIE, 2015b). Also the extensive evaluation of the renewable energy island Samsø in Denmark was found helpful in getting an idea of how a local project can be evaluated (Hermansen et al., 2007). However, while giving a comprehensive overview of outputs and outcomes on different sectors, the way in which the people are affected by the transformation of their island did not come forward.

This lack of assessment of the soft dimension of social impact can be partially traced back to the strong relationship between monitoring and evaluation, and policy making. Walker et al. relate the lack of

methods to the misfit between short-term budgetary timescales in program monitoring leading to standard tick-box approaches and the need for 'project-scale evaluation that is extended, sensitive and in-depth' (2007, p.78).

As a result of the combination of all before mentioned factors, existing assessments of the social impact of CORE are mainly socio-economic assessments carried out on national, regional or project level. Examples are the study of Entwistle et al. presenting an application of the New Economics Foundation's Local Multiplier 3 tool on the CORE wind project in Tiree, giving insight in the benefits for the local economy after three rounds of spending[7] (2014); and the economic effects of community energy Scotland wide by Allan (2012)[8]. Also 'social accounting', giving a more detailed overview of monetary flows, has been used to calculate the socio-economic effects of CORE projects (Allan et al., 2008). However, whilst measuring economic effects can be a valuable as a rough approximation for social outcomes, it cannot create an understanding of the nature of the social impact (HIE, 2015b, p.2). A final example of economic oriented socio-economic impact assessment is the recent study of Okkonen & Lehtonen applying input- output modelling to show the financial benefits of reinvesting in social purposes (2016).

After a review of existing impact assessment a few observations are made. First, social outcomes of CORE are widely acclaimed but seem to be predominantly based on assumptions about the logical consequences of CORE groups' efforts rather than on researching the communities that are supposed to experience them. Second, the sparse impact assessment literature in the CORE field has a strong (socio-)economic focus, and the perspective of the community members is often absent. Third, the community oriented impact assessment that takes place does not aim to get a comprehensive overview of the key social impacts on a community, but rather researches individual relationships between conditions in the community and impacts.

To create a more in-depth understanding of the social impact beyond the economic and other readily countable aspects of social impact, this research will make use build on the thinking of Social Impact Assessment (SIA) and uses the systems thinking lens of impact pathway analysis as a structuring mechanism to come to a methodology that can be replicated and developed further. The subsequent sections will introduce both traditions and their assumptions as the theoretical embedding of this

[7] A multiplier calculates share of the money that is spend in the local economy again. Round 1 is the initial income, round 2 is how much of the initial income is spent locally and round 3 is how much of the found 2 income is re-spent locally (Entwistle et al., 2014)

research.

2.2 Theoretical embedding

This section introduces Social Impact Assessment and the way the insights from this body of literature can help to do social impact assessment of CORE in a more people-centred way. Subsequently, impact pathway analysis is introduced as a structuring mechanism. The section outlines the most important concepts of impact pathway analysis and describes how assumptions within systems thinking, that often seems blind to complexity and context, relate to the aim of this research to design a methodology that takes into account the nature of social reality.

2.2.1 An introduction to Social Impact Assessment

A widely accepted and often quoted description of Social Impact Assessment is the World Bank's definition, characterising SIA as:

"[An assessment of the] changes in the well-being of individuals, households, communities or firms that can be attributed to a particular project, program or policy. The central impact evaluation question is what would have happened to those receiving the intervention if they had not in fact received [it]." (World Bank, 2011)

Social impact assessment of a community RE project comes down to determining what changes the project has made for whom. People are at the centre stage of SIA. Accordingly, the International Principles for Social Impact Assessment describe social impacts as all issues related to a planned intervention that 'affect or concern people, whether directly or indirectly' (Vanclay et al., 2015, p.2). Therefore, a social impact can be anything linked to a project as long as it is important to a specific group of people, either perceptual or corporeal (ibid.).

Environmental impacts, such as impacts on wildlife and natural beauty of the landscape, can therefore be seen as potential social impacts of a community RE project on the grounds that they are valued by people. Social impacts which are only perceived, and not necessarily observed or felt by others, should not be dismissed. For example, fear and anxiety are real social impacts that people experience, and should be managed effectively (ibid.).

As stated by Vanclay this 'means that SIA cannot start with a checklist of potential impacts, but must identify the social impacts from an awareness of the project and an understanding of how the project

will affect what is important to the project's stakeholders' (2015, p.2). Thus, before a systematic methodology to evaluate the nature of the social impacts of CORE projects can be developed, it should be identified how a CORE project affects the community it is part of. Only when the interaction between the community and the project is thoroughly understood, a methodology to assess its social impact can be developed.

Consequentially, this research has two stages. The first stage is identifying the key social impacts of the CORE project that serves as a case to develop an initial version of the SIA methodology. This step of the research project is grounded in impact pathway analysis (Rogers & Funnell, 2011).

Impact pathway analysis is based in systems thinking and can assist in structuring the relationships between the project and the community by breaking them down into project inputs, activities, outputs, outcomes and impacts. The second stage is developing a methodology that can be used to assess the social impacts in a systematic way.

2.2.2 An introduction to impact pathway analysis

Impact pathway analysis is a strand of theory-based evaluation within evaluation research (Funnell and Rogers, 2011). Applying impact pathway analysis can help to identify what information is needed for evaluation studies. More than anything else it is an approach that can be used as a lens to structure complex social situations by breaking down processes in smaller components such as inputs, activities, outputs, outcomes and impacts.

A variety of terms is used to refer to impact pathway analysis, including programme logic (Funnell, 1997), programme theory (Funnell & Rogers, 2011), theory-driven evaluation (Chen, 1990), theory of change (Weiss, 1998), intervention logic (Nagarajan & Vanheukelen, 1997), theory of action (Schorr, 1997), impact pathway analysis (Douthwaite et al., 2003), and programme theory-driven evaluation science (Donaldson, 2005). Each term being defined slightly different by the author who uses it. Although impact pathway analysis is acknowledged as theory within evaluation research (Vogel, 2002), the diversity of terms indicates that it balances on a thin line between theory and method. When indicated as a theory it is seen as a small theory, because of its limited explanatory power (Funnell & Rogers, 2011). As the research has no strong theoretical focus, but works on a methodological question, this lack of grand theory or mid-range theory was no problem for the research. Free from strong theoretical assumptions, an open and inductive approach could be followed to identify relevant processes and outcomes of CORE.

However, to avoid entering the debate of what can be called theory and what not, this research will refer to impact pathway analysis, stressing its value within this research as method for analysis. Impact pathway analysis is defined as an explicit 'model of how an intervention, such as a project, a program, a strategy, an initiative, or a policy, contributes to a chain of intermediate results and finally to the intended or observed outcomes' (Funnell & Rogers, 2011, p.xix).

Impact pathway analysis is part of the strand of so called theory-based evaluation. However, the concept *theory* in theory-based should be broadly interpreted to encompass formal, research-based theory as well as practice wisdom and tacit assumptions. Weiss clarifies that theory should be interpreted in line with its dictionary definition, representing 'a set of beliefs or assumptions that underlie action' (1997, p.503). In this research, 'theory' is used in this latter, more informal sense.

One of the biggest strengths of theory-based evaluation is that it gives insight into the factors that are responsible for the impact of the project. As impact pathway analysis brings cause-effect relations into evaluation, it avoids evaluation taking a 'magic box' approach: measuring the impacts of a project but failing to develop an understanding of the way in which the project and other external factors contribute to the identified outcomes (Funnell & Rogers, 2011, p. 422).

To get a better overview of the interplay between the different causal mechanisms that lead to impacts, impact pathway analysis usually represents the pathways to impact in a diagram, often referred to as logic model. The logic model is the summarized model of how the intervention works (Rogers, 2008).

Figure 2.2 presents the most basic reasoning underlying impact pathway analysis, showing a logic model with the main concepts that are used by impact pathway analysis scholars to structure their theory-based evaluations.

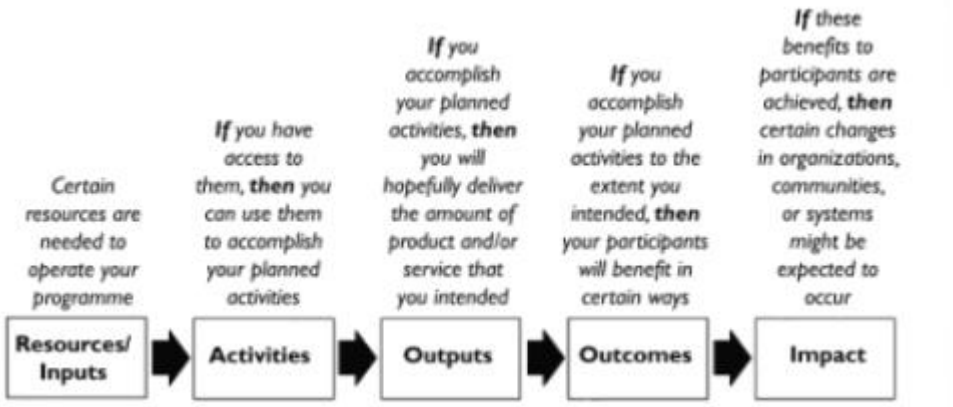

Figure 2.2: An example of a basic logic model with a linear causal path (W.K. Kellogg Foundation, 2004, p.3).

A model is, by definition, a simplification of reality. However, many evaluation scholars recognise that such a linear diagram gives a too simplistic representation of social reality to be useful (Funnell & Rogers, 2011). Such rationalistic representations, showing boxes presenting pathways from inputs to outputs, suggest that the entire causal process in the logic model is under control of the implementer of the programme. Assuming that the intervention is taking place in a stable, or at least manageable, environment raises valid concerns about the neglect of constraining and enabling factors outside control of the implementers (Barnes et al., 2004). To put it like Rogers, 'life is not simple, but many of the logic models used in impact pathway analysis evaluation are' (2008, p.29).

This criticism has increasingly been addressed by evaluation theorists such as Rogers herself, Barnes et al. (2003), Davies (2004), Douthwaite (2003), Pawson (2006), Sanderson (2000) and Stame (2004), taking a realist approach. Complexity theory has emerged as a popular solution to the problem of oversimplification. According to Mowles, the appeal of complexity theory for evaluation research stems from increased ambitions of projects 'configured with multiple objectives and outcomes and the perceived inadequacy of linear approaches to evaluating them' (2014, p.160). Especially, the work on complexity of Glouberman and Zimmerman has caught the attention of evaluation scholars, presenting a threefold categorisation of social problems: simple, complicated and complex (ibid., p.163). Table 2.2 presents the definitions of these categories.

Table 2.2: The threefold categorisation of social problems (adapted from Glauberman & Zimmerman, 2002, p.1)

Simple problems	Simple problems may encompass some basic issues of technique and terminology, but once these are mastered, solving carries with a very high assurance of success.
Complicated problems	Complicated problems contain subsets of simple problems, but are not simply an assembly of their simple components.
Complex problems	Complex problems can encompass both complicated and simple subsidiary problems, but are not reducible to either since they too have special requirements, including an understanding of unique local conditions, interdependency with the added attribute of non-linearity and a capacity to adapt as conditions change. Unavoidably, complex systems carry with them large elements of ambiguity and uncertainty.

Building on this categorisation, Rogers identifies the multi-level and multi-actor characteristics of projects, as well as multiple parallel and alternative causal pathways, as factors adding to the

complication of projects (2008, p.39). Having alternative causal pathways means that an impact is realised either through one or through another mechanism, whereas having parallel causal pathways means that an outcome is realised through a combination of mechanisms. She describes emergence and recursive causality as aspects of complexity (ibid). Recursive causality implies that cause–effect relationships may be 'mutual, multidirectional and multilateral' (Patton in Rogers, 2008, p.38) and emergence signifies that 'specific outcomes, and the means to achieve them, emerge during implementation of an intervention' (ibid.).

CORE projects have many complicated and complex aspects, presenting a challenge for evaluation. The process from inputs to impacts is so variable, and dependent on an ever changing social context, that the type and the scale of impacts is emergent and cannot be articulated in advance. In terms of realist evaluation researchers such as Pawson and Tilley: mechanism + context = outcome (1997). They point out that 'programs work by introducing new ideas and/or resources into an existing set of social relationships', and hence require 'investigation of the extent to which these pre-existing structures enable or disable the internal mechanisms of change' (ibid, p.70). However, Barnes et al. warn that the connection between mechanism + context and outcome should not be taken as a one-way relation, solely addressing 'factors which facilitate or constrain the achievement of objectives' (2003, p.269).

This is highly relevant for constructing a methodology for evaluation of social impacts of CORE projects, because the context within the community changes when impacts occur. Besides the changing context many impacts are emergent, because they depend on the actual distribution of the revenues of the project. In particular concerning the money that flows to the community stakeholders, as community organisations often make their plans for investing profits along the way.

Recognising complicated and complex aspects of projects, evaluation scholars grounded in the school of realism use non-linear logic models to represent their theories. These models involve components with multiple interrelations and feedback loops. This research borrows from that school of thinking and starts investigating the social impacts by means of the conceptual framework displayed in figure 2.3.

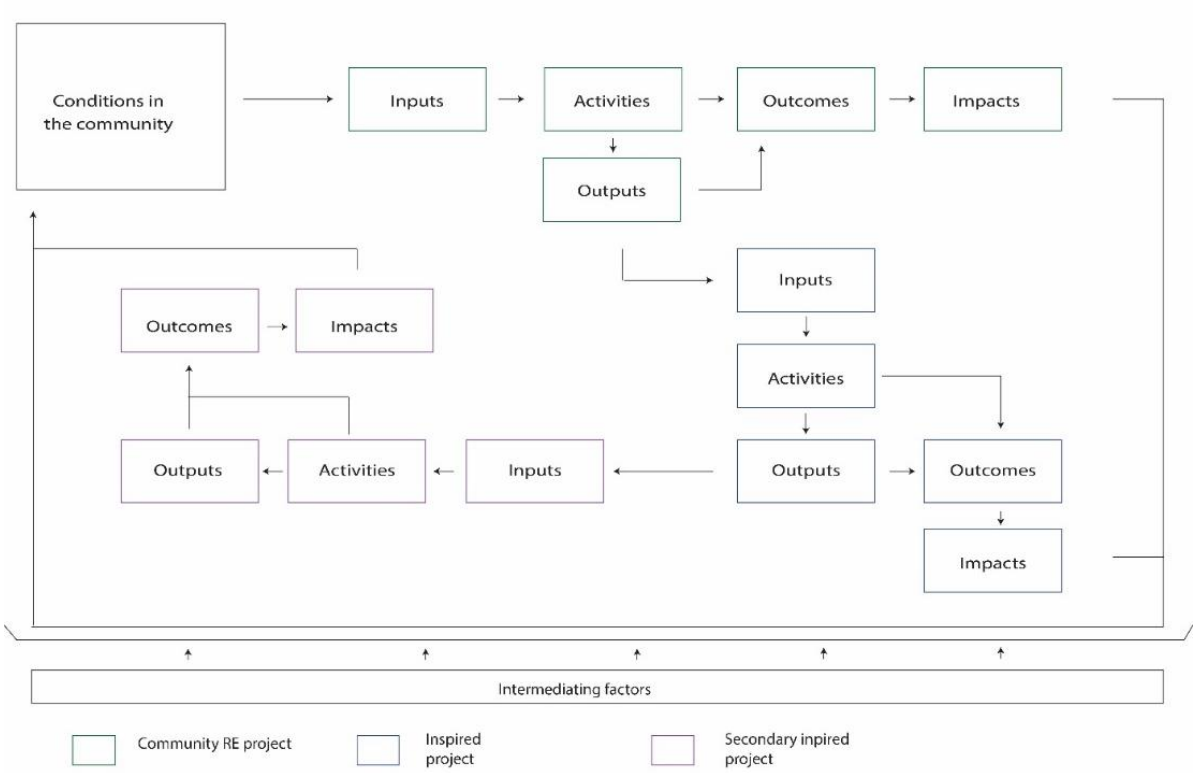

Figure 2.3: Conceptual model of impact pathways (Author's own).

The model presents the turbine project as a series of subprojects that all effect the community in certain ways. The main project is the turbine project itself (green boxes). From the conditions in the community the wish to take a community energy project forward develops. Inputs as money, time, and skills of volunteers and/or paid staff are used to set up certain activities to get the project operational, e.g. doing community engagement and going through feasibility studies. Such activities can have outcomes for the community, e.g. efforts to find a site for the turbine can cause disagreement in the community and can (temporarily) affect social cohesion when residents don't agree about a suitable site. If these activities are successful the turbine ultimately gets installed and commissioned. The turbine itself is then a physical output of the project which can have outcomes for the community in terms of visual impact or perceived negative environmental effects. However, the turbine is then besides an output also an asset that can be used to generate more outputs, often

most importantly revenues from electricity sale to the grid. This money, being an output of the turbine, can be fed into a secondary project of the organisation as input (blue boxes). By simultaneously feeding in other inputs and undertaking activities, extra secondary outcomes can be realised, e.g. the provision of a service to the community or the installation of an additional RE project. If this project results in capital of any kind this can be fed into a tertiary project and can bring even more outcomes (purple boxes). In theory such a process can be extended on and on. It is also possible that a RE project inspires a multitude of secondary projects and has no tertiary projects.

Despite the broad usage of the terms inputs, activities, outputs, outcomes and impacts, there is little consistency in approach and definitions within evaluation research. Table 2.3 shows the labels and definitions that are used by some major organisations and are adapted to come to working definitions for this research project.

2.3 Conclusion

This chapter presented the literature review was undertaken to identify the research question. It also introduced Social Impact Assessment and impact pathway analysis, and the thinking behind these approaches as the theoretical embedding of this methodological research. The chapter concludes with a final concluding remark regarding to the use of impact pathway analysis.

Recognising the risks and limitations, impact pathway analysis can be a valuable means for making a clear, structured methodological framework for the evaluation of the social impacts of community RE projects. Nevertheless, one should stay particularly cautious during a research like this 'not imagine that a logic model, however detailed, can be used to generate performance measures that can be used formulaically' when interventions have complicated or complex aspects (Rogers, 2008, p.44). Therefore, impact pathway analysis should be applied 'purposefully', meaning that it 'should be developed, represented and used […] thoughtfully and strategically, in ways that suit the particular situation' of CORE projects (Funnell & Rogers, 2011, p.xx).

Table 2.3: Operationalisation of the components of the logic model						
Definitions of the W.K. Kellogg Foundation (in Funnnell & Rogers, 2011, p.29-30)		**Definitions of the South African National Treasury (in Funnnell & Rogers, 2011, p. 28-29)**		**Own Working definitions**		**Examples**
Resources/ inputs	Resources needed to operate the programme	**Inputs**	All the resources that contribute to the production and delivery of outputs: 'what we use to do the work'	**Inputs**	All the resources that contribute to operating the project	Money, motivations, organisational skills
Program activities	Processes, tools events, technology, and action that are an intentional part of the program implementation	**Activities**	The processes or actions that use a range of inputs to produce the desired outputs and, ultimately, outcomes: 'what we do'	**Activities**	The processes or actions to produce the necessary outputs in order to achieve desired project outcomes and, ultimately, impacts.	Getting planning permission, going through due diligence, siting the turbine, distributing revenues
Outputs	Types, levels, and targets of services delivered	**Outputs**	The final products, goods, and services produced for delivery: 'what we produce or deliver'	**Outputs**	The tangible products of the activities, including products, services and goods produced.	Turbine, revenues of electricity sale to the grid, provided services
Outcomes	Specific changes in program participants' behaviour	**Outcomes**	The medium-term results for specific beneficiaries that are the consequence of achieving specific outputs: 'what we wish to achieve'	**Outcomes**	Intentional and unintentional results that occur in the community as a consequence of the project's activities or outputs	Job creation, development of project management skills, increased cooperation between neighbouring islands with wind projects, division on the way the revenues are spent
Impact	Changes to organisations, communities, or systems as a result of program activities within seven to ten years	**Impacts**	The results of achieving specific outcomes, such as reducing poverty and creating jobs.	**Impacts**	Results of project outcomes in the community in the medium and longer term	Liveability, demographic balance.

Chapter 3. Methodology

to assess the social impacts of community RE projects

This chapter argues why a case study design is useful to inform the design of the CORE social impact assessment methodology. Subsequently it discusses the case study selection criteria and introduces the case study: the wholly community owned 900 kW wind scheme on the island of Shapinsay in Orkney. Afterwards, the methods of data collection and analysis are explained. Finally the validity and reliability, and safeguarding of ethics are discussed.

3.1 Research design

This section discusses why the case study design is chosen to inform a social impact assessment methodology for CORE. Afterwards it gives insight in the criteria that have been used to select the single instrumental case, and introduces the CORE wind project on the island of Shapinsay as the case on which this research draws.

3.1.1 Case study design

The case study design is chosen as research design. Case study research is 'drawing on multiple sources of information' to provide 'an in-depth understanding of a case' (Creswell, 2013, p.76 & 78). Contrary to an experiment or an archival study, a case study design is typically used when 'the researcher has little control over events and the focus is on contemporary phenomenon within a real-life context' (Yin, 2009, p.2).

Being a present-day phenomenon subjected to factors from changing local social dynamics within communities to shifting goalposts of government policy, CORE projects meet both of these criteria. Furthermore, an in-depth understanding of the social impact of the CORE project is needed as the research is entering a novel field and has little previous work to draw on. The type of case study is a 'single instrumental case study' as the research is to develop a first version of a methodological framework to evaluate the impacts of community RE projects and selects one bounded case to help informing this process (ibid., p.74).

The boundary of the selected CORE project is the boundary of the community of place which the project is part of and wishes to benefit. The place is considered as the area 'community residents identify with most closely and have immediate involvement with' (Entwistle, 2014, p.2). In general this

covers the area in which 'community residents live, socialise on a day-to-day basis and conveniently shop' (ibid.).

In the case of Shapinsay the definition of community of place is not problematic. The physical borders of the community are clearly defined by the sea. While there are by times some tensions between "Orcadians" and "incomers", and "farmers" and "non-farmers", the community is generally speaking coinciding with the place.

3.1.2 Case study selection criteria

Point of departure is to make a methodological framework potentially applicable to a wide range of CORE projects, using diverse RE technologies and having various ownership structures. As the development of the framework requires extensive qualitative research and is constraint by time, it is based on one in-depth case study. This case study has been carefully selected to increase the potential applicability to other cases.

Selecting a case requires that the researcher establishes a rationale for purposeful selection (Creswell, 2013, p.76). The underlying rationale in this research is to narrow down the number of potential cases to a subset of mature CORE projects displaying a rich variety of social impacts to evaluate. Besides content-related criteria, practical constraints are considered as well. For selecting a case to support the development of a methodological framework the following criteria have been used:

- Has a high degree of community ownership
  The project should be a clear example of a community RE project.

- Is a wind energy installation
  This technology generates relatively much energy and revenues, is considered to have a large landscape impact, and needs a great organisational capacity. These factors should increase the potential for a diverse range of social impacts to be measured.

- Has been installed and operating for at least 3 years
  Project organisation had some time to repay loans and should therefore have more revenues available for investment in the community. Had also some time for first experiences with investing revenues in its community.

- Has a generation facility with a community-owned share of about 1 MW.
  The projects should be middle-sized to guarantee that reasonable impacts can be measured

and avoid the impression that a RE project has to be large to have considerable impacts.

- Community organisation is actively committed to optimising community benefits in a wide variety of areas
  To make sure that there are some community projects to research realised with RE money.

- Is preferably based in a location that is accessible by public transport
  Practical limitations.

Currently Scotland's community-owned wind sector counts: 22 wholly community owned projects (the majority run by trusts with a trading subsidiary); 5 joint ventures between a community organisation (predominantly trusts) and a commercial party; 3 joint ventures between a cooperative and a commercial party; and 1 cooperative (Energy Archipelago, 2015)[9]. Application of the selection criteria narrowed down the 31 active wind CORE projects to a subset of 7 projects to approach. Shapinsay Development Trust and its trading subsidiary Shapinsay Renewables ltd. were found interested and willing to participate in the research.

3.1.3 Case study

The wholly community-owned 900 kW wind project on Shapinsay is the case study on which this research is built. Shapinsay is one of the Orkney Islands off the north coast of mainland Scotland. Since 2003 the island has an active trust, the Shapinsay Development Trust (SDT). The SDT owns Shapinsay Renewables Ltd (SRL), which is the trading subsidiary for the wind turbine. Since 2011 when the turbine became operational, the trading subsidiary operates the wind turbine and passes the generated profit to the SDT. Figure 3.1 shows the turbine. The trust uses the revenues from the turbine for a wide variety of projects to the benefit of the community to 'ensure the sustainability of life on Shapinsay' (SDT, 2011a, p.6). To guide development, SDT has made a strategic document with a development plan for the island for 2011-2015. The fields that have been outlined as key

Figure: 3.1: Shapinsay's community-owned wind turbine, Whirly (Author's own).

[9] These numbers represent the operational projects. Many more projects are in the pipeline.

areas for project development include: Education & learning; Culture, Heritage & Environment; Recreation, Community Facilities and Local Services; Enterprising Community; Young people; and Housing (ibid, p.8-11). The diversity of the priorities of the trust makes the SDT an interesting case study. Furthermore, the SDT has already reinvested money in several community projects such as a community buss and an Out-of-Hours ferry service, increasing the likelihood that the organisation the organisation caused a broad range of impacts on the community.

3.2 Data collection and analysis

Data is collected from different sources. The first phase of the research consists of a literature review of impact pathway analysis and SIA literature. In parallel the literature on CORE and its impacts is reviewed. The literature review grounds the research design in previous relevant (academic) work. The information from the literature is taken as starting point for the case study. Throughout this research an inductive approach that is used. Furthermore, Vogel's method for impact pathway analysis is used to collect and analyse the data, as it was found to give a very systematic and practical approach to pathway impact analysis (2012). This section describes the inductive approach taken, the research philosophy, Vogel's method for impact pathway analysis, and gives an outline of the fieldwork.

3.2.1 Inductive approach

An inductive approach is seen as suitable when prior knowledge regarding to the researched phenomenon is fragmented or limited (Cho & Lee, 2014). Accordingly, codes, categories or themes are directly drawn from the data, opposite to the deductive approach that starts with preconceived codes or categories derived from prior relevant theory, research or literature (ibid.). The deductive approach fits when the aim of the study is to test existing theory or retest existing data in a different way (ibid.).

This research takes an inductive approach as little is known yet about the way CORE affects the community in which it is based. The research has an exploratory character and designs a framework with impact pathways that can potentially be used as inspiration for deductive research at later stages. However, this research aims to arrive at a methodological framework, and identifies relationships between components of impact pathways rather than testing these. Guided by the insight from CORE literature that it are the outcomes and processes that characterise CORE (Seyfang et al., 2013; Walker & Devine-Wright, 2008), this research investigates how the process and outcome dimension play out in the case of Shapinsay to make a social impact assessment methodology. Therefore, it starts without hypotheses about the impact pathways that can be found.

3.2.2 Research philosophy

Theory-based evaluation is based on the epistemological foundations of critical realism (Pawson & Tilly (1997). As this research makes use of impact pathway analysis[10], a strand of theory-based evaluation, it grounds itself in this school of philosophy and pays due attention to its assumptions about knowledge and the nature of reality. Critical realism asserts that both the material and the social worlds are existing and can have real effects (ibid.). This implies that the 'pursuit of ontology is the 'attempt to understand and say something about 'the things themselves' and not simply about our beliefs, experiences, or current knowledge and understanding of those things' (ICCR, 2015). Thus, although critical realism believes that there is a real world, it is clearly a different philosophy than naïve realism, which believes that the world is perceived exactly as it is (ibid).

Critical realism translates to the following beliefs about ontology and epistemology in this research: Regarding ontology, on the one hand, the assumption is made that impact evaluation says something about the world itself rather than only about perceptions. On the other hand, it recognises that the reality of CORE projects is complex and socially constructed and builds on these very perceptions to say something about the world. Therefore, critical realism is sometimes described as 'a weak form constructivism' (Ibid.). In terms of epistemological beliefs about what social research can do, this research takes again a realist stance in starting from the position that it is possible to develop a methodological framework that can in the future potentially be used to identify causality and general trends from multiple evaluations, but cannot be used for generalisation to new, similarly cases because of the importance of unique, local social dynamics. Thus, despite the fact that trends may be identified from data, this does not mean that straightforward predictions about social impact can be made.

3.2.2 Vogel's method for impact pathway analysis

For data collection and analysis Vogel's method for impact pathway analysis is used (2012). Vogel points out that impact pathway analysis helps researchers to 'develop an integrated conceptual framework for impact that brings together the issue context, the research project, intended users and research-into-use strategies' (2012, p.5). Impact pathway analysis supports the focus of the research on building the links from the CORE project's inputs and activities, to its outcomes, which enables to create an evaluation methodology that is sensitive to process as well as outcomes. The research stays

[10] See chapter 2 for more elaboration on the understanding of impact pathway analysis as both a theory and a method. Another often used term for impact pathway analysis is programme theory.

away from the assessment of impact, as impact is described to be visible on a medium or longer term, whereas the investigated project has only been operational for 3 years.

Vogel recommends a five step approach, involving intensive interaction between the researcher and the project's stakeholders (ibid.). First, a comprehensive understanding of the context of the project should be established, including social, political and environmental conditions. Subsequently, the state of the conditions that the project is seeking to influence and the presence of other factors able to influence change should be mapped out. These first two stages are addressed in chapter 4, which gives an historical and contextual analysis of the case study.

Then an overview should be created of the activities that the community perceives as causes of change as compared to the situation before the RE project became operational. Also assumptions about how these changes might have happened and how contextual conditions may have affected their occurrence should be made explicit. The last step involves integrating all collected information in one coherent impact pathway analysis, consisting of a logic model and a narrative summary. The results of these last three steps are described in chapter 5, which presents a logic model with impact pathways for Shapinsay.

3.2.3 Outline of the fieldwork

The case study phase of the research consists of several steps that contribute to the development of a methodological framework to evaluate the social impacts of community RE projects. The fieldwork took place during a field work visit of two weeks to Shapinsay.

First, interviews with CORE group actors, high profile community members, and representatives of regional organisations that are involved in CORE development, are used to get detailed information for the impact pathway analysis. The interviews have been analysed by thematic analysis using the concepts from pathway impact analysis as codes (inputs, activities, outputs, outcomes, impact, external factors, and contextual information) (Babbie, 2004). For every code a colour has been used and in the margins of the print transcript a sub-code, aiding construction of the logic model, has been written. The codes related to the impact pathways have been indicated as theoretical notes (TN), codes with ideas for the development of the methodology as methodological notes (MN), and relevant observations, which were made during the interview or later, are indicated as observational notes (ON). In total 11 interviews have been conducted: 6 with actors within the CORE group (board members & staff), 2 with people who are strongly involved in the community (Community Council chair, and owner local café and Community Council member), and 3 with representatives from regional organisations with expertise on the CORE development in Orkney for a wider perspective on

enabling and constraining factors (Highlands & Islands Enterprise, Orkney Council and Community Energy Scotland). In annex 2 a list of indicative interview questions that were used during the interviews can be found (depending on the person's role minor adjustments to the questionnaire were made). The interviews are audio-recorded and fully transcribed.

Second, two focus groups were run, supplemented by one shorter group session with 2 staff members. These focus groups were centred on identifying the key outcomes of the project and a creative process of designing impact pathways. One group was run with board members of the trading subsidiary and one was run with community members. The sessions for the organisation and members of the wider community were separated to enable every participant to speak freely about any outcome they experienced, positive or negative. According to Gilbert focus groups are 'ideally consisting of 6-10 people', but he states that 3 or 4 may be useful when the subject is in-depth (2008, p. 235). The focus group for community members had 7 participants, and the one with the organisation 3. Both focus groups were found to give vivid discussions and high quality information. Respondents felt at ease with sharing positive and critical stories. The focus groups are recorded and summarised by listening to the audio file. In annex 3 the outline of the programme for the focus groups can be found and annex 4 includes the poster that was used to advertise the focus groups. In short the workshops consisted of identifying social outcomes, choosing the most important outcomes by vote, and creating impact pathways for the outcomes. An impression of the focus group setting and outcomes of the workshops is shown in figure 3.2.

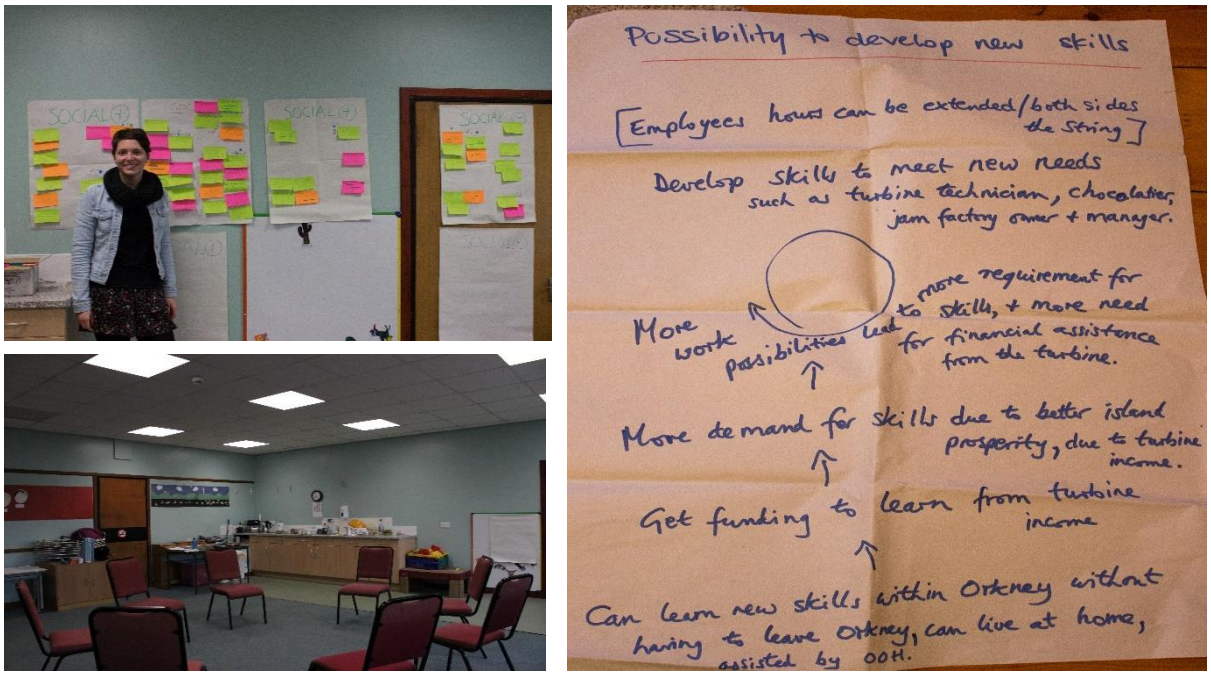

Figure 3.2: Impression of the focus groups (Source: Author's own). Top left: Identified outcomes. Bottom left: Setting. Right: Example of an impact pathway for capacity building that was constructed by participants. (Source: Author's own.

Third, to get a broader overview of the social impacts, a short exploratory survey was made to get input from a larger cross-section of the population. The survey asked residents multiple choice questions about their involvement in the Trust, and asked open questions to identify positive and negative outcomes, such as what respondents saw as the value of the work of the SDT and which moments during the turbine development were memorable (in both the positive and negative sense). At community level was aimed at a minimum number of 26 surveys (corresponding to 20% of the households). Finally, the survey had 33 respondents. The link for an online version was advertised, but had only 8 respondents. Therefore, the other responses were collected door-by-door. The open-ended questions are also analysed with thematic analysis. However, they were not formally coded as questions clearly related to categories such as activities and outcomes. Furthermore, the survey did not provide as much information as was hoped as many questions were skipped or answered in a poor way. Annex 5 includes the questionnaire of the exploratory survey.

The results of the surveys, focus groups and interviews were used to get an overview of the social outcomes of Shapinsay's community wind project and construct a logic model with impact pathways to inform the impact assessment methodology.

3.3 Validity and reliability

Several precautionary measures were taken to enlarge the validity and the reliability of the research. To increase the internal validity of the research this research makes use of theory-based evaluation. Residents of Shapinsay were approached to identify links between the wind project and changes in the community based on their practice and tacit wisdom as community members.

Furthermore, Funnell and Rogers suggest to address the attribution problem by causal analysis combining methods based on 'congruence', 'counterfactual comparison' and 'critical review' (2011, p.473). Congruence focuses on whether results match the impact pathway analysis; counter factual comparisons investigate what would have happened without the intervention; and critical review involves seeking for other plausible explanations of the results (ibid). These methods were applied where possible during the collection and analysis of the fieldwork data. Particularly striving for congruence through data triangulation was an important technique. Data triangulation was realised by asking multiple respondents the same questions. Triangulation was improved by asking community members from within and outside the SDT & SRL, and including the views of representatives of organisations with a broader involvement in the CORE sector as well.

The reliability of the research was safe-guarded as much as possible by using semi-structured interview guides and making a design for the focus groups. However, it is recognised that the reliability of interviews and focus groups is on some aspects lower than the exploratory survey. The dynamic of

the conversation and the mediator play an important role for the results that are generated. Despite the fact that another mediator could be trained to conduct the same research, the interplay between the mediator and the respondents would be slightly different and could give minor variations in results. Also the reliability of the interviews is somewhat lower as they were semi-structured and the researcher came with follow-up questions based on the given answers and followed the line of the conversation. However, despite face-to-face interaction being seen as increasing socially desirable answers, a positive aspect is that such conversations offer room for clarifying questions from both the researcher and the participant, which has a positive influence on the internal validity of the research.

The external generalisability of case study research is limited. This is of bigger concern as the research aims to design a method that could be used on other CORE projects to create a systematic evidence base of the social impacts of CORE projects. However, taking into consideration the time constraints of this project, only one in-depth case study was feasible. This case study has been selected with care to include a rich variety of processes and impacts to increase the applicability to other projects. Yet, it is fully recognised that the methodology cannot simply be applied to other cases and has a lot to gain from further development by future research.

3.4 Ethics

Conducting social research in an ethical way should be based on the basic rules of 'voluntary participation' and 'no harm to the participants' (Babbie, 2004, p.64). Participants to the research should have a full understanding of the research prior to participation in the research. Therefore, a form was provided informing the participants about the research aim, methodology, possible risks of participation and the specific purpose of their contribution, ending with a request to give their consent by signing. Participants were informed that even if they decided to participate they would be free to withdraw their consent and to discontinue participation at any time without prejudice. During the interviews and focus groups the well-being of the participants was taken care off by the researcher by adopting a neutral, non-judgemental, friendly, encouraging stance, and by guiding the conversations so that participants could be comfortable with sharing information. To avoid the participants from being harmed after public disclosure of the dissertation, the information provided by participants of focus groups and interviews is treated confidentially by the researcher and is anonymised in the text of the dissertation. As the small size and the gender distribution of the members of the organisation would make respondents easily recognisable, he and she are used interchangeably. The surveys were anonymous and only if the participant wished to give feedback, contact details were left on the form. Contact information and feedback on the survey were treated confidentially by the researcher.

Furthermore, it has to be recognised that while the literature review and data analysis were the researcher's own work, she gratefully acknowledges that the fieldwork on Shapinsay has taken place in cooperation with a fellow researcher. This cooperation was seen as mutually beneficial as transcription could be shared and the slightly different focusses of the research projects made that both researchers got more information out of the fieldwork.

Interviews were conducted together. The questions were first prepared individually, and were close to the interview discussed and divided among the researchers. Three focus groups were held of which two on impact pathways to inform this research. The third focus group was for data collection of the colleague. The two impact pathway focus groups were prepared and led by the author, while the other researcher played a supportive role. The exploratory survey only served the author's research and is prepared and carried out individually.

3.5 Conclusion

This chapter presented the case study design as appropriate research design and outlined the rationale for selecting the 900 kW project on the island of Shapinsay as case study. It introduced the inductive approach, the research philosophy and Vogel's method for impact pathway as elements guiding data collection and analysis. It argues that an inductive approach helped by the structuring tool of pathway analysis was found to be beneficial for constructing a social impact assessment methodology by giving the researcher the chance to discover freely which concepts are important to include. Furthermore the chapter outlined which measures were taken to safeguard ethics, validity and reliability.

Chapter 4. Contextual and historical analysis

to assess the social impacts of community RE projects

To develop a methodology to measure social impacts Vogel's approach to impact pathway analysis has been used to identify the key social impacts of the community wind project on Shapinsay. The findings related to the first two of the five step process are discussed in this chapter, namely establishing an understanding of the context of the project, and getting insight in the project and the situation it is trying to address. The last three steps are elaborated upon in chapter five.

4.1. Introduction to the context

The researched case study is the 900 kW community turbine scheme operated by the Shapinsay Development Trust (SDT) and its wholly-owned trading subsidiary Shapinsay Renewables ltd. (SRL). As it is of great importance within social impact assessment to have a detailed understanding of the context of the assessed project, this section will subsequently introduce the island of Shapinsay and the development of the renewable energy sector Orkney wide.

4.1.1 Shapinsay

Shapinsay is one of the Orkney Islands off the north coast of mainland Scotland. The area is roughly 30 km^2 and has a population of around 300 residents. Figure 4.1 shows the island directly north of Kirkwall on Mainland Orkney.

Figure: 4.1: Map of Orkney (BBC, 2006).

The island is covered with grass land and fairly flat apart from some gentle hills. At some of the coasts spectacular cliffs and beaches can be found. Shapinsay houses and hosts a large variety of wildlife: from colonies of domestic and migratory birds, to seals, shellfish and rare plant varieties, such as the European orchid.

The economy is primarily based on agriculture with the exception of a few small businesses that are largely tourism-related. There is one village on the island, Balfour, consisting of around 50 households, the elementary school, the community centre, the SDT office, the church, a café, a small supermarket and the ferry terminal.

From the ferry terminal the MS Shapinsay sails six times a day back and forth between Shapinsay and Mainland Orkney. Many of the population in the working age have jobs on Mainland Orkney and use

the ferry service for commuting. From Mainland Orkney journeys can be continued to other Orkney Islands or mainland Scotland.

Apart from the concentration of houses in the village, the population is very evenly distributed over the island. However, despite the population living spread out over the island, Shapinsay has a vibrant community with over 20 community groups and committees, organising activities from the yearly Horticultural Show and Picnic day to lunch club, badminton and yoga. The atmosphere on the island is peaceful, but also open and welcoming. People tend to greet each other when they pass on the roads.

Last decades Shapinsay has seen quite a significant change in the balance of its population. On the one hand, the sustainability of its community is threatened because many young people leave the island to follow higher education courses and pursue job opportunities outwit Shapinsay. With the industrialisation of agriculture farms scaled up and jobs in agriculture decreased, but limited other employment opportunities have replaced those jobs. On the other hand, Shapinsay has also seen a considerable influx of people from elsewhere in the UK that are attracted to island life and the natural beauty of the place. This immigration has reached an extent that the people who are born and brought up on Shapinsay are almost in the minority. The new residents are mostly people over 40. Resultantly, the population has two clippings: a lack of youngsters and a surplus of elderly.

Figure 4.2 gives an impression of the island of Shapinsay.

Figure: 4.2: Impression of the island of Shapinsay (Author's own). From top left to bottom left: Look on Balfour, farmland, Neolithic heritage site, multipurpose building community school and community centre, cliffs, and the ferry terminal.

4.1.2 Orkney and renewable energy

The wider Orkney archipelago comprises 70 islands. The eighteen of those that are inhabited are home to just over 20.000 people. Despite its modest population size, Orkney is playing a world leading role in adoption and development of renewables (OREF, 2015). In 2014 Orkney generated 104% of its electricity needs through renewable sources (ibid.). Located between the Atlantic and the North Sea, Orkney is blessed with some of the strongest wind, wave and tidal resources in Europe (ibid.). The Orcadians have embraced this potential with open arms. Besides housing the European Marine Energy Centre (EMEC), where seagoing technologies are developed, the county is at present home to approximately 500 domestic turbines, as well as several larger scale wind farms and 8 community-owned turbines (ibid.; Energy Archipelago, 2015). With 1 in 12 Orcadian households generating electricity from renewable sources, Orkney has the UK's highest share of households producing their own electricity and is seen as a pioneer in decentral energy generation (ibid.)

However, as a result of the high uptake of wind power, the limits of the capacity of its grid have been reached, leading to some turbines being switched off on windy days. Since 2009 this curtailment has been managed by the UK's first smart grid, using real-time Active Network Management to control the output of the turbines to match the available network capacity (ibid.). The restricted access is having a major impact upon the Orkney Islands' community projects. As Shapinsay's turbine's curtailment figures have been as high as 30-60% of the output, it is considerably limiting revenues. Currently, curtailment is identified by SDT as the biggest challenge for successful continuation of the project, because of the threat of solvency issues. A grid extension is at present not at the horizon.

As necessity is the mother of invention, the trusts within Orkney are working on innovative projects to make local use of the curtailed energy to limit the loss of the turbine's potential and secure a sufficient revenue stream to finance community projects and pay the bank loan. Currently, the Shapinsay Development Trust is leading a Local Energy Challenge Fund[11] demonstration project that will utilise the spare electricity from the turbine to produce synthetic diesel for local farm transport and urea for use for fertilizer[12]. Besides using the potential of the curtailed energy, this project aims

[11] The Local Energy Challenge Fund was launched by the Scottish Government to support a transition to a different approach to energy generation and consumption (Local Energy Scotland, 2015a). The Local Energy Challenge Fund provides grant and loan funding for major demonstration projects providing transformative and innovative local energy solutions (ibid.).

[12] This wind to agri-energy project will: "Utilise the spare electricity from the island by connecting a rapid response PEM electrolyser to the turbine (behind the meter) and operate this at times of curtailment. A Fischer-Tropsch (FT) reactor will also be used to produce synthetic diesel through combining stored hydrogen and CO_2 produced at a local distillery to produce diesel for use in island transport. The project will also combine N_2 from the air (using pressure swing absorption) and will combine this with H_2 to produce ammonia which can then be combined with additional CO_2 to produce urea (fertiliser) for use in farms throughout the islands." (Local Energy Scotland, 2015b)

to decrease the high costs of diesel and fertiliser resulting from shipping by producing them locally. If successful, this technology could generate a considerable income stream from diesel and fertiliser production. Furthermore, the technology could potentially be sold to other remote communities. With this project and the options for another energy production project being researched the trust hopes to ameliorate the negative effects of curtailment. Besides, these projects can generate an independent source of income that will last after the life time of the turbine to be able to keep providing the current services in the long term.

4.2 The project and addressed situation

This section outlines how the Shapinsay Development Trust evolved as a reaction on challenges that the island community is facing. Furthermore it introduces the project by sketching its development from the inception of the idea to develop a wind turbine to the moment that the first revenues were received.

4.2.1 The Shapinsay Development Trust and its objectives

By the nature of living in a small island community, access to and from the island creates extra expenses and is bound by ferry times. Therefore, not only travelling and commuting is more costly but also providing goods and services is more expensive as extra transport costs come on top of all prices. The transport costs together with the small population size make that provision of certain services and goods is unviable or put under pressure. Not only for residents and local entrepreneurs, but also for the local government. By lack of a sufficiently sized user group, it is not possible to run facilities such as a care home, a swimming pool or a public transport service on the island. The main facilities and services on the island are the church, the health centre, the community centre, a small grocer, a café, a tea room and the elementary school. Other services are less accessible as residents need to pass the water, and both have to pay the ferry and are bound to the ferry timetable.

To increase the opportunities for residents on Shapinsay, local volunteers organised themselves in thematic action groups and started to look into the options for mitigating some of the challenges of living in a small, rural island community by themselves.

These local action groups grew together to the Shapinsay Development Group (SDG), which was formed in 2002 as spin off of Highlands & Islands Enterprise's [13] (HIE) Initiative at the Edge project. Building on a long history of support in remote areas, HIE funded Community Development Officers

[13] HIE is the Scottish Government's economic and community development agency.

(CDOs) for several communities in Orkney that were classified as extremely vulnerable. The CDOs assisted those communities in developing and implementing plans for local growth. The initiative worked in partnership with local authorities and other public agencies, and involved close cooperation with the Orkney Council. The project should make the selected communities more resilient. A HIE officer explained by the time in an interview (Compute Scotland, 2010):

"[HIE] expects to see positive outcomes including increased income levels, population retention and growth, enhanced infrastructure, better local services and new income streams. Ideally, all communities should generate an income to sustain this process for themselves in the future. As a result of doing all this we would expect community confidence and accomplishments to grow."

Although, Shapinsay did not get classified as high risk community and did not get Initiative on the Edge support, it saw the approach as beneficial and started its own Development Group. Solely based on voluntary efforts, the group started to develop an own agenda for regeneration. Despite the fact that HIE did not fund staffing, it played an encouraging and supporting role in the development of the Trust.

In order to be able to apply for bigger funds and to have a main body to coordinate strategic development, in 2003 the Shapinsay Development Group incorporated itself as a charitable company limited by guarantee. Consequently, the trust registered with OSCR (Scottish charity regulator) and the Companies House, and has to abide charity as well as company law.

The objects of the SDT are centred on sustaining and enhancing the quality of life on Shapinsay in a broad sense, addressing environmental, economic, as well as social conditions on the island. The trust wishes to be 'the vehicle through which the islanders can collectively help to maintain and improve their lives on the beautiful, peaceful island of Shapinsay' (SDT, 2015). A director of the SRL adds:

"[What the organisation aims for] are very broad brush strokes. Things like ensuring the population is maintained or improved. You want people to choose to live here and you want folk to stay here. You want to make it that the folk who can live here – who can stand the constant wind and rain, who have the ability to make a living here – that they can, and do stay here."

To guide the trust in addressing the liveability on Shapinsay, the SDT has outlined the following objects in its founding document, the Memorandum of Association (SDT, 2011c):

"1) to provide in the interests of social welfare, facilities for recreation and other leisure time occupation available to the public at large in Shapinsay with a view to improving their conditions of life,

2) to advance education and in particular to promote opportunities for learning for the benefit of the general public,

3) to protect and/or preserve the environment for the benefit of the community and the general public,

4) to provide or assist in the provision of housing for people in necessitous circumstances within Shapinsay,

5) to relieve poverty particularly among the residents of the island of Shapinsay,

6) to promote Shapinsay trade and industry for the benefit of the community and the general public,

7) to promote, establish, operate and/or support other schemes and projects of a charitable nature for the benefit of the community of Shapinsay. "

In its early days the trust still consisted of different subgroups that looked into areas such as tourism, youth facilities, elderly care and transport. Each action group consisted of one director of the trust and several other volunteers. At that time the SDT was consisting of about 20 volunteers. Every group sourced funding for, and worked on, smaller community projects. Examples of projects were the signage for the signage for the local Neolithic heritage site 'Burroughston Broch developed by the tourism group, and the refurbishment of the children's play park by the youth action group. Especially the Play park project was an extensive, multi-year project with a value of around £25.000,- that was realised with grants from several funding bodies such as Children In Need, the Trusthouse Charitable Foundation and Orkney Islands Councils Community Development Fund (SDT, 2011b). Currently, the SDT does not have any subgroups as groups came to an end when projects ended and the tourism group decided to go on separate from the Trust.

4.2.2 History of the project

This section gives a historical overview of the development of the wind project and outlines the most important moments in the process towards the turbine.

2002

Opening of a policy and funding window of opportunity for community RE

Around the same time as many of the Orkney trusts were set up, the UK government introduced the Renewable Obligation support mechanism for renewable energy generation. As the 2002 scheme would support electricity production of renewable energy generators for 20 years, HIE identified renewable energy as a way to provide a stable, independent income stream. With for communities to finance their community development aspirations in the longer term. With the UK government promoting renewable energy generation through the Renewable Obligations Certificates (ROCs), communities would be ensured that the costs of a turbine project would be recovered and considerable financial gain could be made.

Besides the ROCs, communities could also source grant aid for the early stages of project development. Grants from HIE, CARES, but also the Big Lottery's scheme Growing Community Assets could help out communities financing early stage investments such as feasibility studies. This supportive policy and funding climate enabled communities to wholly-own projects without needing to collect, put in, and risk own capital. A director explains:

"There was financial gain to be made for relatively low impact. We knew Orkney being windy, it was low risk."

The financial climate was enabling, but developing a community project needs also significant technical, legal, financial and project management capacity from its volunteers. To better support communities in taking advantage of the favourable conditions, in 2002 HIE employees initiated a predecessor of Community Energy Scotland (CES), an independent charity aiming to support communities taking forward renewable energy projects.

2002

Inception

As Orkney is recognised as having one of the highest wind capacity factors in Europe, the Shapinsay Development Trust and other Orcadian community groups were encouraged by HIE, CES and the local government to investigate the options for a community-owned turbine on their islands.

After various meetings and public consultations, in 2007 the Shapinsay Development Trust decided to progress 'the vision to own a community wind turbine' (Sarjeant, 2014). A director explains:

"I have been quite rooted in the community and interested in how you can sustain small communities like this. […] I was quite keen to see Shapinsay taking a bit more ownership over its own destiny."

She adds that the turbine project was perceived as a chance to generate an independent source of income for the island to be used to develop the community:

"Without resources you can have as many committees and meetings as you want, but it is very difficult to achieve things. It is quite difficult to get funding, and since we set up the trust funding has become more and more difficult in this country because of the recession. Where else are you going to get in the region of £60.000,- a year for a community of 300 folk? […] And that is the things that allows the community to shape its own future. […] That helps the community not to stay where it is, but move a bit forward."

Having a community fund to mitigate the challenges of islands life was seen as a way to create financial autonomy to be able to prioritise and address community needs without being dependent on the goalposts of external funding bodies. Thus, while financially incentivised by the UK government's climate change agenda, Shapinsay's turbine scheme was first and foremost socio-economically motivated and promoted by Scottish government bodies through a community empowerment and regeneration discourse.

2003

Development peer-to-peer support network CPO

As the Shapinsay Development Group was not the only group in Orkney that was inspired by the Initiative at the Edge project, in 2003 HIE facilitated an Orkney community conference to increase the contacts between the groups. After the conference forums were established to enable groups to continue to network, exchange good practice and take forward issues of common concern. The development groups recognised that each area had own priorities and solutions, but also had many similar challenges.

Around the same time that Shapinsay Development Trust was looking into the options for having a community turbine also four other community groups from neighbouring islands

were working on comparable projects. As intensity of communication and sharing of information grew, the network between these five Development Trusts and CES became stronger. The five trusts and CES started to have joint meetings around technical as well as community engagement and governance issues. Once in a while also the Development Trust of Westray, that was already further in the process, joined in to give advice and share experiences. A staff member explains that having peer-to-peer support was very helpful:

"It is just having that back-up. Somebody that you can ask. […] Someone to bat ideas around." (Staff member SDT)

A SRL director illustrates the supportive function of the links with the other islands by telling that Shapinsay could employ the turbine manager of Rousay when they had a vacancy for the post:

"That was really good because you have that knowledge and expertise, and folk you can draw on. It is mutually supportive."

2008

A vote to get insight in public support

As the project was supposed to make a contribution to the development of Shapinsay, it was of uttermost importance to the organisation that the project had a community mandate before they fully committed themselves. In case of absence of such a support base, the project would not have been taken on further:

"We felt that it was really important to make sure the community really wanted it. That we weren't just thinking that it was going to be a good thing."(Director)

Therefore, in 2008 a vote to indicate public support for a community turbine was organised. The process around the poll took multiple weeks. Voting slips went out along with information about the project to every resident over 16. To ensure fairness and transparency, Voluntary Action Orkney (a local umbrella organisation for charitable organisations) collated the votes on behalf of SDT.

During the period that residents had to return the slips, a public meeting was held. Board members of the organisation presented information about the project and answered questions of the residents. By and large residents were positive, although there were concerns about the financial risk for the island in case the project would fail, the effects on wildlife, the noise and visual impact.

One resident, who lived very close to the site that was identified as most suitable for hosting the turbine, strongly objected during the questions and answers session on grounds of visual impact. He threatened to leave if the development of the turbine would go on. Dissatisfied with the response of the trust that there was no other, equally suitable location in terms of size, distance to existing built infrastructure and grid connection, he started a campaign against the turbine by putting up posters in the village showing a photomontage of the view on the future turbine from his house. He also put a petition in the local shop that residents could sign in support with him. The trust consciously decided not to react on the campaign as they found the resident was in his right to protest. They wanted to avoid inflaming the situation. A resident describes that the situation caused some friction and animosity in the community. She found it tough to decide what to do:

"If you don't sign, is it going to be held against you? Or do you put your name down and you're not interested in what is going on?"

The trust tried to sort out the issue, but the resident was violently against the turbine project. A director explains:

"We were as open as we could be. We gave him the opportunity to discuss it [with experts]. We went past him and said: 'These are the forms if you want to object'. […] It had to do a lot with Not In My Backyard. A lot of folks were quite in favour, but when they heard where it was going they did not want to have it there."

Despite the upheaval, the vote had a very high outturn and showed broad support, giving the organisation confidence to progress the project. 76% of the community residents over 16 returned their voting slips and 77% of them voted in favour.

However, immediately after the live announcement of the outcome of the poll on Radio Orkney, there was a second expression of strong local opposition. One of the directors of the trust was called by a resident and told in a rude manner that the development of the turbine 'had to be stopped' and the trust was 'ruining the island'. Although, never made into a formal complaint, this moment of opposition connects to a broader tension on Shapinsay around the desirability of development. Some residents are concerned about the nature of the development that the trust aims for. Often is not an outspoken complaint, but more of a subsurface tension. In particular some of the people who have

come to Shapinsay as a life-style decision to live in a rural, little village see the work of the trust, and especially the appearance of the turbine, as unwelcome change.

As the vote provided the SDT tangible evidence of being backed up by the majority of the population, the trust decided to take the turbine project on further. The openly objecting resident, supported by some of his friends and relatives, took his complaint on to the planning commission in an attempt to stop the project from getting planning permission.

Application planning permission

2008

In July 2008 the SDT applied for planning permission for the turbine. The project undertook various feasibility studies and Environmental Impact Assessment (EIA) (e.g. wind speed, noise and bird studies). The outcomes of these studies, and photomontages of the turbine from different angles and locations were subsequently made available for public consultation and displayed in Shapinsay's supermarket, and in the One Stop Shop in the Council Offices and at the library in Kirkwall. Parts of the EIA were also made available online on the SDT's website.

Besides the local resident whose property was neighbouring the site, the project had to face a number of postcard objections supporting the local objector. There were also some objectors from outwit Orkney who were in sympathy with the local objector, and some objectors from outside the region that were fundamentally opposed to turbines. There was also a late objection from the local airport, Highlands and Islands Airport Limited Kirkwall, on grounds that the turbine would cause interference with the airplanes' radio transmissions.

In November 2008 the planning decision was deferred pending further investigations, so that the validity of the photomontage of the resident and the claim of HIAL about the interference could be clarified.

HIAL withdrew its objection. The photomontage of the local resident was deemed inaccurate and his objection was dismissed. After a variation of the planning application, planning was granted in April 2010.

Unfortunately, the local objector and his wife followed through, and have subsequently left the island. This is experienced as a very negative event and an important part of the collective memory of the residents that have experienced the development of the turbine project.

2009

Grid offer

After planning permission was granted the SDT applied for a grid offer in June 2009. The grid offer was funded through CES. The date of this offer was an indication of the stacking order in the event of curtailment. The earlier the grid offer of the turbine, the less curtailed the installation is. As a result of the delay during the application for planning permission, the SDT was lower on the list and faces higher levels of curtailment.

Founding trading subsidiary SRL

In July 2009 the SDT set up its wholly-owned subsidiary, Shapinsay Renewables ltd. (SRL). SRL is listed at the Companies House as a Company Limited by Shares. It is the commercial arm of the organisation and operates the wind turbine. Its role is passing on as much of the generated profit as possible to SDT in the form of gift aid.

It was necessary to set up a trading subsidiary to comply with Charity Law and uphold SDT's charitable status. Having the division between SDT and SRL allows the community group to operate the turbine on a commercial basis -enabling it to make profit, be VAT registered, and to account for its trading activities - separately from the SDT and its charitable objectives.

Unlike many European countries where the cooperative structure dominates, this combination of a charitable organisation and a wholly-owned trust is the most common legal structure among community wind projects in Scotland (Energy Archipelago, 2015). At the Orkney Islands many trusts adopted this structure to the example of earlier community wind projects in Tiree and Gigha that were also funded with Big Lottery grants.

Furthermore, a CES project development officer adds that especially in small communities, in which everybody knows each other, the legal structure of a trust with a wholly-owned trading subsidiary gives the community groups a way to be beyond reproach:

"You are able to say: 'Nobody is going to have a penny in their pockets. This is going to be wider than wide. […] There is nobody going to profit personally."

He explains that there is an actual conservatism in small communities about power and the trust structure avoids a division in the community between ones with shares and ones without.

However, a split in the organisation leads to a need for clear defined lines of communication between a trust and its trading subsidiary. To enhance sharing information within the organisation and give the SDT 'the comfort that the Company [SRL] was acting in the best interests of the Holding Company [SDT]', the SRL has two members of the SDT board on its board (Sarjeant, 2014, p.3).

Still, the structure with two boards that are part of one organisation, and yet have very distinct tasks, can, and has, caused friction and governance challenges within the organisation.

2009 *Big Lottery application and establishing Community Power Orkney*

In 2009 the network of the five Orcadian Development Trusts groups and CES decided to apply for Big Lottery Funding to help financing the turbines. As the Lottery tends to try distribute the money more or less evenly over the country, it would be hard for 5 five neighbouring groups with comparable projects to all get their funding. The Orcadian trusts felt that progressing their funding request as a consortium of five would strengthen their position and make it harder for the Lottery to refuse any of the groups. Therefore, they formally established their network as Community Power Orkney and applied as one. As the groups wanted to avoid an extra layer of bureaucracy, CPO is unincorporated and based on a memorandum of understanding.

The joint application turned out successful and in 2009 the Orcadian trusts got all together nearly £2,5 million from the Big Lottery. SDT was awarded £435.000, of which £35.000,- for project management and £400.000,- towards the turbine itself.

2011 *Financial close*

Originally, the trust planned to finance a major part of the turbine project through the Big Lottery grant. However, during the process the rules regarding the European Union's State Aid changed. This made it impossible to use the Lottery money as capital funding for the turbine. Due to the EU state-aid regulations, a recipient who receives over €200.000,- of funding in 3 years would not be able to receive a Feed-in-Tariff for generated electricity.

Consequently, SDT had to look at another financial construction. After consultation with the Lottery, it was agreed that the SDT could use the money towards realising the outcomes of its development plan. The change in the subsidy system increased the bank loan considerably.

To prove the bank that the project was viable and the trust would be capable of repaying the loan, they had to go through due diligence. As part of this process 116 financial and legal documents had to be provided to satisfy the bank (Sarjeant, 2014). A director describes the process:

"We had lawyers and the bank had lawyers. It is basically each bit of paper is signed in the right way and says the right thing, [so that] […] you had proof that you were what you said and you could do what you said."

Once all the documentation was in place and the bank was satisfied with the equity, due diligence and contractors agreements the project could be funded through the loan. Finally, in June 2011 the project reached financial close.

2011

Leases of the land

The SDT had to negotiate leases with three landowners in August 2011. Two of them own the turbine site and one of them owns the access track. The three get a yearly rent payment and a percentage of the profit. It is the feeling in the community that these agreements have resulted from a fair and legally binding process, but agreed payments are not proportional to the value of the land. A resident states:

"All the people at the sharp end are getting the best deal. […] I have heard people who own the site and the track [together] get £50.000,- a year. And if it would have been my track, I would not have complained either!"

Another resident says that she would not take so much money away from the community:

"Being honest, if I was in the landowners' situation, I would be rubbing my hands together, but I think eventually I would have a conscience."

Overall, it is recognised that there are two sides to the leases. One the one hand, they generate an extra income for some residents on the island. On the other hand, it is felt that the community could benefit much more if the lease payments would be more modest.

2011

Arrival and erection of the turbine

The Enercon 44 turbine arrived in August 2011 on a barge from Germany. A director tells enthusiastically that it was quite a community event:

"Loads of folks came down to watch it coming off the barge. […] Half the island was down at the pier. There was a tremendous buzz."

The arrival of the turbine is the most important part of the collective memory of the turbine project among the residents that were on Shapinsay during project development. Many residents are proud that fellow community members could realise such a significant project. After initial concerns about the risk for the island some remained opposed to the project, but many people tell that they were enthused and excited about the outcomes that the turbine could bring.

Commissioning of the turbine

The turbine was commissioned and started generating in October 2011.

2012

First revenues from the turbine handed over to the SDT

The first gift aid payment by SRL of £10.000,- took place in June 2012. Later in August of that year the SRL could hand over another £40.000,-.

The allocation of the revenues is based on the most recent Community Development Plan, but projects are also consulted through public meetings, and the SDT's monthly newsletter, before they are implemented.

After the development process the SDT kept committed to keep the community involved in the turbine project. The commissioning of the turbine project was celebrated with a time capsule project to make it a memorable event. Children, community groups, and everybody who wished to do so could put something in a time capsule that would be buried at the turbine site and dug up in 20 years when the turbine is going to be decommissioned. Also a community garden was installed, but unfortunately, for reasons of Health and Safety regulation, the garden had to be removed again.

Finally, to make sure that the revenue allocation is in the best interest of the residents of Shapinsay the SDT keeps close contact with the community by organising user groups of its services, public meetings about topics of interest, and distributes a newsletter. Furthermore, the SDT is also on Facebook and has an own website that is used for announcements. It is noteworthy that all meetings, including the Annual General meeting, are open to members and non-members.

4.3 Conclusion

This chapter outlined the history and the context of the project, and introduced the Shapinsay Development Trust and its goals. Looking at the history and context of the project, the process of realising the project can be described as highly open, transparent and participatory as the organisation let the decision to take the project forward depend on community mandate. The openness also showed in offering room for opposition. Furthermore, also at present the organisation seeks connection with the community through a wide variety of communication media and meetings. Contextual factors that were identified as relevant are Orkney's status as forerunner in renewable energy development, Shapinsay's changing demographic, broad external support from organisation such as HIE, and the curtailment.

Chapter 5. Identification of impact pathways in Shapinsay

to assess the social impacts of community RE projects

This chapter discusses the findings related to the last three steps of Vogel's approach to impact pathway analysis, namely creating an overview of the key social impacts; making explicit the assumptions about how these changes have occurred; and finally, representation of the pathways to change in a logic model. The first section gives an overview of the findings of the fieldwork, the second section gives a narrative description of the key findings in the case of Shapinsay, and the final section concludes the chapter with a logic model including the key relationships that come forward from the narrative description.

5.1 Overview of findings fieldwork

This section will give a short overview of the results of the fieldwork and outlines the identified key social impacts of Shapinsay's turbine project. The findings of the focus groups and exploratory survey interviews will be discussed subsequently. Findings of the interviews are not summarised separately, but have also been used to identify the key social impacts and intermediating processes.

The focus groups

One focus group with community members and a second with the organisation have been held to get insight in key social impacts. After identifying key impacts so called stories of change were created by participants to get a better understanding of the factors that have contributed to the key impacts.

During both impact pathway analysis focus groups, a multitude of positive and negative outcomes have been identified. The participants got an introduction in systems thinking, but did not get an introduction in impact pathway analysis. So strictly speaking not all of the identified outcomes are outcomes according to the working definition of outcome in this research: intentional and unintentional results that occur in the community as a consequence of the project's activities or outputs.

However, this was found rather enriching as the participants' selection of outcomes pointed out that some activities are directly resulting in outcomes. The basic logic model used within impact pathway analysis assumes that inputs to lead to activities, activities to outputs, and outputs to outcomes. Yet, it was observed that not only outputs, such as the turbine and the provided services, but also activities can have direct outcomes. To give an example, equitability of service provision can have a direct influence on the social cohesion by creating tensions between community members and the

organisation. This finding has led to a revision of the conceptual model by including an arrow representing a direct relation between activities and outcomes.

During the focus groups social outcomes were put up on posters by the participants and were regrouped by the mediators into categories of similar or related outcomes. Table 5.1 gives an overview of the outcomes that were identified during the focus groups.

Table 5.1: Social impacts mentioned during the focus groups with the community and the SRL board

Positive outcomes	**Negative outcomes**
- Development of new skills and knowledge/ capacity building - Local employment - Carbon savings - Awareness and attitudes towards RE - Inter/cross island knowledge exchange - Increasing island profile - Potential to use more electricity that is wasted to provide additional services - Empowerment - The community buss and its flow on effects - Access to SWAP funding and potential extra match funding - The Out-of-Hours boat service and its flow on effects	- Division on the question whether or not to have a wind turbine - False expectations revenues and service provision - Unequitable provision of services - Division on the siting of the turbine - Landscape effects - Division allocation of revenues and perception of lacking decision making power

After identifying the social impacts of the project, the participants were asked to indicate which outcomes they saw as key outcomes by allocating votes. Table 5.2 shows that the prioritisation of impacts is strikingly similar between the organisation and the wider community.

Table 5.2: Identification of key impacts by the community members and the organisation	
Participants CORE group	**Participants community**
- The Out-of-Hours boat service and its knock on effects (+) - Access to SWAP fund and attracting extra (match) funding (+) - Development of skills and knowledge (+) - Division in the community on revenue allocation (-) - Community empowerment (+) - Negative public perception of the organisation (-)	- The Out-of-Hours boat service and its knock on effects (+) - Access to SWAP fund and attracting extra (match) funding (+) - Development of skills and knowledge (+) - Division in the community on revenue allocation and perception of lacking decision making power (-) - Local employment (+) - Division on siting of the turbine (-)

Exploratory survey

Analysis of the survey showed that a remarkably low number of 13 out of 33 respondents feels involved in the Trust. This finding is somewhat paradoxical as many indicate to use the provided services. It was found that besides showing out a real absence of any involvement with the organisation, these findings also indicate that people were reticent to call themselves involved unless they had a function as board or staff member. Consequently, the question about involvement is reformulated in the final methodology. Asked is whether respondents are aware of the services that are provided and how they can access these. This level of involvement was found to be a major intermediating factor on many different outcomes as that such an awareness seemed to affect both usage of the services and the public image of the organisation.

Furthermore, the survey shows that the flow on effects of the Out-of-Hours boat service, the community bus, and the newsletter are seen as the key outcomes among the respondents. Many respondents are not aware that the trust also provides the Shapinsay's Way Ahead Programme (SWAP) fund and the Here-to-Help support for elderly. Residents did not refer to the electric vehicle, which might be related to its temporary absence during the fieldwork.

The finding that the key social impacts on the wider community were for the major part related to the outputs and activities was used to structure the final survey around the concrete outcomes of projects and create questions about key activities such as the decision making process, public engagement and the organisation's internal governance. The statistical correlation between the different indicators of these activities and the satisfaction with these processes during future research systematically be

assessed to further determine whether and what kind of relationship is existing between activities and outcomes.

Additionally, the survey shows that a large majority of the respondents is either not involved or content with the work of the trust at present and in the past. If asked for what the trust could have done differently, most residents do not have suggestions. A few participants indicate that the negotiation of the leases of the site, transparency of revenue allocation, choice for the site, and dealing with the main objector could have been handled better. For the present way the project is run also little suggestions for improvement are made. More decision-making power for the community regarding revenue allocation and close cooperation with other islands are suggested.

Besides, the survey shows that the development phase of the project had no large social impact on the wider community. Mainly three moments during the development process are part of the collective memory of the community members: the initial vote to test public support, the campaign and subsequent departure of the main objector, and the arrival of the turbine. Later in this chapter will be elaborated more on the social impact of these events. The development process has been neither dividing nor uniting, meaning that the Trust has managed fears, doubts and division in a way that did not have long term negative effects. As a result of the limited number of participants in the project, there is also no general uniting influence visible.

Finally, a last important finding is that the survey confirms that there is quite a large influx of new community members. Almost a third of the participants indicated that they were not living on Shapinsay during the development of the project.

Overview of key impacts

Analysis of the focus group data, survey and the interviews with impact pathway analysis pointed out that the project most strongly affects the service level in the community, internal and external accessibility, employment, capacity building and empowerment, social cohesion, and the appreciation of the living environment. Effects on public support for RE, and other environmental attitudes and behaviour were only incidentally found. The next section will give a narrative description of the key impacts and is based on community members' mental models of which inputs, activities, outputs, and external factors led to these outcomes.

5.2 Narrative description of key impacts

This section is based on impact pathway analysis of the focus group and the interview data. The key outcomes are discussed in decreasing order of importance. After this section, the chapter will be concluded with a summarisation these stories of change in a logic model.

5.2.1 Increased service level

The main outcome that was identified by community members was an increased level of services. Having a higher service level, and being able to enjoy the many knock on effects of these services, was seen as the most important and most positive result of the work of the Trust. The SDT subcontracts an Out-of-Hours ferry service and provides a community bus service, an electric vehicle and a newsletter. Furthermore, it supports a commercial party's Here-to-Help support for elderly. The services and their flow on effects will be discussed more extensively in the remainder of the section.

5.2.2 Accessibility

Inherent to the island nature of the community, the relative isolation has been identified as one of the main threats to sustaining the population of Shapinsay.

The population is too small to have a regular public transport service on the island. So residents without a car or the ability to drive were compromised in their mobility. Especially for the elderly the lack of taxi or public transport services was constraining mobility.

Furthermore, also the access to Mainland Orkney in the early morning and the evening hours was very limited as the last regular ferry service from Kirkwall back to Shapinsay leaves on weekdays at 17.30 and during the weekend at 19.45. People who returned later after for instance holidays, a visit to the hospital, or an evening shift had to stay overnight in Kirkwall to take the first morning ferry to Shapinsay. A private charter was available to residents. However, to make the service viable for the provider, this ferry had to be paid per crossing, not per user. Coming at the price of £60,- for a passage, the charter was not attractive for individuals and was only used for group transport on special occasions. Accordingly, there was a considerable threshold for undertaking evening activities. Residents describe how they felt by times 'stuck' on the island or on Mainland Orkney and stopped them from undertaking activities reaching from following evening trainings on the Mainland, to participating in evening meetings or just having a night out at the night club or cinema.

Therefore, transport was a main priority for the trust. First trialled with a Big Lottery grant and now financed by the revenues of the turbine, the trust provides an Out-of-Hours boat service, a community bus service and an electric vehicle to increase on and off island mobility. As transport enables people

to reach a multitude of destinations, these services induce many other social impacts. The impacts of the transport services is outlined per transport service. The Out-of-Hours boat service, the community bus service and the electric vehicle are subsequently discussed.

The Out-of-Hours boat service

Especially, the Out-of-Hours (OOH) boat service is highly valued by the community members. In the interviews, survey and focus groups, the OOH was by far identified as the main impact of the project. Last year almost 1200 fares were subsidised for a user group of about 40% of the population. A staff member explains that residents have become reliant on the service and that the trust would have 'a revolt' on its hands when the service would be taken away. When the OOH boat was temporarily out of service for a repair, a high number of complaints about its absence and requests for a replacement showed the appreciation for the service.

To avoid harming local employment, the existing charter has been subcontracted by the Trust. It is still operated on basis of demand and sailing only in case bookings are made. A drastic change in its affordability is that, because of the subsidy of the Trust instead of £60,- for a crossing, people now pay £7,- per person. The Out-of-Hours boat sails twice a night back and forth between Balfour and Kirkwall after the last regular boat. With a late boat back to Shapinsay at 22.30, the OOH leaves plenty space for evening activities. Furthermore, the 7AM early morning service enables people to get off the island early, which enables residents amongst others to get morning flights or go to off island morning sports competitions. Figure 5.1 shows the outcomes of the OOH service.

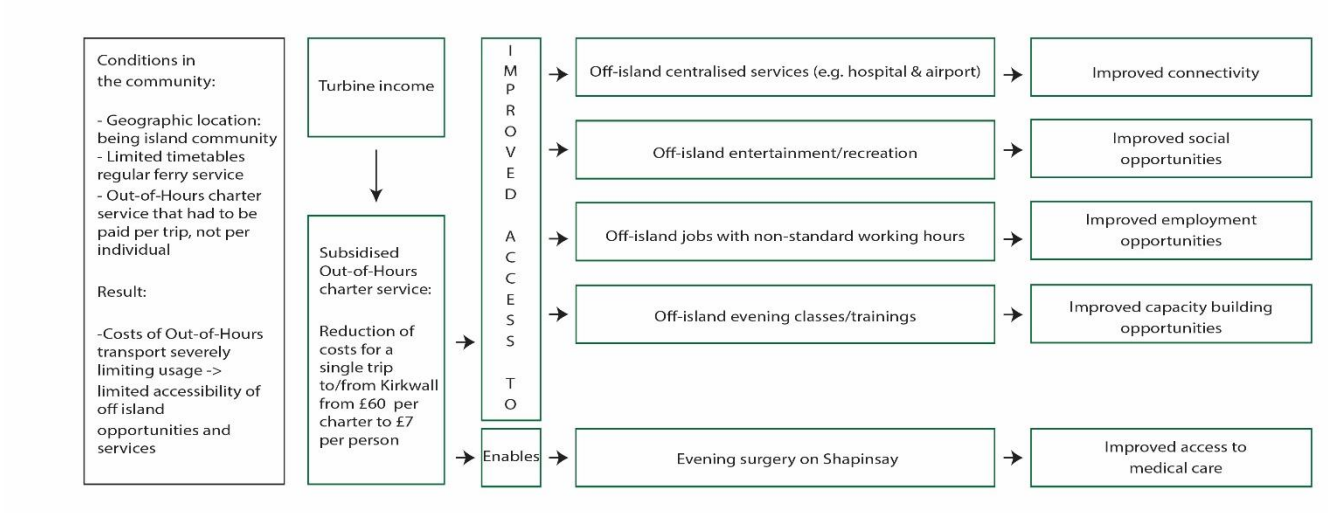

Figure 5.1: The impacts of the OOH service (source author's own).

During the focus group community members identified the main flow on effects of increased off-island accessibility. First, participants described how the OOH service has improved connectivity to off-island centralised services such as the airport and the hospital. Second, they stated that the service has

improved access to off-island entertainment and recreation. Third, it was appreciated how the cheaper evening passages enable residents to have non-standard working hours without having to spend the night outwit Shapinsay. Finally, the OOH has made it easier and cheaper to follow off-island evening classes and other trainings. All these opportunities are more accessible now, because having the OOH enables people to pursue these activities without having to pay high ferry costs or finding accommodation for overnight stay. Furthermore, participants also described that the OOH enables Shapinsay to keep its evening surgeries, because the doctors can use the OOH to return to Mainland Orkney after surgery hours.

The community bus

Although, used by a smaller part of Shapinsay's residents, the buss is seen as the second most important service that the SDT provides. Last year the buss has been used for transporting 900 passengers, serving a user group of around 15% of the islanders.

The weekly lunch club for the elderly used to have an own mini-bus, but when this vehicle needed to be replaced, the Trust had funding to buy a vehicle that could be used by all residents. The bus can be driven by a volunteer driver or a paid driver from the trust. Unless, needed for an entire day residents can use the bus without charge. Especially the elderly benefit from the service as the bus is a disabled mini-bus and has facilities such as a lift to get on board in a wheelchair. Next to the elderly's lunch club, the bus is mainly used for funerals, doctor's surgeries, community events, and off-island community group outings. Figure 5.2 gives an overview of the outcomes of the buss service.

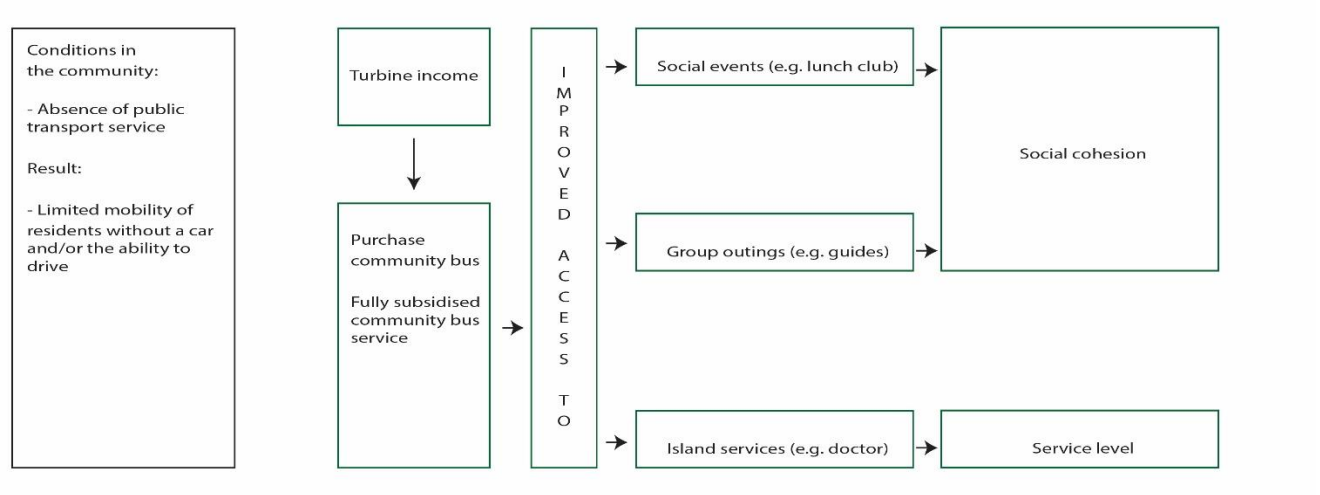

Figure 5.2: The impacts of the community bus service (source author's own).

Electric vehicle

After having a temporary electric vehicle (EV) that was financed through the CARES Infrastructure and Innovation fund, the Trust decided to continue the service and lease an electric vehicle from the turbine revenues. As there are no vehicles for rent on the island, the electric vehicle comes in handy for people who do not own a car or need a temporary replacement. Furthermore, many people tested the vehicle out of curiosity what is like to drive an EV. So in this sense the vehicle makes a contribution to familiarising people with alternative, low-carbon transport options.

The old electric vehicle was used 300 times in one year and had a user group of around 15% of the island. The EV can be used without charge and is seen as a more affordable alternative to renting a car or taking a taxing on Mainland Orkney.

5.2.3 Employment

In the surveys, focus groups and interviews creating local employment is identified both as a main motivation behind the project and as a main benefit A director explains that the trust realised that it probably were not going to be many full time jobs, but a few part-time positions that would make a little difference. Even more so, because people on Shapinsay regularly combine multiple part-time jobs to make a living and the organisation creates high skill level employment.

This research looks at direct and indirect employment generation. Direct employment is defined as the 'direct operational jobs' that the project creates and indirect employment is understood as the jobs that are 'created elsewhere in the local economy' as a result of the CORE project (Chadwick, 2002, p.19). However, the assessment of indirect employment is limited to direct subcontracting of local individuals on a longer term basis. Thus, the assessment does not look into the temporary contribution to employment at the time of the installation of the turbine or local economic multiplier effects[14].

In terms of direct employment the SDT has 3 staff members of who 2 are currently funded through a Big Lottery grant. These three positions include a service manager, an admin and finance officer, and an admin and transport officer. Two of the positions are part-time and one is full-time. Furthermore, the SRL employs 2 turbine responders, who take care of responding to faults and basic maintenance of the turbine. They are paid a retainer fee for availability and a compensation per hour for work on the turbine. The SRL also employs a part-time turbine manager who coordinates the work of the turbine responders and does the administration for the trading subsidiary.

[14] Induced effects on employment by local spending of wages (e.g. support of employment at the local shop, because employed staff spends part of its salary locally).

In addition, the project creates indirect employment, because the revenues of the turbine are used to subcontract the skipper of the Out-of-Hours ferry. As a result of the subsidy of the SDT, he has seen an increase in average usage from a couple of fares a week to around 100 fares a month.

In total the project contributes to the employment of 6 residents of Shapinsay[15], which makes the organisation besides the Council and the owners of the castle one of the main employers on the island.

5.2.4 Capacity building and empowerment

Also capacity building was both during the interviews and during focus groups with the community members and the organisation identified as key impact of the project. It was clearly visible that capacity building mainly takes two forms on Shapinsay: development of skills and knowledge related to the project by members of the CORE group, and development of vocational and educational skills by community recipients of SWAP funding for training.

During the fieldwork was also looked for a development of knowledge about RE and environmentally friendly behaviour, but this effect was not found among members of the community of Shapinsay. Only a very small number of people referred to knowledge about RE and environmentally friendly behaviour that they had obtained from the newsletter. This is a logic consequence of the fact that the CORE group saw the project as an opportunity to create revenues for community development. The project did not grow in any way from a wish within the community to contribute to a wider energy transition or general sustainability.

Based on these observations, capacity building is defined within this research as 'developing the capacity and skills of the members of a community in such a way that they are better able to identify and help meet their needs and to participate more fully in society' (Charity Commission in Craig, 2007, p.343). Capacity building can involve utilising and further developing existing skills, and equipping people with competencies and skills that they would not otherwise have (ibid.). This definition of capacity building is chosen as it describes development of personal capacity as enabling people to take more ownership of their lives as individual but also as citizen, stressing the value of capacity building for community development.

The enabling effect of capacity building is described by Craig as 'empowerment' (2007, p. 344). It is understood in this research as an increase of 'people's ability to take responsibility for identifying and meeting their own and other people's needs' (ibid.).

[15] The positions of admin and finance officer and turbine manager are filled in by the same person.

This section first outlines the capacity building within the organisation and subsequently the capacity building in wider community.

Capacity building within the CORE group

A considerable amount of capacity was developed by the members of the boards of the SDT during the project development phase. Many board members had pre-existing skills from participation in other community organisations and committees, or had basic understanding in other areas that was useful for project development, such as knowledge of financial contracts and other legalities from present or past jobs. Strengths within the board were used where it came in handy, and by times also advice from other community members with a particular expertise was taken in. However, none of the board members or community members had experiences with development of a project with a value of nearly £2.000.000,-. During interviews and the focus group with the organisation was found that development of skills and knowledge has taken place in a wide variety of fields. The following fields have been identified: Management and governance skills, funding allocation, business administration, ICT, legalities, accounting, renewable energy (RE) technology, planning, public engagement, project management and interpersonal skills.

The board members that have been involved in the project development nuance the extent of capacity building by pointing out that all of them acquired skills, but it were mainly the chair and the Community Development Officer who learnt most as they were most active in getting all arrangements in place to progress the project. However, whereas the main development of skills and knowledge in fields such as law, planning and finance was acquired by a limited number of people on the board, directors describe that all board members gained through their involvement an 'awareness' of the steps that need to be taken and the elements that need to be in place. They point out that they developed a capacity to judge advice in many of the identified fields, which has helped them during their current work. The directors stress that through a voluntary role many skills that are transferable to the job market can be developed. An example is one of the former treasurers of the board who further developed accounting skills from her previous job and now has a paid position with the organisation as admin and finance officer and turbine manager. Another example is the knowledge of charity law that one of the directors acquired and can use for his work at a public sector organisation.

Furthermore, going through the project is seen by some of the directors as a character forming process. Directors agree that they approach things in their personal lives differently, because of experiences gained in the process leading up to the turbine. Having contributed to such a significant

project and seeing it operational after taking many hurdles on the way, makes the involved directors feel proud and more able to successfully overcome other challenges in their lives.

In the wider community a sense of ownership of the turbine and pride was found, but the respondents did not feel empowered to undertake actions that they did not find themselves capable of before. However, on the community level an empowering effect was seen in the enthusiasm for the possible solutions for curtailment that the SDT is working on. Community residents seem to have developed an increased trust in the ability of the organisation to further innovative, high-tech, high value projects. So although no effect on the perception of own capabilities of community residents was visible, there is a feeling among some of the community members that through the SDT the community developed a capacity to give more direction to its own future.

This development of project related skills and knowledge expands to the current boards as background knowledge of the project is required for leading the organisation. The skill development is in a narrower field and concerns mainly development of governance, general communication and public engagement skills. Also among the current board members empowerment is visible, as the fact that the organisation has delivered the turbine has built a confidence that the organisation is capable of taking on more innovative projects to make use of curtailed energy.

Capacity building in the community

In addition the organisation aims to build capacity among the wider community of Shapinsay by allocating a part of the revenues to Shapinsay's Way Ahead Programme (SWAP). Education and other training is one of the main purposes that this fund supports. From 2012 until know the following trainings have been supported: 3 Health and Hygiene certificates; 5 pesticide trainings; 1 postgraduate diploma; and 1 undergraduate diploma. As far 10 individuals received training.

5.2.5 Social cohesion

In neither the interviews, nor the survey or focus groups strong effects on community members' private networks of relationships were found. Nevertheless, the fieldwork shows important effects on the social cohesion within the community on a number of other levels.

To be able to see social cohesion from a wider perspective, it is defined in this research as the 'willingness of people in a society to cooperate with each other in the diversity of collective enterprises that members of a society must do in order to survive and prosper' (Stanley, 2003, p.8). This definition is chosen as starting point, because the reference to the 'diversity of collective enterprises' enables to split the concept up in different levels of cooperation. A willingness to cooperate can be found in the private social networks between people in a community. However, willingness to cooperate also

translates to cooperation at the organisational level of the CORE project group, cooperation between the organisation and the community, and the cooperation between community organisations. Any cooperation can be an indicator of social cohesion in a community as long as it influences its social fabric.

This section will subsequently assess the effect of the turbine project on the private networks among residents, the relationship between the community and the organisation, cooperation within the organisation and the effect on the network between civil society organisations in Shapinsay.

Private networks between community members

The results of the interviews, survey and focus groups do not show a big effect on the social cohesion between individuals in the community. When asked for outcomes of the project, an increase or decrease in the interconnectedness of community members was hardly ever directly identified. Nevertheless, the project did make many smaller changes that people connected to their relationship with other community members. It was found that the project simultaneously has uniting and dividing effects. Both effects are discussed subsequently in this section.

Division

Any significant, longer term divisive effect of the project on relationships between community members was not found. Only in the exceptional case of the resident that left the island personal relationships between community members got permanently damaged. Community members describe that the project caused at certain moments division, disagreements and even animosity, but that the concerns were in general defined as comparable to 'talking about the weather' or 'making a storm in a teacup', and dissolved for the major part soon after the more contentious moments such as the siting meeting. The more detailed data from the community focus group indicates that the open and fair way in which the SDT dealt with conflict helped to avoid escalation of disagreements among community members, and between community members and the SDT. Community members also stated during the focus group that the division was minimalized by a fairly extensive engagement process, keeping the community up to date and understanding the decisions made. Frequency and accessibility of information provision, as well as expectation management were found to be the most important factors determining the quality of public engagement. Furthermore, the way in which the organisation stayed out of the public discussion about the project and gave room for protest was an appreciated component of the public engagement style of the SDT. Also the decision making power given to the community by organising a vote on the decision to take the project forward, helped to keep ill feelings limited and increased trust and ownership.

Also concerning the allocation of revenues, the differences of opinion have no dividing character in the community of Shapinsay. Some people are disappointed, because services do not meet their initial expectations or they thought that money could be better spent elsewise. However, any feelings of disappointment or disagreement are mainly silent, subsurface complaints that the organisation tends to hear only second hand. Disagreements about revenue allocation were found to have by times a negative influence on the public perception of the organisation, but do not affect personal relationships between people in the community.

Increased cohesion

A positive effect on the overall network between individual community members is limited, but present on Shapinsay. The limited extent of the positive effect on private networks between community members can be explained by the fact that Shapinsay had a rather vibrant community life already prior to the project. Increasing social cohesion was never a main objective.

However, the community bus and the electric car service make a considerable contribution to the social cohesion on the island for some groups. Especially the community bus, as it enables less mobile elderly to come together for the weekly lunch club. Furthermore, the vehicles stimulate the social network in the community, because they are increasingly used by community groups and the school to go on excursions outside Shapinsay.

Also the newsletter is found to affect social cohesion. The newsletter influences both the actual participation in community life as well as the perception of belonging to the community. Despite residents stated that the newsletter can be slightly complicated for people with no background knowledge in RE and has a quite formal way of presenting information, community members still appreciate the service. Many respondents commented during the survey and interviews that they feel more connected to the community as the newsletter offers an easy way to stay informed about what is going on. It is seen as a plus that the monthly newsletter includes both news about the turbine project and the wider community. Also other community organisations such as the school and the Community Council can make announcements. These announcements range from social happenings to grass cutting and road maintenance.

Relation between the community and the organisation

At present the Shapinsay Development Trust has 56 members, representing 30 of the approximately 130 households on the island. Also the active participation in the organisation is considerable with around 25 people attending the last AGM and some others joining public meetings about amongst others solutions to curtailment.

The Shapinsay's Way Ahead Programme (SWAP) fund that the SDT makes available for applications of community organisations and individuals is indicated by the organisation to be instrumental in creating a positive public perception of the project among community members. The fund with a yearly budget of around £8.000,- is created to help financing smaller projects of community organisations and individual residents. Amongst others, SWAP funding has been used to pay for replacement of the church seating, new blinds for the community centre and trainings. However, it has to be recognised that this influence is currently quite limited, because few of the surveyed respondents know about its existence and the purposes that can be supported.

In line with this, a seemingly trivial but highly valuable insight provided by a director was that there is an important relation between awareness and general social impact. If community members are not aware of the organisation and its work, they cannot be affected. Thus, it is important that community members engage at least to the extent that they have an understanding of what is and can be provided. It is stressed that good communication is central to achieve a well-informed community. As mentioned before main indicators of the quality of public engagement are found to be the frequency and accessibility of information provision, as well as expectation management.

With respect to this awareness the survey showed that the profile of the SDT is rather low at the moment. The organisation recognises the low profile and has identified the need to have short-term projects along with the long-term projects. Also providing small assistance to more groups and individuals and celebrating successes are seen as ways to get the community more involved in the project. A higher profile within the community is also identified as a way to attract more new volunteers for the boards.

The low profile was not visible during the focus group session with community members, but this session has a certain self-selection bias and attracted predominantly residents that were more interested in the project. The majority of the participants were or had been SDT volunteers. Thus, by combining focus groups and an exploratory survey, the research aimed to get both a good cross section of the population, and more detailed information about impacts what has contributed to them.

Network of community members within CORE group

Although, the structure with two boards has caused friction and governance challenges within the organisation, the SRL and SDT have been able to solve past disagreements about distribution of decision making power and sharing of financial information. Conflicts have always been managed within the organisation, which avoided a negative impact on the wider community.

In terms of the organisational network the project involves 2 boards including 9 voluntary directors, 5 staff members and a hand full of voluntary drivers for the community bus. Overall, around 20 of the about 300 people on the island are participating in the organisation. If only volunteers are taken into account the around 15 volunteers still represent 5% of the population of the island, which is a significant participation.

Network between civil society organisations

The Trust wants to ensure being well-rooted in the community and staying well informed about what is going on. Therefore, the SDT aims to have a representative of each of the three major civil society organisation on the island on its board: The Community Association[16], the Community Council and the Heritage Association.

However, in a small community people who are active in civil society organisations often already have roles within multiple organisations and/or go from one organisation to the other. The limited pool to draw volunteers from, together with a certain extent of volunteer fatigue, makes it hard to find new board members, let alone members to take on a double role. Consequently, only the Community Council currently has a representative on the Trust board.

It is found to be a shame that no representative of the other organisations could be found as mutual cooperation is experienced to be beneficial for both organisations. Especially, when it comes to grant applications that the Community Council cannot fund, the cooperation with the SDT comes in handy according to a Community Council member. The representative of the SDT cannot give decisive answers, but can give an indication of whether it is possible to get support from the Trust. The contact with the Community Association and the Heritage Association is at the moment limited to consultation on topics that give direct cause for contact.

Thus, despite that the Trust is not as well connected with other major community organisations as it wishes, SDT still makes a contribution to strengthening cooperation between community organisations on Shapinsay.

5.2.6 Environmental impact

The fieldwork has shown that the turbine has only a limited effect on the appreciation of the living environment.

[16] Umbrella organisation of all local clubs and committees.

Traditionally, within Environmental Impact Assessment, impacts are defined as the 'impacts of planned activity on the environment' (Glasson et al., 2011, p.x). This research assesses the social component of environmental impact and evaluates the turbine's impacts on the physical environment as perceived by community members. Environmental impacts can simultaneously be social impacts, because people depend on their environments, and are attached to places and their natural and landscape values (Vanclay et al., 2015, p.3).

Even if impacts are perceived in a sense that they are non-existent, they are still understood as environmental impacts. An example of such an impact would be a concern about birds getting caught by the blades of the turbine while such an effect is actually not there. Such concerns can like all worries, fears and anxieties, have an actual effect on peoples' satisfaction with their living environment or even well-being, and should therefore not be dismissed (ibid.).

Despite the fact that Orkney is widely known for the natural beauty of its landscape, no strong negative landscape effect could be found. For many people that were surveyed the turbine was neither a positive nor a negative change. Some residents described that after initial concerns or excitement, the turbine became 'part of the landscape'. Many state that it is 'just there'.

Some people find the turbine not particularly beautiful, but are also not disturbed by its view. Multiple times it has been argued that the turbine is less of a disturbance than other infrastructure on the island, such as the electricity lines.

Furthermore, a few people who do not like its sight are still moderately positive about having the wind turbine as they see it as a necessary trade off to be made for more sustainable energy generation.

A minority of the respondents does find the turbine a significant disturbance of the island's natural beauty. Some residents have the feeling that Shapinsay and Orkney have reached a turbine saturation point. Also some of the residents that are positive about wind energy in general agree. They feel like the number of turbines in the region should stay in proportion to other elements in the surroundings to avoid major changes in the character of the landscape. A resident illustrates that it 'gets a bit dizzy' and that it is 'hardly possible to take a picture without a turbine on it'.

However, a couple of them are more positive about the community turbine than other turbines on the island, because the wider community reaps the benefits. It is found that ownership is positively influenced by mainly three factors. First, the fact that community members realised the project makes people more positive. Second, the involvement of the community in the decision to take the project forward is found to affect ownership. Finally, people feel more connected to the project because they

all profits of the turbine go to the community. A sense of ownership is regularly expressed by residents referring to the turbine by its nickname Whirly, or even calling it 'our Whirly'.

The landscape effect was the only environmental impact that has been identified by community members during the research. Neither the surveys, nor the interviews or focus groups have shown that there are concerns about the effect of the turbine on wildlife. Also flicker[17] and noise were not found as significant negative effects. Some respondents stated that they could hear noise of the turbine on windy days, but nuanced that other things around were making much more annoying sounds during storms.

5.3 Conclusion: Logic model of social impact

This section summarises the aforementioned key social impacts and the processes that have been identified as their main contributors in a logic model. The logic model has been used as a tool to structure the complex social reality in order to create a systematic methodology to assess social impact. Figure 4.5 shows the logic model that is made out of a synthesis of the results. It displays the multiple causal pathways and feedback loops in the social context of Shapinsay that the project tries to influence, but is simultaneously influenced by.

The chapter concludes with a short description of the framework to guide the reader through the model.

Inputs

From the fieldwork data five interrelated core inputs to the project have been identified. The needs in the community and the motivations of the community group have been found the main leading factor in determining the nature of the desired outcomes of the project on the community. In the case of Shapinsay the needs in the community were predominantly accessibility and employment opportunities, so activities were set up to create outputs that would promote mobility and create extra local employment.

Furthermore, the legal model influences the outcomes as it determines the kind of community ownership and the laws that the CORE group has to abide. In the case of Shapinsay the trust is registered as a company limited by guarantee and therefore has to abide charity law as well as company law. Consequently, all its activities need to be of charitable nature and it is not possible to directly support local business.

[17] When the sun is behind the blades of the turbine, the rotating turbine blades interrupt the sunlight and can produce a bright flicker.

In addition the financial model and was found to be important in determining the outcomes, because the way the project is financed affects both the development of revenue size and who is going to benefit from the project. In the case of Shapinsay the project is wholly owned by SDT and was primarily financed with a bank loan, apart from small start-up grants that the SDT received for feasibility studies and the grid connection. Resultantly, the bank practically owns the project and the SRL has no access to the account with the revenues from electricity sale. Money is handed over only if all requirements of the bank are met. However, the bank loan is sculpted so that SDT receives significant revenues from the beginning on to be able to deliver outcomes for the community early. Furthermore, the bank needs to approve all major changes in agreements, which becomes relevant with the curtailment as the bank needs to approve local usage of electricity.

Finally, human resources are found to be important. In the end it are the people that are shaping up and executing the project, which makes outcomes greatly dependent on their knowledge, skills and personal networks.

Activities

The aforementioned inputs are used to undertake project activities. Analysis of the fieldwork data showed out that in the case of Shapinsay, it were predominantly four types of activities that influenced the outputs and outcomes of the project.

On the one hand, the decision making structure and public engagement were found to affect the public image of the project within the community. Especially expectation management was found to be an important component of public engagement, because it was found that the public image of the project depended greatly on residents' initial expectations. Furthermore, also the inclusivity of the decision making process had an important effect on the public image. Particularly, the vote whether or not to take the project forward increased ownership. The public image seemed to be constituted by four main components that can be used as its indicators: awareness of the project, trust in the organisation, ownership of the project and active participation in the organisation. These concepts are interrelated as many residents with a positive image of the project show positive attitudes on multiple indicators.

On the other hand, it was found that the public image, together with the internal governance and actual project development contributed to realisation of the project. Good internal governance is important for the continuity of the organisation and has an important relationship with the ability of the organisation to undertake the project development activities. Project management activities are

understood as the steps that need to be taken to get and keep the project going, reaching from getting a group of volunteer together, to getting a grid connection and managing the provided services.

External intermediators on inputs and activities

Both inputs and activities were found to be intermediated by the availability of volunteers, government funding and access to other external support. On Shapinsay the availability of volunteers is found to be influenced both by the population size, but also by the public image of the organisation. Government support through the Feed-in-Tariff enabled full community ownership through debt financing by providing the bank security that the loan for the turbine would be recovered. Finally, although Shapinsay was quite far ahead of the game during the development, the advice and monetary support by HIE, CES, the local Council, and other CORE groups was instrumental in getting the project off the ground. The network that has formed around community RE in Orkney continues to be an important source of advice and support at present.

Outputs

Although, activities can have unintended outcomes as well, they are first and foremost undertaken to realise the outputs that are predicted to benefit the community. Obviously, the principal output of the CORE project is the 900 kW wind turbine.

The profit made from the sale of the electricity can be seen as a secondary output. At present revenues are lower than expected, because of the curtailment the turbine faces as a result of grid limitations. Furthermore, revenues will be reduced in the recent future, because the UK government announced termination of the LEC system[18] by August 2015. When this subsidy ends, the SRL will lose around £8.000,- of its yearly income. Thus, not only for its establishment, also at present the project remains dependent on the UK government's policy and funding for renewable energy.

Finally, from the revenues the Trust receives gift aid payments from its subsidiary to create tertiary outputs, the services provided to the community. These include the Out-of-Hours boat service, Here-to-Help home support for elderly, the community bus service, electric vehicle and the newsletter. As the Trust is subjected to charity law, all services have to meet the public benefit test (Scottish government, 2015). This means that they need to be both generally beneficial, so not replacing

[18] LECs are Levy Exemption Certificates that provide suppliers with evidence needed to demonstrate to Her Majesty's Revenue & Customs that electricity supplied to UK business customers is Climate Change Levy (CCL) exempt, because it is generated from a renewable source (RECS international, 2015). The CCL is a tax on UK business energy use and is charged at the supplier.

existing employment or doing other harm to individuals or businesses, and serving the public, meaning that that the Trust cannot support individual businesses or give individuals income support.

Outcomes

Project outputs lead to outcomes in the community. On Shapinsay it has been found that the outcome of the services are intermediated by community members' usage of the service. Usage is influenced by the public image of the organisation, especially by residents' awareness of the services and how they can be accessed. As the public image influenced by engagement activities and the inclusivity of the decision making structure, activities have an important indirect influence on the other outcomes. Furthermore, the income of the turbine also directly supports employment through funding the staff positions of the transport and admin officer, the turbine responders and the turbine manager. The key outcomes of the project are found to be the service level, accessibility, employment, social cohesion, environmental impact, and capacity building.

Impacts

All before mentioned outcomes impact the liveability on Shapinsay in different ways. In the long-term the organisation wishes to make a positive contribution to the liveability on the island to sustain a balanced population. Retaining population and improving its balance are just for a small part within the influence of the project. Many external factors, such as regional development and personal choices underlay migration choices. As the project is just 4 years operational, it is too early to assess the actual longer-term impacts yet.

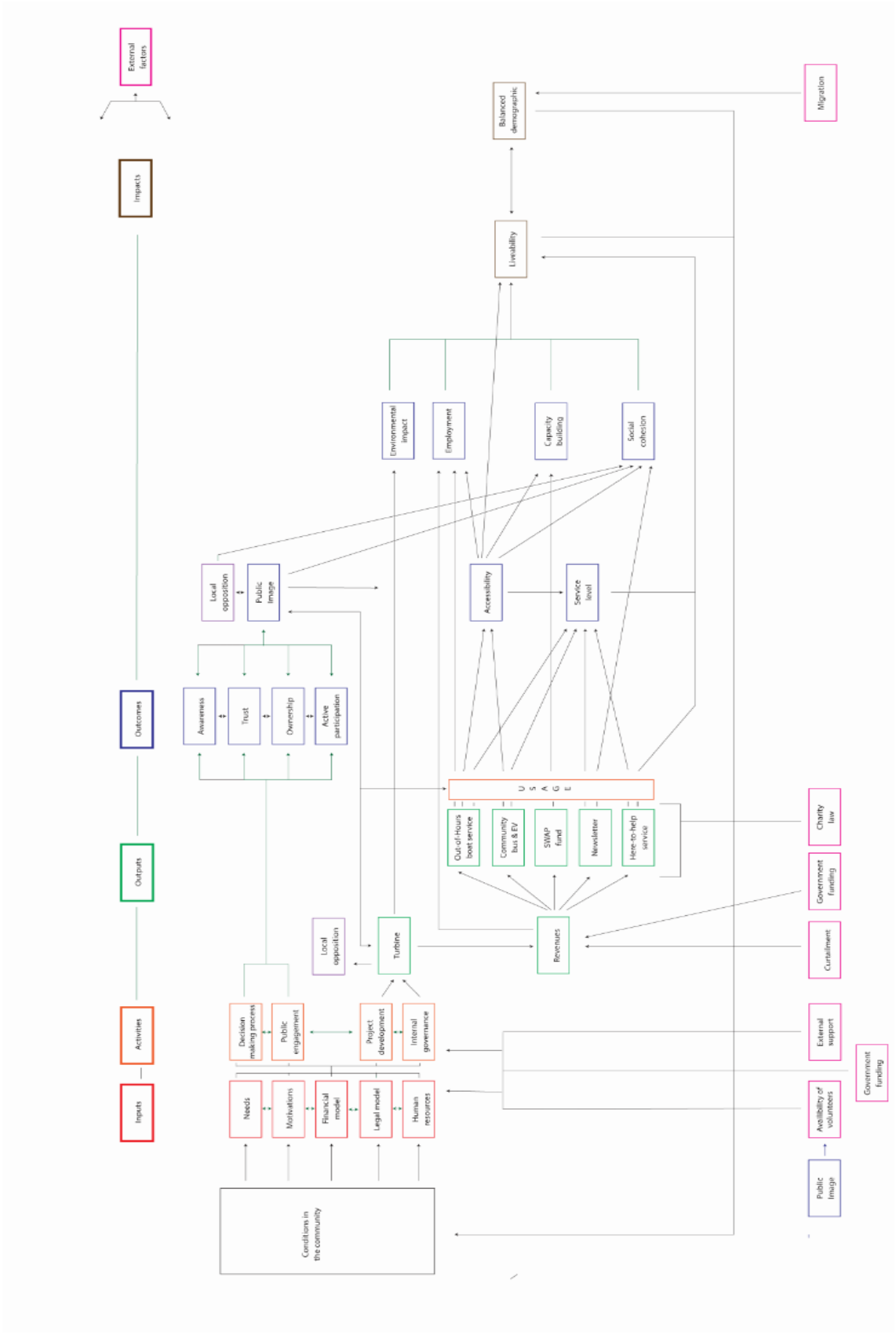

Figure 5.3: Logic model of the social impact of the community wind project on Shapinsay. This page needs to be replaced by an A3 page that is folded in half for better readability in the print version. Apologies.

Chapter 6. Social impact assessment methodology

This chapter outlines the structure of the CORE impact assessment methodology that is developed on basis of the findings of the fieldwork. Explaining the development of the methodology for social impact assessment of CORE projects in detail would be too lengthy. The methodology itself is included in the dissertation as appendix 1.

6.1 The structure of the methodology explained

The methodology presents a framework and proposes questions for a series of interviews to carry out a similar case study. Based on the pathways to impact that were identified after analysis of the data, the structure for the methodology was set up. The questions for the methodology are formulated based on the way outcomes were reported by residents to make it easy for the residents to relate to the questions and increase the validity.

First, the methodology includes a scoping stage to get an overview of the key inputs, activities and outputs. This part takes the shape of an interview with a board or staff member of the organisation. Depending on the structure of the organisation this interview can be split up in multiple shorter interviews. The researcher needs to find at least one or multiple respondents with knowledge of the early engagement process, the financial side and the project management side of the organisation. The fundamental information about the organisation and its work then can be used to adjust the survey for community members to the local situation. For instance, if the organisation has uses certain communication media such as a newsletter, residents' awareness of the work of the organisation can be assessed by asking whether they know the service and read the newsletter.

For staff, board members and local volunteers a slightly different variation on the survey for community members is made. It is largely similar to the one for the wider community, but includes questions about the nature of the involvement and motivations. Furthermore, this survey has a few extra questions about outcomes that can only be achieved by active participation, such as development of project management skills.

As the tangible outputs, such as services and the turbine itself, and the activities of the CORE group were found to be the factors that community members related to outcomes, they are the backbone of the survey. Unless they were strongly involved in the project, other factors that are important in realising outcomes are behind the scenes for most of the participants. Therefore, the factors that shape the preconditions for the outcomes that the community members experience are only included

in the scoping part of the methodology and not in the surveys for actors in the CORE group and wider community members.

After adjustment of the questionnaire to the situation of the researched CORE project, aided by the information of the scoping stage of the methodology, the questionnaire can be distributed.

Gathered data can be analysed with statistical analysis. Overviews of how many people experience certain impacts and how strongly they are experienced can be made, and also regression analysis can be used to test relationships between specific processes and outcomes. An example that could be researched is the relation between the indicators of the public image of the organisation and the extent to which the work of the organisation is perceived as beneficial. However, as potential statistical analysis of future findings of the methodology was no main focus of the study, ideas about analysis of findings beyond descriptive purposes need to be developed further.

A final remark for the use of the methodology is that creating a comprehensive overview of social impacts by following the methodology rather closely would be advised for descriptive studies. However, if the purpose of a social impact assessment study is to be explanatory, it is advised to focus on a subset of impacts and relations. Otherwise a study would get very onerous, and would potentially lack depth or focus.

6.2 Conclusion

The methodology that is designed based on a literature review and the fieldwork on Shapinsay consists of three parts. The first part is a scoping questionnaire to get an overview of the basic project specifications, and the inputs, activities and outputs of the CORE group. The second and the third part include two variations on a survey that assesses the social impacts of the CORE groups outputs, and evaluate the activities related to the process dimension, such as the level of public engagement and the decision making power that is given to the community.

Chapter 7. Discussion and conclusion

Arriving at the last chapter of this research, it is time to give a critical reflection on the findings and answer the questions that inspired the project. The main research question that is addressed in this research is, in contrast to many other Master's dissertations, a methodological one, leading to some challenges on its own, but also to interesting insights. The discussion, conclusions, policy recommendations, limitations, and recommendations for future research will be discussed subsequently.

7.1 Discussion

As this dissertation has predominantly made a methodological besides a small theoretical contribution, the discussion will mainly reflect on the process towards the methodological framework. A critical discussion of value and limitations of the applied theories and methodologies is interwoven in the reflection.

The methodology that this research presents, has developed through an inductive and iterative process, trial and error, getting lost in complexity, and finding small clues in the data to go on. Whereas any type of impact assessment might seem in the first instance a straightforward task of developing indicators and measuring them in the field, as SIA literature had warned, social reality proved to be difficult to force into a corset of predetermined categorisations and indicators (Chadwick, 2002; Ilsekog, 2008; Vanclay et al., 2015; Howell & Haggett, 2015). Seemingly inextricable interdependencies in impact pathways, and the lack of conceptual clarity in the CORE literature about reported outcomes, made the exercise of designing an impact assessment methodology by times a mind stretching and a frustrating undertaking. However, after the challenges finding an approach was the more rewarding.

As the work of both Seyfang et al. (2013) and Walker and Devine-Wright (2008) stress the importance of the process as well as the outcomes dimension of CORE, the aim has always been to develop a methodology that would not only assess outcomes but also evaluate the processes that contributed to them. In this way the methodology does not take a 'magic box' approach and takes care of the attribution problem that impact assessment faces (Funnell & Rogers, 2011, p.422): How do you know that the change you find is really related to the intervention you research?

However, giving process a prominent position in an impact assessment highly increases the number of components under evaluation and so the complexity of the undertaking, because social reality does not work with single cause-effect relationships.

Including the process dimension in a systematic way was guided by impact pathway analysis. Impact pathway analysis was found to be a helpful lens in identifying the key elements of the processes that affect outcomes by breaking them down in smaller elements. Assembling a logic model made it easier to get a grand overview of multiple causal pathways and interdependencies. The logic model representing the residents' mental maps of how outcomes in their community had evolved, arose from continuously going back and forth between the data and the model, updating and regrouping codes to the final model in figure 5.3.

However, no model, however sophisticated and detailed it might be, can capture the full extent of social reality. The research does not claim to have produced a methodology that can display social impact in all its aspects. Still, following an inductive approach during the impact pathway analysis, the main components of the pathways to outcomes could be identified for Shapinsay. Impact pathway analysis forced to make choices, and improved the focus of the impact assessment methodology, as the elements that can be accommodated in a logic model, and even so the concepts that a research can address, are limited.

Prior to the fieldwork initial lists were made of potential components of impact pathways to be sensitive to in the field. However, these lists were too long, detailed, and unfocused to create a framework for a logic model. Therefore a case study design was chosen to get in-depth data on pathways to impacts. A single instrumental case was used to extract the framework for the methodology from. Getting the mental models of impact pathways of a wide variety of residents of Shapinsay largely aided the insight in key components of impact pathways.

Only through the case it became clear that a logical structure for impact assessment could be structuring the methodology around outputs, contrasting to the first unsuccessful attempt to structure the methodology around the outcomes. By structuring impact assessment around outputs, all services and tangible outputs such as the turbine, can be used to set up a location specific survey. Residents are asked to identify how a specific output has affected them. To illustrate this slightly abstract impact pathway jargon, an example: In the case of Shapinsay residents can be asked what they see as the outcomes of the Out-of-Hours boat service. Answers that can be expected range from a better employment situation because the resident could do more evening shifts, to access to evening trainings to develop the personal capacity, to appreciation for the fact that the service enables evening surgeries.

However, creating the structure for the impact assessment methodology showed that, if you want to create a well-structured framework, you have to be very precise but also very concise. Especially, if you want to research the wide spectrum of impacts, activities, outputs, outcomes and impacts, you

can only accommodate a very limited number of each of them. Every component of the model should deserve to be included by being a key concept in the data, or otherwise it would only compromise the logic model by adding complexity. Impact pathway analysis was found to be particularly useful to stay focused on pathways to impacts and avoid the methodology from taking the side track of an organisational evaluation. An impact evaluation and an organisational evaluation might seem two clearly distinct aims, but some activities related to the governance process of the organisation have important direct and indirect effect on the outcomes for the community.

For instance, it is important to know whether the organisation is perceived to act open and fair for the impacts that it has on the community. However, it is not relevant for assessment of the process dimension of CORE to ask why a service that the CORE group provides is not having an outcome (e.g. because there is no need for it, or it is too expensive). Impact pathway analysis helped to make such distinctions by continuously forcing the researcher to think of concepts as components of a bigger frame.

Finally, the main limitation that was found in impact pathway analysis is that it is very much looking from the perspective of the CORE project, which almost automatically reduces the role of the residents to the objects of the work of the CORE group. For instance, an activity of the community such as the act of local opposition is seen as an outcome of the project. This made categorising initially a challenging task, because actions of the wider community are from this systems perspective outcomes.

7.2 Conclusions

Before drawing conclusions the research question is repeated to refresh the memory and get back to the focus of the research:

How can we develop a theory-based monitoring and evaluation framework for assessing the social impacts of CORE projects on community level that can capture the complexity of local social dynamics and alternative causal pathways based on a case study of the turbine project on the island of Shapinsay and literature review?

The research build up to the answer to this main question by answering its sub-questions, so before the final conclusion, these will be concluded upon in short.

1. What is the context for a new type of social impact assessment of CORE?

To make a methodology that is sensitive to the context it researches and suits the academic and societal need for a more people-oriented type of social impact assessment, a literature review was undertaken. This review addressed the following questions:

- What is CORE?

The highly diverse, multi-faced phenomenon of CORE is narrowed down for this research to make the definition overlap with the scope of the research. CORE is defined as energy generation projects that are wholly or partially owned by place-based community groups (Gubbins, 2010).

- What are the assumptions about outcomes of a community-led approach to RE?

Just like many topics in science and everyday life, CORE is far from value-free and readily connected with positive assumptions regarding community ownership and benefit. CORE is associated with 'open and participatory' processes that bring 'ownership' and 'control' and lead to more 'local and collective' benefits than their commercial equivalents (Seyfang et al., 2013, p.978; Walker & Devine-Wright, 2008, p.497). However, it was found that such a rhetoric should be taken with caution. A sense of community is not always present, and seemingly strong and cohesive communities can also be deeply exclusionary and marginalising to those who do not fit in (Walker et al., 2010). Furthermore, communities do not always overlap with places, and one place can host multiple communities (ibid.).

- Why is there currently so much policy attention for community energy in Scotland?

Scottish CORE development is strongly connected to a favourable convergence of UK energy policy, subsidising renewable energy generation to meet EU targets for renewable energy, and the Scottish community empowerment agenda, encouraging communities to take more ownership over local development. Thus, as well as contributing to Scotland's drive to replace fossil fuels and cut carbon emissions, renewable energy technologies are assumed to have a potential to play 'a vital role in strengthening communities' by building local 'capacity' and giving communities 'financial autonomy' to prioritise and address their own needs (HIE, 2015a, p.3).

- Which social outcomes of CORE have been identified in the CORE literature?

A plethora of social outcomes has been identified from previous CORE studies, reaching from capacity building, to increased climate change and environmental awareness, to changes in the service level, to local employment, to social cohesion, resilience, future proofing and many more (Hicks & Ison, 2015; Gubbins, 2010; Slee, 2015; Walton, 2012). However, looking critically at the identified outcomes, it was noticed that authors often jumped from statements on efforts of CORE groups to

assumed outcomes of their undertakings, and had hardly ever assessed the community to come to conclusions about social impact.

- What are the limitations of the existing ways of social impact assessment for getting an in-depth insight in the social impacts of CORE projects?

A limitation of the existing social impact assessments was found to be their narrow focus on the socio-economic aspects of CORE (e.g. Okkonen &Lehtonen, 2016; Allan, 2012; Entwistle; 2014; Allan et al., 2008). Furthermore, also the way in which social impact is assessed in other sectors was often found to be confined to measurement of readily countable indicators (e.g. Hermansen et al., 2007; Chadwick, 2002; HIE, 2015b). The effects that were experienced by community members in their day-to-day lives were not found to be the focus of a comprehensive social impact assessment. Some studies researched specific aspects of social impact (e.g. Walker et al., 2010; Musall & Kuik, 201), but none gave an in-depth and simultaneously broad overview of social effects.

- What are the challenges of doing in-depth social impact assessment from a peoples' perspective?

Although there is an apparent need for a new type of social impact assessment, the field is still in its infancy. Illustrating this Chadwick refers to the social relations as the 'poor relations' within Environmental Impact Assessment (2002, p.4). Besides the extensive and expensive qualitative research required, some other factors make social impact assessment an onerous task. The boundaries of the social dimension are unclear and should be defined (Chadwick, 2002). Also influence of external conditions has to be taken into account, because social impacts can hardly ever be attributed to one project alone (Ilsekog, 2008). Furthermore, impact pathways are rarely single cause-effect relationships (ibid.). Besides, there is little conceptual clarity on definitions of the outcomes that are widely recognised within the CORE literature. Finally, there are few examples of holistic social impact assessment in other fields, as impact assessment has always had strong links to policy making and had to satisfy budgetary timescales and show tangible outcomes (Walker et al., 2007).

2. How can insights from Social Impact Assessment literature help to assess the social outcomes of CORE?

Social Impact Assessment takes a more qualitative, context-aware and people-centred stance towards social impact. This body of literature helped to further the understanding of how social impact could be approached in this research. According to Vanclay et al. the social impact of a project consists of all issues related to a planned intervention that 'affect or concern people, whether directly or indirectly' (2015, p.2). This definition is a broad one, but gave some guidance by pointing at the importance of

perceptions and informed the inductive approach taken. Building on SIA even concerns, fears, anxieties, hopes and expectations are important social impacts as they have a real effect on people (ibid.).

3. How can impact pathway analysis help to structure the processes that are part of the complex social reality a CORE project is shaping and shaped by?

Impact pathway analysis is based in systems thinking and helped to structure the complex pathways to impact. By breaking down processes in smaller components an overview could be created of the myriad of processes that contribute to social impacts and come to an overview of how interrelationships and interdependencies played out in the case study. It was a helpful lens to come to key concepts while looking in a broad way at social outcomes and the processes that influence them.

4. What are the key social outcomes of Shapinsay's CORE wind project on its community and what do the pathways to these impacts look like?

Fieldwork data analysis pointed out that the residents of Shapinsay most strongly value the changes in the service level in their community. These services were found to induce a wide range of knock on effects in terms of internal and external accessibility, employment, capacity building and empowerment, and social cohesion. Thus, it were the effects on opportunities that participants have in their daily lives that were seen as the most important outcomes. Very few changes in attitudes, or behaviour related to climate change and other environmental issues were reported. This finding is found to be strongly connected with the needs in the community that motivated Shapinsay's turbine project. The project was solely socio-economically motivated as residents see the turbine merely as means to make money to support the community and address the challenges of living on a small island.

Within the CORE group development activities were found to have a large influence on enlargement of its members' capacities. The fact that local volunteers could realise a multi-million Pounds project built a sense of trust in the ability to take on projects addressing other issues. An example can be found in the lead position that the SDT has within the Local Energy Challenge Fund Agri-energy demonstration project aiming to address curtailment.

Also the activities of the CORE group have effects on the outcomes in the community. For instance, public engagement was found to affect outcomes such as trust and awareness, which are found to be indicators of the public image of the organisation, and affect the social cohesion on the level of the relationship between the organisation and the community members.

The turbine itself was only found to have only a minor effect on some residents' appreciation of the living environment.

Finally, many inputs, activities, outputs, and outcomes were found to influence the outcomes of Shapinsay's wind project. The research has chosen to stay away from judgement impacts as the project is only three years operational and impact, being the longer-term changes in the community, such as effects on the overall liveability and demographics, has to be assessed after a longer period. The pathways to the impacts are summarised in figure 5.3.

5. How could the social impacts of community renewables projects be assessed in a systematic way while recognising the complexity of the social reality?

The methodology is split in scoping part to get insight in the basic specifications of the project, the activities that the CORE group undertakes and potential services and other support that is provided. The second and the third part are surveys for the community members respectively the staff and board members that are involved in the CORE group. A division between those two groups of respondents is made to avoid tiring community members with going through questions that are only relevant to direct participants in the project. The surveys are included as appendix 1.

From the answer to the sub-questions the overall conclusion can be drawn that the development of a SIA methodology for CORE is not a straightforward task. However, through the inductive approach taken, an initial version of a methodology is developed on basis of the case study of Shapinsay. The most remarkable finding during the case study was that none of the key outcomes of the turbine project was related to the socio-environmental dimension of CORE development. No significant changes in attitudes, knowledge and behaviour with respect to environmental sustainability and the climate change agenda were found. Shapinsay's residents see the turbine as an opportunity to generate income, not as a way to reduce their carbon footprint or contribute to a transition towards a low-carbon energy system. Thus, as all outcomes were found to derive from outputs and activities, these elements of the impact pathway were used as the backbone of the methodology that is constructed.

7.3 Policy implications

Besides making a contribution to academia, this research aims to inform policy making. The policy implications of this research are presented to ClimateXChange, the Sottish centre for expertise connecting climate change research and policy. The following implications are identified.

- This study suggests that CORE might not have as much effect on awareness, knowledge, and behavioural change related to climate change and other environmental sustainability issues

as comes forward from literature. Stimulation of environmental values and action might be better achieved in different ways than support for CORE development.

- However, the support from HIE and the Big Lottery, and extra income from the FiTs was found to enable the Shapinsay Development Trust in its role as social enterprise to provide services that would not be viable alternatively. Service provision is found to have many knock on effects that bring local social and economic development. This case study suggests that financial support for CORE seems to be a valuable means for local development in rural economies with few alternative income generation possibilities. Putting people at the heart of the energy transition cannot only be achieved through winning their hearts and minds, but also through making them share in the benefits through local ownership of RE.

- Furthermore, this case study provides evidence supporting that CORE development builds capacity within communities to take on additional low-carbon projects. The turbine project was found to build trust within both the community and the CORE organisation that a group of local residents can achieve significant, high-cost projects. Resultantly, further challenges are addressed through participation in a Local Energy Challenge Fund demonstration project. For this reason support for CORE seems also valuable from the perspective of offering a niche for RE innovation, contributing to the development of the Scottish RE technology sector.

- Regarding the assessment of the social impact of CORE on a larger scale it was found that there is a significant tension between doing an in-depth context-sensitive assessment and creating a methodology that can be applied on a larger scale. Taking into account constraints of costs and time, this research suggests the following proxies for the case study's key outcomes (although they are little different from existing approximations):

    - Service level: number of services/amenities supported; user group as percentage of the population.
    - Social cohesion:
        - Between residents: number of community organisations supported; financial contribution to community organisations.
        - Between the organisation and the residents: number of members; attendance AGM; number of volunteers.
    - Capacity building:

- For RE development: number of inspired RE installations.
- Other environmental sustainability issues: number of educational projects/campaigns; number of households that has benefited from energy saving measures.
- Vocational & educational: number of individuals supported through trainings and courses.

- Employment: number of people employed; jobs in fte.
- Accessibility: Number of transport services provided; user group as percentage of the population.
- Environmental impact: number of local complaints during planning application.

7.4 Limitations

Whatever their findings may be, all research projects have their limitations. A first limitation of this research is inherent to the case study design. The claims that can be made on basis of a literature review and a single case study are limited in their external validity. Findings about Shapinsay can by nature of the complexity and diversity of social contexts not assumed to be found in other similarly looking cases. A limiting factor in the internal validity of the findings is that, although a subgroup of 33 persons out of 130 households is surveyed, 12 interviews are conducted, and the focus groups had 12 participants, only roughly 50 of the about 300 resident are represented in the research (excluding overlap in participants). This is a very good participation rate for a qualitative study, but it remains that 250 people with possibly different views have not been involved, which potentially effects outcomes. Another limitation of the findings of the research is that one main group of residents is weakly represented among the participants. It was found hard to reach the farmers as they were busy on their farms and houses lacked doorbells.

Furthermore, the methodology that is developed would need minor adjustments to be a valuable framework for other cases, because it is now designed based on context-specific information about Shapinsay. Especially assessment of the socio-environmental outcomes, such of the effects on the awareness, knowledge and behaviour related to climate change and environmental sustainability, needs to be developed further. As a result of the nature of the case, this methodology is most appropriate for the assessment of the impact of CORE groups as social enterprises and evaluation of the qualitative dimension of their impact on local development. The scoping part of the methodology can be used to adjust the methodology to projects with a different focus.

Finally, an important aim of this research was to create a methodology that can be used to create a systematic evidence base. However, there is a tension between project-by-project case study research and creating large scale evidence. A way to shorten the methodology would be to leave out flow on effects of services. Some depth would be lost but on the other hand, many outcomes can be assessed still and relationships between for instance support for community organisations and social cohesion are well-documented enough to be taken as a starting point.

7.5 Avenues for future research

Some questions remained unsolved and other, new questions arose from the findings. This section will conclude this report by presenting three ideas for future research on social impact assessment of CORE:

- A question that this research left largely unsolved is how social impact assessment of CORE should be scoped. Looking at the full spectrum is probably not feasible. A key question to inform a narrower focus could be: On which claim about CORE, evidence about social impact is needed? Which information is required to get evidence on that particular claim about the distinctiveness of CORE? A social impact assessment methodology that looks at the way in which CORE affects thinking and behaviour related to climate change and other environmental sustainability issues would take a very different form from a social impact assessment methodology that looks of the community empowerment aspect of CORE.

- It would be useful to get insight in what Scottish CORE groups see as their main impact. No insight in the size of the impact will be gained, but an indication of the nature of the outcomes would also be valuable to get a better grip on what the contribution of community energy to society is. Such a study could be designed on basis of the identified impacts within this research, and amongst others, the overview that Hicks & Ison present (2015).

- Finally, an impact assessment just gives a snapshot. It would be interesting to monitor how social impact develops over time to see how certain impacts get stronger or weaker. For instance: Does the support for a turbine project grow over time in a community that expressed fierce resistance?

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Annex 1: Social impact assessment methodology for CORE

Part I Scoping the assessment

A. Details project

a. Which RE technology is used?

b. What is the generative capacity of the project?

c. When did the project become operational?

d. Till when will the project be operational?

e. What were the project costs?

f. How is the project financed? (please indicate the investors and their share in the costs)

g. In case of (partial) financing through a loan: What is the payback time of the loan?

h. In case of (partial) private investment: Are there dividend payments? If yes what is the rate of the dividend?

i. Does the project profit from support of a government support mechanism? Yes/no

   If so, which?

j. Who owns the land of the site of the installation?
   a. How did the CORE group acquire the right to use the land?
   b. In case the land is not owned by the CORE group: Does the landowner receive a payment or another contribution (in kind) for the use of the site and/or access track?

B. Details CORE project group

a. When was the organisation founded?

b. Did the organisation exist prior to the inception of the RE project? Yes/no

   If so, does your organisation have prior experience with (community) RE projects? Yes/no

c. How is the organisation incorporated?

d. Is the project co-owned with another organisation? Yes/no

1. Joint venture with public sector organisation (e.g. local authority)
2. Joint venture with a private sector organisation (e.g. cooperative)
3. Joint venture with a another community organisation (e.g. second CORE group)
4. Joint venture with another third sector organisation (e.g. charity)
5. Other (please specify):

If so, please indicate whether this organisation has experience with (community) RE projects: Yes/no

e. The legal structure is: [Note for the researcher fill this in on basis of the answers give at c en d.

C. Details community

[Note for the researcher: ask a board member/chair organisation]

a. What is the delineation of the community that the project wants to benefit?

b. How many people are living in this community?

c. Has it been difficult to draw the boundary of the beneficiary community/ has drawing a boundary ever resulted in difficulties?

If so, please specify what kind of difficulties and how they are/have been addressed:

d. What would you describe as the biggest needs/problems/challenges within the community?

D. Details motivation and objectives of project

[Note for the researcher: ask a board member/chair organisation]

a. What would you describe as the motivation behind this project?

[Note for the researcher: ask as open question and note this. Determine the nature of the primary and secondary motivations yourself. Check your categorisation during the interview with the interviewee]

a. Please indicate the nature of the primary motivation:

- Environmental sustainability (e.g. greenhouse gas reduction, being part of a wider energy transition, nature conservation)
- Political (e.g. increasing energy independence, less dependence on external funding)
- Social (e.g. getting community members together)
- Socio-economic (e.g. making profit for community benefit, reduction of fuel poverty)

- Economic (e.g. making profit for personal benefit)
- Technological (e.g. interest in renewable energy technologies, interest in energy efficiency technologies, off grid energy production)

b. Please indicate the nature of the secondary motivations (multiple answers possible):

- Environmental sustainability (e.g. greenhouse gas reduction, being part of a wider energy transition, nature conservation)
- Political (e.g. increasing energy independence, less dependence on external funding)
- Social (e.g. getting community members together)
- Socio-economic (e.g. making profit for community benefit, reduction of fuel poverty)
- Economic (e.g. making profit for personal benefit)
- Technological (e.g. interest in renewable energy technologies, interest in energy efficiency technologies, off grid energy production)

b. What would you describe as the objectives of this project?

E. External factors

a. What would you describe as the main enabling factors for this project?

b. What would you describe as the main constraining factors for this project?

F. Indication of the revenue stream

[Note for the researcher: Ask admin and finance officer or somebody with a comparable function]

a. Total amount of money invested in the community since the turbine became operational:

b. Revenues for the community in the previous year:

c. Attracted match funding in the previous year:

d. Previous earning capacity community (please give an estimation of the yearly budget of the organisation of the year before the project became operational):

G. Employment

[Note for the researcher: Ask admin and finance officer or somebody with a comparable function]

1. Direct employment

a. How many paid jobs related to running the project does the project support with its revenues?

Please give the job title and working hours per week:

Job title	Working hours per week

Total number of individuals employed:
Number of fte :

b. How many paid jobs related to running the project are supported otherwise?

Please give the job title, working hours per week, and the organisation that funds the position.

Job title	Working hours per week	Funding source

Total number of individuals employed:

Number of fte :

2. Indirect employment

a. How many jobs non-related to running the project does the project support?

Please give the job title and (average) working hours per week

Job title	Working hours per week /retainer fee/ per time service is used

Total number of individuals employed:

Number of fte:

3. Total employment

a. How many people are directly or indirectly employed by the organisation in total?

[Note for the researcher: add up sub-totals, but check whether there are no people

with two hats on]

Total number of individuals employed:

Total of fte:

H. Participation of the community in the organisation

[Note for the researcher: ask these questions to somebody with overview over the organisation, e.g. a staff member or board member]

a. How many members does the organisation have? (if it is member-based)

b. How many members attended the last Annual General Meeting (AGM)? (please give an estimation if numbers are not available)

c. How many people from the community attended on average during other public meetings last year? (Please give an estimation if numbers are not available. If there were multiple meetings, please give a rough estimation of the number of people from the community that has taken part in at least one of these)

d. How many people are volunteering for the organisation:

    a. How many people are active on the board(s)?:
    (in case this is a voluntary position)

    b. How many volunteers are otherwise involved in the organisation?:
    (Please give an estimation)

    Please give a description of the role they fulfil for the organisation and the average time investment per person per week (base the estimation on their support last year) In case one person fulfils multiple tasks use the cells to right to add the secondary tasks)

    Categories: Administrative tasks, technical support, legal support, accounting support, governance support, project management support, supportive/executive role events/projects CORE group, helping out when needed, other (please specify).

    Total number of volunteers:

Task	**Estimated number of hours a month pp**	**Number of volunteers**

e. Total number of volunteers that are actively involved in the organisation:

f. Total number of paid staff (look up at 1a and b):

g. Total number of community members that are actively involved (active participants, volunteers, and paid staff):

[Note for the researcher: add up the subtotals. It are estimates, but check for overlap and people with multiple hats on]

I. Communication between the organisation and the community

[Note for the researcher: ask these questions to somebody with overview over the organisation, e.g. a staff member or board member]

How does the organisation currently communicate with the community?

a. Face-to-face contact opportunities with staff/volunteers/ board members: yes/no

    i. Is there a set place where community members can come to speak to the project organisation?

    ii. If yes: Are there particular times that the community members can come in?

    Particular times/ any time/ on appointment

b. Newsletter: yes/no

Please indicate the type of newsletter:

    i. Printed newsletter for members: yes/no

    ii. Printed newsletter for the whole community: yes/no

    iii. Email newsletter for members: yes/no

    iv. Email newsletter for members and everybody else that signs up: yes/no

Please indicate how often the newsletter is distributed yearly:

c. Irregular distribution of information: yes/no

    i. Printed for members: yes/no

ii. Printed for the whole community: yes/no

iii. Email for members: yes/no

iv. Email for members and everybody else that signs up: yes/no

d. Publication of updates on a website of the organisation (e.g. in case of an important development, general information provision, or if consultation is needed): yes/no

Please indicate how many updates there have been last year:

- 0-5
- 5-10
- More than 10

e. Publication of information in local newspaper or local newsletter: yes/no

Please indicate how many updates there have been last year:

- 0-5
- 5-10
- More than 10

f. Annual General Meeting: yes/no

If so, please identify whether this meeting is open to non-members: yes/no

g. Other public meetings (if topics arise that need community consultation)

Please identify how often they took place last year:

- 0-5
- 5-10
- More than 10

h. Organising community event(s): yes/no

If so, please specify how many:

- 1
- 2
- 3 or more

i. At community events (e.g. fairs): yes/no

If so, please specify how many:

- 1
- 2

- 3 or more

j. Other: (please specify)

Does this communication include distribution of information about financial situation of the project: yes/no

If so, does it include:

1. The total annual profit of the organisation: yes/no.
2. The amount of gift aid to the community: yes/no.
3. Information about the allocation of the gift aid (to what purposes the gift aid is allocated): yes/no.
4. Information about how much each supported purpose receives: yes/no

k. How many different kinds of community communication opportunities are there in total?

[Note for the researcher: count the different opportunities indicated at question 1-10]

l. How many community communication opportunities have there been this year besides face-to-face opportunities?

[Note for the researcher: count the different opportunities indicated at question 2-10]

J. Decision-making power community on prioritisation of revenue allocation community fund

[Note for the researcher: ask these questions to somebody with overview over the organisation, e.g. a staff member or board member]

a. Revenue allocation is informed by community consultation. The community is consulted about their needs and wishes: yes/no.

b. The community can (co-)decide on major decisions.
If yes, please identify how:
1. Vote/poll

If so: the vote has the status of: end decision/ advice

The voting power of individual community members

is based on investment/ one person one vote members/ one person one vote entire community

2. Consensus oriented community consultation

   The reached consensus has the status of: end decision/ advice

3. Other, please specify:

K. Early engagement

[Note for the researcher: ask these questions to one of the founding members of the organisation that has experienced the development of the project]

a. When did the organisation start with involving the community in the project?

Decision to take the project forward

b. Was there communication prior to the decision to take the project forward? Yes/no

   If so please specify the nature of the communication:

   - Public meetings: yes/no
   - Provision of print information of information to members: yes/no
   - Provision of print information of information to the entire community: yes/no
   - Information on website: yes/no
   - Other (please specify):

c. Could the community (co)-decide on the decision to take the project forward? Yes/ no

   If so, please describe how:

   1. Vote/poll

      If so: the vote had the status of: end decision/ advice

      The voting power of individual community members was based on investment/ one person one vote members/ one person one vote entire community

2. Consensus oriented community consultation

   If so: the consensus had the state of: end decision/advice

3. Other, please specify:

d. Did the organisation face opposition from the community during this phase?

   Very strong – strong – intermediate – weak – no opposition

   Please describe the attitudes of the community towards the project at this stage:

Siting of the technology

e. Was there communication prior to the decision of the siting of the technology?

1. Public meetings: yes/no
2. Provision of print information to members: yes/no
3. Provision of print information to the entire community: yes/no
4. Information on website: yes/no
5. Other, please specify:

f. Could the community (co)-decide on the location for the technology? Yes/no

   if so, please identify how:

1. Vote/poll

   If so: the vote has the status of: end decision/ advice

   The voting power of individual community members is based on investment/ one person one vote members/ one person one vote entire community

2. Consensus oriented community consultation

   If so, the consensus has the state of: end decision/ advice

3. Other, please describe:

g. Did the organisation face opposition from the community during this phase?

1. Very strong – strong – intermediate – weak – no opposition

Please describe the attitudes of the community towards the project at this stage:

Progress updates

a. Was there communication about important moments of progress (planning permission, financial close, grid connection, the installation of the technology and its commissioning)? Yes/no

If so:

2. Public meetings: yes/no
3. Provision of print information of information to members: yes/no
4. Provision of print information of information to the entire community: yes/no
5. Information on website: yes/no
6. Other, please specify:

Governance of future benefits

b. Was there communication about the distribution of the funding before the project became operational? Yes/no

If so:

7. Did this include information about the expected income for the community? Yes/no

8. The moment that the community could expect gift aid: yes/no

9. Did this include consultation about the way the revenues would be allocated? Yes/no

Can individuals/ groups from the community apply for funding? Yes/no

If so:

10. Did it include information about the eligibility criteria? Yes/no
11. Did it include information about the way the community could apply for funding? Yes/no

c. Could the community (co-) decide on the allocation of the future benefits? Yes/no

If so, please identify how:

12. Vote/poll

If so: the vote had the status of: end decision/ advice

The voting power of individual community members is based on investment/ one person one vote members/ one person one vote entire community

13. Consensus oriented community consultation

    If so, the consensus had the state of: end decision/ advice

14. Other, please describe:

d. Was there division on how the future revenues should be allocated?

   Very strong – strong – intermediate – weak – no division

   Please describe the attitudes of the community towards the project at this stage:

L. Connections with other organisations

[Note for the researcher: interview organisation member with the role of admin and finance officer, service manager, or something comparable]

With which organisations does the CORE project interact regularly?

Please answer the following questions for every organisation:

a. Type of organisation: public organisation / commercial entity / not-for profit organisation.

b. Please describe the relationship between the project and the organisation (multiple can be applicable):

1. Accountancy services (e.g. financial administration of the project);
2. legal services (e.g. establishing contracts by lawyers);
3. financial services (e.g. debt financing);
4. technical services (e.g. installation of the technology & maintenance);
5. project management services;
6. peer-to-peer support (e.g. of other CORE groups);
7. subsidy provider,
8. advocacy/ interest organisation (e.g. DTAS),
9. grid management
10. electricity sale,
11. other: please specify:

Please also describe in one sentence what the relationship between the project and the organisation is.

c. Did the organisation exist before the initiation of the CORE project? Yes/no

   If not: Is the establishment of the organisation related to the CORE project? Yes/no

   If so, please specify how.

d. Is the organisation a local organisation? (Local as in meaning part of the same community the project wishes to benefit, e.g. Community Council, Community Association)

   Not sure? Please describe where the organisation is located and whether it is part of a bigger organisation.

e. Did ties between this organisation and the community exist before the CORE project started? Yes/no

   If so:

   Please identify if the relation got more intensive/ less intensive

   Much more intensive – more intensive – unchanged – less intensive – Much less intensive

   Please identify the frequency of the contact:

   Weekly – monthly - a couple of times a year - once a year - less than once a year

   Please identify whether the quality of cooperation improved or worsened

   Strongly improved – improved – unchanged – worsened – strongly worsened

Organisation	**Type (private/ public/ third sector)**	**Relationship between organisation and CORE group**	**Existence organisation prior to the project**	**Local/non-local organisation**	**Presence prior contact**	**Quality of the contact**

M. Supported services

[Note for the researcher: ask these questions to somebody who manages the services/ skip if no services are provided]

Which services have been supported with the revenues of the project?

Examples are:

- *Social care services*
  - *Human health services (e.g. elderly care and support services)*
  - *Education services (e.g. community school)*
  - *Youth services (e.g. sports training)*
  - *Residential care services (e.g. housing schemes and association)*
- *Community transportation services (e.g. community bus, taxi, ferry)*
- *Communication services (e.g. newsletter, website, broadband)*

For every service:

a. Does the organisation fully finance this service: yes/no

b. If not which other types of organisations are involved: public organisation / commercial entity / non-for profit organisation

c. Was the service existing previously?

   If not, please indicate whether the service is complementary or additional to a comparable service: complementary, this service is new in the community/ additional to a comparable existing service.

d. How many people within the community make use of this service? (give an estimation if numbers are not available)

Service	**Additional/ complementary**	**Fully/ partially financed**	**Other funding bodies (if applicable)**	**Size user group**

J. Supported organisations

[Note for the researcher: ask these questions to somebody in charge of revenue allocation]

Which organisations in the community were supported?

Please identify for each organisation that received support:

- For which purpose support was given
- Whether the purpose was fully or partially supported
- How subsidising this purpose will benefit the community

Organisation /committee	Purpose	Public benefit

N. Supported individuals

[Note for the researcher: ask these questions to somebody in charge with revenue allocation]

Empowerment and skills development

a. How many educational courses and other trainings were supported?
Please identify the nature of the course/training and the number of beneficiaries:

Course/training	Number of beneficiaries

Increase of environmentally friendly behaviour (and/or reduction of fuel poverty)

b. How many individuals are supported to install renewable energy technologies?

Please specify for each technology which technologies it concerns, the number of households supported, whether the project has contributed to the reduction of fuel poverty, and whether the project was motivated by promoting environmentally friendly behaviour.

Technology	Number of households supported	Reduction of fuel poverty	Promotion environmentally friendly behaviour

c. How many individuals are supported to install energy saving technologies?

Please specify for each technology which technologies it concerns, the number of households supported, whether the project has contributed to the reduction of fuel poverty, and whether the project was motivated by promoting environmentally friendly behaviour.

Technology	Number of households supported	Reduction of fuel poverty	Promotion environmentally friendly behaviour

d. How many individuals received otherwise help to reduce their fuel poverty?

Please identify how and the number of households supported:

Nature of support	Number of households supported

Other

e. How many individuals are otherwise supported?

Please indicate for which purpose they received support and to which public benefit this support contributed:

Purpose	**Public benefit**	**Number of recipients**

Part II for community members

[Note for the researcher: this part of the survey is not for current staff, board members and volunteers!]

A. Awareness of the project

1. Do you know that the project is a community-owned project? Yes/no

2. Do you know which organisation is running the project? Yes/no

3. Do you roughly know who are involved in this organisation? (e.g. board, staff) yes/no

4. Do you roughly know what the organisation is providing for the community? Yes/ no

B. Involvement in the organisation

1. Do you read any of the written information that the organisation distributes? Yes /no

   If yes: Please identify which information you read: (optional if the organisation wants an evaluation of the communication)

   [Note for the researcher: insert the communication options that the organisation has identified as communication media]

2. Do you attend any of the meetings that the organisation organises? Yes/no.

   If yes, please identify which meetings you have attended:

   [Note for the researcher: insert the meetings that the organisation organises]

3. Are you a member of the organisation that runs this project? Yes/no

4. Have you been involved in the organisation as staff, board member or volunteer? Yes/no

   If so, which role did you fulfil within the organisation?:

C. Acceptance of support

5. Have you ever personally received support from the organisation? Yes/no/I don't know / I'd rather not tell

6. Have you used any of the services the organisation provides? Yes/no/ I don't know/ I'd rather not tell

7. Has a community organisation in which you are involved received support from the organisation? Yes/no/ I don't know

   If so, please specify the organisation and the supported purpose:

   Organisation:

   Supported purpose:

   Please also answer the following question:

   I developed my skills and/or knowledge as result of this support which helped me to improve my employment opportunities or increased my skills for my current job.

   Strongly agree –----------strongly disagree

   1 2 3 4 5

D. Image of the organisation and its approach

1. This organisation contributes to the community in a […] way.

   Very positive ----------very negative

   1 2 3 4 5

2. I am […] the project.

   Strongly in favour of ----------strongly opposed to

   1 2 3 4 5

3. I […] trust that the organisation leads the project in a way that optimises the benefits for the community.

   Strongly –----------do not

   1 2 3 4 5

4. The organisation reacts on disagreements and division in a way that

brings people together----------drives people apart

1 2 3 4 5

5. The organisation acts in a […] way.

Fair and transparent–----------unfair and obscured

1 2 3 4 5

6. I feel like my views about the project are […] considered.

Very much –---------- not at all

1 2 3 4 5

I have no wish to express my views, because (multiple answers possible):

[] I have no interest in expressing my views

[] I don't feel comfortable with expressing my views
[] I have trust in the organisers of the project
[] Other reason, please specify:

7. I […] have the ability to influence decisions.

Very much –---------- not at all

1 2 3 4 5

I have no wish to influence decisions, because (multiple answers possible):

[] I have no interest in influencing decisions

[] I don't feel comfortable with taking part in the decision making process

[] I have trust in the organisers of the project

[] Other reason, please specify:

8. This project is a community project

Strongly agree –----------strongly disagree

1 2 3 4 5

E. Evaluation of the development process

Please answer these questions if you lived in this community between …. and ….
[Note for the researcher: insert phase of project development]

9. I feel like my views about the project have […] been taken into account.

Very much –---------- not at all

1 2 3 4 5

I had no wish to express my views, because (multiple answers possible):

[] I had no interest in expressing my views

[] I didn't feel comfortable with expressing my views
[] I had trust in the organisers of the project
[] Other reason, please specify:

10. I […] had the ability to influence decisions made.

Very much –---------- not at all

1 2 3 4 5

I had no wish to influence decisions, because (multiple answers possible):

[] I had no interest in influencing decisions

[] I didn't feel comfortable with taking part in the decision making process

[] I had trust in the organisers of the project
[] Other reason, please specify:

11. I think the setting up and development of the project have been carried out in a […] way

Fair and transparent----------unfair and obscured

1 2 3 4 5

[] I was not following the development of the project.

12. The project has only gone ahead because of community support and involvement

    Strongly agree –----------strongly disagree

    1 2 3 4 5

    [] I was not following the development of the project.

F. Supported services and their flow on effects

[note for the researcher: this part can be left out if you want to make the evaluation shorter]

Supported service 1: The Out-of-Hours boat service (transport)

1. Do you know this service? Yes/no

   If not: please continue at service 2.

2. Are you aware that the organisation supports [insert service]? Yes/no

3. What benefits does this service have in your opinion:

   - Has created local employment
   - Offers a more environmentally friendly transport alternative
   - Access to/ better connection to social care services (nurse practitioner, general practitioner, hospital, elderly support)
   - Access to/ further connection transport services (e.g. airport, ferry)
   - Access to more / better connection to (social, political and cultural) gatherings (e.g. church, friends, family, sports events, committees, meetings, community events)
   - Access to more / better connection to social amenities (e.g. swimming pool, cinema, pubs)
   - Access to more/better connection to training opportunities (e.g. evening trainings)
   - Access to more/ better connection to employment (opportunities) (e.g. jobs with non-standard working times)

[] none

4. Which negative effects does this service have in your opinion?

   This service:

   - Has replaced other local employment
   - Is environmentally unfriendly
   - Is causing division in the community. Some benefit, but others don't and this causes bad feelings.
   - Other, please specify:

     [] none

5. Do you use this service? Yes/no

   If not, continue at service 2.

6. Which of these benefits do you experience personally?

   - Has created local employment
   - Offers a more environmentally friendly transport alternative
   - Access to/ better connection to social care services (nurse practitioner, general practitioner, hospital, elderly support)
   - Access to/ further connection transport services (e.g. airport, ferry)
   - Access to more / better connection to (social, political and cultural) gatherings (e.g. church, friends, family, sports events, committees, meetings, community events)
   - Access to more / better connection to social amenities (e.g. swimming pool, cinema, pubs)
   - Access to more/better connection to training opportunities (e.g. evening trainings)
   - Access to more/ better connection to employment (opportunities) (e.g. jobs with non-standard working times)

     [] none

7. Which of these negative effects do you experience personally?

    - Has replaced other local employment
    - Is environmentally unfriendly
    - Is not the most important need. Another service would be more enabling.
    - Is causing division in the community. Some benefit, but others don't and this causes bad feelings.
    - Other, please specify:

      [] none

8. Having this service makes me feel [….] isolated in this community.

   Much more---------- much less

   1 2 3 4 5

9. Having this service makes enables me interact […] with my fellow community members

   Much more---------- much less

   1 2 3 4 5

10. This service makes the community […] a place where I want to live and stay

    Much more---------- much less

    1 2 3 4 5

Supported service 2: The community bus (transport)

1. Do you know this service? Yes/no

   If not: please continue at service 3.

2. Are you aware that the organisation supports [insert service]? Yes/no

3. What benefits does this service have in your opinion:

    - Has created local employment

- Offers a more environmentally friendly transport alternative
- Access to/ better connection to social care services (nurse practitioner, general practitioner, hospital, elderly support)
- Access to/ better connection to further connection transport services (e.g. airport, ferry)
- Access to more / better connection to (social, political and cultural) gatherings (e.g. church, friends, family, sports events, committees, meetings, community events)
- Access to more / better connection to social amenities (e.g. swimming pool, cinema, pubs)
- Access to more/better connection to training opportunities (e.g. evening trainings)
- Access to more/ better connection to employment (opportunities) (e.g. jobs with non-standard working times)

[] none

4. Which negative effects does this service have in your opinion?

   This service:

   - Has replaced other local employment
   - Is not enabling because it does not provide in a need (e.g. not that many people use this service)
   - Is environmentally unfriendly
   - Is causing division in the community. Some benefit, but others don't and this causes bad feelings.
   - Other, please specify:

   [] none

5. Do you use this service? Yes/no

   If not, continue at service 3.

6. Which of these benefits do you experience personally?

   - Has created local employment
   - Offers a more environmentally friendly transport alternative
   - Access to/ better connection to social care services (nurse practitioner, general practitioner, hospital, elderly support)
   - Access to/ better connection to further connection transport services (e.g. airport, ferry)
   - Access to more / better connection to (social, political and cultural) gatherings (e.g. church, friends, family, sports events, committees, meetings, community events)
   - Access to more / better connection to social amenities (e.g. swimming pool, cinema, pubs)

- Access to more/better connection to training opportunities (e.g. evening trainings)
- Access to more/ better connection to employment (opportunities) (e.g. jobs with non-standard working times)

[] none

7. Which of these negative effects do you experience personally?

   - Has replaced other local employment
   - Is not enabling because it does not provide in a need (e.g. not that many people use this service)
   - Is environmentally unfriendly
   - Is causing division in the community. Some benefit, but others don't and this causes bad feelings.
   - Other, please specify:

   [] none

8. Having this service makes me feel [….] isolated in this community.

   Much more---------- much less

   1 2 3 4 5

9. Having this service makes enables me interact […] with my fellow community members

   Much more---------- much less

   1 2 3 4 5

10. This service makes the community […] a place where I want to live and stay

    Much more---------- much less

    1 2 3 4 5

Supported service 3: Here-to-Help support (elderly support service)

1. Do you know this service? Yes/no

   If not: please continue at service 4.

2. Are you aware that the organisation supports [insert service]? Yes/no

3. What benefits does this service have in your opinion:

   - Has created local employment
   - Makes the community more attractive for elderly, contributing to an attractive climate for all demographics.
   - Other, please specify:

     [] none

4. Which negative effects does this service have in your opinion?

   This service:

   - Has replaced other local employment
   - Is causing division in the community. Some benefit, but others don't and this causes bad feelings.
   - Other, please specify:

     [] none

5. Do you use this service? Yes/no

   If not, continue at service 4.

6. Which of these benefits do you experience personally?

   - Has created local employment
   - Makes the community more attractive for elderly, contributing to an attractive climate for all demographics.
   - Other, please specify:

     [] none

7. Which of these negative effects do you experience personally?

   - Has replaced other local employment.
   - Is causing division in the community. Some benefit, but others don't and this causes bad feelings.

- Other, please specify:

  [] none

8. This service makes the community […] a place where I want to live and stay

   Much more---------- much less

   1 2 3 4 5

Supported service 4: Newsletter (communication service)

11. Do you know this service? Yes/no

    If not: please continue at service 3.

12. Are you aware that the organisation supports [insert service]? Yes/no

13. What benefits does this service have in your opinion:

    - Keeps people up to date about what is happening in the community and around the project and keeps them up to date without needing much effort.
    - Advertising community events encourages people to participate in community life.
    - By communicating news about the project people can learn about renewable energy.
    - By communicating news about the project people start to feel more positive about renewable energy and energy transition in general.
    - By communicating news about the project people are stimulated to install renewable energy technologies at home.
    - Other, please specify:

      [] none

14. Which negative effects does this service have in your opinion?

    This service:

    - Is environmentally unfriendly
    - Other, please specify:

[] none

15. Do you use this service? Yes/no

    If not, continue at service 3.

16. Which of these benefits do you experience personally?

    - Keeps me up to date about what is happening in the community and around the project and keeps them up to date without needing much effort.
    - Advertising community events encourages me e to participate in community life.
    - By communicating news about the project I learnt about renewable energy.
    - By communicating news about the project I started to feel more positive about renewable energy and energy transition in general.
    - By communicating news about the project I was stimulated to install a renewable energy technology at home.
    - Other, please specify:

      [] none

17. Which of these negative effects do you experience personally?

    This service:
    - is environmentally unfriendly my opinion
    - Other, please specify:

      [] none

18. Having this service makes me feel [….] isolated in this community.

    Much more---------- much less

    1 2 3 4 5

19. Having this service makes enables me to interact […] with my fellow community members

    Much more---------- much less

    1 2 3 4 5

20. This service makes the community […] a place where I want to live and stay

Much more---------- much less

1 2 3 4 5

Impacts of the turbine installation

1. In my opinion the turbine has a […] influence on the natural beauty of the landscape.

Very positive ----------very negative

1 2 3 4 5

2. In my opinion the turbine […] represents our community's contribution to a bigger transition to renewable energy.

Very strongly ---------- not at all

1 2 3 4 5

3. In my opinion the turbine project built […] skills and knowledge to undertake other projects to benefit our community.

Much more ----------Much less

1 2 3 4 5

4. In my opinion the turbine gives the community […] financial means to give direction to its own future.

Much more ----------Much less

1 2 3 4 5

5. In my opinion the turbine has a […] influence on wildlife (e.g. birds).

   Very positive ----------very negative

   1 2 3 4 5

6. I am […] disturbed by the noise of the turbine.

   Very much ----------not at all

   1 2 3 4 5

7. I experience […] flicker caused by the turbine.

   Very strong –----------no

   1 2 3 4 5

8. I find the turbine a […] danger to the safety of the people that live close by and/or visit it.

   Very large –----------no

   1 2 3 4 5

9. I find the turbine otherwise a […] risk to the mental or physical health of the people that live close by and/or visit it.

Very large ←----------no

1 2 3 4 5

If so, please specify what you see as a risk:

10. This turbine makes that the community is […] a place where I want to live and stay

Much more---------- much less

1 2 3 4 5

G. Personal information

a. For how long have you lived in this community?

Please specify:

i. 0-5 years
ii. 5-10 years
iii. Longer than 10 years
iv. My entire life
v. I prefer not to answer

b. Have you lived in this community during your childhood (any time between your birth and 18th)? Yes/no/ I prefer not to answer

c. Age:

- 16-30
- 30-40
- 40-50
- 60 +
- I prefer not to answer

d. Sex: male/ female/other

e. Ethnicity: white - Scottish, white - other British, white – Irish, white - other, Asian/ Asian Scottish/ Asian British, other ethnicity.

f. Marital status: Married/civil partnership, single (i.e. never married), divorced/separated, widowed, other

g. Highest qualification:

- Postgraduate degree or above
- Undergraduate university degree or professional/vocational equivalents
- Higher Grade/Advanced Higher/A level or vocational equivalents
- Standard Grade/GCSE/O Level grade A*-C, or vocational equivalents
- Other qualifications: level unknown (including foreign qualifications)
- No qualifications
- I prefer not to answer

h. Household size: [number]

i. Household income:

- £0 to £9,999
- £10,000 to £19,999
- £20,000 to £29,999
- £30,000 to £39,999
- £40,000 to £49,999
- £50,000 to £74,999
- £75,000 to £99,999
- £100,000+
- I prefer not to answer

j. Employment status:

"Which of the following statements best describes you at the moment?"

- I work 16 hours a week or more
- I work less than 16 hours a week
- I am self-employed
- I am not working
- I am in fulltime education (16 hours or more a week)
- I am in part-time education (less than 16 hours a week)
- I am retired
- I am a housewife/househusband
- I am an unpaid carer
- None of these. Please specify:
- I prefer not to answer

Part III for CORE group actors

A. Involvement in the organisation

1. I am involved as volunteer: Yes/no

   If so, please:

   - specify your role in the organisation:
     - chair
     - board member;
     - administrative tasks;
     - technical support;
     - legal support;
     - accounting support;
     - governance support;
     - project management support;
     - service management;
     - public engagement;
     - advocacy;
     - supportive/executive role events/projects CORE group;
     - nothing specific, helping out when needed;
     - other (please specify)

   - specify the average number of hours you spend per week:
     - 1-4
     - 5-8
     - 8-16
     - 17 or more

2. I am involved as paid staff: Yes/no

   If so, please:

   - Specify your role in the organisation:
     - chair
     - board member;
     - administrative tasks;
     - technical support;
     - legal support;
     - accounting support;
     - governance support;
     - project management support;

- service management;
- public engagement;
- advocacy;
- supportive/executive role events/projects CORE group;
- nothing specific, helping out when needed;
- other (please specify):

- Specify your working hours per week:

  - 1-4
  - 5-8
  - 8-16
  - 17 or more

3. For how long have you had this role (the role indicated at question 1 or 2)?

4. Have you had any other roles within the organisation in the past?

   If so, please specify which roles you had and when you had these roles:

Roles	**Period**

B. Personal background and motivations

1. What motivated you to become involved in this project?

   a. Please indicate the nature of your primary motivation:

   - Environmental sustainability (e.g. greenhouse gas reduction, being part of a wider energy transition, nature conservation)
   - Political (e.g. increasing energy independence, less dependence on external funding)
   - Social (e.g. to get more involved in this community, to bring people together)
   - Socio-economic (e.g. making profit for community benefit, reduction of fuel poverty)
   - Economic (e.g. making profit for personal benefit)
   - Technological (e.g. interest in renewable energy technologies, interest in energy efficiency technologies, off grid energy production)

b. Please indicate your secondary motivations (multiple answers possible):

- ○ Environmental sustainability (e.g. greenhouse gas reduction, being part of a wider energy transition, nature conservation)
- ○ Political (e.g. increasing energy independence, less dependence on external funding)
- ○ Social (e.g. to get more involved in this community)
- ○ Socio-economic (e.g. making profit for community benefit, reduction of fuel poverty)
- ○ Economic (e.g. making profit for personal benefit)
- ○ Technological (e.g. interest in renewable energy technologies, interest in energy efficiency technologies, off grid energy production)

2. Do you have background knowledge/ experiences in any of these fields that came in handy while working for this organisation? Yes/no

   If so, please tick the boxes of the relevant fields:

   - ○ Management/ governance
   - ○ Funding allocation
   - ○ Business administration
   - ○ ICT
   - ○ Building / construction works
   - ○ Legalities
   - ○ Accounting
   - ○ Engineering
   - ○ Renewable energy (RE) technology
   - ○ Planning
   - ○ Public engagement
   - ○ Advocacy
   - ○ Service management
   - ○ Project management
   - ○ RE project management
   - ○ Community RE project management
   - ○ Interpersonal skills
   - ○ Other, please specify:

3. Are there skills/knowledge that you developed through your participation in this organisation?

   I gained skills and/or knowledge in the following fields:

   - ○ Management/ governance
   - ○ Funding allocation
   - ○ Business administration
   - ○ ICT

- ○ Building / construction works
- ○ Legalities
- ○ Accounting
- ○ Engineering
- ○ Renewable energy (RE) technology
- ○ Planning
- ○ Public engagement
- ○ Advocacy
- ○ Service management
- ○ Project management
- ○ RE project management
- ○ Community RE project management
- ○ Interpersonal skills
- ○ Other, please specify:

4. I gained awareness of the importance of:
   - ○ Management/ governance
   - ○ Funding allocation
   - ○ Business administration
   - ○ ICT
   - ○ Building / construction works
   - ○ Legalities
   - ○ Accounting
   - ○ Engineering
   - ○ Renewable energy (RE) technology
   - ○ Planning
   - ○ Public engagement
   - ○ Advocacy
   - ○ Service management
   - ○ Project management
   - ○ RE project management
   - ○ Community RE project management
   - ○ Interpersonal skills
   - ○ Other, please specify:

5. Do you have connections with people or organisations that came in handy while working for this organisation?

   If so, please specify:

   - ○ Local government (e.g. the Council)
   - ○ Other public sector organisations (e.g. HIE, universities)
   - ○ Local third sector organisations (e.g. Community Council, Community Association)
   - ○ Other third sector organisations
   - ○ Other community RE groups
   - ○ Local private enterprises
   - ○ Other private enterprises
   - ○ Local community members within the organisation
   - ○ Local community members in general
   - ○ Others, please specify:

6. Did your relationship with people or organisations improve thanks to participation in this project? Yes/no

   If so, please specify:

   - ○ Local government (e.g. the Council)
   - ○ Other public sector organisations (e.g. HIE, universities)
   - ○ Local third sector organisations (e.g. Community Council, Community Association)
   - ○ Other third sector organisations
   - ○ Other community RE groups
   - ○ Local private enterprises
   - ○ Other private enterprises
   - ○ Local community members within the organisation
   - ○ Local community members in general
   - ○ Others, please specify:

7. Did your relationship with people or organisations worsen thanks to participation in this project? Yes/no

   If so, please specify:

   - ○ Local government (e.g. the Council)
   - ○ Other public sector organisations (e.g. HIE, universities)
   - ○ Local third sector organisations (e.g. Community Council, Community Association)
   - ○ Other third sector organisations
   - ○ Other community RE groups
   - ○ Local private enterprises
   - ○ Other private enterprises
   - ○ Local community members within the organisation
   - ○ Local community members in general
   - ○ Others, please specify:

C. Image of the organisation

13. This organisation contributes to the community in a […] way.

    Very positive ----------very negative

    1 2 3 4 5

14. I am […] the project.

    Strongly in favour of ----------strongly opposed to

    1 2 3 4 5

15. I […] trust that the organisation leads the project in a way that optimises the benefits for the community.

    Strongly –----------do not

    1 2 3 4 5

16. The organisation reacts on disagreements and division in a way that

    brings people together----------drives people apart

    1 2 3 4 5

17. The organisation acts in a […] way.

    Fair and transparent–----------unfair and obscured

    1 2 3 4 5

18. I feel like my views about the project are […] considered.

Very much –---------- not at all

1 2 3 4 5

I have no wish to express my views, because (multiple answers possible):

[] I have no interest in expressing my views

[] I don't feel comfortable with expressing my views
[] I have trust in the organisers of the project
[] Other reason, please specify:

19. I […] have the ability to influence decisions.

Very much –---------- not at all

1 2 3 4 5

I have no wish to influence decisions, because (multiple answers possible):

[] I have no interest in influencing decisions

[] I don't feel comfortable with taking part in the decision making process

[] I have trust in the organisers of the project

[] Other reason, please specify:

20. This project is a community project

Strongly agree –----------strongly disagree

1 2 3 4 5

D. Evaluation of the development process

Please answer these questions if you lived in this community between …. and ….
[Note for the researcher: insert phase of project development]

21. I feel like my views about the project have […] been taken into account.

Very much –---------- not at all

1 2 3 4 5

I had no wish to express my views, because (multiple answers possible):

[] I had no interest in expressing my views

[] I didn't feel comfortable with expressing my views
[] I had trust in the organisers of the project
[] Other reason, please specify:

22. I […] had the ability to influence decisions made.

Very much –---------- not at all

1 2 3 4 5

I had no wish to influence decisions, because (multiple answers possible):

[] I had no interest in influencing decisions

[] I didn't feel comfortable with taking part in the decision making process

[] I had trust in the organisers of the project
[] Other reason, please specify:

23. I think the setting up and development of the project have been carried out in a […] way

Fair and transparent----------unfair and obscured

1 2 3 4 5

[] I was not following the development of the project.

24. The project has only gone ahead because of community support and involvement

Strongly agree –----------strongly disagree

1 2 3 4 5

[] I was not following the development of the project.

E. Supported services and their flow on effects

Supported service 1: The Out-of-Hours boat service (transport)

11. Do you know this service? Yes/no

    If not: please continue at service 2.

12. Are you aware that the organisation supports [insert service]? Yes/no

13. What benefits does this service have in your opinion:

    - Has created local employment
    - Offers a more environmentally friendly transport alternative
    - Access to/ better connection to social care services (nurse practitioner, general practitioner, hospital, elderly support)
    - Access to/ further connection transport services (e.g. airport, ferry)
    - Access to more / better connection to (social, political and cultural) gatherings (e.g. church, friends, family, sports events, committees, meetings, community events)
    - Access to more / better connection to social amenities (e.g. swimming pool, cinema, pubs)
    - Access to more/better connection to training opportunities (e.g. evening trainings)
    - Access to more/ better connection to employment (opportunities) (e.g. jobs with non-standard working times)

    [] none

14. Which negative effects does this service have in your opinion?

    This service:

    - Has replaced other local employment
    - Is environmentally unfriendly
    - Is causing division in the community. Some benefit, but others don't and this causes bad feelings.
    - Other, please specify:

    [] none

15. Do you use this service? Yes/no

If not, continue at service 2.

16. Which of these benefits do you experience personally?

    - Has created local employment
    - Offers a more environmentally friendly transport alternative
    - Access to/ better connection to social care services (nurse practitioner, general practitioner, hospital, elderly support)
    - Access to/ further connection transport services (e.g. airport, ferry)
    - Access to more / better connection to (social, political and cultural) gatherings (e.g. church, friends, family, sports events, committees, meetings, community events)
    - Access to more / better connection to social amenities (e.g. swimming pool, cinema, pubs)
    - Access to more/better connection to training opportunities (e.g. evening trainings)
    - Access to more/ better connection to employment (opportunities) (e.g. jobs with non-standard working times)

    [] none

17. Which of these negative effects do you experience personally?

    - Has replaced other local employment
    - Is environmentally unfriendly
    - Is causing division in the community. Some benefit, but others don't and this causes bad feelings.
    - Other, please specify:

    [] none

18. Having this service makes me feel [….] isolated in this community.

    Much more---------- much less

    1 2 3 4 5

19. Having this service enables me to interact […] with my fellow community members

    Much more---------- much less

    1 2 3 4 5

20. This service makes the community […] a place where I want to live and stay

Much more---------- much less

1 2 3 4 5

Supported service 2: The community bus (transport)

21. Do you know this service? Yes/no

    If not: please continue at service 3.

22. Are you aware that the organisation supports [insert service]? Yes/no

23. What benefits does this service have in your opinion:

    - Has created local employment
    - Offers a more environmentally friendly transport alternative
    - Access to/ better connection to social care services (nurse practitioner, general practitioner, hospital, elderly support)
    - Access to/ better connection to further connection transport services (e.g. airport, ferry)
    - Access to more / better connection to (social, political and cultural) gatherings (e.g. church, friends, family, sports events, committees, meetings, community events)
    - Access to more / better connection to social amenities (e.g. swimming pool, cinema, pubs)
    - Access to more/better connection to training opportunities (e.g. evening trainings)
    - Access to more/ better connection to employment (opportunities) (e.g. jobs with non-standard working times)

    [] none

24. Which negative effects does this service have in your opinion?

    This service:

    - Has replaced other local employment
    - Is environmentally unfriendly
    - Is causing division in the community. Some benefit, but others don't and this causes bad feelings.
    - Other, please specify:

    [] none

25. Do you use this service? Yes/no

If not, continue at service 3.

26. Which of these benefits do you experience personally?

- Has created local employment
- Offers a more environmentally friendly transport alternative
- Access to/ better connection to social care services (nurse practitioner, general practitioner, hospital, elderly support)
- Access to/ better connection to further connection transport services (e.g. airport, ferry)
- Access to more / better connection to (social, political and cultural) gatherings (e.g. church, friends, family, sports events, committees, meetings, community events)
- Access to more / better connection to social amenities (e.g. swimming pool, cinema, pubs)
- Access to more/better connection to training opportunities (e.g. evening trainings)
- Access to more/ better connection to employment (opportunities) (e.g. jobs with non-standard working times)

[] none

27. Which of these negative effects do you experience personally?

- Has replaced other local employment
- Is environmentally unfriendly
- Is causing division in the community. Some benefits, but others don't and this causes bad feelings.
- Other, please specify:

[] none

28. Having this service makes me feel [….] isolated in this community.

Much more---------- much less

1 2 3 4 5

29. Having this service enables me to interact […] with my fellow community members

Much more---------- much less

1 2 3 4 5

30. This service makes the community […] a place where I want to live and stay

Much more---------- much less

1 2 3 4 5

Supported service 3: Here-to-Help support (elderly support service)

9. Do you know this service? Yes/no

   If not: please continue at service 4.

10. Are you aware that the organisation supports [insert service]? Yes/no

11. What benefits does this service have in your opinion:

    - Has created local employment
    - Makes the community more attractive for elderly, contributing to an attractive climate for all demographics.
    - Other, please specify:

      [] none

12. Which negative effects does this service have in your opinion?

    This service:

    - Has replaced other local employment
    - Is causing division in the community. Some benefit, but others don't and this causes bad feelings.
    - Other, please specify:

      [] none

13. Do you use this service? Yes/no

    If not, continue at service 4.

14. Which of these benefits do you experience personally?

    - Has created local employment
    - Makes the community more attractive for elderly, contributing to an attractive climate for all demographics.
    - Other, please specify:

      [] none

15. Which of these negative effects do you experience personally?

- Has replaced other local employment
- Is causing division in the community. Some benefit, but others don't and this causes bad feelings.
- Other, please specify:

  [] none

16. This service makes the community […] a place where I want to live and stay

Much more---------- much less

1 2 3 4 5

Supported service 4: Newsletter (communication service)

31. Do you know this service? Yes/no

    If not: please continue at service 3.

32. Are you aware that the organisation distributes a newsletter? Yes/no

33. What benefits does this service have in your opinion:

    - Keeps people up to date about what is happening without needing much effort.
    - Advertising community events encourages people to participate in community life.
    - By communicating news about the project people can learn about renewable energy.
    - By communicating news about the project people start to feel more positive about renewable energy and energy transition in general.
    - By communicating news about the project people are stimulated to install renewable energy technologies at home.
    - Other, please specify:

      [] none

34. Which negative effects does this service have in your opinion?

    This service:

    - Is environmentally unfriendly
    - Other, please specify:

      [] none

35. Do you use this service? Yes/no

    If not, continue at service 3.

36. Which of these benefits do you experience personally?

    - Keeps me up to date about what is happening in the community without needing much effort.
    - Advertising community events encourages me to participate in community life.
    - By communicating news about the project I learnt about renewable energy.
    - By communicating news about the project I started to feel more positive about renewable energy and energy transition in general.
    - By communicating news about the project I was stimulated to install renewable energy technologies at home.
    - Other, please specify:

      [] none

37. Which of these negative effects do you experience personally?

    This service:
    - is environmentally unfriendly in my opinion
    - Other, please specify:

      [] none

38. Having this service makes me feel [….] isolated in this community.

    Much more---------- much less

    1 2 3 4 5

39. Having this service makes enables me interact […] with my fellow community members

    Much more---------- much less

    1 2 3 4 5

40. This service makes the community […] a place where I want to live and stay

    Much more---------- much less

    1 2 3 4 5

Impacts of the turbine installation

11. In my opinion the turbine has a […] influence on the natural beauty of the landscape.

    Very positive ----------very negative

    1 2 3 4 5

12. In my opinion the turbine […] represents our community's contribution to a bigger transition to renewable energy.

    Very strongly ---------- not at all

    1 2 3 4 5

13. In my opinion the turbine gives the community […] financial means to give direction to its own future.

    Much more ----------Much less

    1 2 3 4 5

14. In my opinion the turbine project built […] skills and knowledge to undertake other projects to benefit our community.

    Much more ----------Much less

    1 2 3 4 5

15. In my opinion the turbine has a […] influence on wildlife (e.g. birds).

Very positive ----------very negative

1 2 3 4 5

16. I am […] disturbed by the noise of the turbine.

Very much ----------not at all

1 2 3 4 5

17. I experience […] flicker caused by the turbine.

Very strong –----------no

1 2 3 4 5

18. I find the turbine a […] danger to the safety of the people that live close by and/or visit it.

Very large –----------no

1 2 3 4 5

19. I find the turbine otherwise a […] risk to the mental or physical health of the people that live close by and/or visit it.

Very large –----------no

1 2 3 4 5

If so, please specify what you see as a risk:

20. This turbine makes that the community is […] a place where I want to live and stay

Much more---------- much less

1 2 3 4 5

F. **Personal information**

k. For how long have you lived in this community?

Please specify:

i. 0-5 years
ii. 5-10 years
iii. Longer than 10 years
iv. My entire life
v. I prefer not to answer

l. Have you lived in this community during your childhood (any time between your birth and 18th)? Yes/no/ I prefer not to answer

m. Age:
- 16-30
- 30-40
- 40-50
- 60 +
- I prefer not to answer

n. Sex: male/ female/other

o. Ethnicity: white - Scottish, white - other British, white – Irish, white - other, Asian/ Asian Scottish/ Asian British, other ethnicity.

p. Marital status: Married/civil partnership, single (i.e. never married), divorced/separated, widowed, other

q. Highest qualification:

- Postgraduate degree or above
- Undergraduate university degree or professional/vocational equivalents
- Higher Grade/Advanced Higher/A level or vocational equivalents
- Standard Grade/GCSE/O Level grade A*-C, or vocational equivalents
- Other qualifications: level unknown (including foreign qualifications)
- No qualifications

- I prefer not to answer

r. Household size: [number]

s. Household income:

- £0 to £9,999
- £10,000 to £19,999
- £20,000 to £29,999
- £30,000 to £39,999
- £40,000 to £49,999
- £50,000 to £74,999
- £75,000 to £99,999
- £100,000+
- I prefer not to answer

t. Employment status:

Which of the following statements best describes you at the moment?

- I work 16 hours a week or more
- I work less than 16 hours a week
- I am self-employed
- I am not working
- I am in fulltime education (16 hours or more a week)
- I am in part-time education (less than 16 hours a week)
- I am retired
- I am a housewife/househusband
- I am an unpaid carer
- None of these. Please specify:
- I prefer not to answer

Annex 2: Indicative interview questions

Interview Orkney Council representatives

1. What is the role of the council regarding community owned RE?
2. From your point of view as council staff, what do you perceive as enabling factors for community RE projects?
3. From your point of view as council staff, what do you see as constraining factors for community RE projects?
4. What do you see as key social outcomes of community RE projects?
5. Have you seen any social impacts of community RE projects in Orkney? If so, could you give some examples? What are the most visible ones? What is less tangible, though still important?
6. What do you see as key prerequisites for community RE projects to maximise their social impact?
7. Does the council collect information on the social conditions in Orkney? If so, which indicators do you use? (How do you collect this information)
8. What do you see as useful information for the council regarding social impacts of community RE projects?

Interview Highlands and Islands enterprise & Community Energy Scotland

(Organisation is during the interview replaced by the name of the relevant organisation)

1. What do you see as key social outcomes of community RE projects?
2. Have you seen any social impacts of community RE projects in Orkney? If so, could you give some examples? What are the most visible ones? What is less tangible, though still important?
3. What do you see as key prerequisites for community RE projects to maximise their social impact?
4. Do you collect information on the social conditions? If so, which indicators do you use? (How do you collect this information?)
5. What do you see as useful information for the organisation regarding social impacts of community RE projects?
6. From your work for this organisation, what do you perceive as enabling factors for community RE projects?
7. From your work for this organisation, what do you see as constraining factors for community RE projects?

Community and CORE group actors

(Questions were rephrased/left out/ added depending on the role of the interviewee)

-Tell bit about what we are doing, asking for signing consent form and giving permission for audio recording.

1. What is your involvement with SDT/SRL?
2. How long have you been involved?
3. What motivated you to become involved? Why is (case study name) important to you?
4. What would you say are the driving motivations behind the project as a whole?
5. What goals are the goals of the Trust and the Turbine Company at the moment?
6. What makes (case study name) a 'community' project?
7. Could you explain a bit more about what it is like in practice to have a double function? Does this sometimes result in tensions, dilemmas? Are the board and SDT mostly likeminded? What are the points that can be difficult to get people on one line?
8. How have you gone about developing the project? Can you tell us about the process of developing the turbine? How were the community involved?
    - What are the most important organisations that SDT and SRL work with? Why? What kind of contacts/partnerships are there? (e.g. other Orkney trusts, council, public administration Kirkwall)
    - What are the ways/moments that the community can share its thoughts with SDT and SRL?
9. Were there turning points, or key milestones, in the life of the project? Particular markers that define the relationship between the project and the community?
10. Do people start to speak with you about the turbine? If so, what things do they mention? What positive stories and what critical stories do they tell? (ask for reasons why they might feel like that if that doesn't come up)
11. Has there been any opposition? How has these been managed?
12. Can you please a draw mind map for me of the various economic interactions of your project? And of the governance / legal model?
    - (Could you tell us about the structure of the SRL and the task division within the organisation (if handy, please draw a mind map)?
13. How has the project changed or influenced you?
    - Is there anything you want to get out of the project for yourself? Like learning new skills or obtaining more knowledge, getting more contacts within the community?
    - Did having a role in the boards of the trust and the SRL influence your life in the community? Relations with people in the community
14. What do you think the impact and outcomes of the project have been for the local area in terms of environmental, social and economic outcomes?

15. Do you think the same outcomes could be realised via a different type of project (eg. corporate, developer-led)?
16. How has the project changed or influenced the community?
    - What are the biggest changes that the turbine has brought for the community in your mind? Which negative and which positive? Do you see a trade-offs?
17. How has the project changed or influenced the region, country or international arena?
18. What do you think is most important for successful continuation of the turbine project? What needs to be in place for to get that done? Are there things that need to be in place or need to stay in place that SDT and SRL cannot control?
19. What would you change or do differently?
20. What would you like to see grow from the project in the future?

Other/ extra

1. Could you recommend some people with positive or critical attitudes towards the project to talk to?

-Thank you for your time. Is there something else that you would like to share?

Annex 3: Outline programme focus groups

- Welcome and consent forms
- Introduction to the research
- Objectives of the workshop
- Programme of the workshop
- Ground rules

All together 5-10 minutes
19.30-19.35

Activity	**Technique and purpose**	**Description**	**Materials**	**Time**
Introduction	Round-robin Introduction participants.	Name, how long they live on Shapinsay, why they were interested to come along. Start with introducing ourselves.	-	10 minutes 19.35-19.45
How to make a woollen pullover (the Shapinsay version of how to make toast, many sheep in Orkney)	Practising systems thinking - Give people time to draw the process of making a woollen pullover – discuss the different representations and explain systems thinking.	A system consists of nodes and links. Nodes represent the tangible objects like the pullover, needles, wool, and people, and links represent the connections between the nodes. And it's the combination of links and nodes that produces a full systems model, and it makes our private mental models visible about how we think something works. So that's the value of these models. What's interesting about these systems models is how they reveal our various points of view. Different people include different steps. All models have nodes and links, but some are more complicated and some less complicated. Some include people, others don't. You can make it as extensive as you like. You can start with the wool and show the process from there on, but you can also include the production of the wool or even start with the birth of the sheep, or go back to the way sheep evolved or even development of first	1 A4 pp. 1 pen pp.	15 minutes 19.45-20.00

		life on earth. Anyway, including multiple contributions makes the model richer and clearer. So you don't have to agree and we can include everybody's views!		
What are the social impacts of Whirly on Shapinsay	Popcorn brainstorm	Participants put post-its on a poster with social outcomes. One part for positive and one for negative. Continuing on the poster of the earlier focus group and outcomes that were mentioned in the exploratory survey. First positive, then negative. Can be outcomes of the project that affect you personally, but also changes that you see in the wider community. Discuss the contributions, group them if comparable, and split positive and negative. Possibly some outcomes are both positive and negative.	Poster with positive social outcomes and one with negative social outcomes, post its, pens.	15 minutes 20.00-20.15
What are the most important outcomes	Scoring the outcomes	Please give every post-it that has an outcome that you also recognise in the community or on yourself a dot. Researchers count and determine the key outcomes.	Pens.	10 minutes 20.15-20.25
What caused these impacts?	Creating pathways of change – Depending on the number of identified key impacts and participants create sub groups.	Establishing pathways of how change was brought about. It is about creating a story that explains what happened and caused the outcome. What resources were needed (money)/ which activities were needed (turbine making money, making application to the swap fund, supported activity taking place.)	For every outcome a poster. Give poster the name of the outcome. Post its and pens needed.	30 minutes 20.25-20.55

		Possibly multiple stories that contribute to one outcome. Every group gets some positive and negative outcomes to work on. Sub groups are asked to draw on post its how they think that particular outcomes were established. If multiple groups, give people the opportunity to work on different chains of outcomes (if it is possible time-wise). Small group, then outcome per outcome. Adding the post its in a popcorn brainstorm way.		

- Wrapping up: Talk through the end results of one of the posters and enable people to have a look at what is created and put the poster up on the wall. *5 minutes* 20.55-21.00

- Thank you and goodbye!

Annex 4: Promo poster research

How do you think Whirly's going?

We are Jarra and Esther and we'd like to hear your thoughts about how the community wind turbine has changed Shapinsay. What do you think the outcomes have been in the community?

What ever your thoughts, we'd like to hear them!

DISCUSSION GROUPS - Fri 5 & Tues 9 June 7.30-9pm,
Shapinsay Community Centre
All residents of Shapinsay are welcome to come along to one or the other, as convenient. No preparation or prior knowledge needed. Snacks provided.

SURVEY – online from the Friday 29 May at
www.surveymonkey.com/s/2KDNF2J
Open to all residents of Shapinsay. Should take about 20 minutes.
Fill in the survey to go in the draw for a prize.

INTERVIEWS – at a time & place that is convenient for you,
between 20 and 60mins.
Get in touch if you'd prefer to share your thoughts one-on-one.

We look forward to meeting you!

About Jarra & Esther:
Jarra & Esther have travelled from overseas to visit Shapinsay and hear your experiences of having a community wind turbine. They are very happy to have the chance to visit your beautiful island. Jarra is a PhD student from the University of New South Wales in Sydney, Australia. Esther is Masters student from Radboud University in Nijmegen, The Netherlands.

+ 01 856 711 733 or + 01 856 711 719
jarra.hicks@student.unsw.edu.au or esther.vdw@sceneconsulting.com

Share your thoughts on Whirly!
Discussion groups Fr. 5.6 and Tue 9.6: 19.30-21.00
One-to-one chats any time that suits you
Contact:: + 01 856 711 733 or + 01 856 711 719
jarra.hicks@student.unsw.edu.au or esther.vdw@sceneconsulting.com

Annex 5: Questionnaire exploratory survey

Share your thoughts on Whirly!

Fill in 10 questions and go in the draw for a gift certificate for Smithy's
We will come Wednesday & Thursday for collecting. Drop off at the Trust is also possible.

Our names are Jarra and Esther and we were hoping to ask you just ten questions about Whirly, the community wind turbine. This is part of a study we are doing on how we can measure impacts of community energy projects, supported by Scene, the University of Edinburgh, ClimateXChange, and the University of New South Wales. The information in this survey will be used to understand what the turbine project on the island has meant to you, and how it has affected you in positive or negative ways. Any information you share with us remains completely confidential (meaning that no one beyond us will be able to connect your responses with your name), and it will take maximum 15 minutes of your time.

The following questions are about Shapinsay's 900 kW community wind project (Whirly), led by Shapinsay Development Trust, and operated by Shapinsay Renewables Ltd. It is also about activities of the trust that were made possible through revenues from the turbine.

Your involvement in the Shapinsay Development Trust

These questions are about your involvement in the Shapinsay Development Trust.

1. In what way are you involved in the Shapinsay Development Trust and its work? (Please tick the box or boxes that describe you best)

- ☐ Not
- ☐ As member of the board
- ☐ As staff member
- ☐ As volunteer helping the trust
- ☐ I attend general meetings
- ☐ I have benefited from the SWAP fund (Shapinsay's Way Ahead Programme)
- ☐ I profited from other purposes that were supported through the SWAP fund
- ☐ Other (please specify)

2. Why is it important for you to be involved in the Shapinsay Development trust? (Please describe below)

3. What value do the services that the Shapinsay Development Trust provides have to you, and why?

(Please share below your thoughts on services like the Out-Of-Hours boat service, community bus, and Here-to-Help support for elderly)

4. Which of the purposes that the Shapinsay Development Trust supported through the SWAP funds are most valuable to you, and why? (Please share your thoughts on up to 5 of them below)

(Examples include diverse trainings, educational trips, and equipment)

1.

2.

3.

4.

5.

5. What activities do you think Whirly's revenues should be allocated to and why? (Please describe below)

From idea to turbine (2007-2011)

These questions are about the period from the initial idea till the moment that the turbine became operational (2007-2011). If you were not living on Shapinsay during any of these years, you can skip these questions.

6. Were you engaged with the planning and development of Whirly in the period between 2007 and 2011? (please tick the box that describes you best)

- To a great extent
- Somewhat
- Very little
- Not at all

7. Can you describe any moments during the development process from 2007-2011 that were memorable to you, and why? (please describe below)

Last question!

8. Do you feel, with the benefit of hindsight, that any particular aspects of the project could have been handled differently, and why? (feel free to share both positive or critical thoughts and please describe these below)

-You can skip this question if you were not living on Shapinsay during any of these years.

a. **Period from the initial idea till the turbine turned (2007-2011)**

b. Period from having a turning turbine till now (2011-2015)

End: thank you for participating

Thank you for sharing your experiences with us. The study depends on participants like you. In the next few weeks we will be running around Shapinsay doing focus groups and interviews, and we would be thrilled if you could join us!

9. Can we contact you later on to tell us more?

☐ Yes, for an interview (45 minutes, no prior knowledge needed, refreshments provided, at a place & time convenient for you)

☐ Yes, for discussion group 1 Friday 5 June - 19.30 - 21.00 (1.5h, no prior knowledge needed, refreshments provided, at the community centre)

☐ Yes, for discussion group 2 Tuesday 9 June - 19.30 - 21.00 (1.5h, no prior knowledge needed, refreshments provided, at the community centre)

☐ I am not sure now, please contact me later to ask me again

☐ No

10. Please fill in the following information about yourself. This information will be treated confidentially and will not be given to anybody else.

Name

Age

Email

Phone number