

# **The progress of Renewable Energy Community Initiatives within The Netherlands and The UK, from a Strategic Niche Management perspective.**

Master's Thesis for Spatial Planning (Planologie) programme

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20<sup>th</sup> August 2018

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## **Abstract**

System-wide transformations in sociotechnical systems of energy provision are required in order to promote sustainable development. Within recent decades, the presence of community initiatives has become increasingly notable within Europe, with aims of providing renewable energy, in order to tackle this prevailing challenge. Conversely, inadequate comparative research has been conducted regarding the processes and conditions necessary for such initiatives to strive and create an effectual impact on wider energy systems. Consequently, a comparative case-study was piloted between six RE community initiatives: Drumlin Cooperative, Westmill Cooperative, Alt Dearg Wind Farm, Hockerton Housing Project within the UK, and Nijmegen Betuwe and Zuidenwind within the Netherlands. The cases were a forum to answer the following research question: “What are the overarching drivers for change in community initiatives for renewable energy within the Netherlands and the UK and how do these compare from the theoretical perspective of a Strategic Niche Management outlook?”

Many terms are applied to the cases studied such as ‘community initiatives’, ‘local cooperative’, ‘grassroot innovation’ or ‘abstract’ niches. These can create space for contemporary social arrangements, habits and practices that differ from those in the regime to be enforced and further practiced. Subsequently, every case was analysed relative to the Strategic Niche Management framework to derive factors which initiated such changes in their system of energy. The three predominant aspects proposed by Kemp et al. (1998) postulate for being crucial for technology-centred niches (building networks, managing expectations and learning processes) are seemingly appropriate for ‘social’ niche innovations. Every individual case in the study addressed all three of the aspects successfully, albeit with differentiating intensities and priorities to a specific degree. This has facilitated these initiatives to tackle and overcome many of the standard obstacles that such bottom-up organizations typically face.

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**List of Abbreviations**

ADWF: Alt Dearg Wind Farm

BWEA: British Wind Energy Association

CEGB: Central Electricity Generating Board

E4A: Energy4All

EIA: Environmental Impact Assessment

CHP: Combine heat and power

GBP: Great British Pounds

MEP: Millieukwaliteit van de Elektriciteitsproductie

MLP: Multi-Level Perspective

NB: Nijmegen Betuwe

NI: Northern Ireland

NIMBY: Not in my backyard

NFFO: Non-Fossil Fuel Obligation

NGO: Non-governmental organisation

REAP: Renewable Energy Action Plan

RE: Renewable Energy

RO: Renewables Obligation

SDE+: Stimulerend Duurzame Energieproductie

SNH: Scottish Natural Heritage

SNM: Strategic Niche Management

WeSET: Westmill Sustainable Energy Trust

WWF: Westmill Wind farm

HHP: Hockerton Housing Project

## 1. Introduction

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### 1.1 Research Problem & Statement

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The facility of energy globally at present is immensely dependent on the use of fossil fuels. These are restricted and also release harmful CO<sub>2</sub> emissions which stimulate the phenomenon of climate change. Combined with increasing populations and therefore predicted energy consumption rates, issues arise in the quality of the environment as well as its security in future (EZ, 2008). It is therefore interesting to study ways in which various countries are aiming to combat such issues, especially through the recent prevalence of RE community initiatives.

#### **Goals within the Netherlands and the UK**

Without stringent governmental forces, energy-related CO<sub>2</sub> emissions are expected to increase by approximately 60% within the following quarter of this century (EZ, 2008).

The Dutch central government has thus committed to certifying that 14% of all energy used in the Netherlands is sustainable by 2020 and has increased this level to 16% by 2023. The predominant driver of renewable energy within the Netherlands is wind and in support of this the government segregates sites for offshore wind farms. The amount of megawatts (MW) of electricity generated from wind turbines will inevitably increase (Bilgili *et al.*, 2011). In 2015, offshore wind turbines generated 357 MW and it is predicted that 4,450 MW will be required by 2023, providing electricity to approximately 5 million households. As a result, offshore windfarms will produce an estimated 3.1% of the overall energy use in the Netherlands. This is a substantial figure to accomplishing the aim of 16% sustainable energy in the Netherlands by 2023 (Government of the Netherlands, 2016).

The Dutch national ambitions are particularly high on arranging and implementing offshore wind farms, as the Dutch government is aware of the largely densely populated country and its landscape to be less appropriate for a spread of large-scale onshore windfarms. Such types are more suited to less densely populated countries with increasingly rural landscapes, for example, the island of Ireland. In many states, wind farms will be tactfully planned and implemented within a lengthy proximity from residential areas to avoid detrimental noise or visual impact.

Offshore wind in the Netherlands is of high importance within National planning policy, and the current government has proposed to produce 1,000MW per year post 2020 (DONG Energy Netherlands, 2017). However, it must be noted that policy objectives have recently intensified for the planning of onshore wind farms. The policy objective is divided into provinces relative to expected wind revenue and landscape considerations. Hereby, the provincial and municipal governments eradicate regional planning and siting procedures and facilitate the development of actual wind farms in the appointed regions (DONG Energy Netherlands, 2017).

The Dutch governments policy objective for planning and implementing onshore wind farms are proposing to elevate. At the end of 2015, there were at least 2525 onshore wind turbines, generating a total of 3,000 megawatts (MW) of electricity, approximating to 5% of the Netherlands total requirement. This must progress to a capacity of 6,000 MW by 2020 and is set out in the Energy Agreement for Sustainable Growth, which claims this goal should be simplified given the spatial availability in the Netherlands. Furthermore, central government has decided to build more onshore wind turbines in order to contribute to the European Union's goal of achieving 14% renewable energy by 2020 (GovernmentNL, 2016).

The United Kingdom also has ambitious aims to meet challenging future climate change goal of an 80% reduction in greenhouse gas emissions by 2050. With the necessity to reduce greenhouse gas emissions, the UK's policy is also to generate 30% of electricity from Renewable energy sources by 2020 (The Environment Agency, 2015). The rise of community initiatives in both countries can aid the accomplishment of their goals. However, obstacles and delays may arise in planning process and implementation of these projects. One predominant obstacle includes the lack of social and/or political support (Breukers & Wolsink, 2007). In hindrance to the UK however, the current UK PM 'Teresa May', has recently announced that negotiations are occurring to halt the spread of on-shore windfarms in the future. Such statement has caused controversy massively within the UK, predominantly with Environmentalists and Green Parties (The Guardian, 2018). Inevitably, if such 'halts' are to occur, this means wind farm implementation will stagnate, which is problematic for the UK in meeting its climate change goals.

Measures towards sustainability have created various social innovations combined with innovative technologies in alternative arenas and at different scales (Seyfang & Smith, 2007). Nonetheless, our typical energy habits have been deeply embedded in our daily lives. As a result, sustainable development is challenged to deal with the demand and rising of system-wide transformations evident within sociotechnical systems of supply. The transition to local and renewable energy systems tackle the generalized growth-based conceptions of our increasingly globalized and industrialized world, whereby growth in oil and gas has been concomitant with affluence and progress (Seyfang & Haxeltine, 2012).

Growing evidence states that in order to deal with climate change and achieve a low-carbon economy, system-wide transformations are paramount (Foxon et al., 2009; Jackson, 2009). However, innovation tends to be dependent on routines, resources, capabilities and knowledge of technology producers and users. It is also dependent on the market and social normal that posit results viewed as substantial, having the ability to influence certain lifestyle changes and entrenching these practices in the future (Seyfang & Smith, 2007).

Enforcing a goal like sustainable development within existing sociotechnical regimes indicates the assembly and coordinating changes in actors, institutions at various points within and beyond the regime. Commencing within a network of pioneering organisations, technologies and users that create a niche practice, it is likely for an overarching regime to experience monumental changes regardless of path dependencies and therefore, the aim of this research is to explore how this can occur.

## 1.2 Research Aim & Questions

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The research within this project is necessary as there is little empirical research available that proposes evidence for community initiatives in being successful and ways in which citizen engagement can influence success and influence wider systems (Van der Schoor & Scholtens, 2015; Hielscher et al., 2011). Nevertheless, literature in relation to transition theory has demonstrated how classical regime transformations progressed from the development of projects in 'niches', or reserved spaces, where practices differ from the conventional (Foxon et al., 2009; Jackson, 2009). Strategic Niche Management (SNM) (applied to this study) is a specific branch of this literature and is applied as a framework for governing sociotechnical niches to catalyse a preferred outcome (Kemp *et al.*, 1998). However, until recently, this literature focused increasingly on the technological characteristics of sociotechnical transitions and less on social innovation, movements and actors. The SNM theory is applicable when transferring the focus from technological to social, being an appropriate conceptual framework in comprehending the duties of civil society in the prevalence and governance of sustainability transitions. This niche-based approach focuses on niche occurrence and development by concentrating analysis on social networks, learning processes and the management of expectations. In chapter 2, the SNM Theory is further explained.

Thus, the problem statement of this research is:

What are the overarching drivers for change in community initiatives for renewable energy within the Netherlands and the UK and how do these compare from the theoretical perspective of a Strategic Niche Management outlook?

Renewable Energy (RE) community initiatives of wind turbine projects on land have been chosen, as this is where increasing conflicts of interests are noted in relation to site selection and social support. Additionally, the study of wind farms on land relates to my study as they are decentralized in nature (similar to community initiatives) and also within the decision-making process. On the other hand, the operations of wind projects at sea are increasingly handled at a central level and unreflective to this project. Finally, I thought the study would be increasingly interesting as an international comparative one and thus took advantage of using my native home country as a comparative case.

The overarching research question aims to comprehend and compare measures whereby community initiatives within each country contribute to the development of energy niches in favor over conventional energy regimes, in order to promote change. The results from applying the SNM framework to these empirical studies provide a new outlook on how community initiatives promote and enhance sustainability transitions.



### Research Objectives:

The objectives of this research are:

- To uncover the link between local support/opposition and wind power development within community initiatives, and what breakthroughs resulted in change
- To provide understanding with regards to the effects that RE community initiatives have for wind turbine projects within the Netherlands and the UK, and how these can be successful with the application of SNM theory.

### Research Questions:

1. What aspects promoted the initiation of these RE community initiatives in the UK and the Netherlands? What fundamentals were required for the initiation and implementation of RE community initiatives in each country?
2. How can the UK and the Netherlands be compared in terms of socio-technical regime, and within the socio-technical regime, what barriers were present and how were they faced by the studied RE community initiatives?
3. What are the predominant key actor-networks in the studied local RE community initiatives (niche) and the main key actor-networks in the regime of the UK and the Netherlands?
4. How were the niches managed so that the local RE community initiatives were enabled to make progress in each country? Can an authoritative role of a 'strategic niche manager' be identified in the studied case studies in the UK and the Netherlands, and how did these strategic niche managers plan and act strategically to make the local transition a success?
5. How does social learning occur within and outside the niche in RE community initiatives to pave the way for the niche to grow?

## 1.3 Scientific & Societal relevance of the proposed research

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### Scientific:

The promotion of community initiatives are argued to increase the number of communities which have transformed into self-sufficient renewable energy systems. They are additionally expected to enhance the planning process as well as the decision-making process involved in RE projects (Oteman *et al.*, 2014). Such projects also improve efficiency as they are typically motivated by environmental gain and therefore a personal incentive. Cultural and psychological factors are related to personal preferences regarding the utilization of RE community initiatives, also known as new technologies. This may be because of lack of knowledge regarding the new technology and its potential high unit cost (Caniels & Romijn, 2006). An additional aspect believed to stunt the development of niches is related to governmental policy and the regulatory regime. Literature has posited that even with rising environmental concerns and societal pressures which advocate sustainable technologies, some governments do not have the political will to implement new innovative measures, propose concise policy guidelines and strategies and follow to these over a long timeframe. Often the standard regime favours less sustainable technologies (Kemp *et al.*, 1998; Elzen *et al.*, 2004; Weber *et al.*, 1999). Furthermore, underutilization of new technologies may be due to technological aspects, as the use of these can require much learning and capital for an individual who is not a professional in this field. The individual may further become disinclined due to uncertainty in relation to market prospects which may lack in these (Caniels & Romijn, 2006).

It is vital to at least consider what is needed in future in order to advance scientific understanding of energy planning in different countries. Innovation upscaling is readily available in various fields, for example, the alteration of the building production from handy craft towards industrialization, whereby building components are machine produced (Sandick & Oostra, 2016). However, many articles have stressed the importance of upscaling energy related innovations, due to becoming increasingly aware that change is paramount regarding the global CO<sub>2</sub> output, reflected by results of International Panel on Climate Change (IPCC) and United Nations Framework on Climate Change Convention (UNFCCC). The process of upscaling is renowned to take lengthy periods of time, and can take up to several decades (Bosch, 2009).

International comparative studies are available; however, these often focus less on opposition to wind power and what negotiations must occur for these to be implemented, i.e social learning, management of expectations and social networking, being the three key aspects necessary for successful application of SNM. I will thus aim to retain information through this study regarding potential drivers and barriers within the socio-technical regime of each community initiative. With regards to SNM, it undoubtedly involves the introduction of sustainable radical innovations and experience illustrates this is often a difficult process with a high likelihood of failure. This is regularly due to the fact that technologies are embedded in a complex system, known as the 'regime' (Caniels & Romijn, 2006). Mature technologies and the current regime are greatly attuned to each other and operate well together due to a lengthy process of incremental co-evolution, for example, large energy companies and central government. While the regime is renowned for adapting swiftly to technological advancements, i.e large commercial wind farms, it is less experienced in dealing with the emergence of contemporary technologies which differ in characteristics, i.e community owned wind farms (Kemp *et al.*, 2001, Weber *et al.*, 1999). As a means of overcoming this problem, the SNM approach proposes the creation of niches, where experimentation occurs and learning from actors, including; government, producers, researchers, users. Academic research on this proposition is however lacking, so we cannot assume that every regime cannot adapt to new innovations or struggle in doing so. Furthermore, academic literature suggests 'niche managers' are paramount for success of such innovation, which will also be interesting to clarify within each case studied within this thesis, and comparing each country.

Within this study, it is therefore intriguing to follow up on difficulties obtained from the literature to clarify ways in which the UK and the Netherlands can be compared in their regimes, and within these, what barriers arise and how they are overcome in each country. It will be interesting to test arguments of 'failure' with SNM and such new technologies due to radical innovation, and whether this is actually true, and also to comprehend how civil society adapt to and interpret these. This question of success therefore is relative to the amount of actors present and contributing positively to the community initiative, these being from the niche and the regime, relating to resources that are required to implement the project. This research aims to provide an increasing level of clarity with regards to the main enablers for change within the niche and regime and their effectiveness for successful implementation within each case studied, and how these compare to the theory of SNM. In this way the results of this research can be used to improve the theory on SNM. In addition, it will provide insight into the actual applicability of SNM theory in planning and successful implementation of wind turbine projects.

Given that all cases are successfully established for at least a decade and comprise more than one turbine per site, we can make *ex ante* estimations that these sites have overcome virtually any

barriers present within the regime, have had at least one individual who adopted successfully a niche manager role and also that civil society has adapted to local transitions. For the ADWF case (Scotland), information online can be easily obtained which explains its growth of an additional sister wind farm known as 'Srondoire'. Thus, prior to data analysis, it can be surmised that this wind farm project has posited successful implementation and has also adopted the three necessary elements essential for SNM; including social learning, networking and management of expectations and as a result can be easily compared to the theory of SNM.

Lastly, it is intriguing to compare these countries as according to Devine-Wright (2005), the UK, in contrast to other EU countries, poses insufficient examples of renewable energy development with a high degree of local involvement or leadership. Additionally, these efforts have been believed to be steered by economic prospects and are often privatized.

### **Societal relevance:**

Currently, various members of society oppose against wind farms due to NIMBYism and additionally stating these developments to be an eyesore, which can delay or prevent their development and emergence (Walker, 1995). However, it is evident that society overall is advantaged from the inclusion and increasing rise of RE. The hindrance to the environment is eliminated when the increasing numbers of RE developments enhance the energy security of supply. As a result, less opposition from social learning and subsequently an influx of support for RE projects, such as wind turbine projects will advantage civilization.

Furthermore, the rise of community initiatives increase the motive for social good as opposed to virtually monetary profits experienced from market and state innovations. As a result, opportunities to progress social experiments that are community based exist, which simply would not have been proliferated from a solely profit oriented perspective. Additionally, actions which are locally rooted elicit socially entrenched changes in behavior (Seyfang & Smith, 2007). As the number of community initiatives rise and civil society becomes increasingly involved from social learning and networking, the encouragement from stakeholders will additionally proliferate. In spheres of civil society, the growth of renewable energy community initiatives is viewed as a solution to heighten the level of renewable energy and simultaneously improve local cohesion and community solidarity, thus creating a region which becomes increasingly 'autarkic' or self-sustaining and independent, lowering the dependence on multinational-dominated fossil fuel markets. In Germany, this is considered 'Energy Democracy' (Morris, Craig & Jungjohann 2016). However, it is paramount to consider how local initiatives can work towards erecting such energy democracies. Additionally, it is intriguing to consider how small initiatives can succeed and grow, within current regimes, which are historically institutionalized during the fossil fuel era and are not yet adapted to such types of renewable energy provision by local communities. This thesis will aim to obtain answers on these questions for the emergent trend of growing amounts of local community initiatives in the UK and the Netherlands.

Therefore, it can be established that this research will hypothetically improve society by exposing the benefits of community initiatives in adding to preserving of the environment and how these can result in many success stories in wind energy projects, accompanied by positive actions from communities working with various actors within the niche and the regime making collaborative decisions.

## 2. Literature review & theoretical framework

### 2.1 Review of academic literature

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Sustainable Development is a predominant goal in various treaties globally, in which renewable energy is a major component in its success. Dating back to the 'Brundtland Report', proposed in 1987, also referred to as 'Our Common Future', planning the potential for a new era involving economic growth centred within policies while considering the environment. Throughout the report, much consideration is fixated to areas of population and energy provision (WCED, 1987). The transition towards renewable and sustainable energy from one dependent on fossil fuels has been evident since the 1970's. Many states in Europe are aiming to reach European Union goals within energy packages, although still commonly dependent on non-renewable energy provisions to hold prosperity within their economies and industries (European Parliament, 2009).

"Community or grassroot initiatives, community initiated sustainable energy, civic engagement, civil society participation, community ownership or governance, local ownership, community management, social action and societal initiative"; are a variety of the terms used to signal the involvement of civil society in renewable energy projects (Healey, as cited in Otelan, 2012, p.2). It illustrates the wide scale of terms used by scholars, policy-makers and citizens in debates with respect to participation of citizens in local renewable energy. Community initiatives enhance the production and consumption of renewable energy and are emerging across Europe. They can be categorized as decentralized, non-constitutional initiatives including local citizens which are often situated within communities (Oteman *et al.*, 2014).

Such changes within energy production have been argued to be durational in prospering within the Netherlands in comparison to other European countries, such as Denmark and Germany (Breukers & Wolsink, 2007). However, it must be noted that the number of these are expected to rise as Dutch locals have commenced to take increasing action. For example, numerous cities and towns have combined striving ambitions related to prospects of becoming energy neutral, zero-emission and/or low-carbon communities. The rise of community initiatives may aid the occurrence and process of such visions and thus transition these into actuality (Van der Schoor & Scholtens, 2015).

## 2.2 Theory I: Community Initiatives

### 2.2.1 How does a 'community initiative' work?

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Within definitions explored, all portray community initiatives possessing two incumbent qualities, one being that these posit a high degree of ownership and control, as well as advantaging from the outcomes of projects (Seyfang *et al.*, 2013). These two aspects have been translated into a process and outcome element, thus organising community projects, concerning “who a project is developed and run by, who is involved and has influence” (Walker & Devine-Wright, 2008, p.498). The role of community participation and its citizens is imperative in this dimension. In contrast, the outcome element illustrates who precisely the project is aimed at and parties which are advantaged economically and socially from such activities. This element regards the spatial and social dissemination of the outcomes of a given project (Seyfang *et al.*, 2013).

The community is thus interpreted in different ways as determined by Walker and Devine-Wright (2008), see figure 1. These include the initial interpretation (A) concentrates on the process dimension and states that community energy projects largely incorporate citizen involvement, combining locals being involved in the commencement, operations and progresses within the project. The following interpretation (B), rather concentrates on the outcome element, whereby, community initiatives do not precisely include citizens, but remunerations derived from the project should be contributed within the local community. The final interpretation of community initiatives (C) considers not so much the two elements, but adopts an increasingly rational view. In this case, the most virtual aim is solely to establish a successful and useful product (Walker & Devine-Wright, 2008).

Displayed in the figure 1 below, the ultimate community project would be situated in the top right corner, as it posits supreme levels of citizen participation with aims to retain profits within the local community, reinvesting these in contemporary energy projects and local public amenities. Within these projects, local consumers are virtually the members (Blokjuis *et al.*, 2012).

On the other hand, characteristically private projects are obtained within the bottom left corner of the image, which would exemplify a standard utility wind farm. These projects obtain a low degree of citizen participation and dissipate profits to detached shareholders, not entrenched within the project. Singular ownership models with a predominant focus on attaining profit targets are increasingly frequent within this group (Walker & Devine-Wright, 2008).

Within the process and outcome element, community initiatives concentrate on local scale, within both interpretations. The citizens are more likely to become intrigued and participate if they live in close vicinity to the initiative. With regards to the outcome dimension, community initiatives aim to retain benefits within the local community.

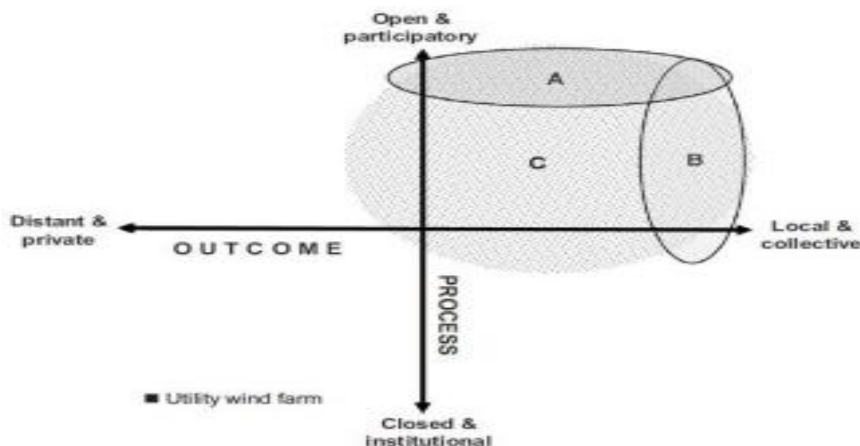


Fig.1. Comprehending community energy through the process-outcome dimension  
Source: Walker & Devine-Wright, 2008, p. 498 498).

Figure 1 illustrates interpretations of community initiatives in developing and operating wind farms, see text for explanations of part A, B and C (Walker & Devine- Wright, 2008).

### 2.2.2 How does a community initiative differ from government- or business-led intervention?

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Three predominant aspects have been identified which segregate community initiatives from organizations initiated by the market and state. Hielscher et al. (2013) posit that, firstly, these are multidimensional and incorporate behavioural initiatives with efficiency measures, while concentrating on holistic interventions. Secondly, by connecting individuals with shared purposes, communities become empowered to collectively alter their social, economic and technical contexts to promote increasingly sustainable lives, with the newfound ability to adapt their ideological commitment to sustainability (Mulgetta *et al.*, 2010). Lastly, they facilitate citizen participation in positing problems surrounding sustainable energy, via building on local knowledge and networks, and postulating solutions necessary to local contexts (Walker *et al.*, 2007). It is therefore evident that the overarching aims of community initiatives exceed ideas and benefits than that of a policy-instrumental energy-generation, carbon elimination and financial benefits combining a larger scope of sustainability goals.

### 2.2.3 Social cohesion in Communities

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Social cohesion is obtained on various degrees, and often occurs within a community or neighborhood, but can also be evident at the urban or city level. A socially cohesive neighborhood should incorporate common values which are shared, intertwined social connections; social solidarity and wealth distribution should be equated. People should also attach themselves to that specific place and identify themselves within this area. When developing a community initiative, it is paramount to consider how socially cohesive the community or neighborhood is (Kearns & Forrest, 2000).

Within social cohesion, influence is necessary, as it has both the ability for a member to influence the community and for the community to influence its members. In essence, members are increasingly attracted to communities whereby they sense the opportunity to make an impact, gaining the option to influence, voice their opinion and connect with others. Additionally, a community is increasingly welcoming to members that pose compassion to conforming. An individual may be indirectly pressurized to conform, the result of the member becoming involved results in a process of uniformity and results in group norms. This relates to socialization and normalization of values (Koppenjan & Groenewegen, 2005).

Integration and fulfilment of needs is relative to the reinforcement of needs and values. Furthermore, it is inevitable that for any group to retain a positive sense of togetherness, the individual-group association must be rewarding for the members involved. Imperative factors to feel continuously integrated are 'status' and 'competence', as one is enticed by another that contribute skills that are advantageous for another's necessities. Thereby, a cohesive group with a sense of community yields a way to fit in members, whereby their individual needs are met while at the same time meeting the needs of others. As a result, a sense of community is achieved. Furthermore, trust between individuals is heightened and members are more likely to openly divulge their needs (McMillan & Chavis, 1986).

The frequency and quality of interactions between members will lead to a positive shared emotional connection. Inevitably, the more positive the experience of interaction is, the greater the bond between members will be. Shared experiences via certain experiences, may be historic, shared crises, create emotional connections as a story is developed as well as a degree of identification through certain dramatic events. Furthermore, emotional connection can be defined as a subjective value an individual experiences from the sense of community. This can be experienced through honor or dishonor from peers, or shared history and events (McMillan & Chavis, 1986).



## 2.2.4 Recruiting members and support

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Longstanding literature has posed many challenges faced by community initiatives, including vulnerability to prompt vulnerability to decline, experiencing inactivity or increasingly detrimental cases “mortality” (see for example (Prestby & Wandersman, 1985; Yates, 1973). The maintenance of these can be increasingly complex as opposed to their sole formation. Community initiatives expend an abundance of energy involving the collection of inputs (recruiting members, raising capital) and converting these into outcomes. Thus, a highly proficient capacity should be created as a means of obtaining access to and use resources in order to secure survival (Slavin *et al.*, 2013).

A contemporary strategy as a means of engaging with the community is known as crowdfunding, and is increasing in terms of popularity, for example, initiatives crowdfunding with boards such as ‘Greenspread’, or establishing a crowdfunding project independently. Crowdfunding enables those to participate who do not necessarily live in close proximity to the initiative and they participants do not always have a say. This strategy has gained criticism however as it creates a low-threshold potential for individuals to participate actively in community projects and as a result, the board becomes dissolute (LEM, 2015).

Many initiatives experience complexities in enticing new customers as a result of potential individuals to be associated not being aware of the initiatives within their vicinity, or having low interest in energy issues. Additionally, many individuals are disinclined to obligate to initiatives as they have other commitments and enough financial burdens (Lloyd & Subbarao, 2009). Due to these reluctances, residents or nearby neighbors are often complex in relation to gaining their involvement. As a result, contemporary initiatives struggle to gain their acceptance or positive input, as opposed to an older organization in which they are familiar and comfortable with. Therefore, gaining members can prove to be an increasingly labor-intensive activity (De Bakker, 2016).

The element that local actors are not a business is crucial to them in they are embedded in, aligned with their bottom-up perspectives. However, this can also be considered as a drawback in their relations with developers, who view them as lacking adequate skills and resources. The fact that many of these organisations are run by volunteers is very demanding and pressurizes the organization increasingly within the early stages (Saintier, 2017).

### 2.2.5 Obtaining Capital & Expertise

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A predominant challenge for local community initiatives is gaining sufficient capital, given their decentralized nature. This challenge becomes increasingly complex when projects object to increase their scope and size, which according to Verbong et al. (2008) has been on the rise for community initiatives. These become increasingly costly due to high investments necessitated for installation costs and labour. Due to many initiatives having a greater potential of a short life expectancy than that of a centralized organization, banks are often disinclined to provide loans, and do not desire to bear the risk of the initiative being discontinued (Lloyd & Subbarao, 2009). As a result, initiatives often acquire independently the initial start-up capital required by drawing on their own personal funds, which does not posit financial resilience or stability (Seyfang *et al.*, 2013).

Aligned with financial issues include the obtaining of volunteers to carry out the work necessary to fulfil project objectives. Within the Netherlands, many initiatives are reliant on the work provided by volunteers, while centralized projects do not rely on volunteers and have the ability to employ numerous professionals (LEM, 2015). Larger community initiatives are characteristically more labour intensive and require additional members and volunteers. Expecting increased efforts from volunteers unpaid inevitably results in volunteer fatigue, thus posing further challenges for the initiative obtaining volunteers fit for purpose (De bakker, 2016). In these cases, initiatives should aim to propose income with their activities in order to compensate volunteers for their active involvement and efforts.

Furthermore, initiatives should not heavily rely on volunteers in relation to their skills and knowledge, as these are in most cases limited. As a result, specific skills and knowledge gaps may be evident where heavy reliance occurs (Seyfang *et al.*, 2013). The involvement of volunteers can become increasingly costly as they will sooner or later require compensation for their input, but will inevitably have a requirement for expertise and advice, incorporating financial, technical, legal and organizational expertise. Larger projects will necessitate an increased rate of expertise, time and endurance (De Bakker, 2016). Key committed individuals are paramount to success in which previous examples have illustrated. For example, the cooperative wind turbine project at 'Bro Dyfi' in Wales, was initiated and operationalized by individuals with a history of grassroots interlinked with the proximal Centre for Alternative Technology, contributing distinguishable expertise which is not voluntarily accessible elsewhere (Walker *et al.*, 2007b).

Obtaining expertise, capital, support and additional prerequisites from support networks through multiple relations poses advantages to community initiatives. Research from Van der Schoor & Scholtens (2015), posit that every community initiative has multiple relations, including with the local, regional and/or national government. Additionally, every actor in a network is in retrospect affiliated within other networks. Various members are engaged in diverse networks and contribute knowledge and opportunities as a result of their attachment to other actors. Furthermore, those employed in the energy sector voluntarily engage in local initiatives, or group members have been educated in the energy field. Additionally, small locally based companies, vigorous in the area of renewable and sustainable energy participate in community initiatives. Having multiple relations and forming a network of actors is paramount is obtaining essential necessities such as expertise and capital.

## 2.2.6 Commitment of local actors

The level of commitment from local actors heavily depends on organizational development, shared visions and level of activities. Community initiatives are dynamic in size, and those possessing highly committed members along with stimulating leadership experience a formalization process following the period of six months to 2 years from establishment (Van der Schoor & Scholtens, 2015).

Increasing commitment of local actors can be identified where there is a strong shared vision, which should incorporate renewable energy and sustainability. Visions may vary slightly from each actor or initiative, but should be similar in nature. For example, one initiative, may have the ultimate goal of a village becoming energy neutral by 2020, while the other may consider the stimulation of energy efficient measures (Salas *et al.*, 2005). Seyfang *et al.* (2013) found that in the UK, visions were increasingly loose among informal organisations as opposed to energy plans within municipalities. The informal organisations had many differing goals and vision, and overall, economic objectives gained utmost importance, (96% of groups), which should not be typical of a community initiative. However, environmental objectives followed this, (88% of groups), which should be the predominant goal, according to Seyfang *et al.* (2013). These results are displayed in Figure 2 below.

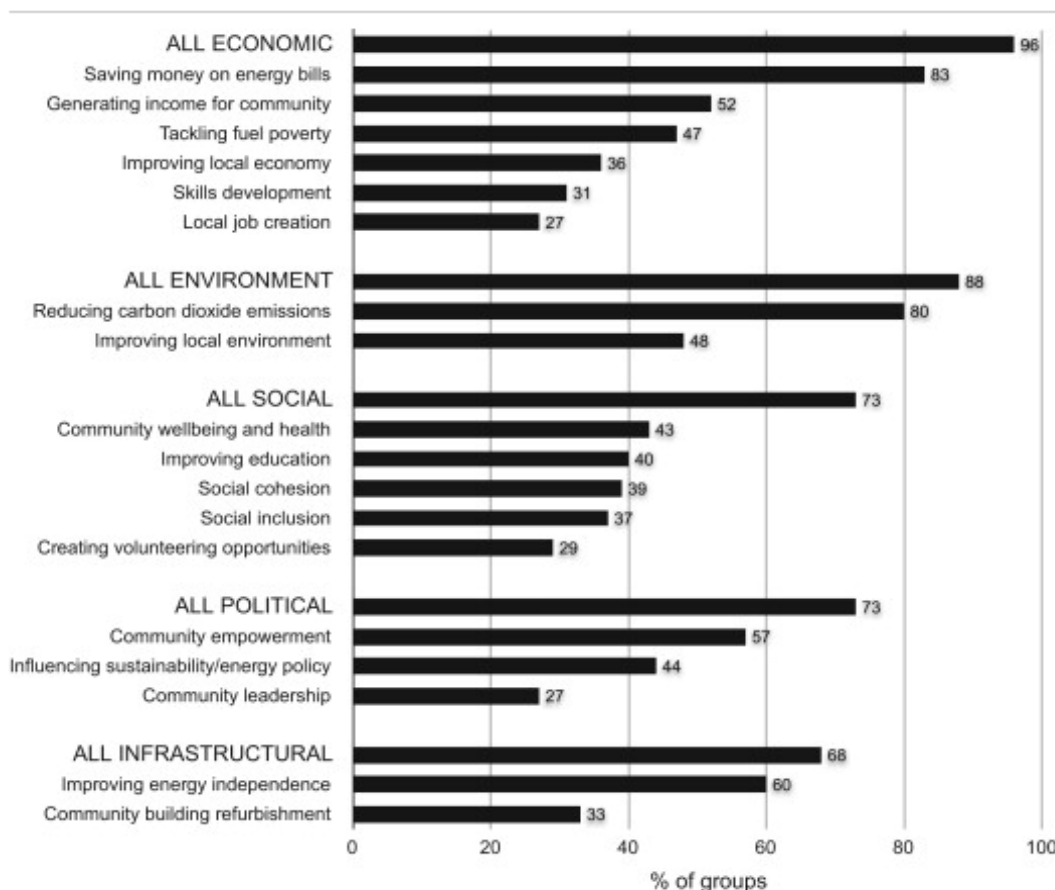


Fig.2. Various motives for wind farms within the UK in 2012. Adapted from:(Seyfang *et al.*, 2013).

Lastly, the level of activities with local energy can potentially increase commitment of actors. Specifically in the Netherlands, the level of activities with local energy as a topic has elevated since 2010. The initial information meetings mentioned in the newspapers proceeded in 2010, and by 2014 it was possible to attend a local meeting on energy issues virtually every week. The internet and social media is also a vital communication tool for local organisations. Websites can easily be created by members and/or use social media, which will inevitably implement embeddedness in the community. The higher the local commitment, the higher will be local activities. One challenge may be the continuity of the frequency and variety of activities within initiatives, being difficult due to time constraints and other competing issues, (Van der Schoor & Scholtens, 2015).

### 2.2.7 Local perceptions

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The social controversy wind farms propagate during implementation or from NIMBY reasons propose a risk to the successful initiation of renewable energy and the achievement of the 2020 goals throughout Europe. However, generally, wind power receives high public support, yet on the local scale resistance remains strong. Devine-Wright (2005), describes opposing views as the supposed unreliability of wind energy as a power source, the high expenses associated with wind power and the implications these will pose on birds and wildlife and finally the mistrust of the motives from development organisations involved. Moreover, in relation to the size of windfarms, Lee, Wren & Hickman (1989) state that wind farms which are larger in scope and size are inclined to increasingly negative attention, as opposed to those smaller in size. Clusters of 2-8 wind turbines experience less opposition as opposed to large-scale wind farms (Daugarrrd, 1997).

However, policymaking more than often favors large-scale developments, relating to larger numbers and larger turbines as opposed to small-scale development. This illustrates how policy makers have adopted renewable energy development within the customary approach of centralized infrastructural development. Such large-scale approach was proposed historically for the exploitation of nuclear energy and fossil fuel derived energy which concentrated on economic and technical productivities, as opposed to the selection of a bottom-up approach (Devine-Wright, 2005).

An additional notion of wind farm perceptions includes how the wind farm is incorporated into the historic value of the location. Devine-Wright (2003) provides an example of a small-scale hydroelectric power installation in an English National Park, which received positive perceptions from locals. The project was positively perceived as installations were relatable to locals with historic water mills situated in the park. Therefore, encouraging a feeling of continuity with historical values can increase positively the judgement of visual implications on specific technologies. It is possible that communication strategies can link wind turbines to windmills as a means of elevating positive perceptions of suitability in a location, which in the past had windmills present, or still does.

Various studies regarding local perceptions have focused on whether or not perception become increasingly positive or negative the longer a wind farm has been established. In general, these studies found that elevated exposure over time results in higher acceptance. Additionally, where one becomes increasingly familiarized with wind power, their support in the implementation will rise (Wolsink, 2000).

The 'proximity hypothesis' has been investigated by Devine-Wright (2005), and is subjective to local perceptions in relation to those who live closest to a wind farm undergoing increasingly negative

ideas surrounding it. However, some studies have found no relation between proximity and negative perceptions, and others have gone as far as to reverse the hypothesis; those living closest to the wind farm actually having the most optimistic perceptions of it.

### 2.2.8 Common themes regarding success and failure factors from previous community energy research

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Various themes have emerged in literature on (grassroots) community initiatives and renewable energy which can influence positively or negatively success and/or failure factors for a community initiative. For example, a project receiving sufficient capital would be more successful. Literature from Seyfang et al. (2013) has grouped success and failure factors for community initiatives into five areas, associated with differing levels of activity.

Imperative success factors, summarizing partially what has been discussed in this study thus far and within five groups include:

- *Group*: obtaining key committed individuals to aid with the progression of a project; an effectual organized group able to overcome impediments.
- *Project*: having ample time, information, skills, expertise, capital and resources to adequately conduct the project.
- *Community*: The project is orchestrated to fulfil community's requirements; interacting and building trust with the community
- *Network*: creating encouraging and supportive partnerships and information-sharing networks
- *Policy*: a supportive national policy context

Challenges which many initiatives face have also been categorized into the same five groups:

- *Group*: absence of concise direction or management
- *Project*: a greater requirement for skills, information, financial and material resources
- *Community*: combatting disinterest from the public and/or locals, as well as wariness of new energy systems, overcoming a sentiment of discouragement within stakeholders.
- *Network*: the necessity to combine learning and skills so they can be conveyed to other individuals
- *Policy*: absence of policy support, complexities regarding legal issues and planning permits.

Grouping mentioned above can relate to group cohesion (also relative to section 2.2.4), and identity and particularly engagement of stakeholders within the initiative.

To further elaborate on Community and Networking, organisational learning relative to Double-loop learning is paramount. The manner in which an organisation builds supplements and organizes knowledge and routines within their daily operations, their ability to adapt and cultivate organisational efficiency, is fundamentally termed as 'organisational learning'. This is normally successful by the organisation enhancing the use of the broad skills of their members. Learning arises when firms perform in changed and increasingly advantageous ways, e.g. initiating renewable energy via a local wind farm, and the overarching goals of learning are useful outcomes. It can also be

viewed as a means of improving productivity and innovativeness in uncertain situations (Dodgson, 1993).

Organizational learning has become of higher importance, as the concept of 'learning organization' in alternative organizations is gaining popularity, as aims are to contribute structures and systems which are more adaptable and responsive to change. Such work has previously been developed and predisposed by management analysts such as Kanter (1989) and Senge (1990). It is undoubtedly crucial that learning is required to implement competitiveness. Additionally, due to technological changes and organisational changes, i.e. bottom- up community initiatives, uncertainties arise due to their contemporary nature. As a result, organisational learning is paramount when dealing with these (Dodgson, 1993).

Such theory of learning can be practiced as single or double loop learning. Single loop learning occurs when a task can be carried out or understood immediately. In contrast, double loop learning arises whereby tasks can only be performed by questioning underlying organisations policy and objectives and is therefore increasingly complex (Argyis, 1997).

Double-loop learning would occur whereby; a crisis is predicted by some event in the environment, a revolution from within (new management or ways of operating). Double-loop learning can be applied to community initiatives for numerous reasons. They are alternative to developments and functioning of mammoth energy companies and they can be viewed as a revolutionized version of these which question differing underlying policies and goals, thus relating to the claims of Argyis (1997).

In the UK, measures of adaptive governance have been applied to facilitate organizational learning via single and/or double loop-learning. This can be implemented through civil society participating to a project through setting project agendas; assessing project issues, developing solutions and making decisions. Within community initiatives, members attending workshops have found this advantageous in broadening their horizon and providing valuable feedback. In many cases, the promotion of workshops and simple tasks such as delegation of flyers can increase learning within a region and prevent cases of NIMBY (Clark & Clarke, 2011).

Lastly, Policy is accountable for different policy and regulations which can benefit or hinder a community initiative in each country, which will be further explained in Section 5.0.

The relevant parts of literature review in the area of (grassroots) community initiatives, renewable energy and wind park planning have been summarized in this chapter. This field is amplifying and in planning literature, particular perceptions on planning for wind energy and community participation is progressing. Within this study, the literature review has been constructed wider than 'planning for wind energy' intrinsically and it has been obtained in Innovation Literature (as part of Organisational Theory for Business Administration), unambiguous theory regarding the upscaling of new initiatives and contemporary technologies, which emphasize on the organizational aspects. This particular theory was perceived to be suited to this type of research, Strategic Niche Management, and is described in the following chapter.

## 2.3 Theory II: Sustainability Transitions & Strategic Niche Management (SNM):

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The Strategic Niche Management Theory has been used for this research in order to provide an applicable 'lense' to the study within the interdisciplinary field of 'transition management'. It has been used to analyse and manage the process from niche innovation to institutionalization in a regime, which combines various steps. Firstly, the grassroots innovation has the opportunity to flourish in a protected space, being the niche, subsequently, being able to interact with the regime, gaining the ability to learn and network eventually resulting in institutionalization. It is therefore interesting to apply SNM to this study to learn how the process from niche innovation (community initiative) becomes standardized and how it interacts with the regime.

SNM was made to serve innovations with two particular characteristics; those which serve long-term socially desirable goals, including sustainability, and those which are contemporary in nature and pose a mismatch with the existing infrastructure, practices and regulations (Schot & Geels, 2008). Community initiatives regarding Renewable Energy fit these characteristics as they aim for a sustainable future via the generation of renewable energy, since they are local as opposed to centralized, and are guided by individuals and communities as opposed to the current regime of centralized energy companies (Schot & Geels, 2008).

### 2.3.1 Sustainability Transitions

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Climate change is an ongoing phenomena, albeit it is environmental in nature, it disseminates into other global issues including poverty, energy security, economic development and population growth. The very transition of non-renewable energy towards renewable energy is a major measure to combat this issue. It is paramount to comprehend renewable energy beyond its technicalities, and should thus be examined within a wider framework as a sociotechnical regime which includes social practices aligned with technological developments (Rohrache & Ornetzeder, 2006).

The energy supply sector exemplifies a sociotechnical system which includes actors (individuals, firms, collective actors) and institutions (societal and technical norms, institutions), and additionally knowledge and resources. In order for transformations to become apparent, these elements must collaborate and in a way depend on one another. As a result, the necessary services will be applied to society which is imperative for transformations to occur (Seyfang & Smith, 2007). Innovation must occur at the scale of sociotechnical regimes in order for major enhancements to be made in the development of production and consumption systems. This innovation arises in the form of a sociotechnical transition, being a system of processes that result in a shift in sociotechnical systems. Changes within the transition will operate over a long timeframe and within various levels (technological, organizational, institutional, political, economic, socio-cultural) (Kemp, 1994). Contemporary products, services and organizations surface from these transitions, and potentially replace the existing one.

Sustainability transitions occur where sociotechnical systems are established and shift towards an increasingly sustainable form or production and consumption via long-term and multi-faceted process. Academic literature can be obtained regarding these innovations for sustainability and are increasingly prevailing as a means of understanding the changing aspects of these as well as their governance. These have gained increasing attention in recent years and have been paramount in the workings of NGOs and governmental bodies (Rohrache & Ornetzeder, 2006).

### 2.3.2 The Role of Community Initiatives in Low Carbon Energy Transitions

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Verbong & Geels (2007), have explored energy transitions and illustrated how historic regime transformations flourish from the growth of 'niches', or guarded spaces where practices and procedures differentiate from regimes and conventional markets and where innovations can establish themselves independently (Kemp *et al.*, 1998). Strategic Niche Management (SNM) is a predominant branch in the literature, which can be comprehended as a guideline for organizing and governing sociotechnical niches in order to endorse preferable changes in sustainable systems (Raven, 2005). In this study, community initiatives are viewed as sociotechnical niches that can contribute to the promotion of low carbon energy transition.

Seyfang et al. (2014) propose how SNM can be used, concentrating on social innovations as opposed to technological innovations, thus being an appropriate conceptual framework for understanding the role of community initiatives in the prevalence and governance of sustainable transitions. Niche progression and development can be understood from the construction of social networks, learning processes, expectations, participation of actors and resources in evolving niches.



### 2.3.3 Strategic Niche Management

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SNM is used to analyse and manage the process from niche innovation to institutionalization in a regime (Schot & Geels, 2008). SNM can be defined as: “The creation, development and controlled phase-out of protected spaces for the development and use of promising technologies as means of experimentation, with the aim of (1) comprehension of the enticing factors of the new technology; and (2) progressing the potential of development and the rate of application of the new technology (Kemp *et al.*, 1998, p. 186).

The overarching goals of SNM is to advance learning in relation to problems, requirements and potentials of a technology; building actor networks; supporting visions and different interests towards an attainable goal; modifying the expectation of the various actors and promoting institutional adaptation. Niches are able to positively influence the regime by promoting the replication of projects within the niche, and enabling change by advocating the promotion of growth in scope and size as a means of enticing an influx of participants. Theorists of SNM posit that the prosperous growths of niches are centred within three predominant processes: *(i) the management of expectations*; *(ii) development of social networks*; and *(iii) learning processes* (Kemp *et al.*, 1998).

*Expectations* refer to how niches present themselves to the public and if they meet their posited aptitudes in which they have expressed or committed themselves to accomplishing. Publicizing expectations is advantageous to niches and provides them with motivations to fulfil or better yet, exceed their goals (Kemp *et al.*, 1998). The articulation of expectations eliminates precariousness in innovation processes and promotes mobilization of resources by promoting aims for the future via the new system, e.g. from non-renewable to renewable energy. Expectations can act as scripts that positively influence others. They are powerful when shared amongst many actors as they will potentially be guided in a similar direction, by sharing examples of previous successful projects (Geels & Raven, 2006).

*Developing social networks* is advantageous to the niche as it can embrace various stakeholders who generate much knowledge and expertise, and may even encourage the potential of niche development. Networks also provide necessary resources; carry expectations, articulate contemporary requirements while enabling learning. However, networks controlled by regime actors are not considered to be an advantage as they may naturally aim to exhibit traditional trajectories as opposed to exploring new ones, which are more than likely to be increasingly sustainable. It is interesting to learn how local networks and national or global networks interact or operate solely. Also, national networks will virtually play a role in interacting with existing regimes (Kemp *et al.*, 1998).

*Learning processes* relates to the aggregation of knowledge and expertise and can inevitably aid the development of the niche, being clarified as a key process in SNM (Kemp *et al.*, 1998). Learning is relative to one to educate those regarding cultural and symbolic meaning, industry and production networks, regulations and government policy, along with societal and environmental effects of the new technology. The technology developer is inclined to learn about the users and societal preferences, and therefore adapt the technology accordingly. On the other hand, users and additional social actors must educate themselves regarding the technological characteristics and change their preferences if need be (Raven, 2012), (i.e. accept the visuals of a wind turbine as a means of combatting climate change).

In reality, various actors (e.g., local authorities, NGOs, policy makers), may adopt an authoritative role in piloting SNM. Similar to any form of management, niche management involves the tasks carried out not by one individual actor, but potentially all of those involved.

### 2.3.4 SNM from a MLP Perspective on Sustainability

The SNM framework studies niches in collaboration with sociotechnical regimes and probes which paths a technological system may best follow in order to effectually change the existing regime. Changes will occur within different aspects (technological, organizational, political, economic, and sociocultural) within the sociotechnical transition (Loorbach, 2007).

SNM is built on the Multi-Level Perspective (MLP) theory of sociotechnical change and conveys conceptual tools for comprehending and governing transitions towards sustainable development. MLP places the niche against an overarching sociotechnical regime as a means of comprehending how niches may develop beyond the regime in these protected spaces where new practices can develop. Similar to the SNM approach, the MLP approach has emerged to capture the relationship between micro-level actors and macro-level structures (Loorbach, 2007).

The MLP organizes an analysis of the sociotechnical system within three levels, including; the landscape, regime and niche.

The *regime* is virtually stable in relation to its institutional structure and consists of the rules, whereby individual actors can impose only limited implications and via indirect measures (Raven, 2010). Market rules, government policies, cultural meaning, user practices, consumption habits and scientific knowledge create the regime heavily dominated by fossil fuels. High consumption levels of oil and gas are deeply enshrined in our societies habits of energy consumption (Seyfang & Smith, 2007). Innovations are tested and developed inside, the '*niche*' or '*niche spaces*', which may compose an institutional structure that is poorly developed, but pose many options to develop these.

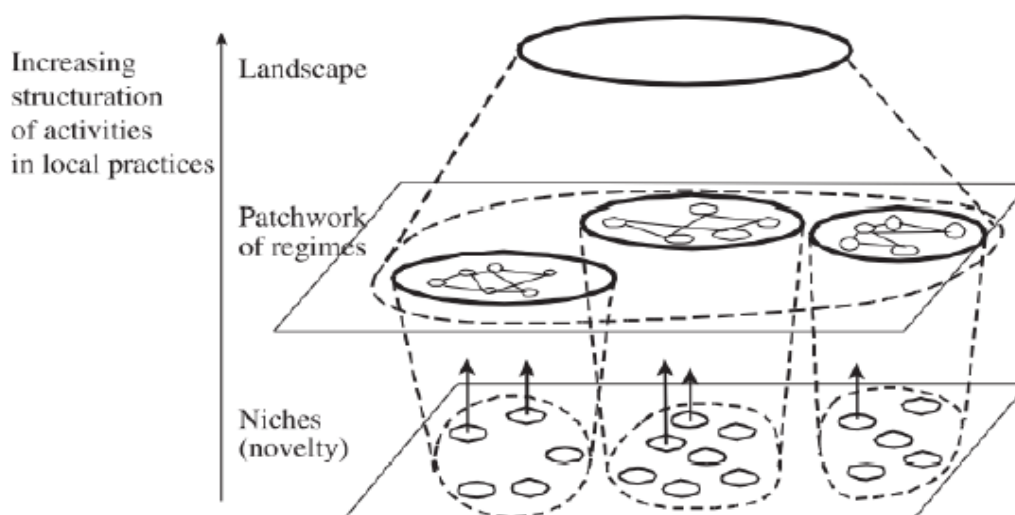


Fig 3. Niche innovations influencing the mainstream regime. Source: Verbong & Geels (2010, p. 1215).

The niche can grow through experimentation, shared learning and networks and ultimately influence the regime, as shown in Figure 3 above.

The *landscape* must not be forgotten, and is a metaphor regarding the background setting and development available to the niche and regime. It is not influenced by actors, but can have huge implications on actors behaviors and selection criteria, as it signifies the external environment for these (Raven, 2010). Various factors are comprised within the socio-technical landscape such as cultural and normative values, oil prices, economic growth and public awareness of environmental issues. Major changes that occur at landscape level can inhibit or exhibit the energy system but may not be within control of the regime. The 1970's oil crisis would exemplify this, whereby a global occurrence influenced nations' comprehension of the imperativeness of renewable energy (Geels, 2002).

The most complexing shift may be experienced through the regime. Every transition is individual, although there may be a number of elements that arise within these. Firstly, there is quite a correlation amongst the social and managerial environment and the technological progress. Contemporary technologies mean new relationships formed between users and suppliers whereby issues may arise as well as managerial problems. Additionally, social views regarding the technology are paramount. These involve engineering ideas, management views and expectations regarding market potential as well as the users opinion of the technology. Such beliefs and views amongst various actors regarding the new technology will be noted as disparities according to communities and individuals. As a result, they can either promote or constrain the development of a particular technology (Kemp *et al.*, 1998).

### 2.3.5 Community initiatives as a locus for Strategic Niche Management

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In order to suitably apply the SNM theory and to assess how the niche can overcome barriers while stimulating drivers, it must be certified that these community initiatives actually constitute a niche. In principal, SNM is usually concentrated within a predominant, technologically oriented set of local experiments that have a singular analytical focus. Therefore, the diverse nature of community initiatives has been argued by many authors as not fitting into the SNM category (Middlemiss & Parrish, 2010). This is simply due to the fact that there are disparities in the nature of community initiatives, for example; differing sizes, forms of organization, type of participation process, resource access, rate of energy efficiency, and their predominant source of renewable energy, partitioned to wind, solar and hydro. However, Hielscher et al. (2011) agree that it is most logical to categorize the differing community initiatives together as a single niche, as they all share a similar overarching goal in the production of sustainable energy. Therefore, any community initiative whose aim is to increase sustainable energy transition are eligible to being a 'niche' and therefore can be analysed using SNM (Seyfang *et al.*, 2013).

### 2.3.6 An Integrated framework for assessing local energy initiatives

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The literature surrounding SNM and grassroot innovations posits significant insights into understanding community initiatives. There are 5 clusters of factors presented by Hoppe et al. (2015), which are differentiated and can be used to analyse community initiatives. These incorporate; **(i) drivers for establishment of community initiatives; (ii) visioning and strategy making; (iii) actors and networks; (iv) learning capacity; and (v) outcome indicators** (Hoppe *et al.*, 2015). I will avoid explaining actors and networks and learning capacity as these are very relatable and similar to section 2.3.3.

*Drivers for the establishment* of LEI's relate to reasons that citizens have for initiating community initiatives. Some seek to obtain social gratification (the pleasure gained from collaboration and politics as a reward for participation), civic gratification (fulfilling a desire to contribute to the welfare of the community), and the incline to encourage policy outcomes are all imperative drivers when aiming to establish a community initiative (Hoppe *et al.*, 2015). Arentsen & Bellekom (2014), discuss the resentment of local communities to the centralization of the authority of the state or globalization whereby large-scale and commercialized industries navigate the production of services in a manner where individuals believe this to be unreliable and opaque. Economic incentives are an additional reason to contribute to or establish community initiatives (Agterbosch *et al.*, 2009).

*Visioning and strategy making* relates to the creation of long term visions, goals, strategies, road maps and action plans and combining these within a strategy in order to put forward sustainable system change. When determining the visions and actions, it is imperative to identify who has the ultimate impacts on decision making. This also includes the understanding of the 'rules of the game', relating to the roles of 'governance' within the community (Van de Graaf & Hoppe, 1996).

*Actors and networks* refer to those presently active in the local setting of the community initiative. This factor discourses the degree of power in how decision-making takes place and resources are dispersed. The dispersion of resources is of particular relevance as the literature hugely outlines the role of ownership within the processes involved in community initiatives which have been proven a

success (Warren & McFadyen, 2010). A sense of community ownership is essential for prosperous community initiatives, deriving positive public attitudes and support, while also motivating those involved. Furthermore, actors and networks provide an institutional dimension that regulates how interactions are operated between each other (rules of the game), (Li *et al.*, 2013). This idea aligns with literature from Ostrom (2009), who posits institutional rules within an analytical framework, which is deeply rooted in local communities which manage natural resources in a decentralized way and becoming accustomed to practicing the shift from ‘government to governance’.

Furthermore, this dimension additionally views the enforcing of community action plans and the membership of the niche actors, e.g. those citizens who actually contribute and participate in community projects, and those who are regarded as imperative regime actors, such as electricity grid operators and the suppliers (Hoppe *et al.*, 2015).

*Learning capacity* refers to how well equipped individuals involved in community initiatives are to learning from experience when trying to meet their objectives. It is related to SNM (Kemp *et al.*, 1998), and Transition Management (Loorbach, 2007), clarifying the knowledge obtained from previous transition experiments at a local scale. Learning from previous lessons and experiments enable community initiatives to understand how to effectually overcome barriers from various aspects (technical, institutional, social, or financial-economic barriers). This may lead to those learning to be increasingly aware in relation to what is actually expected, or realizing the necessity for additional actors and/or expertise. As a result, more experiments are able to be implemented, aiding the level of professionalization (Hoppe *et al.*, 2015).

*Outcomes* are simply the results of community initiatives activities. Literatures from Walker *et al.* (2010) refer to outcomes specifically as the dispersion of financial revenues derived from the community initiative. However, Hoppe *et al.* (2015) discuss additional outcomes other than these being solely monetary related, deeming the inclusion of changes made in the physical environment to be an outcome. For example, the construction of wind turbines or the installation of solar PV panels on rooftops of buildings. Such physical installations can be categorized relative to their total installed capacity. Moreover, presenting the installed capacity of renewable energy generation can additionally approximate the amount of greenhouse gas emissions which are impeded through these technologies. Community initiatives posit further beneficial outcomes, including increased local employment, and the initiation of new firms or attraction of larger cooperatives, thus stimulating local growth (Del Rio & Burguillo, 2009). Furthermore, local cooperatives can foster (a feeling of) independence and autarkic living, sustaining decision-making on local levels, contributing to ‘energy democracy’ as opposed to consumer-dependence on large, anonymous multinational companies and foreign markets.

### 2.3.7 Protection of the Niche

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A key concept within SNM studies and often discussed is protection (Levinthal, 1998; Hoogma *et al.*, 2002, Kemp *et al.*, 1998). Niches are producing something which varies in its level of alternativeness. Usually it differs from the 'norm' or 'mainstream', due to particular circumstances, i.e. certain locations and/or who precisely initiated the project. Protection of the niche is often necessary in terms of space and of external actors wishing to invest. Ideally, protection can be understood when learning capacities increase social embedding and economic viability of an innovation (Kemp *et al.*, 2001).

For both the UK and the Netherlands, protective approaches for sustainable energy have not been as prosperous as various other EU states, e.g. Denmark and Germany. According to Lipp (2007), support for sustainable energy in the UK did not commence to a substantial degree until the early 1990's. This was due to the favor of use of fossil fuels and a void of public disapproval to nuclear energy and as a result, little to no pressure was placed on the state to use various renewable energy types.

The aim to decrease CO<sub>2</sub> emissions in the UK was aided by the 'dash for gas', under the Thatcher government, even though climate change at that point was not an overarching feature within the agenda as was in Germany or Denmark. However, the niches for sustainable energy prevailed with the Non-Fossil Fuel Obligation (NFFO), which was an economical binding system performed in various rounds. This proved to be unsuccessful and was subsequently substituted by a Renewable Obligation (RO) in 2002. It re-established the procedures of NFFO by enforcing a requirement for utilities to purchase a certain amount of sustainable electricity as opposed to the distribution of a contract to them for generation from particular projects (Raven, 2012).

In the Netherlands, a major issue has been a deficiency in protective policies for building and raising the profile of sustainable energy niches. Niche building was encouraged by determined and enthusiastic individuals, in combination with research and development programs as well as direct investment subsidies for demonstration projects. Such efforts lead to the Dutch government in the 1990s negotiating voluntary agreements with the energy distribution sector (Rooijen & Wees, 2006). Subsequently, a green tax was initiated in 1996 for small-medium scale users, albeit taxation was not applied to green electricity. Afterwards, the proliferation in green tax and freedom of the green electricity markets resulted in intensified growth of green electricity use. Due to the accelerating pace, utilities were compelled to begin importing green electricity as opposed to generating it locally.

A new policy initiative 'Milieukwaliteit van de Elektriciteitsproductie' (MEP) (Environmental Quality of Electricity production) (in English), was introduced in 2002, after realization of tax money was frequently being distributed across the border. The MEP was predominantly designed to support energy production as opposed to use and was virtually a feed-in tariff. It unfortunately was abruptly terminated in 2007 as a result of budget cuts (Rooijen & Wees, 2006). A redesigned scheme was implemented in 2009, 'The sustainable Energy Incentive Scheme Plus', (SDE+), but was controversial from the get-go. One year after introduction, the Minister of Economic Affairs commenced discussions regarding uncertainty of the schemes financial feasibility and whether or not this would be durable (Raven, 2012).

### 3.0 Conceptual Framework

This research is fundamentally based on analyzing the drivers within community initiatives and how these compare from a SNM outlook. The varying institutional arrangements within each case relate to the regime and inevitably contribute to the success/failure of RE community initiatives for wind turbine projects within the Netherlands and the UK. The internal and external relationships between institutional actors, additional stakeholders and community initiatives are imprecise.

Theories regarding sustainability transitions, multi-level perspective (relative to the regime) and mainly Strategic Niche Management reveal that there are numerous aspects which influence the community projects. These are chiefly the 3 aspects relative to SNM theory which include; social networking, management of expectations and social learning. These elements relate to incentives and barriers which pose a major influence on a successful outcome. The lower left box displays the three elements of SNM theory and strong presence of these can lead to outcomes presented in the lower right box, thus a successful community initiative (niche). The upper middle box illustrates the regime and relates to institutional arrangements, which involves external factors within the project. The scope and scale of these vary within every individual project.

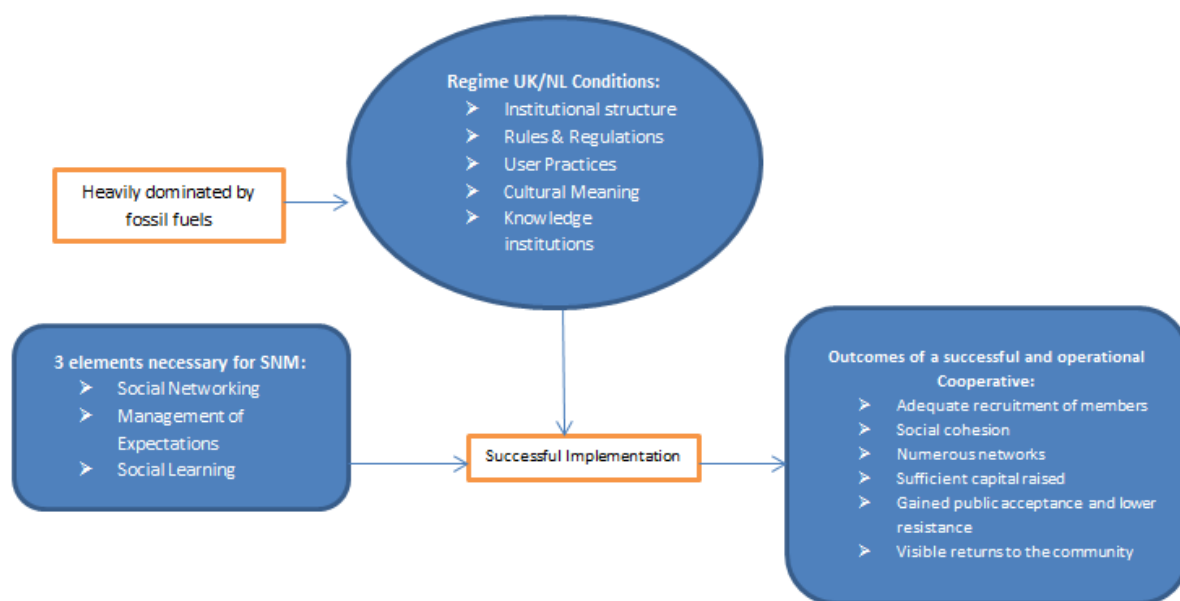


Fig. 4. Conceptual Model for proposed research. Source: Authors own

The proposed model is a general interpretation and in reality, these aspects are intrinsically increasingly difficult in dealing with. However, where a community initiative for renewable energy poses the 3 elements necessary for SNM, successful outcomes should be evident. Cases in the literature which posed these elements were successful in implementation and attained desirable outcomes which are similar to those in Figure 4 above, including; gained public acceptance, lower public resistance, visible returns to the community and adequate capital raised. Such exemplary cases include best practices from Saerbeck (Germany) and Lochem (The Netherlands). These also were obliged to follow various regime conditions due to differing states, whereby predominantly,

institutional structures, rules & regulations and knowledge institutions differed, yet both have proven to be successful. When studying these cases and additional literature, pondering occurred regarding what the differences would be in the cases from the UK and the Netherlands case studies within this study.



## 4.0 Methodology

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### 4.1 Research Strategy

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The overarching research strategies that were implemented for this project were desk research and case study research. The research commenced with desk research which was used to create a model for the institutional arrangement (regime), SNM theories and outcomes for wind turbine projects. Additionally, the study assessed barriers present in the regime of each case and also who are the key actor-networks in both the regime and niche (research question 2 & 3). The model was also created to assess the literature on RE community initiatives promotion, what fundamentals are needed in this process and if there is a general key to success, i.e. niche managers (question 1 & 4). Lastly, to note how the niche and regime implicates social change, this is clarified in question 5. While I heavily focused on academic literature and personal interviews, I combined this with some media sources and administrative reports to gain additional local information.

All questions were answered with the use of the case study strategy. Gerring (2004), argues case studies to be exceedingly useful as they formulate a concise distinction between two or more cases, being an intensive study of a single unit proposing to simplify across a larger set of units. Moreover, they necessitate the answering “what?”, “why?”, and “how?” questions. For this reason, case studies are beneficial in answering research questions (Saunders *et al.*, 2007). These can be applied within one single case study or within a multiple of cases. I aimed to study a larger number of cases with less detail to derive wide-ranging results which are increasingly simple to comprehend. The selection of a larger number of cases corresponds with the objective of the research. Additionally, according to Kellet, (2003), studies that address the local level of implementation persist to focus on numerous cases within each study, which I viewed as a guide and is an additional reason as to why I will study more than one case per country.

### 4.2 Research methods, data collection and data analysis

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#### 4.2.1 Data collection

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Data was obtained via primary and secondary sources. Information that is collected by the researcher is regarded as primary sources, as a means of directly communicating with the initiator of the organization. In this project, semi-structured interviews were conducted with various stakeholders of wind energy projects (explained at the beginning of each case). Semi-structured interviews are proposed as a means of creating open conversation and avoiding stringent questions and answers which are increasingly closed.

I had wished to travel to each individual site for an increasingly detailed and open interview while potentially experiencing the wind-farm first hand. Visiting the site and communicating directly with those directly involved in the project would have been beneficial in providing sufficient understanding within each project. However, all recipients firstly suggested a face-to-face interview was not necessary, and some replied to emails hastily and scheduled an immediate telephone interview.

Table 1 : *List of interviewees within this Thesis*

PC	Name	Position	Affiliation	Date
1	James Lithgow	Developer, Entrepreneur & Resident	ADWF	02/05/18
2	Hamish Nicol	Project Developer & Resident	ADWF	25/05/18
3	Paul Phare	Project Manager of Drumlin & E4A	Drumlin Cooperative	08/05/18
4	Andrew McMurray	Project Developer & Resident	Drumlin Cooperative	17/05/18
5	Joan Mitchell	Local resident and volunteer	Drumlin Cooperative	30/05/18
6	Simon Tilley	Resident Director	HHP	09/05/18
7	Paul Cooke	Local Resident, member & volunteer	HHP	13/05/18
8	Mark Luntley	Chief Director	Westmill Cooperative	17/05/18
9	Nan Pratt	Ex-Member and Current Volunteer	Westmill Cooperative	21/05/18
10	Eoin Lees	Chair	Westmill Cooperative	25/06/18
11	Ben Dankbaar	Retired professor and board member	Nijmegen Betuwe	14/05/18

It was rather complex to obtain interviewees within the Netherlands, due to interviewee's hectic schedules. As a result, only one interview was gained from one Dutch professional involved in Nijmegen Betuwe. However, this was by far the most fruitful interview and he provided much information, being face-to face. 'Joan Mitchell', of Drumlin Cooperative (Belfast) was also the only other individual interviewed face-to-face. Others were contacted via skype and telephone, which also yielded all necessary information due to recordings.

In contrast, secondary sources regarded information which was previously published, and was attained via academic literature and industry documents derived from the internet. Search engines such as Google Scholar and Web of Science were used frequently, as well as books from the University Library. Catchwords such as 'Community initiatives', 'institutional arrangements', 'wind turbine project', were used to obtain necessary literature.

Finally, I used the Policy arrangements approach during my data collection phase for my methodological approach (not for my theoretical framework, where I gave preference to extensive upscaling focused orientation of the Strategic Niche Management theory over the policy arrangements approach). In the Policy arrangements approach, policies involved directly in the energy sector are explained as a policy scheme. Through this approach, various arrangements of behaviors of actors, power relations and rules of the game are institutionalized (Oteman *et al.*, 2014). From this approach, I prospered to gain insight regarding how the actors interact with one another and the strength of community initiatives within these. I sought to 'triangulate' all data collected from numerous sources in order to derive insightful conclusions.

### 4.2.2 Case Selection

Each case was selected in relation to a few selection criteria. Each initiative was selected on the basis of their age and geographic location. It was preferred that each site had been established within the previous 10 years in order to derive most recent data. Also, it was vital that actors from civil society initiated them partially or entirely, as this research aims at investigating community wind energy from a bottom-up perspective. Lastly, it would be beneficial to the research if the cases differed as much as possible, or at least between each country, to obtain as many drivers and barriers as possible due to the exploratory nature of the research.

Additionally, the selected cases differ relative to their accomplishments in wind power implementation, albeit, they are pertinent in other factors. Both countries are from within the European Union (Brexit will not officially occur until March 2019), thus, both are subject to EU law and regulation in relation to energy market liberalization and on the promotion of renewables. The national governments of both countries have devoted themselves to the improvement of wind power (at least in words), clarified by policies relative to wind power from the 70's (section 3.1 & 3.2). I found it interesting to choose the UK as a second option as it is slightly less populated than the Netherlands, possesses increasingly favorable conditions and resources for wind power, yet has less success on wind power implementation thus far. Similar to the Netherlands, early opposition in relation to wind projects at local levels has hindered implementation from the early nineties (Clark & Clarke, 2011; Oteman *et al.*, 2014).

Table 2 below illustrates each case with its location, name, year of establishment and number of turbines for this project.

Name	Municipality	Province	Year of establishment	No.	Capacity (MW)
<b>Drumlin Co-op</b>	Belfast	Down	2014	6	6x250kw
<b>Hockerton Housing Project</b>	Nottinghamshire	Nottingham	2002-2009	3	15
<b>Alt Dearg</b>	Argyll	Yarmouth	2012	12	10,200
<b>Westmill Coop</b>	Shrivenham	Oxfordshire	2008	5	
<b>Nijmegen Betuwe</b>	Nijmegen	Gelderland	2013	5	10,000
<b>Zuidenwind</b>	Limburg	Limburg	2011	1	-

Table 2. Selected cases within both Countries of research

### 4.2.3 Data Analysis

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Data collected was analyzed separately; firstly the individual cases were analyzed for every separate case in a chapter. The objective of the individual cases analyzed separately is to understand their situation first and foremost before illuminating any potential relations within the multiple case analyses between social networking, management of expectations and social learning. The comparison within the cases should facilitate some insights into the impacts of elements of SNM theory and how these are resultant in a successful community initiative.

Cases are compared in two different countries, thus incorporating two planning systems in a comparative approach. As a result, an analysis of two different planning systems in the contextualizing part of the case-analysis is evident. This promotes the synthesis of similarities, differences and patterns across each case which shares a mutual goal.

### 4.3 Validity and reliability of the research

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The qualitative nature of the research is validated for and is appropriate for answering the research questions as social reality is developed via interaction and analysis of data, (Bryman & Bell, 2003), in which were incorporated via interviews. Qualitative research is additionally suited to this research as it uses words and is inductive in the generation of theory, as opposed to quantitative data which refers to exact replicability and figures, which would be unsuited to this research. Additionally, qualitative aspects are normally validated within choice of cases, in order to study unlimited relatable patterns.

## 5.0 Multi-Level Perspective: The Netherlands and the UK Policy Regimes compared

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The sociotechnical regime and landscape of the Dutch and British energy situations are analysed in this chapter as a means of better comprehending their impact of the energy systems within the cases studied.

### 5.1 Planning Systems

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In order to describe location specific governance arrangements, 'Spatial Planning Systems' have been a term frequently used. Models of Spatial Planning have arisen, which compare planning systems in Western Europe, resulting in a clustering of systems. Debates have proceeded within these regarding how these adjust to external and internal pressures for alterations via reform (Nadin & Stead, 2008). Planning systems have become increasingly influenced by various aspects, chiefly the requirement to respond to economic competition and international agreements. Great exchanges of developments and knowledge, ideas and practices have occurred via extensive cooperation between planners across national and regional borders (Duhr *et al.*, 2007).

The Dutch Planning System is intertwined with its government system and is incorporated of three tiers; national, provincial and municipal. It is within a comprehensive integrated approach (providing horizontal and vertical integration of policies across sectors), and therefore is one of the most elaborate planning systems in Europe. It is plan-led, whereby no development occurs where it is not in accordance with the local land-use plan, as this is legally binding. Important to note, property developers can pose a strong influence on the contents of a plan (Breukers, 2007).

The National Spatial Strategy 2006, created a contemporary division of responsibility between the three levels of government, whereby central government took a step back enabling municipalities to adopt an increasingly authoritative role and thus having more say in relation to planning. However, simultaneously, the national and provincial government become involved when national interests are implicated, e.g. biodiversity, national landscapes (Nadin & Stead, 2008). Although municipalities are eligible to construct framework plans and binding allocation plans, these still are necessitated to be in line with the regional and national plans. The three layers involved in planning have been believed to label the Dutch planning system as 'inefficient', and causing time lags and difficult procedures in planning (Van der Valk, 2002).

Planning systems within the UK fall within the Anglo-Saxon and basic security category. It is encompassed with the individual liberal social model, which holds a lengthy history of stable national state boundaries. The Central government holds dominant position in decision-making, albeit the system is operated by local authorities and binding zoning instruments are not considered with regards to decisions on development (Nadin & Stead, 2008).

Dissimilar to the vast majority of EU countries, the UK devises a discretionary system of planning. Therefore, classically it has not been characterized by fixed rules, but increasingly general guidelines. Less of an indication is provided via the local development plan with regards to prospects of future developments, as opposed to zoning systems (evident within the Netherlands and Germany) (Breukers, 2007).

Alterations to planning in the UK have been largely influenced by transnational cooperation and are being conveyed as a learning process. Amendments have been made to planning tools with overarching aims of the consolidation of regional strategic planning capacity and empowering local planning authorities to positively stimulate development. Such changes include increasing long-term

strategies and greater policy integration, but these are rather complex to rigidly implement (Nadin & Stead, 2008). In England especially, the longstanding tradition of landscape protection have meant that local authorities are increasingly sensitive regarding this factor and are sympathetic to complaints. In the Netherlands, this tradition is also evident, but not as strongly. Moreover, the powers of these traditions greatly influence local planning and decision-making for wind power (Breukers, 2007). Therefore, from this suggestion, it would be suggested that there may be more cases of NIMBY due to land protection in the UK as opposed to the Netherlands. This will be further explored in the following sections.

### 5.1.1 The Netherlands

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#### The Dutch Energy Situation

While the Netherlands is often positively associated with the windmill and the states traditional usage of wind power to drain water and grind grain, it falls behind many neighboring European countries in relation to production and consumption of energy derived from renewable sources. The Groningen gas field is the largest gas field in Western Europe and reasons why the Dutch energy regime is dominated by natural gas (Verbong & Geels, 2007).

The predominant objective of the national energy policy during the 1960s incorporated the accelerated generation and supply of natural gas to various sectors, being highly dependent on the Groningen gas field. Subsequently, the initial oil crisis occurred in the 1970's which resulted in the nation reconsidering where energy was being obtained from and lead to an increase in governmental participation in relation to the energy field. This resulted in intensifying the use of coal and essentially no oil (Nijkamp & Perrels 2009).

Nonetheless, the Chernobyl Accident of 1986 created negative outlooks towards the use of nuclear and mobilization of anti-nuclear movements in not only the Netherlands, but additionally Germany, France and Switzerland, to name a few. This resulted in increasing discussions to further increase the energy mix, eliminating nuclear, yet diversifying energy to reduce CO<sub>2</sub> emissions, which was also on the rise of discussion (Koopmans & Duyvendak, 2014). The Netherlands has one nuclear reactor (Borssele) generating a small amount of its electricity and has been in operation since 1973, currently viable for little as 3.5% of the countrys electricity (World Nuclear association, 2018). The parliament voted to phase out nuclear power in 1994. However, the contemporary government in 2003 decided that Borssele would continue open until 2034 (Delta, 2012). To date, Borssele holds importance as its predominant research reactor and produces approximately 60% of Europe's medical radioisotopes (World Nuclear association, 2018). Following the Dutch elections in 2010, the government was actively considering the launch of 'Borssele 2'. However, the idea was abolished by a prime investor in 2012 (Delta Energy), due to NIMBY but chiefly due to the detrimental outlook yet again regarding nuclear as a result of the Fukushima incident during March 2011 (Delta, 2012).

The state fixed a target of 14% renewable energy by 2020 and 16% by 2023 in retort to the EU Directive on renewable energy (EC Renewable Energy Directive 2009/28/EC), being shy in comparison to other member states targets. As a means of meeting these goals, the government networks with the market/business partners as opposed to local communities. This is resultant of the authority of the Ministry of Economic Affairs in the Dutch energy sector (Raven, 2012).

While the SDE+ scheme has been controversial, from its initiation in July 2011, it has fostered highly efficient cost-effective technologies. It operates whereby the producer receives an allocated

payment for the energy they produce from a renewable source. This is an alternative as it does not encourage the funding for equipment or services required for such production, like an investment subsidy. The SDE+ is directed at those producing renewable electricity, renewable gas and/or combined heat and power (CHP) (Raven, 2012).

Oteman et al. (2014), suggest the close ties the state has with the Environmental Assessment Agency, the Social Economic Council (SER) and the Agentschap NL, would insinuate the take on renewable energy planning is increasingly economically incentivized. In addition to state actors, virtually fossil fuel-oriented market parties play a substantial role, e.g. Gasunie, Royal Dutch Shell and Exxon).

Moreover, companies monopolizing electricity or gas as their products, also known as 'fossil lobbyists', form ties with the agricultural and transport sector, which are profoundly subsidized for their use of fossil fuels, thus creating a strong lobby. Interesting to note, there is a void of an industry for the implementation and rise of renewable energy technologies, e.g. such as high implementation of solar panels in Germany. While the level of operating NGO's in the Netherlands is inadequate, to add further negativity they attract limited political influence and financial resources (Oteman *et al.*, 2014).

In a nutshell, as summarized by Oteman et al. (2014), renewable energy in the Netherlands is most appropriately categorized as having a business-oriented policy arrangement. Thus, renewable energy is heavily dominated by the market, whereby these parties also remain dominant in terms of steering within the energy field. Undoubtedly, steering has a substantial influence regarding the performance of communities, whereby funding, tenders or permission grants are provided (Del Rosario, 2007). Policies have become increasingly concerned with economics, and are engaging in 'high potential' projects via the Green Deal subsidy system which remunerates projects that are economically viable. Albeit, it is evident policy-making is centralized, provinces and municipalities are liberalized to enforce independent strategies, i.e. community initiatives.

### 5.1.2 Renewable Energy Community Initiatives in the Netherlands

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Community initiatives in the Netherlands are relatively new in comparison to other EU member states, e.g. Germany and Denmark. While they are progressing at a substantial scale, they are susceptible to inadequate attention from the national government and as a result receive little financial help (Oteman *et al.*, 2014).

At present, two types of initiatives are operational in the Netherlands today; the traditional wind cooperative and the 'new style' local renewable energy companies (translated in Dutch to: Lokale Duurzame Energiebedrijven or LDEB). Following the Chernobyl incident, with the ongoing anti-nuclear and pro-environmental movements, 25 wind cooperatives prevailed. Interesting to note, most of these still exist. They are commonly found in remote areas, or in close proximity to shores, and their members collectively comprise and exploit at least one wind turbine. Additionally, these initiatives sooner or later become actively involved in other events which may include a combination of: the provision of information regarding renewable energy and/or sustainability practices (Oteman *et al.*, 2014).

LDEBs are also found in remote rural areas, but also in cities and usually implement a municipal identity which is represented in their name. Many of these are still developing within the planning phase and focus on the progression of a legitimate business plan. They also pose additional plans

including the implementation of solar panels on roofs and the purchasing of 'green electricity' via collective contracts (HIER Opgewekt, 2013). Overarching aims within LDEBs include the promotion of energy savings and enable collective renewable energy production and contribute this to members. Generally, within these, the collaboration of projects support the local economy through energy savings and revenues generated (Oteman *et al.*, 2014).



## 5.2 The UK

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### The British Energy Situation

Coal has been the dominant provider and a chief energy source in Britain and has stemmed from the late 1960s, when offshore oil and natural gas reserves were discovered. As a result, the UK virtually became self-sufficient in these fuels. Moreover, at the same time, the UK had been a pioneer in nuclear power. *A vast part of England resides rolling hills, with the inclusion of the Pennine mountain range situated in the Northern part of the country* (Elliot, 1997).

In 1957, the Central Electricity Generating Board (CEGB) was founded to control the construction and functioning of all power stations, thus holding a great authoritative position. Interest in renewables was emanated from the first oil crisis in 1973, albeit, the Labour government at the time remained uncertain regarding adequate contribution from these. The CEGB were extremely supportive of the conventional and nuclear energy sector and virtually neglected ideas regarding decentralized concepts about electricity generation and supply (Suck, 2002). Overall, government spending on renewable energy technologies remained inadequate in the seventies and eighties, equating to a tenth (approximately 20 million GBP) of the spending on nuclear power (Toke, 1998). Policies were heavily influenced by the 'Thatcherie legacy', which promoted commercialization and competitiveness as being paramount, and virtually neglecting environmental issues and roles of spatial planning (Breukers, 2007).

Currently, According to BWEA (British Wind Energy Association), one of the predominant barriers for the development of onshore windfarms is due to planning processes. The Planning Act 2008, posited the establishment of the Infrastructure Planning Commission (IPC) to accept and support applications for infrastructure of national importance. This combines renewable electricity generating plants which exceed 50 MW onshore and 100 MW offshore. As a result, many onshore windfarms in the UK (especially England), are 50MW or less and will therefore not fall within the concern of the IPC. Therefore wind farms set up by communities producing 50 MW or under are considered 'insignificant' by the national government (House of Commons, 2009).

### 5.2.1 Liberalization and deregulation

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The initial attempt to cease the CEGB was the establishment of the Energy Act of 1983, but proved to be unsuccessful. The market for wind power wasn't enabled until the nineties whereby the new government eradicated the CEGB, and the contemporary Renewable Energy Advisory Group (REAG) reviewed the government's energy strategy. New labour committed itself to the international climate change agreements and the international sustainable development agenda. The NFFO was also initiated as a tendering system to support wind power (as mentioned in section 2.3.7), as well as the Renewables Obligation (RO) in 2002. The NFFO was less favored as it remotely encouraged diversity in the market for wind power development and was unrelated to the actual recognition of such projects (Mitchell, 2000).

The RO was effective as it enforced an obligation on licensed UK suppliers of electricity to supply a heightening proportion of their electricity via renewable sources. Suppliers were subject to three

ways to negotiate with the RO. Firstly, they may choose to obtain a Renewables Obligation Certificate (ROC), via purchasing electricity from a renowned renewable energy source, therefore clarifying that a certain amount of electricity had been generated from a renewable source. Suppliers could also simply purchase ROCs on the market. Lastly, in order to make up the shortfall between the amount of certificates they have received and the amount they should have received, suppliers often chose to pay a 'buyout price'. The RO was also popular as it held no fixed price or specific length in contract (Garton *et al.*, 2016). Furthermore, for the longer term, new projects were guaranteed 20 years of support under the RO, as this promotes indirectly the prospects of long-term characteristics of the UK renewables sector and thus encourage investment in such projects. The RO resulted in heightened implementation of wind parks in 2004, which lead to a review of extending the RO and was established by the extension of the RO from 2010-2015 (House of Commons, 2010). This evoked positive impacts when initiated as the amount of ROCs issued elevated from 5.5 million in 2002 to 7.5 million in 2004, as displayed in the figure 5 below.

**Table 5.6 Renewables Obligation order and accredited projects**

<b>First RO period (2002-2003)</b>	- 5.5 million ROCs issued, 20 % for onshore wind.
<b>England:</b>	- 42 onshore wind projects accredited <sup>a</sup> (145 MW). Buyout price: £30/MWh (3 pence/kWh).
<b>Second RO period (2003-2004)</b>	- 7.5 million ROCs issued, 16 % for onshore wind.
<b>England:</b>	- 47 onshore wind projects accredited (155 MW). Buyout price: £30.51/MWh

Fig 5. Capital delegated to RE projects in England from 2002-2004. Source: (Ofgem, 2005)

The NFFO system was deemed to be too competitive and proved to be increasingly complex for smaller and independent projects, i.e. community initiatives, to obtain contracts. However, within the UK, due to an undersupply of renewable energy (thus less competition), smaller and independent producers have proved successful in obtaining prices and contracts which are enticing enough to cultivate a project. Less competition via the RO also meant that developers did not need to factor in implementing wind farms at windiest locations only (Garton *et al.*, 2016). However, according to Baywind (2004), independent producers are increasingly dependent in relation to their supplier. This is due to the necessity of the independent developer showing a contract with a creditworthy supplier when applying for a loan at a UK bank, in order to provide the bank with a longer-term source of income to remunerate the loan.

Generally in the UK, the RO proved successful, providing 23.4% of UK electricity between April 2015 and the end of March 2016. However, it was predominantly a scheme which was fueled by demand, and the higher than anticipated costs of the RO along with the political arrangement of the Conservative Party Manifesto resulted in its termination. In March 2017, the RO was officially closed to all newly operating capacities, except those who fortunate to be within the grace period (Atkins, 2017).

One drawback of liberalization within the wind market in the 1990's was the result of developers purchasing foreign turbines. The predominant turbine manufacturer Wind Energy Group (WEG), produced turbines for National Wind Power was incapable of delivering turbines on short notice.

Additionally, other European countries that had previously experienced growing domestic markets were able to provide inexpensive turbines. Of 415 turbines bought within the NFFO project from 1990-1993, 345 were derived from abroad (Breukers, 2007).

### Scottish Government

The Scottish government is a key player in the UK wind power market (which must consent any Scottish developments over 50 MW). The National Planning Framework for Scotland emphasises that rural areas are perfectly positioned to be advantaged from the intensifying of wind power in Scotland. A target has been set for 500MW of community and locally owned energy by 2020 in Scotland by the Scottish Government and is increasingly pro-wind. Additionally, the government is encouraging regarding the idea of community initiatives and developments. This is evident through from the Scottish Land Reform Act 2003, which enabled community buy-outs of land and also the Community Empowerment Action Plan, which provides an agenda which is favourable to enhance community engagement with and comprising of local resources (Scottish Government, 2009).

In Scotland, planning obligations are also known as Section 75 Agreements (known as section 106 agreements in England and Wales), which involve contracts entered into between a landowner and the planning authority. Within this agreement, a planning obligation can be entered into at any stage of the planning process, most frequently arising in relation to applications for planning permission. However, interesting to note since the appeal provision being enforced in 2014, there have been very few appeals to the Scottish Ministers (approximately 50), according to the Directorate for Planning and Environmental Appeals (DPEA 2016). This would suggest that predominantly, the population of Scotland are for the development of onshore wind and do not wish to oppose its progress.

### Local Scottish Authorities

In recent years, Scottish local authorities have developed guidance on how to manage community benefits. Within local councils these policies relative to guidance normally consist of; a set, per-megawatt annual sum payment, a defined 'impacted area', (e.g. the Highland Council's policy of a 15km radius), a decision based on a weighting formula which decides how much benefit a specific area is eligible relative to the implications and a formula by which benefit is divided between local and regional areas. Councils such as Argyll & Bute and Highlands have established a concise guidance policy on community benefit as such, for example, Argyll & Bute announced a guideline amount of £2,000 per MW in 2005. However, others, such as Moray Council, implement policies in development (Scottish Government, 2009).

There are 32 local councils in Scotland, however, this study will discuss the objectives of one which is involved in the Scottish Wind farm studied (ADWF) of Argyll & Bute Council. The Council is eager to ensure that Argyll & Bute continue to provide a fruitful contribution in meeting the Scottish Governments targets for RE generation, as promoted via the Councils Renewable Energy Action Plan (REAP). This specific council is Scotland's second largest local authority area and has a varied mix of RE consents including on shore wind, hydro, solar, biomass and tidal (Argyll & Bute Council, 2015). The council heavily considers sustainable development when giving consent to the implementation of a wind farm which is detailed in the figure below.

#### 4.4 Policy LDP 6 – Supporting the Sustainable Growth of Renewables

The Council will support renewable energy developments where these are consistent with the principles of sustainable development and it can be adequately demonstrated that there would be no unacceptable significant adverse effects, whether individual or cumulative, including on local communities, natural and historic environments, landscape character and visual amenity, and that the proposals would be compatible with adjacent land uses. A spatial framework for wind farms and wind turbine developments over 50 metres high in line with Scottish Planning Policy will be prepared as Supplementary Guidance.

This will identify:

- Areas where wind farms will not be acceptable.
- Areas of significant protection.
- Areas which may have potential for wind farm development.

All applications for wind turbine developments will be assessed against the following criteria:

- Net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities.
- The scale of contribution to renewable energy generation targets.
- Effect on greenhouse gas emissions.
- Cumulative impacts arising from all of the considerations below.
- Impacts on communities and individual dwellings, including visual impact, residential amenity, noise and shadow flicker.
- Landscape and visual impacts, including effects on wild land.
- Effects on the natural heritage, including birds.
- Impacts on carbon rich soils, using the carbon calculator.
- Public access, including impact on long distance walking and cycling routes and those scenic routes identified in the NPF.
- Impacts on the historic environment, including scheduled monuments, listed buildings and their settings.
- Impacts on tourism and recreation.
- Impacts on aviation and defence interests and seismological recording.
- Impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised.
- Impacts on road traffic.
- Impacts on adjacent trunk roads.
- Effects on hydrology, the water environment and flood risk.
- The need for conditions relating to the decommissioning of developments, including ancillary infrastructure, and site restoration.
- Opportunities for energy storage.
- The need for a robust planning obligation to ensure that operators achieve site restoration.

Further information and detail on matters relating to the growth of renewables. A spatial framework for onshore wind energy developments will be provided in Supplementary Guidance.

Fig.6. Local Development Policy 6 of Argyll & Bute Council. Adapted from: Argyll & Bute Council, 2015.

Evidently, from the briefings within the table above posited from Argyll & Bute Council, (which is the council relative to the Scottish case (ADWF) within this project, there are many imperative aspects to consider when constructing a wind farm. With so many factors to consider, this can stunt the growth and progress of RE community initiatives or lead to a longer period of time for actual project initiation (Lithgow, 2018).

### 5.2.2 Civil Society and Support networks for RE Community Initiatives, the UK and the Netherlands compared

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In North Holland, regional environmental organisations combined with provincial village organisations are increasingly engaged and proactive in organizing meetings for local initiatives to hold meetings collaboratively, in order to learn from one and other as well as share experiences and advice. Moreover, on a national level, organisations for lobbying and networking have been initiated which have been proposed by various environmental organisations, provincial organisations and/or energy initiatives. As a result, currently, there are three national networks of local energy initiatives, including; HierOpgewekt, Netwerk Duurzame Dorpen and E-decentraal (Van der Schoor & Scholtens, 2015). The positive impacts of local initiatives on national policy are elevating, as E-decentraal adopted a leading role in negotiations for the national energy covenant (Energieakkoord) (North, 2011).

Several policy initiatives have openly targeted to elevate community energy, including; Scotland's Scottish Community and Householder Renewables Initiative (Scottish Executive, 2006), the Welsh Assembly's Community Scale Renewable Energy Programme (Welsh Government, 2010), and the Rural Community Renewable Energy Fund (DEFRA, 2012). A predominant element of government support for the sector involves the distribution of benefits: "We will encourage community-owned renewable energy schemes where local people benefit from the power produced. Furthermore, communities which host renewable energy projects are enabled to retain the additional business rates they generate", (HM Government, 2010, p. 17). Instrumental policy takes evidently view community projects as assisting technological shifts to renewable technologies, encouraging behavioral change, and entrenching social acceptability for the increased scale and scope of sustainable energy technologies (HM Government, 2005).

In opposition, lack of support from networks and the community can posit many issues for RE community initiatives. Where this occurs, detrimental attitudes from locals arise. Although the initiative is trying to aid and better the community, not all residents are swayed by this and therefore become against the project. Many individuals wish to see the benefits of a project immediately and are reluctant to wait for success. A cooperative, 'Energie-U', founded in Utrecht, worked on the development of a wind farm for two years and was cancelled by the council as a result of intense local resistance (De Bakker, 2016).

Additionally, previous examples have illustrated that preliminary doubts in relation to wind turbines are frequently short-lived, with those against the projects changing their views through time. For example, the village of Hockerton in Nottinghamshire went from opposing a local wind farm in 2001 to establishing their own community wind project in 2008 (Murray, 2018). Both cases exemplify NIMBYism and resistance to change due to individuals associating wind energy with spoiled scenery and noise disturbance. It is therefore evident that robust networks create imperative prospects for initiatives. They provide aid to many organizations via local, regional and national networks, and work closely with other initiatives in close vicinity in order to develop interactive bonds (Seyfang *et al.*, 2013). The Association Energy Cooperatives in Noordt-Brabant and the Community of Practice in Gelderland exemplify the interrelations of initiatives (LEM, 2015).

### 5.2.3 Who initiates these projects?

The number of initiatives within the Netherlands has increased in recent years with an approximated 500 existent in 2015, incorporating projects established by citizens, local authorities and commercial parties. However, rising patterns identify initiatives led by local authorities or businesses pose limited involvement of citizens, thus increasingly concentrating on the outcome, as opposed to the process dimension. These groups range from local neighbourhood initiatives and homeowners, to larger and more professionally experienced wind cooperatives (LEM, 2015).

Historically, it was rather complex to elicit where these projects had been successful within the UK. This is resultant of a primarily centralised, large-scale and uncommunicative development ethos which has been standard and resulted in deviation within the level of local entrenchment in renewable energy projects. Such asocial characteristics are revealed in the guidelines published by energy trade organisations including the British Wind Energy Association and the European Wind energy Association, that overlook any mention of co-management or co-ownership by local individuals (Hinshelwood, 2000).

However, from the late 1990s, these initiatives have gained increasing support from the public due to the awareness of successful examples (Devine-Wright, 2005). A study from Seyfang et al. (2013), composed a survey for the four states of the UK and obtained that the initiation of these groups were intensely rooted solely by civil society, with (59%) established by individuals, and (34%) by pre-existing community groups. These results insinuate that the community energy sector is currently principally citizen-led from the beginning, as opposed to these being initiated by businesses or local authorities and afterwards involving communities. The scope of UK community energy initiatives have intensely increased since the mid 2000's and is displayed in the figure below.

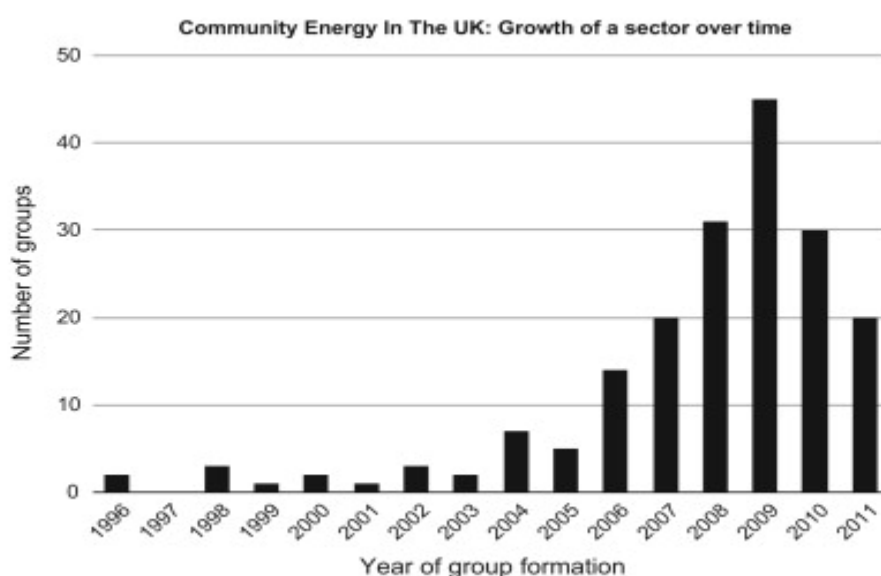


Fig. 7. Growth of Community Energy from 1996-2011 (Adapted from: Seyfang *et al.*, 2013)

As there are many types of initiatives operating at varying scales and scopes, I will focus solely on community initiatives operated by citizens to generate a concise project.



## 6.0 Results: SNM Theory

### Strategic Niche Management: Applied to every individual Case

#### 6.1 WESTMILL COOPERATIVE (OXFORDSHIRE)

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##### **Building of Social Networks**

Mark Luntley has had a substantial role in widening the networks Westmill and recruiting an adequate number members as stated by a retired volunteer and member during the interview, “Mark believes in the power of people working together, and has had much experience within this given his professional background”, (PC, Interview 9, 2018). He has had many positions as a director prior to that of Westmill, including; director of Corporate Services at Oxford City Council, Finance Director at the Local Government Association, chairs at the Oxfordshire Credit Union and is lastly the non-executive director of both the Ethical Property Company and Energy4All. While being extremely busy, he has immersed himself into the community and has built up many contacts for Westmill. He has the experience and several years of networking to further build strong robust networks in Westmill (PC, Interview 9, 2018). Westmill has gained national recognition due to it being surveyed for Community Energy England’s new State of the Sector report and inevitably due to Mark’s networking history. As a result, Westmill is currently enabled to learn about developments at a national level (PC, Interview 9, 2018).

The directors of Westmill have made connections with its fellow REScoops (Renewable Energy and Sustainability cooperatives), is an initiative which was established in April 2012 by the federation of groups and cooperatives of citizens for RE in Europe with the backing of Intelligent Energy Europe Program (European Commission). As a means of increasing the degree of influential citizen-led RE projects within Europe, twelve initiatives within seven countries have collaborated. These incorporate Belgium, Denmark, UK, France, Germany, Italy and the Netherlands. Within REScoop, best practices, business models and financing schemes are researched with the potential prospects of adapting these into the project (REScoop, 2014). Following their connections with REScoops, public acceptance increased as many in the community see this cooperative of being high importance in terms of sustainability due to its negotiations with various other European states (PC, Interview 9, 2018).

All interviewees admitted that the Cooperative would be unable to function without the support received from Energy4All cooperative, and that the assistance provided has gone far beyond the standard items listed in their service agreement.

Energy4All facilitates the creation and development of at minimum ten, wind turbine cooperatives in the UK, with Westmill being the most successful. Energy4All additionally promoted many share offers within Westmill and guided the cooperative through the planning process. The collaboration between Westmill and Energy 4all has undoubtedly lead to mutual advantages, including economic and environmental. This is due to the fact that energy savings are being increased and Westmill has established a successful solar park after experiencing the success from the wind park (PC, Interview 9, 2018). Therefore, it is evident that sufficient capital is being raised and visible returns are being made to the community, which are important outcomes briefed in the conceptual model of this project.

While Westmill has successfully developed adequate communications with other cooperatives, the project maintained to sustain good relationships with civil society. The residents within Shrivenham were consulted and involved in the founding of Westmill. As a means of incorporating residents into

this process, the directors initiated a survey to be completed by the residents of Shrivenham, to note if they would be interested in cooperating in a renewable energy cooperative (PC, Interview 9, 2018).

The Cooperative has also created stronger networks with other renewable energy initiatives. During the AGM (Annual General Meeting) in 2017 was hosted by the board members. Invited were private companies such as suppliers, other coops related to westmill, i.e. Drumlin coop, as well as locals involved in volunteering. Ideas were conveyed relating to the enablement of a higher % of its members to be local via share trading, aiming for more local investors. Discussions within the AGM included how the cooperative could be used as an educational resource, whereby an aim of 85,000 GBP is to be allotted from 2018-2022 to sponsor a full studentship and those who cannot afford all costs associated with University. Also discussed were ideas of the provision of training and work experience for young locals (PC, Interview 8, 2018). This meeting was of utmost importance as it enabled the exchange of knowledge and starting points that could potentially result in contemporary social and organisational arrangements amongst stakeholders.

Additionally, the initiation of Westmill Sustainable Energy Trust (WeSET) has obvious benefits as it is a charity and receives grants from the Coop. Within the charity, rewards of Westmill are transferred to the extended community. Furthermore, many activities are carried out; chiefly educational work, local energy conservation workshops and art projects. Visitor days are also conducted via WeSet in the warmer summer months whereby visitors are educated in relation to the wind turbines and how photovoltaic panels work and renewable energy (PC, Interview 10, 2018).

Furthermore, it must be noted, that the coop recruited seven trustees who expressed strong interests to be included at every AGM held. This is paramount for building social networks for civilians involved in the coop, who are not normally invited in other cases. They thus have the ability to talk to investors, members from similar cooperatives, and express their issues within the cooperative (PC, Interview 8, 2018).

At the last AGM meeting held at the end of 2017, 3 of the 7 trustees were able to attend and invite all stake holders to Westmill's 10<sup>th</sup> Anniversary Party on community owned renewable power on June 16<sup>th</sup>, 2018. They enticed those at the meeting by explaining details of free entry, live music and hot food to be provided. This party is another opportunity for trustees to develop their social networks (PC, Interview 9, 2018).

The members have suggested the trustees within WeSET to establish working groups in relation to sustainability and network with 'Low Carbon Communities Network', (LCCN), in order to convey the aims of the Trust. Networking with LCCN is beneficial to the trustees, as it has experience in supporting zero carbon technologies at community level. It has also created an impressive media and profile for itself, for example, it influenced the UK stance at the UN Climate Summit in Copenhagen in 2009 and operated in many national events since (PC, Interview 10, 2018).

The working groups are to be self-organised and open to any members from Cooperatives in the SW of England who chose to become involved. As a result, their social network is likely to expand meaning trustees and local residents have the opportunity to participate in sustainability activities (PC, Interview 8, 2018). Creating networks with other cooperatives and investors would be internal to the niche itself and support its own progression (Seyfang & Smith, 2007).

However, it must be noted that one should always consider who exactly they Network with and what the other stakeholder's motive is. On one occasion Nan Pratt (member of campaign Wind over Westmill & Interviewee 9), was invited to 'chat about the wind farm', on a local Radio Station. Initially, she was overjoyed to detail its progression and contribution to carbon reduction and believed this would be a positive experience. However, during the talk, the presenter focused on Nuclear Power and only informed her then that he was actually strongly against the idea of the wind



park. As a result, she became extremely unhappy, choosing not to speak any further. At the time, she was extremely disappointed as her motive was to advertise the wind farm as there was no social media then (PC Interview 9, 2018).

### **Management of Expectations**

Combined in the management team of Westmill includes numerous volunteers with differing backgrounds, posing knowledge in fields of business management, public management, engineering and economics. An integration of such skills has proven a success to Westmill (PC, Interview 9, 2018). Currently, Westmill has 2260 members, with approximately 70% of these being local (PC, Interview 10, 2018). This would insinuate an adequate number of members has been recruited thus gaining public participation, relating to the outcomes of a successful community initiatives in the conceptual model.

Many forms of communication are evident between the Management team of Westmill and the participants. General meetings are forwarded twice per year where all members are invited to discuss future prospects of the wind farm. Once every two months, volunteers meet in order to discuss ongoing projects and how they can combine new ideas to their current events, e.g. marquees held every two weeks to be changed during bad weather or extremely cold winters (PC, Interview 10, 2018).

The board members meet mostly once per month, sometimes twice, inviting volunteers who are active and most knowledgeable, to propose new ideas and projects. These meetings have been successful as during these, plans were proposed for a solar park, which became a successful reality in 2012 (PC, Interview 8, 2018). In addition to meetings, monthly newsletters and updates to the website to keep their participants informed as regularly as possible. The marquee events held every two weeks (elaborated in social networking section), can also fall into the managing of expectations category, as volunteers update other participants and the wider public on news relative to the wind park, (PC, Interview 8, 2018).

In order to manage expectations of the public and meet their goal of 'combatting climate change by financing a reliable source of renewable energy', the board members have appointed the 'Registry Trust' to be the registrar. As a result, all information regarding the windfarms progress is available to the public and can be accessed on their site (PC, Interview 10, 2018). This was paramount as the public often have high expectations and it is often difficult for members to deal with differing requests and constant questions from the public. When too many queries arise and there are too many emails to respond to, those questioning are redirected to the Registry Trust. This is due to the fact that the nature of renewable energy is often categorised into many topics therefore posing additional queries, and as a result is often overwhelming to manage the expectations of participants with distinguishing priorities and opinions (PC, Interview 10, 2018).

### **Social Learning**

The education of participants and the wider public surrounding and within Westmill is imperative to Westmill. Education is not refined to renewable energy, but also climate change mitigation and adaptation which are topics covered in the two-weekly marquee events set up via WeSET and are often held on Friday evenings and targeted to an older age group. Such events are also aimed at increasing social cohesion (PC, Interview 9, 2018).

Westmill also ensures to include younger populations into the learning process. Primary School and Secondary school children have been invited and visited from many provinces within SW England.

During visits, they are given a site visit of the wind park and also the solar park, as a means of educating them on what these technologies are contributing to the environment (PC, Interview 8, 2018).

Furthermore, leading up to the opening ceremony in June 2008, initiators involved local schools by holding an educational week, inviting 5 local primary schools to name the turbines (similar to ADWF in Scotland). Incidentally, as part of celebrating a decade of Westmill operation, they renewed their relationship with this school earlier this year by giving them each 250 shares, so they are currently part owners with the other 2260 members (PC, Interview 10, 2018), (also relating to networking). As the individuals within the surrounding areas view the wind park and more recently solar park on a daily basis, they are coerced to consider renewable energy frequently. Prior to the consideration of becoming a member or purchasing electricity, one will learn about how precisely these technologies benefit the environment and subsequently their household. The provision of education within Westmill and predominantly WeSET has been the prevailing factor in leading to the projects success (PC, Interview 8, 2018).

## 6.2 DRUMLIN COOPERATIVE (N.IRELAND)

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### Social Networks

The social Networking within Drumlin are in some ways similar to that of Westmill Cooperative. Drumlin coop also received assistance from Energy4All when aiming to implement the wind farm, and like the case of Westmill, all interviewees admit that this company was paramount for the success of the coop as well as the initiation due to their financial input. Energy4All also promoted many share offers within Drumlin and guided the cooperative through the planning process (PC, Interview 3, 2018).

Andrew McMurray was one of the main initiators of Drumlin and is the prominent Project Developer. He also formed 'NRG Solutions', which provides a consultancy service in the renewable energy and electrical engineering sector. It has also contributed technical electrical expertise to an abundance of RE projects in Ireland. He was able to enable networking from his employees of NRG Solutions to advise and support board members within Drumlin, and thus was not obliged to convey this process solely (PC, Interview 3, 2018).

Furthermore, Andrew has volunteered with 'Friends of the Earth', for over a decade and was a board member from 2006-2009, which has provided Drumlin with many networks and exchanging of ideas and knowledge. His participation within this organisation was extremely beneficial for the aspect of networking, as it is an international network of environmental organisations in 74 countries. The networks within Friends of the Earth are multi-faceted which range from individual activists to national pressure groups who advocate sustainable policies (PC, Interview 3, 2018).

The assistance from Energy4All has been a massive advantage and developed networking. Earlier this year, Drumlin was able to find a proficient new project officer who has utmost expertise in this area through management of the other coops in the UK initiated by Energy4All. She now manages 6 cooperatives (including Drumlin). Due to her experience, she is able to provide networks to Drumlin from the other 5 coops she deals with (PC, Interview 4, 2018).

The coop has also developed beneficial communications with stakeholders from the political ground within their network. The chair of Drumlin Cooperative (Anne Ford), is married to politician (David Ford), has improved networks and raised Drumlins profile throughout Stormont (Parliament Buildings) and as a result within Northern Ireland. As a result many 'Green Parties' have advocated the progression of Drumlin and broadcasted its success in a positive manner (PC, Interview 3, 2018). Meanwhile, Anne Ford has been paramount for providing networks through serving on school Boards of Governors and in additional community, charity and church organisations, therefore covering many social aspects (PC, Interview 4, 2018). These efforts undoubtedly improve social cohesion within these communities and is an outcome of a successful wind farm as briefed in the conceptual model within this project.

Similar to many cooperatives in the UK, Drumlin has not networked a great deal with the national government, other than for obtaining the RO which was capital required for start up (PC, Interview 4, 2018). The financing social enterprise of Ulster Community Investment trust (UCIT) was paramount within the regime, being a charity providing loans to cooperatives and organisations of similar nature to Drumlin (NI), and the project would not have been established without its generous loan provision (PC, Interview 3, 2018). Lastly, Drumlin Cooperative, similar to Westmill, has also been able to Network with REScoops. The board members have been grateful to be included in this board as it has divulged professionalism and shared values between REScoop colleagues within many countries (PC, Interview 4, 2018). Drumlins networks are displayed in Figure 8 below in various categories.



Fig. 8. Illustration of Drumlins Networks. Source: (Author: 2018).

Gaelic Athletic Association (GAA) clubs and churches across Northern Ireland were paramount for gaining public acceptance and improving social cohesion due to hosting events and members of Gaelic teams offering to volunteer at social events regarding Drumlin Cooperative. Intrinsic Networks of a robust nature are essential for successful implementation and survival of wind farms, as detailed in the conceptual model.

## Management of Expectations

There are various actors involved in the management of Drumlin ranging from public, project, environmental and financial management, grid connection, electrical engineering, sustainable development and business administration. A combination of such professional backgrounds has been a major help for the success of Drumlin (PC, Interview 4, 2018).

Informing the wider public is paramount and always conducted prior to the proposal of any project. Due to the small size of the wind farm this should be simplistic. However, due to each turbine being scattered across sites within NI, this process becomes rather difficult as opinions vary in different towns and inevitably there are many more civilians to be considered. In dealing with demands from the public over a scattered region, the evident hierarchical arrangement becomes beneficial. The public is of course informed after discussions with all board members, and the final decision is made by the government within NI, however, predominantly solely regarding planning permission (PC, Interview 3, 2018).

In order to avoid NIMBY cases and remain in decent terms with nearby residents, telecoms consultees were vital on site to avoid existing line-of-sight signal pathways, for example, avoiding significant impact on airports and radar. This was imperative within Drumlin as particularly 2 out of the 6 sites, (Ballyboley and Ballyrobert, Co. Antrim) were in close proximity to both the International and George Best Airports in Belfast, Co. Antrim (PC, Interview 3, 2018). Developers made residents aware of their efforts in reducing noise impacts by sending out flyers, as a means of reducing NIMBY and was successful at the time (PC, Interview 5, 2018), verifying Clark & Clarke (2011), statement of reduction of NIMBY due to flyer delegation in section 2.2.8.

The number of volunteers is growing within each site and Drumlin has been overwhelmed by their contributions, by conducting community workshops and sending out flyers (PC, Interview 5, 2018). In a recent Newsletter sent out, participants have been informed to contact E4A due to changes of rules regarding Data protection. Therefore, one must confirm that E4A can contact an individual in relation to what projects to expect in the future and also on recent updates within the Coop (PC, Interview 5, 2018). Overall, managing of expectations is slightly more difficult currently with these changes of rules, as many people are unaware and thus do not know what to expect in the future. Additionally, not as many volunteers are seeking to attend AGM's as there is less of a cohesive feel due to the sparse distribution of the turbines, (PC, Interview 5, 2018). Therefore, social cohesion could be improved in this respect.

## Social Learning

The board members are extremely keen to display the reality of ordinary individuals owning and managing a sustainable wind farm, as Drumlin was the first in NI to do so (PC, Interview 4, 2018). As a means of increasing education regarding climate change and renewable energy, Drumlin has initiated some classroom sessions to Key Stage 2 pupils in eight schools within close proximity to the six turbines. At secondary school level, speakers from University of Ulster and Queens University Belfast were invited to speak about Climate Change and the importance of Renewable Energy (PC, Interview 4, 2018). Additionally, Drumlin wind pays 2.000.000 GBP to each of the six sites across NI per annum, as a means of funding and advantaging the Northern Irish community and predominantly to implement primary school educational activities (PC, Interview 3, 2018). Evidently, visible returns are

therefore being made to the community which is an important outcome in a successful wind farm as detailed in the conceptual model.

Although the scattering of the windmills has been a detrimental factor within the decision-making process, it has been beneficial for social learning. The residents surrounding each of the six sites (as opposed to one) are forced to consider the topic of renewable energy and climate change on a daily basis, if not multiple times per day. Individuals are more likely this way to consider how they should purchase their electricity, knowing that becoming a member and purchasing from Drumlin is increasingly environmentally friendly as opposed to the conventional method (PC, Interview 3, 2018).

### 6.3 ALT DEARG WIND FARM (SCOTLAND)

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#### **Building Networks**

L1 Renewables Ltd is comprised by the Universities Superannuation Scheme (one of the largest principle private pension schemes for universities within the UK). The L1 provided a loan and aided the project to 'get off the ground' and provided ADWF with long term financing solutions at the time of initiation (PC, Interview 2, 2018). Npower Renewables were also valuable to network with, as they barely knew them but as potential developers who backed out, they contributed wind data for the site as a gift (PC, Interview 2, 2018).

It is worth noting that the reputation of ADWF has enticed companies which concentrate on renewable energy technologies. They have partnered with Lomond Energy, a Scottish company, who has much experience partnering with landowners, developers and communities to develop projects independently and retaining economic benefits as locally as possible. They have aided ADWF in the necessary technical, commercial and planning skills to aid its success. ADWF avoids large energy companies and rather wishes to involve smaller companies to become involved in their projects. Additionally, local establishments are involved, as the local primary school children were given the right to name the first turbine installed named 'Generator Genius' (PC, Interview 1, 2018).

To further involve locals and/or tourists, ADWF has commenced the operating of the popular wind farm bus every summer on four Saturday mornings and is known as the 'Windy Tour'. Tickets are free of charge, albeit numbers are confined to 48 passengers on the bus. The tours commenced in 2013 and have operated every year since, showing high success rates. Since its beginning, over 500 visitors have enjoyed the trips to both wind farms. On the tour Volunteers host and explain the running and nature of ADWF, while James Lithgow being the initiator and expert attends the vast majority of these to transmit his knowledge and expertise (PC, Interview 2, 2018).

As a component of the planning consent ADWF decided to enter into a long term Landscape and Habitat Enhancement Plan (LHEP), which is a plan objecting to enhance the local landscape and environment for wildlife. Such networking has raised the profile of ADWF within Scotland, as within this plan, ADWF have conducted many projects (PC, Interview 2, 2018).

These projects include the replacement of commercial conifer plantation with native woodland in close proximity to the shores of Loch Caolisport that lie within the South Knapdale National Scenic Area, the abolition of highly invasive weeds (*Rhododendron Ponticum*), the restoration of the upland peat bogs surrounding the turbines and the reinforcement of endangered Black Grouse via particular land management. These projects are completely uneconomic and are conducted via an agreement

with the Landscape and Habitat Enhancement Plan. Directors decided to establish these projects whereby individuals could learn from and convey environmentally friendly measures via money generated from the wind farm (PC, Interview 1, 2018; PC, Interview 2, 2018).

A crucial form of networking resided with speaking to and seeking advice from local government agencies. Such agencies were able to provide tips on what could lead to failure, thus preventing them from failure from the beginning. They believe pre-planning consultations are a paramount factor in relation to networking. ADWF has a sister wind farm termed 'Srondoire', consisting of 3 turbines. It differs greatly in the networking process as it receives much public funding and thus a great deal of networking is evident within that project (PC, Interview 2, 2018). The development of the sister project would suggest there are visible returns to the community from the initial project, which is a successful outcome for any wind farm.

The figure below illustrates various networks involved within ADWF, Srondoire is a product of visible returns to the community which is required as a successful outcome for a RE community initiative as illustrated in the conceptual model. Furthermore, Ardishaig Community Trust and The Educational Trust have been paramount in gaining public acceptance via education.



Fig 9. ADWF Networks. Source: (Author, 2018)

## Management of Expectations

Involving the public and civil society was paramount as the project is community based and thus wishes to incorporate individuals. Argyll is an area which attracts tens of thousands of tourists in the summer months and therefore is dependent on tourist surges for economic rejuvenation after a quiet year in the area. It was therefore paramount to detect if the ADWF would discourage tourists from visiting the site and/or surrounding areas. Independent surveys were sent out to measure this, whereby no hard evidence was obtained to insinuate tourists would be dissuaded from visiting after construction of the turbines (PC, Interview 1, 2018). Furthermore, walking and biking on the Alt Dearg access tracks have grown and has proven increasingly popular over the previous two years. There is no evidence to suggest this is related to the windfarms, however it is advantageous to not as opposed to a decline (PC, Interview 2, 2018).

Typical questions forwarded in the survey included; Would your decision to stay in the area be affected by the presence of a wind farm? Would you agree that wind farms are necessary for the future of energy generation? Do you feel that wind farms are an eyesore on the landscape and negatively impact the tourist experience? A substantial amount of the tourists who completed the survey were extremely positive regarding the generation of energy through wind power. Some believed they do have a detrimental impact on the landscape, but that it would not prevent them from visiting the site. Overall, the results displayed how individuals were virtually positive regarding RE (PC, Interview 1, 2018).

## Learning

The education of their residents is key to Argyll, proving this by establishing The Alt Dearg Educational Trust initiated in 2013 with 17 young locals receiving grants. The support has successfully progressed each year; in 2016/17 39 locals were supported and 60 in 2017/18 with 63,000. GBP provided for to the individuals to subsequently attend University. The Trust is funded by the owners and priority is allocated to those who live in closest proximity to the wind farm, thus reaping the benefits as locally as possible (PC, Interview 1, 2018).

Learning is not only confined to adults and young adults, but also children within the area. Lithgow (initiator of ADWF) ran a project, operating early 2018 which operated for five consecutive days. They paid for half day RE science and technology education in 8 primary schools closest to the turbines. The education of primary school children was believed to be crucial to develop their knowledge and understanding from a young age, as they have prosperities that RE would be the future (PC, Interview 2, 2018). Simplified workshops have also been held for the children to attend (adults also welcome), to simply provide learning. Topics covered include; where wind is sourced from, how the turbines turn wind into electricity, how much electricity can be produced, how these benefit future generations etc. (PC, Interview 1, 2018). Such efforts are likely to gain public acceptance and lower public resilience which is required for a successful RE community initiative. Lithgow is heavily involved in the social learning aspect, as he has spoken at many conferences at Scottish Land & Estates. All local members are invited as well as volunteers, whereby he explains various details of the operations and performance of ADWF and provides lessons to landowners regarding maximising output by providing RE (PC, Interview 2, 2018).

## 6.4 HOCKERTON HOUSING PROJECT (NOTTINGHAMSHIRE)

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### **Social Networking**

With regards to the municipality of Hockerton, it was virtually absent during the implementation and progression of HHP. However, most members within the municipality supported the idea and were for the sustainability element which was virtually all the project developers required. The land was readily available for construction and implementation, as well as adequate capital, thus, little support was required from the municipality. A housing minister became involved, but more or less at the end of the project and virtually to say 'well done' (PC, Interview 7, 2018).

In terms of networking with the National State, this has been extremely distant, especially when the project was established in 1997. Those involved in the project felt as though they were required to educate the state. They feel the imperativeness of sustainability is still not fully implemented within the UK government. However, the cooperative did not feel the need to network with the state other than to confirm planning permission and gain access to the Renewables Obligation (PC, Interview 6, 2018).

During the Planning Permission processes, much advice was obtained through 'Co-operatives UK', a business entity which poses the role of promoting, developing and uniting co-operative enterprises. This was beneficial as a starting project, as any community-led project can join and there is an abundance of information available online with regards to promoting the networking of other cooperatives together. There are various opportunities online for projects to connect and exchange ideas via the latest co-operative news, innovation and campaigns (PC, Interview 6, 2018).

Furthermore, initiators used many ideas from 'Baywind Cooperative' due to its national recognition of success and being the first UK cooperative to own its own turbines in 1997 (very early for the UK) (PC, Interview 10, 2018). The initiators included locals by inviting them to all meetings and workshops in order to manage expectations within the niche which will be further explained (PC, Interview 10, 2018).

### **Management of Expectations**

Prior to the application for planning permission a public survey was conducted, whereby 121 out of 145 respondents were for the wind farm. Questions asked included; How do you feel about Renewable Energy? Do you feel Wind Turbines negatively impact the landscape? How aware are you of government Renewable energy targets? If answered aware - how well do you believe the government is achieving their targets? Would you be interested in becoming involved in this community-led project? Due to such high levels of encouragement, the results were presented at the following public meeting (PC, Interview 6, 2018).

Prior to the construction of the third turbine, 46 people from the village attended meetings and workshops coordinated by Hockerton Housing project, the local exemplar of sustainable living. Together, they identified ways to become increasingly environmentally friendly within the village and concluded this would best be practiced by initiating and producing more sustainable energy. This exercise was easily implemented due to a combination of various levels of skills and knowledge within different areas, while simultaneously raising awareness surrounding sustainability issues via education. During exercises locals along with the initiators developed and dispatched questionnaires to 50 homes relative to the third turbine. The respondents of these were increasingly positive,



whereby a minimal 4 out of 50 homes opposed to the idea (PC, Interview 6, 2018). Evidently, this showcased the gaining of public acceptance and lowering of public resistance, detailed as a successful outcome in the conceptual model.

In order to predominantly manage expectations and avoid NIMBY cases, prior to any formal plans, interesting mapping exercises were conducted by the initiator. Such exercises included map drawings around each house which would be impacted. Firstly these were conducted informally, and afterwards an architect was employed to professionally implement the sketches. Following this exercise, it was ensured that only those sites selected for implementation were at least 500 m or more away from an individual's home (PC, Interview 7, 2018).

Also, as a means of consulting the community, a specific Workshop was held to present the mapping exercises conducted informally by the land owner and formally by the architect employed. The very few members who opposed the idea were increasingly settled after seeing first-hand how far the turbines would actually be from any residential area (PC, Interview 7, 2018).

The most important component of the plan contributing most fear within this project from what locals had expressed was the perceived visual impact. The initiators compiled a photo montage as an aim of illustrating the completed project and it helped in changing the negative views of those who believed the wind turbines would be unattractive (PC, Interview 7, 2018).

Additionally, a desk based survey was piloted in relation to the impacts the wind turbines would have on ecologically and predominantly the birds within the area. The ecological perspective was paramount to consider as the few individuals who opposed the idea of the wind farm expressed negative ecological impacts as profound reasoning (PC, Interview 6, 2018). Manufacturers' data was subsequently used to assess the noise levels and to express that over a certain distance the noise levels would equate to background noise. There are tonal characteristics of wind turbines, which do not typically occur in well designed and maintained present. Therefore, maintenance would additionally be of utmost importance in order to keep locals content, and inevitably keep the wind turbine intact (PC, Interview 7, 2018).

The very few individuals who remained unsure about the third turbine were won over by the project manager, who showed the visual impact (or non-visual impact) demonstrated by the use of the BBC windfarm analysis tool, whereby telecoms provide mockups of the perceived visual impact (PC, Interview 6, 2018). Therefore, public acceptance elevates and leads to a successful outcome of the RE community initiative, as detailed in the conceptual model.

The management team of HHP is incorporated of many volunteers, some with professional backgrounds and some without. All input is necessary and greatly appreciated within the owners. Communication between management and participants takes several forms. A general meeting occurs once per annum whereby all members and stakeholders are invited to discuss future prospects within HHP. Once every three months, a volunteer meeting occurs which is organized by the most active volunteers to discuss roles and to overlook ongoing projects. Others who have visited the site and shown their interest are also welcomed. Recently, University lecturers have become present, including an Associate Professor of the Chemical and Engineering Department from the University of Nottingham (PC, Interview 6, 2018).

## Social Learning

Many organisations do not have the audacity to experiment with alternative, specifically regarding the notion of decentralized provision of RE, whereby the rules are different from the norm.

Fortunately the proactive nature of initiator Nick Martin had the much required attitude of pushing beyond the boundaries and taking the ultimate risk (PC, Interview 6, 2018).

HHP organizes many events, workshops and professional training for those wishing to progress their career in the environmental/renewable field. Sustainable Living Tours are held every month.

Additionally, to provide further education, Masterclasses in RE and energy efficiency aid people in taking action in their homes as well as communities and workplaces to lessen their carbon footprint. Also, for those interested in softer learning and for children, craft events are conducted which hold a sustainable element and incorporates kids craft classes. The most frequently classes (weekly) are aimed increasingly at relaxing and appreciating the environment, including the 'Tai Ji' (meditation) class in the sustainable lakeside venue within the site (PC, Interview 7, 2018).

Education within HHP is endless and is further progressing with several means of facilitation.

HHP aims to meet the necessities of teachers and pupils studying Geography, whereby visits to local Bilsthorpe Flying High Academy Secondary School and Queen Elizabeth High School twice per year is implemented to provide knowledge regarding sustainable living within their case as a reality (PC, Interview 6, 2018). Their expertise and inspirational background is also expressed in their fortnightly Workshops. All members of the public are welcome; however, these are directly aimed at individuals wishing to set up a similar community-led project with energy efficiency and RE topics (PC, Interview 6, 2018). Furthermore, technical group tours are organized 4 times per year (beginning of every season), providing additional information on the design and operation of energy and water systems. These events have proven beneficial to postgraduate students, architects (specifically from Axis Design Collective), developers and building professionals (PC, Interview 7, 2018).

Learning is not limited to energy efficiency and RE. HHP also operates a housing project (given away in its name) and thus provides Eco homes advisory services. Meetings are held where advice is provided regarding installation of self-sufficient systems for energy for small and medium scale developments. Within these meetings, graphic design services are also provided to support the progression of sustainable buildings and publications relative to sustainable development are also presented (PC, Interview 7, 2018).

Publications of Electricity Production per month have recently been published online for members of public to access. During recent meetings, locals and volunteers felt that these publications were motivating and spurred them on to continue their volunteering efforts, as they learn and become increasingly aware of the scale of production. They also stated they would be overwhelmed to note any future prospects of the erecting of additional turbines (PC, Interview 6, 2018). Electricity Production from the HHP website is illustrated in Figure 10 below, for the year of 2015/16.

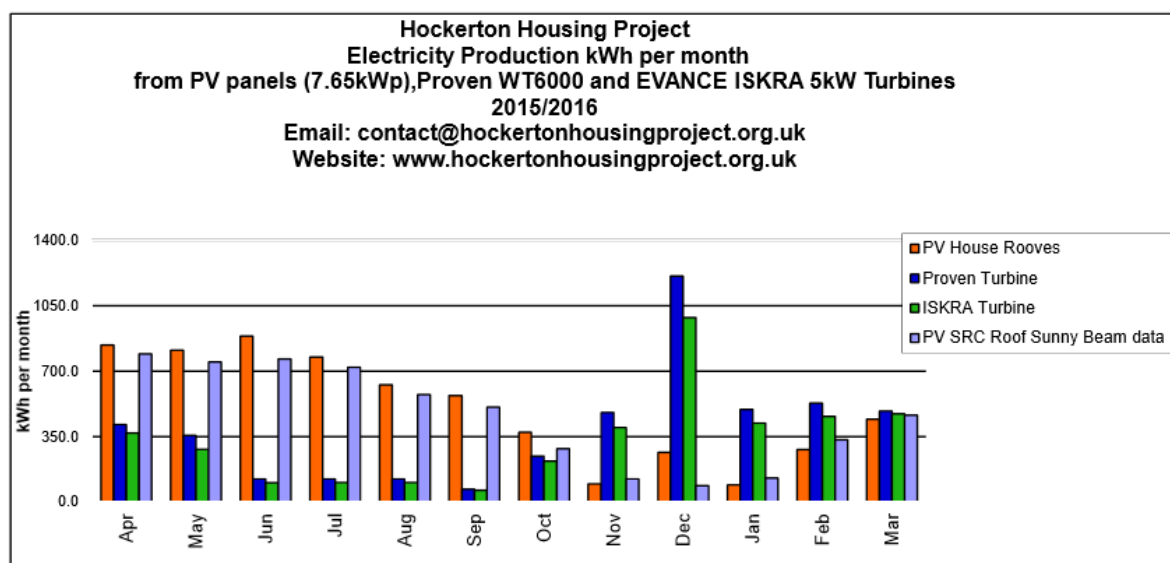


Fig 10. Electricity Production 2015/2016 Adapted from: (Hockerton Housing Project, 2016).

The blue and green bars in the table above are relative to each turbine at HHP and its monthly electricity production expressed in kWh. Typically, best production of electricity occurs in the Winter and Spring Months. This table refers to the outcomes within the niche via the presentation of installed capacity which can provide a rough estimate of Greenhouse gas emissions being reduced as state by Hoppe et al. (2015), in section 2.3.6.

## 6.5 NIJMEGEN BETUWE (GELDERLAND)

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### Social Networks

Within the Netherlands, at niche level, the predominant players are; ODEdecentraal, REScoopNL, HIERopgewekt and the HIERklimaat bureau at the national level. ODEdecentraal is a lobbying organization promoting better opportunities for local cooperatives, and operates at national level. It can also be viewed as a regime actor as it lobbies at regime level and works with regime actors. However, it does not have the resources to compete with many of the larger lobbying organisations of energy companies and as a result requires many volunteers to provide assistance. ODEdecentraal promotes communications and aims to encourage the networking of cooperatives. This is successfully implemented per annum, whereby they organize the HIERopgewekt event where cooperatives can meet, exchange knowledge and ideas and network. Furthermore, the scheduling of workgroups on specific subjects of wind energy production is an activity that provided networking and learning opportunities (van der Stappen, 2018). Such forms of social networking gains public acceptance and inevitably lowers resistance.

The presence of Gelderse Energy Cooperatives shows there is cooperation and networking, and therefore niche building. This is a cooperative of a cooperative which predominantly works on either regional or provincial level (PC, Interview 11, 2018).

Within Nijmegen Betuwe, very little networking has occurred with the regime (government policies), as it was not needed. However, it must be noted that networking occurred between Lagerweij and the project as the company funded part of the project, in exchange to implement and erect turbines produced by Lagerweij (a turbine producer based in Nijmegen). It was admitted that they could have cooperated with Eneco, but it was not required. Additionally, Nijmegen Betuwe had sufficient funds (with a little excess), due to the number of members it successfully held. In relation to expertise required, this was available from networks within the regime. Funds and expertise are the main reasons a cooperative may choose to collaborate with a regime actor, as this was already available, such collaboration was not necessary. The province of Gelderland was extremely encouraging regarding the idea of the wind farm, which gave the cooperative an advantageous position when networking with regime actors (PC, Interview 11, 2018).

Nijmegen Betuwe currently has well over 1000 members who have invested in wind stocks. This was successful from the cooperative establishing a formal membership recruitment campaign which was in operation for the summer of 2015. Thus, successful networking occurred between the cooperative and local civilians as an influx of members were gained as a result (PC, Interview 11, 2018). "The City has a decent and progressive population so I never had any doubts on gaining networks or members, especially when the city was always rooting for the wind park. Additionally, Nijmegen has previously been involved in green campaigns and many people are generally environmentally friendly" (PC, Interview 11, 2018).

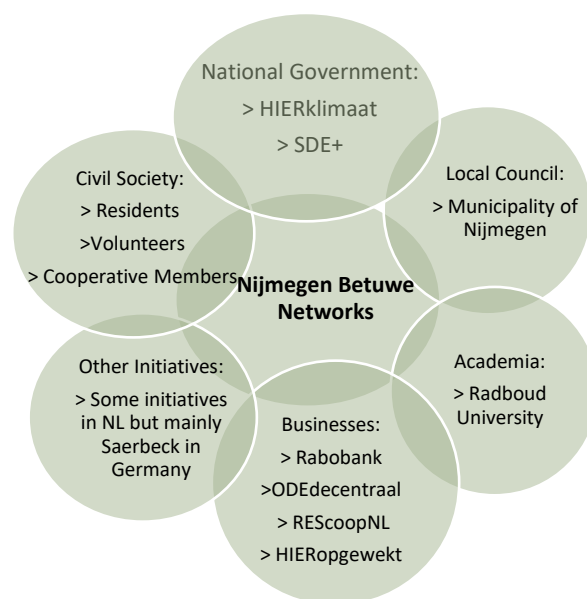


Fig. 11. Nijmegen Betuwe's Networks. Source: (Author, 2018).

Nijmegen Betuwe's Networks displayed above were of crucial importance in gaining successful implementation. Businesses such as Rabobank and REScoopNL were imperative to provide capital and expertise, leading to sufficient capital raised which is an important outcome for success and is elicited in the conceptual model, section 3.0.

#### The membership recruitment campaign

Once the plans were secured, some members were evident but not enough; the 1,050 mark had not yet been reached. In order to yield as many members as possible, the cooperative initiated a formal membership recruitment campaign which operated for the summer of 2015. In order to set this up successfully, it was paramount professionals within the community were present and actively involved. The campaign was a triumph and at the time more money was raised than was required (PC, Interview 11, 2018).

The establishment of various networks was paramount as these also provided financial assistance paramount for start-up costs. Additionally, as the number of members increased, more capital was raised. Additionally, there was funding from the province for the costs of founding the cooperative and the municipality delegated some capital to planning procedures and a price question from the province of Gelderland which provided 100.000 euros. The precise funding is displayed in the table below.

Source of Funds	Amount (euros)
Cooperative members	2.000.000
Province of Gelderland	100.000
Rabobank	13.000.000
Municipality of Nijmegen	80.000
Price question	100.000

Table. 3. Funding Sources for Nijmegen Betuwe. Source: Bram, 2016.

The cooperative organizes lecturers to visit the site and present talks. Invited are Scientists, politicians, policy makers, businesses and citizens. Anyone with an interest in the energy transition and the role of citizens is welcome to speak. Such events with many different stakeholders present provided a fruitful opportunity for these to network successfully and exchange ideas (PC, Interview 11, 2018). The most recent event held on June 15<sup>th</sup>, 2018, had a successful turnout of many from different professional backgrounds and thus a great deal of networking occurred. Social Learning was heightened as Radboud University Students within the Spatial Planning Department were invited, whereby I attended and learned further about this case.

### **Management of Expectations**

Informing the public about future decisions which has an impact on them is essential. Those in close proximity to the wind turbines were immediately informed that they would be paid damages if there house was to reduce in value, known as Planning Damage, and this was legally organized. Individuals were also informed that when wind turbine shadows were evident in their house during sunny conditions, that the windmills would be immediately stopped. It was necessary to manage individuals expectations and as a result, those individuals became increasingly supportive of the project (PC, Interview 11, 2018). Therefore, public acceptance is heightened and is paramount for the success outcomes of community initiatives, detailed in the conceptual model of this project.

Membership meetings are organized in order to review operations and progress of the turbines. Board members are present and often ensure people do not become over excited regarding yielding their returns immediately, which has often been experienced. It is disappointing but should be noted that approximately only one tenth of the members show up at these meetings. Those who attend are evidently the motivated and green thinking individuals, not just motivated by their return on investment (PC, Interview 11, 2018).

An integrity committee supervises the correct compliance with the code of conduct of the cooperative. The code of conduct aims to promote and conserve the integrity and fruitful reputation of the cooperative. As a result, transparency is increased in relation to the wind farms development and therefore avoids conflicts (PC, Interview 11, 2018).

### **Social Learning**

Nijmegen Betuwe enforces various workshops, projects and seminars as a means of educating and raising awareness within their participants and members of society. For example, In June 2018, a unique energy festival was held, 'under the smoke of' energiefestival. A lecturer from Radboud University co-organised a lecture and debate to be held with the cooperative, which was also a contribution of GPE to Nijmegen Green capital of Europe. Many University students in Environmental relative courses were invited and attended. Much knowledge was gained at this lecture; including the role of citizens in the energy transition, with national regional and local experts and stakeholders. At the beginning the overall aims and objectives of the project were explained. Also discussed were the reality of citizens movements and if these can actually play a significant role in energy transition and what precisely is needed to facilitate this transition.

Individuals living in close proximity to the wind farm are surrounded by wind farms and shortly will experience the new addition of solar panels. As a result, subconsciously, they are and will be coerced to at least consider the subject of renewable energy regularly. If people previously did not retain the knowledge, they quickly learned the need for considering the environment before purchasing electricity, for instance. The ex-chairman agrees that the significance of the educational element is a great reason for the cooperatives success. Additionally, Nijmegen has often been involved in green campaigns and many of the population are somewhat environmentally friendly (PC, Interview 11, 2018).

## 6.6 ZUIDENWIND (LIMBURG)

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### **Social Networking**

Fortunately, within Zuidenwind, there is the encouragement for cooperation, networking and therefore niche building via the development of umbrella organisations. In this case, there has been the desire to expand and help other cooperatives which lead to the networking with REScooplimburg. Being associated with REScooplimburg is beneficial to Zuidenwind as an increasingly influential actor is noted which could better impact policy. This has been clarified in the case of REScooplimburg, which has created the enablement of developing wind energy policies in other surrounding municipalities where Zuidenwind was situated. The establishment of such umbrella organisations is also advantageous to the cooperative as they now have an experienced representative. This may be paramount in an occasion where policy makers ask cooperatives to the negotiation table before crucial decisions are finalised. In recent years, there has been an increase in the willingness of regime actors to network and cooperate with cooperatives, as REScoop have commenced drawing up contracts with project developers. These contracts posit that project developers have the ability, from the initiation period, to actively negotiate with cooperatives regarding the realisation and establishment of the project (van der Stappen, 2016). Therefore social cohesion becomes a reality as developers influence those involved with the cooperative and detail its positive outcomes to be yielded.

Also, project developers from Yard believe that cooperation with cooperatives is extremely beneficial as it acts as a form exchange; the cooperative yields its enticing factor of local support while the project developer typically has access to the required funds and expertise. The predominant goal of the regime actors is to build as inexpensive and speedy as possible and a project can progress at a quicker pace when the input from a cooperative is noted. It is also increasingly inexpensive, as it would result in fewer judicial costs due to fewer appeal cases (Yard, 2016). This was proven as an additional cooperative joined Zuidenwind 'DEunie'. It became involved, having a license to buy and sell energy. This was paramount as once the turbines started to produce energy, the energy was to be sold and delegated to the appropriate people, i.e. members of the cooperative. This process requires expert knowledge and a license and DEunie were able to do this successfully, who afterwards ensured to sell the energy locally to the cooperatives of Leudal, Weert and Peel & Mass, who afterwards sell it to their own members (van der Stappen, 2016).

## Management of Expectations

To manage expectations of the public, Newsletters are published online frequently regarding upcoming events and meetings. These are forwarded at the beginning of each month, one can find a graph presented which illustrates the proceeds of the following month.

General Members Meetings take place every three months and are particularly aimed at members to attend. Standard procedures of these meetings include the reiteration of goals and visions within Zuidenwind and the output produced every three months (Zuidenwind, 2017).

Occasionally, a 'kick-off for new members' site occurs, whereby directors call on members to increase the awareness of Zuidenwind by informing all acquaintances and neighbours. This is a clever way of gaining member and as an incentive to fulfil the task required, those who apply an additional member receive a bottle of wine from the cooperative. The directors can make estimations of how many members it is possible to gain by the number of members present at each meeting. For members of the general public who are not invited to General Member Meetings, short reports from each meeting illustrating highlights are also forwarded online in the Newsletter (Zuidenwind, 2017). Additionally, information evenings take place in the neighbourhood community of De Witdonk, to involve individuals residing in the area and surrounding area in future plans and to note how they feel with the progress of Zuidenwind (Zuidenwind, 2016). Such networking has reduced the Level of NIMBY and increased individuals positivity towards Zuidenwind (van der Stappen, 2018), and would back up NIMBY reduction with communications from Clark & Clarke (2011), in section 2.2.8.

## Social Learning

Lack of knowledge was detected early on in the case of Zuidenwind and was overcome through the interim board members, possessing the necessary expertise and experience, albeit, these were not members of the cooperative from the beginning (van der Stappen, 2016). Furthermore, the initiator, Geenan, used the benefits of the freely accessible information available at ODEdecentraal. However, this was not so much for him to learn, but rather for him to express his knowledge and teach others. At these meetings, knowledge is shared and queries forwarded are answered as best possible by various stakeholders relating to factors of the implementations of wind turbines (van der Stappen, 2016).

Much learning occurred to positively impact Zuidenwind after its initial plans fell through and members of Meerwind and Windvogel took over, as a result, the second try of Zuidenwind adopted an increasingly professional approach. This was chiefly because new board members had had excessive experience and knowledge regarding the steps required to realise a wind turbine. During the second attempt, locals were able to join as a learning process, which can be applied in future projects (Geenan, 2016). The involvement of the new members (Windvogel/Meerwind), being older cooperatives, and the new cooperative (Zuidenwind) was prime example of sharing experience and learning between the two (van der Stappen, 2016).

Furthermore, it was clear learning and knowledge was specified to certain actors. This was evident when of course experience was yielded from those from older cooperatives. However, it must be noted, when the wind turbine was implemented, the project was delegated to the locals, who had been previously inexperienced. As a result, Zuidenwind are currently able to practice what the older cooperatives practiced for them during the initiation process, being a prime example of direct learning between two cooperatives (van der Stappen, 2016). Additionally, REScoopNL and ODEdecentraal view the case of Zuidenwind as a blueprint of cooperative wind energy development, even though it is not occurring on the large-scale. During the niches development, it progresses by enticing an influx of experienced actors which in reciprocity can aid other cooperatives in the



implementation phase to gain success. Additionally the annual HIERopgrwkt event also is a great opportunity for cooperatives to exchange knowledge with experts and also to express what they have succeeded. As a result, other cooperatives may learn from them and view them as inspiration (Geenan, 2016).

## 7.0 Comparative Analysis

This study seeks to identify how RE community initiatives within the Netherlands and the UK have progressed towards the development of a niche. This chapter compares cases within each country by answering the research questions obtained in section (1.2).

### **1) What aspects promoted the initiation of these RE community initiatives in the UK and in the Netherlands? What fundamentals were required for the start and implementation of RE community initiatives in each country?**

Community-led projects virtually commence in a gradual manner with a small number of individuals who initiate a small-medium sized project and subsequently, an organisation follows. For all cases studied in the Netherlands and the UK, a comparable occurrence emerged. Within each case of the UK, there were one or more members initiating an idea who later became the backbone to the cooperatives. In comparison, the case of 'Zuidenwind' (Limburg), within the Netherlands commenced from two individuals who were local entrepreneurs and remain to be heavily involved in the project. On the other hand, the second case studied in the Netherlands, 'Nijmegen Betuwe' (Gelderland), was initiated from the City of Nijmegen. There was a new neighbourhood being built, which was in line with national aims to elevate the number of homes in the Netherlands. The municipality of Nijmegen thought it would be relevant to consider turbines along the highway that signified the end of the neighbourhood, while construction would be ongoing anyway.

Within both cases of the Netherlands, the municipality of Nijmegen and Weert greatly supported the idea of a community-led wind farm, as within Nijmegen the plan was firstly proposed by the municipality and within Weert, the municipality were for the idea and subsequently conducted a feasibility study on wind energy within the region to detect the most appropriate (windy) regions in the area to implement the project (PC, Interview 11, 2018). Within all cases, residents were consulted during early developments to note their enthusiasm and also detect and prevent potential NIMBY cases.

It must be noted that however, for the cases of Westmill (Oxfordshire) and Drumlin (NI), these were of course initiated by individuals, but paramount to their implementation and ongoing success is from association and networks with Energy4All (also a cooperative), which gives power to those willing to establish a cooperative while additionally providing financial aid (PC; Interview 3,6,9,10, 2018).

The initiation of a cooperative usually stems from a particular requirement where the overarching goal is to meet the necessities of members involved. For the case of Nijmegen Betuwe (Gelderland), residents were neutral with regards to how the government was handling the transition towards sustainable energy, and simply decided to be proactive as they felt the process could be speeded up. They were also aware that the Netherlands lags behind its neighbouring European states in relation to RE production, specifically Germany (PC, Interview 11, 2018). Within the case of Zuidenwind (Limburg), it was initiated in the beginning by two local entrepreneurs who were inevitably for the idea of RE, but chiefly to support the region, with the main vision of the revenues from turbines to be generated back into the local economy (van der stappen, 2018), thus being more economic based than that of Nijmegen Betuwe (Gelderland).

Within the cases of the UK, reasons for initiation varied. The predominant initiator of Alt Dearg Wind Farm (ADWF) (Scotland), conceded that his predominant aims for the project were 'economic to be frank, yes of course environmental issues are a major concern for us, but to see money being generated back into Argyll to support turbines and households, especially into this economically fragile area' (PC, Interview 1, 2018). He was aware of the little opportunity the rural area of Argyll

had to offer other than its scenic beauty. “In this region, the ageing population is something I want to reverse, unfortunately, the younger population are moving to Edinburgh and London for increasingly prosperous opportunities and change must be enforced” (PC, Interview 1, 2018). As the owner and predominant initiator, he has been ultimately pleased with the large amounts of revenue generated by the project thus far.

For the case of HHP (Nottinghamshire), the chief reasons for initiation were sustainability, similar to Westmill (Oxfordshire) and Drumlin (NI), and less economic than that of the Scottish case.

However, one difference between cases within each country is that within cases from the UK, the local government had very little involvement and provided minimal help. For example, within the case of Westmill (Oxfordshire), the local government attended a meeting a year after initiation to basically say, ‘well done’ (PC, Interview 9, 2018). The formation of Drumlin (NI) also occurred as the initiators had been aware of the successful Westmill project across the pond and how Energy4All can aid massively during the development of such projects. The initiators hoped they would receive similar level of assistance and funding for Drumlin as Westmill did, (PC, Interview 10, 2018).

## **2) How can the UK and the Netherlands be compared in terms of socio-technical regime? Within the socio-technical regime, what barriers were present and how were they faced by the studied RE community initiatives?**

The overarching barriers experienced by RE community initiatives are characteristically non-technical. As postulated by Seyfang and Smith (2007), two types of challenges are experienced by these; namely barriers that are intrinsic and diffusion-related.

Intrinsic challenges are specific to the initiative from the moment of its foundation and furthermore, once established, the challenge is to continue and survive. Many community initiatives, specifically in the early stages, rely and depend on volunteers who are eager to give up their free time to the organisation. Intrinsic challenges are presented for each case below:

All cases within the UK were grateful and overwhelmed by the efforts provided from volunteers. However, within the case of Drumlin (NI), the Cooperative struggled to efficiently manage their volunteers, due to the scattering nature of the sites it is rather difficult to keep track. Additionally, four of the six turbines are in extremely remote areas and are increasingly complex to access. As a result, people become accustomed to the idea of volunteering and being involved but in reality inaccessibility and additional life commitments reduce the allurement after time (PC, Interview 3, 2018).

Additionally, within the UK, while overall NIMBY was not a major issue, it was experienced in every case with at least one to a small number of individuals at an older age (PC; Interview 3, 6, 9, 10, 2018). This was overcome by educational workshops and sending out flyers detailing the benefits derived from renewable energy projects of such nature. While some older individuals were still not won over (specifically in the case of Windmill (Oxfordshire), where much opposition was identified from the onset), they remained in the minority and simply had to deal with it in the end (PC, Interview 9, 2018).

Within the case of Zuidenwind (Limburg), barriers intrinsically included lack of knowledge and expertise within initiators. Fortunately, this was overcome after incorporation from two cooperatives with exceeding expertise from the late 80’s/early 90’s (early in the Dutch regime) and available funding. These two adjoining cooperatives immediately initiated the required legal procedures and talked with citizens regarding how such project could be advantageous to them. Some locals

confidences in the wind farm were low as a similar civil initiative alongside the A73 had failed in the same year, thus, the two cooperatives were a major help in reassuring locals (van der Stappen, 2016). The entrepreneurs within Zuidenwind (Limburg), had zero experience with wind energy projects, albeit fortunately their knowledge excelled in relation to writing reports and bureaucracy due to experience from working in the local council. Thus, virtually all legal requirements were met without too much difficulty (van der Stappen, 2016). However, due to the existing absence of knowledge in relation to the setting up of a cooperative, barriers were present, as they were unaware of legal aspects in this specific activity (Geenan, 2016).

The secondary category defined by Seyfang & Smith (2007) are extrinsic challenges, and are relatable to the wider institutional context and imposed from those within the upper levels within the hierarchy incorporated within imperative regimes.

Nijmegen Betuwe (Gelderland) experienced difficulties when wishing to implement the project, as the municipality of Reeth commenced an objection procedure which succeeded at the council of state. This was extremely detrimental for Nijmegen Betuwe (Gelderland) as their potential partner Eneco withdrew from the projects as a result of time delays (PC, Interview 11, 2018). To overcome this unfortunate event, almost immediately after the withdrawal, a working group of local partners involved in sustainability, (known as 'power to Nijmegen'), arranged a meeting. Incumbent members of this group worth mentioning were individuals from the municipality of Nijmegen and the Gelderse environmental and nature federation (GMNF). The members of the GMNF decided they would take over the project and it to be established as an overall initiative incorporating civil society with local citizens as proprietors of the wind farm (PC, Interview 11, 2018).

As for the case of Westmill (Oxfordshire), plans for an additional windpark were abolished due to its close proximity to the RSPB (Royal Society for the Protection of Birds) Langford Lowfields nature reserve. Local planners rejected this plan as it is a National Nature Reserve (NNR) which is an area of national nature conservation importance designated under Section 34 and 35 of the Wildlife and Countryside Act 1981. Such sites are either managed by English Nature, the RSPB or the National Trust and therefore are of great ecological value (PC, Interview 8, 2018).

The cooperative was obliged to invite experts to determine the amount of animals, in order to note where they were at certain times of the day and to record migration patterns. Experts decided a wind farm to be constructed in such close proximity would be unsafe and would harm the nature reserve. As a result, the developers were unable to justify their plans to local council as they were against rules within these acts (PC, Interview 6, 2018). While this wasn't a total hindrance to Westmill (Oxfordshire) as there was already one successful established wind park, the project developer wished to expand the number of windmills and heighten sustainability aspects.

Within ADWF (Scotland), institutional issues included the local council objecting to the wind farm due to statutory objections from Scottish Natural Heritage (SNH), regarding ecological issues. SNH have a statutory role in environmental assessments and will only promote the development of wind farms in environmentally sound areas (PC, Interview 2, 2018). Issues regarding objections from SNH predominantly arose due to bat fatalities being extremely high in the UK in the same year (PC, Interview 1, 2018). While a diffusion challenge similar to this was inevitably a hindrance to those establishing wind farms, it was in fact 'a blessing in disguise for ADWF at the time' (PC, Interview 1, 2018). Subsequently, objections went to local hearing but was rejected and as a result, ADWF did not have to undergo various ecological studies as this was already conveyed by SNH during the period of their objection. "So as they saying goes, you win some, you lose some, however, in this case we didn't lose anything but beneficially gained free ecological studies", (PC, Interview 1, 2018). The local

council also forced the developers to enter into 'Landscape & habitat enhancement plan', which obligated them to deliver many ecological benefits; including the reduction of their deer population which were posing ecological and erosion issues and additionally the construction of dykes within the surrounding area to manage flooding. "At the time, this felt unnecessary, however once locals witnessed our additional environmental efforts, they became further pleased and increased their support within the wind farm" (PC, Interview 1, 2018).

One barrier for every RE community initiative (within this study) is that they have an increased level of learning to attain in relation to dealing with government bureaucracy, as opposed to traditional energy companies who are proficiently aware of the energy market (PC, Interview 2, 2018). Furthermore, there are many disparities in the European energy market regarding regime and market structure. In the Netherlands, public shareholders control eight regional electricity grid operators who monopolise the market and act independently but are owned by the national government (NL Agency Ministry of Economic Affairs, 2013). As a result, citizens are not able to develop a program for pilot smart grid independently. To exemplify the lack of scale of small grid companies in the Netherlands, within its neighbouring state of Germany, these hold over 900, whereby some are even owned by local initiatives and (Ahrens, 2017). It is therefore evident that the Dutch market is rather immobile when comparing to its neighbouring state of Germany.

The traditionalism noted within the Dutch consumers attitude towards the energy market may stem from when the Dutch government commenced the privatisation and liberalisation of the electricity and gas market from 1998-2005. Such characteristics of an open market provided energy consumers with the authority to choose from various energy providers. However, this also placed consumers in vulnerability with regards to increasingly optimistic decision-making due to unregulated and resultant capricious energy prices (Verbong & Geels, 2007).

A comparable attitude encourages the average UK consumer in the energy market. The liberalisation and privatisation of the UK energy market in 1989/1990 with main aims of price reduction for consumers, has beneficially resulted in numerous small companies acting independently. However, it must be noted that over 80% of fossil fuel production is still derived from the predominant giants, renowned as the 'Big Six Suppliers'. These include; British Gas, EDF Energy, E.ON, Npower, Scottish Power and SSE (Connor *et al.*, 2014). Refreshing to note albeit, all cases studied from the UK stand firm in avoiding large firms becoming involved in their projects. With the exception of Drumlin and Westmill both requesting assistance from E4A, it must be noted that this is a relatively small company and strictly only deals with renewable energy assistance (Phare, 2018).

### **3) What are the predominant key actor-networks in the studied local RE community initiatives (niches) and the main key actor-networks in the regime of the UK and the Netherlands?**

Regarding all six cases studied (4 within the UK and 2 within the Netherlands), the fundamental networks were combined of actors from civil society, the state, the market, knowledge institutes and alternative RE community initiatives. As identified in the question above, there are key-actor networks that are internal to the niche and key-actors in the regime. Development of the niche is supported by actor-networks from either or combined, civil society, volunteers, members, the local government and additional RE community initiatives.

### **Key actor Networks in the niche:**

#### **Expanding Members**

Cooperatives within the cases studied which are influential in expanding their member base include Drumlin (NI) and Westmill (Oxfordshire). This stems from the nature of E4A and its high profile in assistance and raising of members. Thus far, E4A has 23 member coops (including Drumlin and Westmill) and 13,693 individual members (E4A Annual Report, 2017). As a result, the yielding of more members subconsciously becomes competitive between the two cooperatives and they can easily access each other's information online (PC, Interview 1, 2018). Increasing the member base is paramount as when these rise, as the project becomes increasingly diverse and participating members are able to yield more knowledge and experience. It additionally increases support provided from the local community for decision making of the local council, and therefore enhances the legitimacy of the cooperative, which all interviewees from Drumlin and Westmill believed were paramount for success (PC, Interview 5, 2018).

#### **Management team**

In all cases, interviewees believed their management team was strong and diverse. Some cases had individuals with stronger knowledge and backgrounds in particular sectors however, for example, the case of ADWF (Scotland), members possessed strong skills in engineering and economics. Generally, however, all cases consisted of management teams with diverse skills (albeit not all from the onset), involving business, economics, engineering and public management. Such skills from various sectors complemented each other greatly for the benefit of the project as each project has operated successfully.

#### **Setting up a membership recruitment campaign**

Interesting to note, within the cases of the Netherlands, both had initiated membership recruitment campaigns. Within Nijmegen Betuwe (Gelderland), it was crucial to yield enough members to fund the turbines essentially, and this campaign was a means of connecting with as many citizens as possible. The campaign proved a success and astonishingly yielded more members than necessary to fund turbines during its operation for three months over the summer of 2015 (PC, Interview 11, 2018). Zuidenwind (Limburg) raised many members, those specific to financial sectors as well as local entrepreneurs, and were also successful in this activity due to its membership recruitment campaign which involved small scale meetings where people could freely join to obtain information. The membership recruitment campaign was essential in this case as at one stage the cooperative was in great need of an adequate number of members in order to yield enough money to progress the development of the turbines (van der stappen, 2018).

In contrast, the cases in the UK did not set up a 'membership recruitment campaign' per se, albeit they all conducted at least one similar activity to inform and yield members; such as local meetings, workshops, transmission of surveys and questionnaires.

#### **Inclusion of civil society**

Particular individuals or civilians are usually first considered when 'civil society' is discussed, however, societal institutions which are incorporated in the area (or region nearby) are also considered such as schools, universities, churches and local sports clubs. Every case studied has yielded supportive activities within at least one of these local institutions.

As stated by Tilley (2018), these activities within civil society are imperative to endorse, embolden and support the transmission of any community-led project (niche) from a social perspective. To exemplify how these societies showcased their support for the cooperatives, churches across Northern Ireland supported organisations by enabling Drumlin Cooperative to use the building when hosting meetings for their members. Within each of the six sites scattered across Northern Ireland, holding meetings in a church was always viable due to their remote nature, willingness of ministers and additionally due to the abundance of churches in this state.

Furthermore, many Gaelic Athletic Association (GAA) sports clubs enabled these meetings to occur at these and many of the young players showed overwhelming support, even querying about volunteering opportunities (PC, Interview 5, 2018).

Within ADWF (Scotland), it was arranged that pupils of Achahoish Primary School would name the first turbine installed, settling with 'Generator Genius', (PC, Interview 1, 2018). The Westmill Sustainable Energy Trust (WeSET), is crucial to mention as it proposes many supportive activities for the project and is a prime example for cases across the UK to learn from. It predominantly involves educational work regarding local energy conservation and art work conducted by school children (PC, Interview 8, 2018).

To exemplify the inclusion of civil society within a dutch case, the involvement of Ben Dankbaar (ex university professor), within Nijmegen Betuwe (Gelderland), was important for raising the profile of the wind park. This individual was well known within the area and had much expertise to transfer within the initiative. He believes he was a desirable candidate to be involved in the project as his expertise ranges from business economics, manufacturing, organisation studies, sustainability and innovation. Additionally, he published an article on 'Proactive involvement of consumers in innovation: selecting appropriate techniques', in 2010, and knowledge within this area is extremely beneficial to the operation of a wind farm as well as enticing members, which he was able to convey in the membership recruitment campaign. He brought expertise in areas in which there were voids, specifically business economics and manufacturing, as the original initiators had higher levels of expertise in other areas such as sustainability and environmental issues (PC, Interview 11, 2018).

### **Local government**

The local governments played crucial pioneering and encouraging roles in the development of Nijmegen Betuwe (Gelderland) and Zuidenwind (Limburg). After the forming of 'Windpower', which included a group of individuals from GMNF and local partners in sustainability and would later be a cooperative, they went to the municipality to explain their desires to own and operate the wind park. The municipality were extremely supportive from the onset as they wanted to exploit a wind farm in the area as early as the 1990's anyway alongside a new residential plan (PC, Interview 11, 2018). The municipality of Nijmegen financed the costs of the planning process that was needed before formal planning was fully granted, with no evidence that the cooperative would be able to pay back. If the cooperative were unable to remunerate costs to the municipality, the municipality was willing to pay for the cover, thus being a monumental help to Nijmegen Betuwe at the time. Moreover, the cooperative did not have to posit any initial costs – where there is great precariousness regarding the plans and its future generations (PC, Interview 11, 2018)

Additionally, the municipality were already proprietors of four of the five ground positions where the turbines could be erected and they very early on granted that the cooperative could buy these grounds from the municipality (van der stappen, 2016).

Interesting to note however, from initiation, there was a clear separation between the municipality and the cooperative. Nijmegen Betuwe (Gelderland) aims to remain a cooperative independently. It

appreciates that it was founded in consultation with the municipality of Nijmegen and it grateful for the assistance they provided. However, it preferred the decision-making process to operate disjointedly from the local government. Nijmegen Betuwe were therefore able to continue operations with minimal influence from the local government once it was no longer required (PC, Interview 11, 2018).

Similar to that of, Nijmegen Betuwe, Zuidenwind (Limburg), incorporated the involvement of the municipality, but solely for feasibility studies. Greater actors involved in this project which showed more support included two additional cooperatives that were paramount for the establishment of Zuidenwind, that being 'Windvogel' and 'Meerwind'. Meerwind was paramount for expertise, as it is a well-established wind cooperative based in North-Holland and was willing to provide financial help, in order to note the production of an increased number of wind turbines. It was a cooperative passionate about wind power, but was unable to implement additional turbines in North Holland due to the province prohibiting this. Furthermore, the involvement of Windvogel was paramount for expertise as they had independently built their first turbines as early as the 80s and 90s. These two cooperatives joining Zuidenwind (Limburg) were paramount for its operation and functioning, being key-actors in the niche (van der Stappen, 2016).

In contrast, within cases studied in the UK, the local council (municipality is more often referred to as council), were less involved than that of the municipalities within the Netherlands. The case which experienced the least involvement from the council was Hockerton Housing Ltd (Nottinghamshire). The initiator believed this was not too problematic, as it they were only really required to 'give the green light', for development in that area (PC, Interview 7, 2018). Land was readily available and necessary capital, so they were extremely independent from the beginning. At the time, the council wanted no involvement with the wind farm and only at the end a housing minister became involved, but virtually to say 'well done', (PC, Interview 6, 2018).

The local councils consent and promotion is now more important than ever after recent changes in planning law as opposed to when HHP (Nottinghamshire) was initiated back in 1995 (PC, Interview 6, 2018) and in future will become key actors in the niche, like that of the Dutch cases.

In June 2015, the government of Westminster published a Written Ministerial Statement changing the planning regime in relation to onshore wind development (only within England). It advises local planning authorities to only grant permission if the site for development is an area identified as suitable for wind energy development in a Neighbourhood Plan. This was always a 'general rule of thumb anyway' but an additional requirement would make planning slightly more complex (PC, Interview 7, 2018). This includes following consultation, planning implications should be identified by communities (these should be fully addressed and the community made aware), and the proposal must have their support. This stemmed from The UK Governments Localism Act 2011, which meant the developer is to negotiate directly first with a neighbourhood before applying for planning (PC, Interview 4, 2011; Centre for sustainable energy, 2017).

In a nutshell, the involvement of a community and their opinions regarding a wind farm are now integrated into a plan more than ever and local councils within England will always put their needs first over a wind farm. While changes in local planning did not marginally impact HHP (Nottinghamshire), as they established the wind farm in 1995 (long before law changes), it will make their plans to expand in future increasingly difficult (PC, Interview 7, 2018). Therefore, due to these changes in planning law within England, citizens are currently key actors in the niche of HHP (Nottinghamshire) and within the additional English case studied (Westmill - Oxfordshire). While this is frequently beneficial when citizens are supportive and in favour of a wind farm, in the case of



Westmill (Oxfordshire), concerns have been raised to suggest that future developments may be impeded by the minority of those in the local community set against wind power (PC, Interview 8, 2011).

It must be noted however, that within both English cases, developers consulted the community prior to applying for planning anyway and this was before the Localism Act was established/before they were obliged to do so. Accordingly, in future, they are certainly obliged to ask for the communities approval if they wish to construct additional wind turbines, although this will not be new to them (PC, interview 8, 2018). Additionally, the local council in the UK are key actors in the niche and in enabling the development of plans and initiation, but other than that the council is not needed for any other aspects and more than often it doesn't want any involvement (PC, Interview 6, 2018).

Within the case of Drumlin (NI), due to the scattering nature of each windmill across various counties within the state, various local councils were involved specific to each wind mill which lead to different timescales and initiation of each wind mill. Some local councils were quicker to grant permission than others (PC, Interview 4, 2018). Similar to other cases, the council were only needed to grant permission and were not greatly involved in any other procedures (PC, Interview 3, 2018). The local council within ADWF (Scotland) were a key-actor to the niche in a negative and positive way initially as they objected due to ecological issues. It went to local hearing and was rejected, and subsequently, the council was supportive once aware of the precise plans. Therefore, they are involved in the decision-making process and will be if ADWF wish to expand in future (PC, Interview 1 2018).

#### **Key-actor networks in the regime:**

To focus on the second section of the question, key actor-networks in the regime include the government, businesses, and knowledge institutes.

Every case studied to some extent came into contact directly and/or indirectly with other RE community initiatives nationally and internationally in order to gain knowledge from each other's experiences. For example, Nijmegen Betuwe (Gelderland) used the case of 'Klimakommune Saerbeck', in Germany as a reference project, as developers were aware of how successful this project had been and has a great reputation for green energy known all over Germany, many states in Europe and as far as the middle east (PC, Interview 11, 2018). Furthermore, the initiative was overwhelmed with the knowledge that ex university professor was able to forward, being able to obtain information indirectly from the university (PC, Interview 11, 2018). Additionally, Westmill (Oxfordshire) proposed for Oxford Brookes University to conduct research being social related and relative to wind farms. The research conducted was subsequently presented by the students at WeSET marquee events to educate and disperse information further to the wider public (PC, Interview 9, 2018). In this case, university students from knowledge institutes have been key-actors networks within the niche from the regime. In order to develop and progress the niche, every stakeholder within the network should be aware of each other's interests.

In the case of Drumlin (NI), there were many key actors in the regime, one being the Northern Irish government (also referred to as 'Stormont'). The parliament were extremely supportive and for the idea of the wind park and were particularly in favour of the project from a community perspective, when the board directors visited Stormont to explain their plans to the ministers. Stormont was especially beneficial for raising their profile and sought to present the cooperative ideas on BBC (British Broadcasting Corporation) News. During their visit to Stormont, politician 'David Ford'

showed his interest and got his wife 'Ann Ford' on board. She has travelled to Germany and studied some of the effectual practices in RE generation and supply and is now seeking to become a part of the board within Drumlin. Developers were keen for her to join as she had much knowledge being an ex professor at QUB and is now acting as chair of the cooperative (PC, Interview 3, 2018).

The financing social enterprise of Ulster Community Investment trust (UCIT) was paramount within the regime, being a charity providing loans to cooperatives and organisations of similar nature to Drumlin (NI). This trust is well renowned in Northern and the Republic of Ireland with supporting benefits for communities, thus sharing similar motives to Drumlin (McMurray, 2018). Developers would not have obtained sufficient funds for all six turbines without the loan provision from UCIT and the number of turbines constructed would have been reduced from six to two (PC, Interview 3, 2018).

The Westminster Government were relatively supportive at the time by offering tax credits, although these are no longer available. A subsidy scheme was also provided via the Renewable Obligation Certificate (ROC). Drumlin Cooperative were fortunate as this scheme is now not available to new projects as it abruptly ended in 2016. However, subsidies are still provided by the RO as cooperatives are locked into the scheme for 20 years after becoming involved (PC, Interview 4, 2018).

Lastly, two overarching key actors in the regime for the UK cases include The Westminster Government and E4A. The Westminster Government was undoubtedly a key actor in the regime as according to Phare (2018), Drumlin Cooperative would not have been able to even be established yet survive without its provision of the RO. E4A was massively involved in the development of Drumlin through a management contract, providing assistance in capital and expertise, as it has grown to become a family of 23 autonomous RE cooperatives, possessing 13,250 individual members and generating 30MW of electricity capacity. They also delegated many high quality project managers to each of the six sites which was not available in NI at the time (PC, Interview 3, 2018).

Key actors in the regime of ADWF were government agencies, paramount to the provision of advice and lead to smooth runnings of the planning processes. Lithgow had many talks with Scottish Environment Protection Agency (SEPA) who provided advice where himself and developers were unsure of. Advice included ensuring to obtain pre-construction rights in order to prevent pollution of the surrounding environment, harm to human health and avoidable damage to nature conservation. They also advised that this would eliminate risks and costs as well as programme delay (PC, Interview 2, 2018). Developers were also advised early on by the SEPA to change location of the proposed wind park as it was too close to Loch Lomond and the Trossachs National Park. This was paramount before wasting time and sending forward plans to the local council to then be rejected (Lithgow, 2018). It was paramount to eliminate any waste from the beginning, especially with capital, due to the instability of the local economy (PC, Interview 2, 2018). For this reason, SEPA helped developers eliminate the amount of capital lost, as developers explained they wanted the energy produced locally to remain in the community and a portion of the money to be invested in the future project of solar panels (now successfully implemented), (PC, Interview 1, 2018).

An additional key actor in the regime of ADWF (Scotland) was their supplier Vestas. They had an increasingly positive experience with these as they have been highly proficient in maintaining the turbines and ensuring they are running powerfully. They are a highly experienced company working in 79 countries, and this was evident when collaborating with them (PC, Interview 2, 2018).

Vestas also provided utmost advice during the design and installation process (which was to be expected), however, developers did not expect to receive such abundance of advice and information

regarding concerns with ecological aspects and installation. They simply expected they would be a large company wanting to 'get down to business and make the money', (PC, Interview 2, 2018). Instead, they also have commitments relative to RE production and aim to reach 60% share of RE in 2020 from 55% in 2015. Additionally, they have recently partnered with the UN as members of the Global Compact. As a cooperative, developers enjoy being closely associated with these as they have an environmentally friendly façade, thus sharing similar motives to ADWF (PC, Interview 1, 2018).

For the Cases within the Netherlands, the objectives within Nijmegen Betuwe (Gelderland) and Zuidenwind (Limburg) matched with national policies and local policies regarding sustainable development via renewable energy (van der stappen, 2018).

The national government is inevitably a key actor in the regime, which was not interviewed for this research, however, its overall outlook can be obtained from the policy document 'structural vision on-shore wind'. Within this document, it is evident that the motives of the national government are to establish a minority of large wind farms (IenM & EZ, 2014). As a result, the project developer reaps the benefits, being unattractive to wind cooperatives as more than often they are ill-equipped to negotiate projects of such scope and size. Instead, they depend on the development of smaller wind farms. Thus, the policy of the national government is eliminating wind chances for cooperatives. Furthermore, the government prefers to generate wind farms in a centralised/top-down form (IenM & EZ, 2014). Therefore, the national government in both Dutch cases were in essence a key actor network, but not necessarily in a positive way.

**4) How were the niches managed so that the local RE community initiatives were enabled to make progress in each country? Can an authoritative role of a ‘strategic niche manager’ be identified in the studied case studies in the UK and the Netherlands, and how did the strategic niche managers plan and act strategically to make the local transition a success?**

Within a niche, a single or a combined number of actors often adopt an authoritative role as niche manager. Normally, this is dependent on who best fits the specific role and can be delegated to various actors including; the state, policy makers, a regulatory agency, local authorities, civilians, and/or NGO's, and therefore, the niche can be a single individual or organisation (Raven, 2006).

### **Gelderland**

The province of Gelderland played a significant role in enabling the cooperative Nijmegen Betuwe. A policy was made by the province whereby singular turbines were accepted and municipalities became the authoritative body on wind turbines. Also incorporated into the policy was the need for some level of public participation within any wind power project (PC, Interview 11, 2018). The enforcement of this policy was ideal for cooperatives, as it facilitated wind turbine production locally and for that of smaller projects. It also provided the cooperative with a profound level of power during negotiations with the municipality and project developers (van der stappen, 2015). This was a major relief to the cooperative and developers felt rather lucky, as provinces in the Netherlands only promote and enable the development of large turbines and no singular, such as the province of Fryslan in North Holland. The development of such preferred wind turbines in North Holland are often incapable within developers of cooperatives as they pose higher financial capital to be forwarded (PC, Interview 11, 2018).

Moreover, the province of Gelderland enabled the provision of funds which could be exploited by the cooperative. These funds were particularly delegated to the costs of establishing the development and secondly, a price question on sustainability. Such funds were paramount to the funding of the initial set-up costs, which are to be showcased before the project receives approval. Costs of this nature are often remarkably high and if they are incapable of being raised, this poses a high level of precariousness in relation to project establishment, survival and success (Yard, 2016). The raising of such capital is often a huge hindrance for civilians and was eliminated due to the funds provided by the province of Gelderland (PC, Interview 11, 2018), inevitably transpiring to a stronger and increasingly robust niche.

### **Limburg**

In contrast, in reference to the additional Dutch case studied, the province of Limburg is lacking in generating policy for on-shore wind energy generation, with no reference to the provincial government of Limburg (RVO, 2016). However, the lack of provincial policy was not a total hindrance as it enabled the cooperatives to merge and create their own policy by establishing the cooperative Zuidenwind. Therefore, the worthy enablers paramount to mention were the cooperatives of Windvogel and Meerwind, from REScoopNL. They joined to aid Zuidenwind in constructing its turbine, positing knowledge and expertise, as well as required funds which were not able to be obtained solely by Zuidenwind (van der stappen, 2016). Additionally, without advice and financial provision of 1.5million euros from Rabobank, the initiation and construction of the turbine would not have been possible, even with financial provisions from the two developers. Thus, key enablers in this case in setting the local transition in motion were Windvogel and Meerwind cooperatives as well as Rabobank (Yard, 2016).

### **Scotland**

For the ADWF (Scotland), Npower Renewables was a paramount enabler as it saved the project over 250.000 GBP in start-up costs as they had previously conducted a great deal of pre-planning work. Any capital available was paramount, as the initiators (Lithgow and his family), were only able to put forward approximately 20% of the initial costs, being inadequate at the time (PC, Interview 2, 2018). Additionally, pre-planning work led to easier obtainment of planning permission as potential aspects which could lead to an objection in planning was eradicated early on. Npower revised their application and advised them to reduce the project in scope to eliminate the overall footprint of the development, and was implemented before applications were sent. Therefore, objections were avoided and the process of re-applying, thus leading to a smoother process (PC, Interview 2, 2018). Lithgow had saved 86.000 GBP being a substantial amount for one individual to raise, however in terms of wind power, this amount of money is insufficient (PC, Interview 1, 2018).

Another enabler which must not be failed to mention is The Ardrishaig Community Trust (already in existence), as they were able to delegate 300.000 GBP to the project. Not only were they extremely helpful in providing funds but there was one individual who was a key leader in the trust and enabler within ADWF (Scotland). This individual was allocated as the agreed point of contact for the community and additionally to progress initial discussions (PC, Interview 1, 2018). Lastly the Trust provided ADWF to network with other enterprises and services and has an unprecedented level of recognition from the Scottish Government. The involvement of the ACT thus undoubtedly was an enabler or facilitator, and lead to fewer objections in planning once locals were aware of its involvement, virtually being automatically won over (PC, Interview 1, 2018).

### **Nottinghamshire**

For the case of HHP, (Nottinghamshire) the chief initiator 'Nick Martin', was the main enabler in the project. His creditable reputation was not just known in Hockerton, but also across Nottinghamshire and the Westminster Government. He was well renowned as the wind farm was not his initial environmentally friendly operation, but the development of earth-sheltered homes as well as water capture and treatment systems (PC, Interview 6, 2018).

The project has been recognised nationally as the UK's first genuine self-sufficient eco-settlement back in 1995, when Community RE production in the UK was generally unheard of. Therefore, when plans for the wind farm arose, his name was beneficial as an enabling factor as he had contacts with politicians, administrators and civil society organisations. He had a keen interest in sustainable development before many in the UK, being a green builder and a member of British Earth Sheltering Association (PC, Interview 6, 2018).

Furthermore, due to the scope and scale of his plans for the project and creating an overall eco-village, the project was enabled straightforwardly. At the time, 'David Pickles', a chief architect of the local council, conceded that the "project broke many planning rules". However, due to the council realising the fine landscape which would be developed, plans were accepted and an enthusiastic backing was provided (PC, Interview 7, 2018).

Lastly, he was most certainly the enabler as he was the landowner's son, and therefore the provision of space was readily available. It is evident that Nick Martin was the predominant niche manager in this case due to his genuine care for the environment over economic gains, as well as his prosperous profile (PC, Interview 6, 2018).

### **Oxfordshire**

The main facilitator in the niche of WWF, was 'Adam Twine', being the main initiator, landowner and local farmer. Without this individual the projects would not have been physically feasible, due to his

provision of land. Furthermore, he was key for survival of the project as he has been heavily involved in all aspects of the project including planning permission, developments with the grid and educating the locals (PC, Interview 9, 2018). He was a commendable individual and well known for all the right reasons in Oxfordshire and within the local council. He participated in much campaigning regarding Nuclear energy in the late 70s and early 80s, being intrigued in energy issues very early on, and was additionally a member of the parish council for some years (PC, Interview 8, 2018). Adam also gained recognition from the Agricultural European Innovation Partnership (EIP-AGRI), from the set-up of the Farm Carbon Cutting Toolkit (FCCT) (and is a not-for-profit community interest company), as a means of enabling farmers to exchange knowledge thus promoting the awareness of climate change within the UK's farming community. During the launch of this, talks were conveyed in Northern and Southern England, where he also gained an opportunity to discuss Westmill (Oxfordshire) and its noteworthy progress since initiation. In a nutshell, he is a proactive individual who providing the key resource – land.

### **Northern Ireland**

For the Northern Irish Drumlin Cooperative, Andrew McMurray was the pioneer of the niche being not only the main initiator, but the individual with utmost knowledge due to his educational background in engineering and RE (PC, Interview 5, 2018). He is one board member of eight. These individuals devote many hours per month, (not recorded but all are proactive), without a salary and these are certainly the niche managers. However, for this case, the ultimate pioneer who set such changes in the transition must be awarded to Baywind Energy Coop. Essentially, it provided development for E4A and it owns the cooperative, which provided assistance to Drumlin and Westmill. It was also the first Energy cooperative to own wind turbines in the UK. So Baywind Coop has been the 'Mother Cooperative and Pioneer', for many windfarms throughout the UK (PC, Interview 3, 2018).

### **5) How does social learning occur within and outside the niche in RE community initiatives to pave the way for the niche to grow?**

According to Mitchell (2018), in relation to the introduction and use of contemporary technology, social learning can be difficult to implement and for every individual to fully understand. She is a resident of one of the Drumlin locations, and conceded that within the older population of Northern Ireland, terms such as 'renewable energy', 'climate change' and 'sustainability', are virtually taboo terms to certain individuals. Furthermore, they are often intimidated with new user practices implemented within their landscape which they treasure from a historical perspective.

Social learning is a prerequisite for sustainable energy use and for it to be adopted successfully, behavioural changes are paramount through direct experiences and/or by witnessing the new or changed behaviours of people around them (Darby, 2006), thus being influenced by social norms, for example, by imitating role models (Bandura, 1977).

It must be noted that within every case social learning events have been implemented and ongoing explained in each case of section 6, under the 'social learning' section.

To mention the cases that have put highest efforts into this area, would include ADWF (Scotland). They have forwarded capital for RE science and technology education in 8 primary schools within close proximity to the turbines. However, they soon realised it was predominantly the older population who were to be targeted as these are the individuals who oppose on the highest level. From 2016, the board have sent out monthly newsletters to all neighbours to showcase the development of the win farm and highlighting facts regarding its savings on CO<sub>2</sub> emissions within

previous years (PC, Interview 1, 2018). Furthermore, the transmission of 63.000 GBP in 2017/18 via the Alt Dearg Educational Trust has provided numerous young locals to attend Metropolitan Universities within Scotland to study a social science degree. The initiator also holds 'open meetings' at Scottish Land & Estates, as a means of encouraging the local population to attend.

The predominant initiator (Tilley), of HHP (Nottinghamshire), noted in the beginning of their project, many objections to planning permission were from that of the older population. It was noted that when workshops were first conducted for educational purposes, mainly younger individuals were present with a small handful of older. However, after a short timeframe (matter of weeks), the number of older individuals at meetings grew. Thus, Bandura's (1977) theory of social norms was exemplified, whereby people are influenced by others changing roles and are more likely to adopt these after noting others changes and efforts.

Furthermore, Tilley has been an advocate for social learning, as this was greatly required during planning processes in 1995 due to civil-society windfarms being unheard of and feeling as though he had to educate Westminster on the importance of these and their relation to sustainability. He is adamant the most efficient way of social learning to take place is being proactive through interaction. Therefore, in the initial stages of HHP, he arranged copious amounts of meetings within the community to gain information regarding what each individual favoured and also to address their fears. Subsequently, Tilley aimed to address their fears as sufficiently (which were predominantly negative visual impact of a wind farm), and conducted mapping exercises. Firstly, these were conducted informally, and afterwards an architect was employed to professionally implement the sketches. Following this, many who opposed the wind farm on the grounds of detrimental visualisation and fear of their home decreasing in value had a change of opinion, and the majority finally approved of the wind farm (PC, Interview 7, 2018).

Within the case of Westmill Wind farm, the WeSET greatly promotes social learning. Albeit it has been briefly explained in section 6.1, the activities within are expanding and prosperous. Westmill Wind delegates 6500 GBP per year to the trust to promote such activities. The vision within the trust is to increase social learning and provide potential to encourage others to initiate similar community owned renewable schemes. In 2017, trustees employed film crews to WeSETs open days and site visits, with footage containing interviews with site visitors and board members. The most recent film is entitled "I think the turbines are epic" and can be found on the website News page. This led to great publicisation of Westmill Wind and WeSET, with more people acting proactively in regards to the wind turbines in Southern England and the number of visitors elevating at such open days and site visits in 2018 (PC, Interview 10, 2018).

Within the case of Drumlin (NI), social learning was not so problematic due to the scattering nature of the six wind turbines and these virtually being rural. Therefore, the scattering nature has been advantageous as a wider range over a wider area are forced to at least consider and educate themselves (if they haven't been already) in renewable energy. Also, the initiation date (from 2012-2014), meant that the majority of those individuals living nearby the turbines had been educated previously to some degree in this field, unlike the early initiation date of HHP (1995-1997), where many locals did not fully comprehend the matter or were simply disinterested. Nonetheless, social learning remained an important aspect within Drumlin and was conveyed mainly through University professors speaking to children and young adults at local primary and secondary schools (PC, Interview 3, 2018).

### **Follow up on progress**

None of the cases studied however have piloted any surveys or interviews to study or detect any changes within their participants in relation to sustainability practices such as purchasing energy efficient appliances, or in general becoming increasingly conscious regarding their energy consumption. The only signs of real improvement in relation to one becoming more energy conscious are the additional joining of members, however, this is normally not solely implemented with environmental concerns but is combined with economically incentivised reasons (PC, Interview 1, 2018). As a result, it is rather complex to note the level or importance of social learning within the daily lives of those resident/stakeholders of each wind farm.

Furthermore, it becomes difficult to measure the success of the initiative in challenging general practices of energy provision and subsequently consumption (PC, Interview 6, 2018). However, the initiator of HHP (Nottinghamshire), is adamant that residents of windfarms across the UK must be more open to learning and consider their actions within the environment since this is an evergrowing topic and for that of the younger population, they have to deal with this in the future. Additionally, he has sectioned a percentage of profits to be delegated to a charity initiated to promote RE and conservation within the Hockerton area, as a means of employing progressive learning (The Climate Coalition, 2017).



## 7.1 Cross comparison summarised

<b>Research Questions 1&amp;2</b> <b>Case Studies</b>	1. Aspect that promoted initiation	2. Barriers faced by initiative
Westmill (Oxf)	Awareness of success of projects of similar nature and availability of assistance from E4A, giving initiators power to those wanting to establish a cooperative while providing financial aid. Also aware of the success of Baywind Coop in Cumbria (First civil society initiative in wind power in the UK).	Support from locals lacked for initial 2 years due to it being the first wind farm cooperative located in Southern England.
Drumlin (NI)	Knowledge of successful projects, especially Baywind Coop and availability of assistance from E4A (both organisations mentioned above)	Acquisition of capital – quickly overcome by UCIT and E4A provision of loans. However, this took 2 years and stalled initiation. Scattering of 6 turbines not easily managed and different planning processes in each area
ADWF (Sc)	Two land owners and entrepreneurs wishing to rejuvenate an economically fragile area. They conceded that economic perspective won environmental over initial and utmost reason for initiation.	Local council objections due to statutory objections from Scottish Natural Heritage. Overcome by entering Landscape & habitat enhancement plan
Hockerton (Nott)	Initiators heavily intrigued in sustainability and have furthered plans to make Hockerton an eco-village, thus generating wind power prompted initiation. Initiators are also honest that wind power was chosen at the time over solar as it was more cost effective.	Planning permission was problematic, taking 5 years and 4 appeals before consent was received. Many locals resistant to change as there were very few wind turbines in Nottinghamshire at the time (1997).
Nij Betuwe (Ge)	The City of Nijmegen was heavily involved with established energy companies and were rooting for a bottom-up organisation. Once local citizens became interested, mutual agreements occurred. The project actually started from the city and the involvement of established energy companies dating back to 1990 when there were plans for a neighbourhood to the north of the city, corresponding to plans within the national framework to increase number of homes Holland. The municipality had ideas from the beginning of building turbines along the motorway until the end of the neighbourhood.	Potential partner 'Eneco' withdrew from project due to time delays as a result of an objection from municipality of Reeth which was forwarded to highest court. Withdrew also because a project of similar nature (initiated by civil society) had also been unsuccessful in the same year, thus lacking confidence in citizens having substantial knowledge and financial capacity to complete and sustain the project.
Zuidenwind (Li)	Initiated by two local entrepreneurs who virtually were for the production of RE, but chiefly the predominant aim of the wind farm was to generate capital from electricity sales back into the local economy. Reasons for initiation are slightly more economically induced in comparison to the other Dutch case.	Lack of knowledge was noted early on in the project and was overcome through the interim board members, who possessed the necessary experience and expertise. To gain more information, initiators took advantage of freely accessible information online provided by ODEdecentraal. To further enhance understanding and learning, initiators attended the annual HIERopgewekt event, whereby cooperatives exchange knowledge with experts (learning from and inspiring other cooperatives).

<b>Research Questions 3-5</b>	<b>Case Studies</b>		
		3. Key actor-networks in the niche (n) and in the regime (r)	4. How were niches managed to enable progress?
			5. How did social learning processes evolve?
Westmill (Oxf)	(n): local farmer & initiator Adam Twine (r): Westminster Govt – provision of Renewables Obligation Knowledge institutes such as the University of Nottingham conducting social research relating to wind farms beneficial	Employment of Environmental Health Officers assessing noise issues and landscape assessments. Major assistance from E4A and the main 8 board of Directors	WeSET Invitations for 5 local Primary Schools to visit numerous times per year Workshops & marquees held to express benefits General meetings twice per year where all members are invited to discuss the projects future prospects (participation process). Monthly newsletters distributed and website frequently updated to keep those interested up to date with necessary news.
Drumlin (NI)	(n): Andrew McMurray (project developer & entrepreneur) (r): Stormont for raising the profile and getting 'Green politicians' on board and publicising the wind farm on BBC breakfast show. Westminster for provision of Renewables Obligation – key to its survival UCIT key to provision of funding for initiation.	Assessments undertaken from Environmental Health Officers & EIAs conducted. Major assistance from E4A in collaborating effectively with board members, thus gaining experience and knowledge. Telecom consultees employed to avoid existing line-of-sight signal pathways – avoiding impacts for two nearby airports	Social Learning not needed so much in this case. Most locals approved of the idea. Community workshops conducted and flyers distributed to each local area. Drumlin pays 2.000.000 GBP to each of the six sites to educate nearby schools regarding sustainability and environmental issues.
ADWF (Sc)	(n): Main initiator (James Lithgow), key actor in communicating frequently with and seeking advice from governmental agencies advising on pre-planning (r): Government agencies, needed for planning and advice. Scottish Environment Protection Agency provided advice regarding environmental, ecological and health & safety aspects. Also provided advice on best place to build turbines and thus lessening time waste into unsuccessful planning permission. Their turbine supplier (Vestas), provided advice regarding installation and maintenance (saving much time and capital)	Owner attended many pre-planning consultations which lead to smooth process and no appeals in court. More than 20% of start-up costs needed were saved by the owner. This led to Lomond Energy being more willing to provide a loan. Much knowledge and experience was distributed to ADWF via Vestas (Danish Supplier).	Inviting school children to site visits, involving them in the process by allowing them to name the first turbine installed. ADWF contributes over 63.000 GBP through its Alt Dearg Educational Trust in 2017/2018, to send 60 young locals to University to study an Environmental related course. Locals made aware of ADWF ongoing environmental projects within their agreement within Landscape and Habitat Enhancement Plan (LHEP), e.g. ongoing restoration of the upland peat bogs surrounding turbines.
Hockerton (Nott)	(n): initiators and local citizens as the majority of capital needed was from their pockets. (r): very little input other than granting planning permission 5 years later. Initiators felt they needed to educate the state on wind power. Much advice obtained via 'Cooperatives UK', regarding the initiation of a successful bottom-up project. 'Baywind Cooperative' (first bottom up wind coop in the UK also helpful during initiation process)	Mapping exercises improved locals perceptions of wind turbines and their misperceived detrimental visual impact. Copious amounts of meetings held within community regarding what they believe to be positive and negative regarding a wind farm – lessening the number of NIMBY cases.	Mapping exercise conducted by the initiator including map drawings around each house which would be impacted – afterwards ensured that sites selected for implementation were at least 500m away from the individuals home. Workshops also coordinated by HHP to identify other ways of becoming environmentally friendly other than purchasing electricity via wind turbines. Questionnaires were dispatched at meetings to note how environmentally friendly and aware attendees were.
Nij Betuwe	(n): members were paramount in supporting Windpower and providing	The province of Gelderland were paramount to enabling	Membership meetings scheduled to elaborate on progress of

(Ge)	<p>capital. The municipality of Nijmegen advised initiators to prompt a membership recruitment campaign. This gained an abundance of members who successfully virtually fund the turbines.</p> <p>Local governments also crucial in supporting Windpower and selling their land to develop the turbines on. Had strong interests in developing this area long before initiators initiated plans. The municipality also financed the costs of the planning process. Involvement of ex university professor crucial for raising profile of wind farm.</p> <p>(r): National government inevitably needed for guidance within policies regarding sustainability and RE, but were not necessarily a key actor. Niche actors were of higher importance.</p>	<p>Windpower. A policy was made whereby singular turbines are accepted and where municipalities are the authoritative body on wind turbines. This policy was needed for facilitation and especially for that of smaller projects. Initiators were overwhelmed as provinces within NL normally only promote the development of larger wind turbines, inevitably being increasingly expensive to install and maintain.</p>	<p>turbines.</p> <p>During planning process, those living in close proximity to the wind turbines were informed about visual damages payments if their house reduces in value (Planning damage). Social Learning was not a huge priority in this case due to few objections and many locals being environmentally friendly.</p>
Zuidenwind (Li)	<p>(n): also initiated a membership recruitment campaign which aided gaining professional entrepreneurs and individuals from financial sector ODEdecentraal was required as a lobbying organisation to promote better opportunities as well as REScoopNL.</p> <p>(r): National government required for guidance within policies regarding sustainability and RE, but were not necessarily a key actor. The niche actors were of much more importance</p>	<p>Cooperatives of Windvogel and Meerwind from REScoopNL – joined to aid Zuidenwind in constructing its turbine as well as delegating knowledge and expertise.</p> <p>Financial assistance (1.5 million euros) from Rabobank paramount for start-up costs.</p>	<p>Newsletters published online frequently in relation to upcoming events and meetings per month. General Member Meetings take place every three months whereby all members are encouraged to attend. Within these, goals and visions are revised and output produced</p>

## 8.0 Conclusion

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This study was conducted in order to answer the question: What were the overarching drivers for change in the local energy systems of energy projects studied in the Netherlands and UK, and how do these compare from a theoretical Strategic Niche Management (SNM) perspective? Thus, this chapter will encapsulate the findings in relation to what SNM posits regarding the driving factors which lead to change in both countries. Also, it is interesting to learn from this study if it is actually logical to apply SNM theory to bottom-up civil-society based niche development of sociotechnical innovations.

RE community initiatives are alike in their sustainable nature, but can contrast in relation of energy type produced; whether that be solar, hydro, wind and/or biomass. All cases studied within the Netherlands and the UK are precisely what Seyfang and Smith (2007), would denote as ‘grassroot initiatives’ or RE community initiatives that were created and progressed in a bottom-up manner, with overarching aims to locally produce green energy for the use of local residents.

During analysis, the cases are the ‘abstract’ niche or the form in which each project structured new social arrangements, routines and applications that are differential from the ‘norm’ of the sociotechnical regime (Raven *et al.*, 2010). By categorising all RE community energy initiative as ‘bottom-up’, this study illustrates that the relation to SNM theory is logical because system innovation is entrenched within every case studied. As Kemp *et al.* (1998) stated, the three elements paramount for technology-centred niches (building social networks, managing expectations and learning processes), are seemingly appropriate for niche innovations. All three elements were evident within each case studied, which have been beneficial in preventing barriers which these type of projects often face. For example, managing expectations within HHP (Nottinghamshire), lead to its implementation and success. Chief architect at the time claimed that the project “broke virtually all planning rules”, but once made aware of this project and its transpiration to an eco-settlement, it was fully supported (PC, Interview 5, 2018). Therefore, social learning and management of expectations lead to gaining of public acceptance in this case, which is a required outcome for successful implementation of wind farms, as briefed in the conceptual model in section 3.0.

As suggested by Hielscher *et al.* (2013), in order to build social networks, the SNM theory insinuates that niches are best implemented when they incorporate a variety of stakeholders, who gain access to various resources from their organisation as a means of stimulating the growth of the niche. This assertion is confirmed within the cases studied. All cases have adopted measures in building their networks in numerous sectors including a combination of; the state, business entities, universities and educational systems, civil society and alternative RE community initiatives (locally, nationally and internationally).

Ex-chairman of Nijmegen Betuwe believes that the cooperatives networking with the local municipality and also learning from the successful Kilimakommune Saerbeck German case, have successfully contributed to the growth of networks of the cooperative (PC, Interview 11, 2018). To exemplify networking within UK cases, while the local governments in this state have had much lower involvement in comparison to Dutch cases, the networking with another national RE initiative renowned as ‘Energy4all’, was imperative for the success of Drumlin (NI) and Westmill (Oxfordshire). All interviewees within both cases conceded each project would have been unsuccessful without networking and assistance from E4A, providing much expertise in initiation and survival as well as capital (PC, Interview 2,3,6,9, 2018).

To elaborate on the management of expectations within SNM theory claims from Kemp *et al.* (1998), niche development is best progressed if expectations delivered by the niche are widely shared,

concise, representative and inevitably feasible. Individuals are often unaware and unaccustomed to the development of a new technology in relation to the advantages it can pose. In order to acquaint the public with a new technology, the niche managers or pioneers convey expectations regarding the technology they will put forward. Such expectations are particularly autonomous when they are dispersed, accountable (thus normally supported by facts and tests), and should relate to a combination of technological, economic and social aspects. Therefore inclusion is paramount, which was showcased in every project either by inviting members and/or general public to informal meetings regarding the wind farm. As a result, individuals become empowered and become increasingly aware in relation to what to expect from the project.

Furthermore, as the initiative becomes increasingly transparent, i.e. by open invitations to meetings etc. civilians begin to comprehend the project and overall process to a higher degree and become aware specifically of the overall objectives (PC, Interview 2, 2018). Transparency can be attained via continuous communication to guide individuals and notify them regarding the status of projects, its progression, how effectual it is and benefits derived thus far. Every case studied does successfully communicate to the wider public. However, for the case of Drumlin (NI), interviewees conceded this is increasingly difficult due to the scattering nature of the six turbines across Northern Ireland and additionally to many of the turbines being located in obscure places (PC, Interview 5, 2018).

It must be noted however, for the case of Westmill (Oxfordshire), the board of members struggled to communicate their objectives and visions to the public in the beginning with regards to what precisely the project could contribute in relation to economic and social benefits. Even when they transmitted their goals and objectives at the beginning, there remained to be huge local opposition from anti-wind farm campaigns (PC, Interview 8, 2018). This illustrated unrealistic goals from the board of members (internally), and in relations to the wider public (externally). This is due to the fact that the general public were not won over by the estimated money to be generated back into the community and also 'no noise' to be generated by the wind farm as claimed by board of members. This was a hindrance to development at the beginning and lead to delays in planning and public trust was lessened within the cooperative. However this obstacle was overcome mainly through time, once some members grew to like the idea, others virtually 'jumped on the bandwagon', (PC, Interview 9, 2018).

While lack of public trust was disadvantageous at the time, the board of members did not want to send out misleading information regarding money regeneration, thus avoiding disappointment from individuals in the future. Therefore, they made slightly lower estimates than expected of money generated back to the community (imagining a worst case scenario), in hoping they would, in theory, generate back more than expected and thus surprisingly please individuals. This was mainly implemented to avoid discontent amongst individuals and eventually gain trust (PC, Interview 9, 2018).

In order to win over those who were worried about noise, BBC study noise pilot tests were conducted to show how unnoticeable noise generated from turbines were. Eventually, most of those opposing became at least neutral to rooting for Westmill (Oxfordshire) (PC, Interview 8, 2018). The WeSET charity created by developers was chiefly a way of managing expectations and to actively communicate with their participants (additionally a way of implementing social learning via exchange of knowledge and experiences amongst residents and experts from various fields. Informal meetings often occurred, providing English Tea and Scones, which was often exemplified in all UK cases (also for Belfast). Interviewees were appalled yet pleasantly surprised by the rise of individuals turning up once they were aware of condiments provided. However, certain individuals were often generous

and provided home baked goods, these were usually the advocates for the wind farm (PC, Interview 9, 2018). Such provisions of goods are deep within English and Irish culture, and are a way of socialising. Topics discussed within WeSET varied from each meeting, ranging from climate change, energy efficiency, volunteering tasks, revenues generated etc. and those present included environmentalists, university lecturers, board members and residents interested in the cooperative. The time and date of meeting are sent via their own newsletter and also to the local newspaper (only when it is a bigger meeting) (PC, Interview 8, 2018). From an SNM perspective, the WeSET is one example within UK cases which is imperative in developing a general comprehension amongst participants regarding issues of the global energy situation and aiding their understanding in how small changes can from their efforts can contribute to climate change adaptation and mitigation, thus providing solutions at a local scale. Such meetings also warrant that expectations of what the organisation and the technology are capable of contributing are widely dispersed.

Finally, SNM theory in proposes that in order to increase niche development is not solely to be the first-order, where individuals broaden their knowledge of renewable energy; but also within second-order of learning, where participants advance their level of understanding and commence the questioning of systems within the current regimes (Geels et al., 2013). Nonetheless, it is difficult not only to educate those with very little to zero knowledge in relation to climate change, peak oil, energy security etc. It is especially difficult to enforce this along with lifestyle changes (PC, Interview 1, 2018). Furthermore, often the small group of opposing individuals do not change how they feel until they note the majority of the community being proactive in relation to community energy, thus only choosing to change when they see the new 'norm', (PC, Interview 9, 2018).

According to Jackson (2007), prompt benefits are provided to a community where community based activities are evident and therefore widespread public engagement prevails. Every case studied has provided opportunities for locals to become educated via workshops, school visits and some cases even provide substantial cash for young adults to attend University away from home, i.e ADWF(Scotland). Out of all cases studied, social learning is seemingly the most important given the amount of money delegated to potential university students, providing a generous 30.000 GBP per annum to their 'Educational Trust' and thus providing support to approximately 60 young locals. Provision of funds for University students was also noted within HHP (Nottinghamshire), but not as substantial. More funds have been provided to university students in the UK cases as opposed to the Dutch (no funds provided for university students in both cases). This is inevitably due to the fact that the UK University system is one of the most expensive in Europe.

The main initiator of ADWF (James Lithgow), could not reinforce enough the imperativeness of educating the locals and enticing them to become participants. He believes, 'education is key and those uneducated or simply unaware a major part of the problem and those who form the NIMBY candidates'. He has organised site visits with the surrounding primary schools as he believes, 'we need to improve education with relation to RE and climate change by doing so when they are young and therefore eradicating NIMBY cases in future'. As a cooperative, they enabled cooperation with primary school children by inviting them to the field and allowing them to name the first turbine erected, in which they settled with 'Generator Genius', (PC, Interview 1, 2018). Therefore, the cooperative is already setting positive examples to the minds of the youngest within the population who are not subject to path dependencies initiated by the existing energy regime. Furthermore, education of some primary school children lead to them 'changing the minds of the strongest opponents – their grandparents. One Grandfather went from strongly opposing to actively for Westmill (Oxfordshire), after his granddaughter of nine years old was given a site visit and became

increasingly passionate about the site' (PC, Interview 9, 2018). That case most certainly verified the term, 'knowledge is power'.

To conclude, this study has explored how RE community initiatives exemplified in the UK (4 cases) and the Netherlands (2 cases), have developed endeavours to understand society's conventional practices regarding energy production from a SNM perspective. In every case, all three explanatory elements from SNM theory were illustrated, albeit, to different extents and in various manners. Within the case of Drumlin (Belfast), social networking was of great importance to the cooperative and was one of their main activities. Project developer Paul Phare stated, 'Networking with organisations such as Energy4All, Friends of the Earth and certain politicians were paramount, especially during the implementation phase, as much knowledge and expertise was forwarded which was not readily available in Northern Ireland at that time', (PC, Interview 3, 2018).

### **Summarised answers on Research Questions**

#### **1) What aspects promoted the initiation of these RE community Initiatives in the UK and the Netherlands? What fundamentals were required for the start and the implementation of RE community initiatives in each country?**

Each case within both countries were implemented by a small number of individuals, which is often typical in the nature of community initiatives. For the Dutch case of Nijmegen Betuwe, the municipality of Nijmegen greatly supported the idea and had previous plans to implement a wind farm in this region long before the individuals approached them. Great support was also noted from the municipality of Weert within the case of Zuidenwind. From the initial negotiations, they supported the individuals plan by conducting feasibility studies of the site free of charge. One disparity between the Netherlands and the UK in relation to aspects which promoted initiation is the support (or lack of) within each country from the local municipalities. Within both Dutch case studies, support was evident from municipalities and has been elaborated in Chapter 7. For the UK cases, the main aspects which promoted initiation were similarly a drive from a small number of individuals for environmental and sustainability reasons. However, one major difference for the UK cases were little to no support shown from local municipalities. Virtually no support was shown from local municipalities in these cases except for the case of Westmill (Oxfordshire). Yet, the support shown was not needed and rather dismal, as the municipality attended a meeting a year following the projects initiation to verbally congratulate the team.

#### **2) How can the Netherlands and the UK be compared in terms of socio-technical regime, and within the socio-technical regime, what barriers were present and how were they faced?**

Barriers within each case were nothing new or exceptional from those experienced with conventional wind farms, ranging from lack of funding, lack of expertise, lack of support from municipalities and central government and energy companies withdrawing from collaborative plans. One major difference in barriers faced within each country is NIMBY. Overall, generally throughout all cases studied, NIMBY levels were low. However, they existed to a higher level within the UK cases, especially within the two English cases, due to British individuals attachment to their English heritage and scenic landscape, wanting to maintain and preserve this historical scenic attractiveness. Another predominant difference in barriers between the two countries was the lack of support present from the UK municipalities, no feasibility, provision of loans and/or land provided for the British, as was generously experienced within the Dutch cases. Instead, for the Scottish case of

ADWF, the local council dissuaded wind farm ideas initially and objected the plan due to objections from Scottish Natural Heritage.

The UK and the Netherlands can be compared in terms of socio-technical regime, as both National governments commenced the privatisation and liberalisation of the electricity and gas market in the 1990's. However, both governments own and control electricity grid operators which make it increasingly difficult for citizens to develop a program for pilot smart grids independently. Within the regime of the UK, predominant giants are greatly present in the landscape and currently contribute to a staggering 80% of fossil fuel production. Thus, within both countries, the market for electricity remains to be greatly controlled by the National Government.

### **3) What are the predominant key actor-networks in the studied local projects (niches) and the main key actor-networks in the regime of the Netherlands and the UK?**

Key actor-networks in the niches of the UK included alternative cooperatives where knowledge, expertise and assistance is attained. For example, 'Baywind Cooperative' was a key actor network in the niches which were the UK cases, as every case used this cooperative as a prosperous example, being the first successful independent wind cooperative in the UK in 1996. All cases studied within the UK also believed their management team was strong and diverse and paramount to success. Therefore, the management teams were also paramount to the niche, as different managers held more experience in different sectors, ranging from economics in ADWF (Scotland) to engineering and construction in HHP (Nottinghamshire). An additional cooperative worth mentioning and paramount to the niche was Energy4All, which provided much financial assistance to Westmill (Oxfordshire) and Drumlin (Belfast).

Key actor-networks in the niches of the Netherlands would include the membership recruitment campaigns which were a paramount component of the niche and its aggregation of members and thus local acceptance. The setting up of membership recruitment campaigns is not usual in the UK. As already stated, the municipalities for the Dutch cases were paramount to success. The municipality of Nijmegen was content to finance the cost of planning process, providing a loan of €80.000, and immediately agreeing to sell their land on which the turbines would be constructed on. University professors were also paramount for one case in each country. For example, Ben Dankbaar was an ex-University professor of Radboud University and acted as chair of Nijmegen Betuwe. He was able to provide expertise in sustainability and the selection of appropriate techniques in innovation. For Drumlin Cooperative (Belfast), a retired Queens University Belfast (QUB) posited expertise in RE and the physical environment. Such strong professional individuals who demonstrate expertise and knowledge where there are voids are necessary for any niche.

Key actor-networks in the regime of the UK cases include the National government. Although virtually all interviewees stated there was little involvement from the government other than the provision of the Renewables Obligation, they conceded the wind farms would not have been able to operate without it – therefore central government was a crucial actor network in the regime. Westminster Government agencies were also imperative in providing advice, e.g. Scottish Environmental Protection Agency in particular provided advice relating to ecological aspects and H&S which enabled smoother operations in planning processes.

For the Dutch cases, the national government was imperative for guidance within policies regarding sustainability and RE. Furthermore, national government has overall say in granting planning permission. Rabobank must not fail to be mentioned due to its generous provision of loans, with



Zuidenwind receiving €1.5.000.000 and Windpower €13.000.000. For the case of Zuidenwind, REScoopNL and ODEdecentraal were also crucial for expertise and provision of loans.

It must be noted that the Dutch National Government eliminate chances of bottom-up wind farms succeeding as they plan and favour the development of a minority of large windfarms. Therefore, the niche actors, namely the municipalites were more important than regime actors in the Dutch cases.

#### **4) How were the niches managed so that the local RE community initiatives enabled to make progress in each country?**

Within the UK, alternative cooperatives including 'Baywind', 'E4A' and 'Cooperatives UK' were paramount as a means of managing the niche, whether that be via financial aid and/or assistance, the general prerequisites in running a cooperative, how to win over locals who oppose the idea and combat NIMBY cases. Within the UK cases of Westmill (Oxfordshire) and Drumlin (Belfast), both interviewees conceded that cooperatives would not have been successfully implemented without professional advice from E4A. Also, within each case there is virtually a single or small group of individuals required to adopt an authoritative role and act as niche manager, and are usually a land owner, local farmer or board member.

The municipality of Nijmegen acted as the authoritative body on the wind turbines as they sold the land to build these on, had already a vision in mind of similar project while providing financial assistance. This proved very different to the UK cases where municipalities took little to no involvement and were not needed for implementation or survival of the projects. Instead, UK cases were managed continually, even after initiation, by winning over locals and lessening the number of NIMBY cases. This was implemented by initiators focusing on conducting noise and visual impact assessments, mapping exercises, attending pre-planning consultations, all to lessen the number of NIMBY cases.

#### **5) How did social learning processes evolve?**

All cases adopted similar learning exercises such as the holding of workshops, transmission of Newsletters and flyers etc. However, it must be noted that the UK cases were much more proactive in getting school children involved in site visits and naming the turbines, thus, involving them in the process being one major difference. Furthermore, social learning exercises were not so important in the Dutch cases as NIMBY levels were extremely low in comparison and therefore winning over the public was not of utmost importance. The UK cases also put more funds into educating young locals as opposed to that of the Netherlands. For example, Drumlin wind (Belfast), pays 2.000.000 GBP to each of the six sites across NI per annum, as a means of funding and advantaging the Northern Irish community and as a means of promoting primary school educational activities. Furthermore, The Alt Dearth Educational Trust initiated in 2013 provided 17 young locals with educational grants. The support has successfully progressed each year; in 2016/17 39 locals were supported and 60 in 2017/18 with 63.000. GBP provided for to the individuals to subsequently attend University and study an Environmental related degree.

**What are the overarching drivers for change in community initiatives for renewable energy within the Netherlands and the UK and how do these compare, from the theoretical perspective of a Strategic Niche Management outlook?**

The overarching drivers for change in community initiatives for renewable energy are chiefly for environmental reasons with local individuals hoping to make contributions to their central governments highly ambitious commitments of Carbon Reduction to the European Union. Such locals become aware of community initiatives for renewable energy not only in neighbouring towns and cities, but these emerging across European countries, most successful examples including Germany, Denmark and Spain as explained by Oteman et al. (2014). The success of these gives incentive to create a bottom up project, involving civil society and less of the market and state. Individuals are also enticed from an economic perspective, whether they admit this or not, but inevitably when a local wind farm succeeds remunerations are put into the local economy and that area can be rejuvenated, which was the case for ADWF (Scotland).

The application of a theoretical perspective from innovation sciences proved useful, the case studies could be studied and comprehended from a Strategic Niche Management outlook.

SNM is applied to manage the process from niche innovation to institutionalization in a regime which relates to any bottom up wind farm. Such wind farms are not conventional, different from the standard large and centralized wind farm and are usually a small space which can be understood as the niche. The niches (wind parks) are also managed strategically by a group of individuals, whether this be the main initiator, land owner or local farmer, volunteers and/or members.

Three aspects of SNM include social networking, management of expectations and social learning. All three aspects were greatly adopted and showcased in every case and were paramount to success. SNM theory focuses on these three aspects but also on the niche becoming independent and having the ability to make changes at the regime level, and the growth of niches are forcing the regime to change. To exemplify this, when the Dutch case of Zuidenwind became willing to support ODEdecentraal, this actor could significantly elevate its lobbying practices to make an impact on the national level and the decision making process.

## 8.1 Recommendations

### *For Practice*

Albeit the number of civil-society lead wind farms are elevating in both the UK and the Netherlands, both countries could increase activities to heighten the level of the niche. However, this is not always simplistic and within virtually all cases, at least one barrier or obstacle was present, whether from the legal/policy aspect, lack of funding, lack of knowledge and expertise and/or NIMBY. Nevertheless, it would be advantageous if the respective national governments as well as municipalities adopted an increasingly authoritative role in promoting and supporting such community-lead RE projects to improve the level of CO<sub>2</sub> emissions and meet stringent governmental obligations relative to these. Currently, it would seem the national government of the Netherlands is more supportive of wind power in comparison to that of the UK. As mentioned in section 1.1, the UK PM has forwarded guidance to effectively ban onshore windfarms in England in order to protect natural landscape heritage. Fortunately, this is not set-in-stone. However, since the PM's Speech in December 2017 only 4 onshore wind turbines have been allowed and England has witnessed a 94% collapse in new Planning applications for wind energy (The Guardian, 2018). Thus, the national government inevitably plays a major role in the occurrence of community initiatives, i.e. granting planning permission and feed-in-tariffs. However, pushing for change with regards to how society views wind farms would result in a smoother transition and simplified process of strategic niche management.

Overall, the level of NIMBY cases were low, however for two of the English cases (Westmill Wind, Oxfordshire & HHP, Nottingham) it was problematic in the initial stages and stalled planning permission. Also, while some locals in all cases do care for the environment and reducing carbon emissions, some cannot afford to become members and purchase their electricity from cooperatives at higher rate than conventional energy companies. Furthermore, where locals are unsure of what benefits the wind farm will actually forward, it is logical for future initiators to carry out activities similar to HHP, who involved the community by conducting interesting mapping exercises inclusively with locals. Following this exercise, it was ensured that only those sites selected for implementation were at least 500 m or more away from an individual's home. This exercise was paramount for managing expectations of the locals, and should be implemented in future projects to make individuals feel increasingly secure with regards to wind farms. Kemp et al., (1998) theory on SNM would therefore be improved via implementing one of the main aspects, which includes the management of expectations. Finally, all cases should conduct pilots or surveys to note how locals feel in relation to the wind farm and for those who felt negatively about, to detect if their feelings have changed positively. None of the cases studied in this project have conducted such task and would be ideal to consider in future, noting if the revelation of community owned windfarms have gained public acceptance via successful SNM techniques and social learning.

#### *For further research*

It would be intriguing to continue research regarding how both the Netherlands and the UK are dealing with community owned wind farms and their approaches to these from an SNM outlook and to note how social learning has further evolved. Furthermore, the prospect of interviewing a greater number of specialists as well as representatives of different levels of government which would provide an increasingly concise picture of what various levels of government are seeking and precisely what the goals of the municipalities are and not just hearing these from an exclusive source, i.e. project initiator. It would be interesting to hear what is wanted from various sources in relation to community-led wind farms.

One could argue a potential weakness within this study would be the disproportional number of cases studies against each country (4 within the UK and 2 within the Netherlands). Potentially, increasingly truly representative results could be derived if there were an even number of cases studied per country. To overcome this, in future I would possibly commence contacting potential interviewees before winter break.

Also of interest would be the analysis of social values with wind farms and age. This is intriguing as I learned during data analysis within this project that within every case (to different extents), NIMBY experienced or those who were against the wind farm or neutral were from the older generation.

## 8.2 Reflection

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### *Theoretical*

#### Theory of SNM

SNM is used to analyse and manage the process of niche innovation to institutionalization in a regime. This theory was therefore useful for comprehending how a niche (community-owned wind farm) can be managed regarding various factors, such as legal political and social. Furthermore, it promoted research into various aspects which may not have been originally included, e.g. studying social networks, management of expectations and social learning within each case. This theory posed thoughts which were not conspicuous beforehand, leading to comprehension of why this should be

incorporated into the framework and why one should pay more attention to specific aspects. However difficulties were noted in following the framework to compare SNM from a multi-level perspective as a result of uneven information sources as some forms of information was attainable in greater evidence in a particular city or country. For example, finding information regarding the UK government was much more simplistic to that of the Dutch, also due to zero language barriers. However, overall, the use of the framework posited new insights into the differences within both countries and their management systems.

### *Methodological*

The use of case studies was a wise decision as it enabled for wider exploration of the topic and allowed various lines of questioning and research to arise. The topic was rather broad with many research questions and therefore it would be increasingly complex to answer the questions thoroughly with the use of a survey. The use of surveys were undesirable in this research as they necessitate firstly predefined questions and do not consider open answers and also require access to sources which are not attainable, for example, municipalities and actors from the National Government. While the choice of using case studies worked well, especially for comparative analysis, unforeseen difficulties arose in the process. Firstly, in relation to data collection, it became increasingly difficult to obtain interviews and as a result, the number of interviews conducted was much lower than expected, especially within the Netherlands. Many interviewees responded to my email to say they would be free for an interview, but not suggesting a time or date. The interviewees in the UK were much more helpful and willing to give up their free time. The lack of interviews in the Netherlands is potentially where this research failed. However, luckily the Dutch interview with University Professor at Radboud for Nijmegen Betuwe case was extremely insightful being one to one where much information was dispersed to me. Furthermore, fortunately for the Dutch case of Zuidenwind, there were endless documents online which luckily related to the theory of SNM and its 3 core aspects of social networking, management of expectations and social learning, which made the collection of detailed and valuable information much more simplistic. For all cases studied, the online open information for the case of Zuidenwind was by far the most detailed, insightful and useful. Inevitably, this information was only available in Dutch and to resume this issue Google Translate was required. With regards to online translation, these were extremely helpful but often did not deliver the same quality and standard of writing as a text originally written in English. Sometimes when Dutch text was translated to English, texts would be jumbled up and quite difficult to understand, or appear to be in the wrong context. More than likely I may have missed out on many links during the research process as perhaps it was not conspicuous and I believed it was not worth translating. This is more than likely to occur within the information provided for the case of Zuidenwind, as due to the abundance of information and weekly newsletters on events for years on end, I did not find the time to translate every individual link.

On the other hand, when reading documents in English for the UK cases, it was simplistic to skim and highlights or necessary information to use could be easily obtained. It became evident that the translation aspect was an extra element of work to consider due to the guaranteeing information was translated adequately in order for legit comparisons to follow. This is due to the fact that words can have various meanings in English, with terms and expressions being translated in a number of ways, and some words not having a direct translation which poses problems as I cannot make guesses, especially for a thesis project.

*Limitations of validity and generalizability of conclusions*

This project is not perfect, like every piece of academic research. Some aspects were to be simplified and I had no choice but to make assumptions due to particular constraints including time, budget and personal capacity. In this section I will explore these limitations and reliability of the research. For every case studied, the overarching drivers of change in community initiatives for renewable energy were explored within the Netherlands and the UK, and were to be compared from a Strategic Niche Management perspective. While interviewees communicated what the main drivers for change were, these may not be truly representative. For example, one case may stress the predominant driver for change is for improving sustainability in a region or city, yet realistically it may chiefly be for economic gain.

Furthermore, when interviewees were questioned about barriers faced and NIMBY levels in relation to local resistance, they provided sufficient information, but this also may not be truly representative. This is a flaw of my own, as I did not query or investigate the precise number of inhabitants living in close proximity to the project area. It is probable that NIMBY levels increase when the number of inhabitants living nearby the project area increases.

Additionally, the research is qualitative in nature, and potentially impacts the objectivity or fairness of the outcomes. However, the information that has been used was predominantly objective and could be confirmed by more than one source. Lastly, only six cases were studied, making it rather complex to obtain results that are generalizable.

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## **Appendices:**

### **A. Interview Questions for Developers/Initiators/Managers/Chair**

#### **Names:**

James Lithgow, Hamish Nicol, Andrew McMurray, Paul Phare, Simon Tilley, Mark Luntley, Eoin Lees.

1) My research defines community initiatives as the following:

RE community initiatives are projects “initiated and developed by actors from civil society, with overarching aims to educate individuals people regarding energy consumption and production, to provide, generate and disperse renewable energy. Those who live in close proximity of the renewable resource benefit from its consumption.”

To what extent do you believe this definition is accordant to your cooperative/project?

2) What encouraged the residents of your area to conduct energy transitions? Did they mention either of the following; environmental concerns, issues regarding climate change, hindrances of national government or large energy companies?

3) What are the predominant objectives and goals within the initiative?

- Can you tell me about your development over the past few years?
- Who was the project established by and when?
- Have you any future projects planned?

4) Did you experience any opposition or strong NIMBY cases from residents in close proximity or from large energy companies? Were there any factors that lead to particularly smooth planning processes?

5) What measures did you go to in order to promote the project and gain individuals interests? How did you apply social learning and management of expectations?

6) Do you believe social learning among members has been adequate? Have you noted any behavioural changes?

7) As the initiative grew, how did the networks change? Were additional networks involved in the decision-making process?

8) How do you manage expectations of all participants? Is it complex balancing their requests due to differentiating requirements and beliefs etc.?

9) Can you tell me how your experience was with the initiation of the project with the state? Furthermore, would you elicit state involvement necessary for success?

10) Are there any politicians involved in raising the profile of the project? What are their predominant reasons for support/lack of support?

11) What were the main developments since initiation of the project until present?

12) Can you explain any major challenges or obstacles faced from initiation? How were these dealt with?

13) What would you elicit as key to success?

## **B. Interview Questions for Ex-Chair/University Professor**

**Name:** Ben Dankbaar

- 1) Are you still affiliated with Nijmegen Betuwe at present?
- 2) Where did the idea for Nijmegen Betuwe stem from?
- 3) What role did you play within the cooperative? Were you involved in the implementation or development process – or both?
- 4) What drove the individuals to conduct the energy transition? Would you believe it was mainly environmentally based? Were there complaints regarding energy companies or the national government?
- 5) Were there many NIMBY cases present? If so, how were these handled?
- 6) Do you believe social learning among members has been adequate? Have you noted any behavioural changes?
- 7) Being an ex-university professor, do you feel you were able to teach/educate in some way? Were you able to transpire your knowledge? Can you provide any examples?
- 7) As the initiative grew, how did the networks change? Were additional networks involved in the decision-making process?
- 8) How do you manage expectations of all participants? Is it complex balancing their requests due to differentiating requirements and beliefs etc.?
- 9) Are there any politicians involved in raising the profile of the project? What are their predominant reasons for support/lack of support?
- 10) What were the main developments since initiation of the project until present?
- 11) Can you explain any major challenges or obstacles faced from initiation? How were these dealt with?
- 12) What would you elicit as key to success?

### **C. Interview Questions: Ex-Members/local residents/volunteers**

**Name:** Paul Cooke, Nan Pratt, Joan Mitchell.

- 1) How were you associated with the cooperative? Are you still associated, and if so, to the same level as before?
- 2) Why did you decide to withdraw from being a member of the cooperative?
- 3) How did you become a volunteer? What types of activities did you conduct in this process? Did you find this rewarding?
- 4) Were you able to learn from others in this process? Or encourage other individuals to join in on your efforts?
- 5) Did you expect anything from the cooperative when becoming a member? Were there any perks in particular?
- 6) Were you involved in any membership recruitment campaigns? (If there were any)  
- Did these or any activities similar improve networking, social learning and management of expectations within participants?
- 7) What measures did it take to involve more civilians and gain their interest?
- 8) Was there much support available from the local council/municipality?
- 9) What would you elicit as the predominant reasons for success behind the cooperative?
- 10) Does the future of the cooperative look prosperous?