Blowing us towards a brighter future?

Assessing organisational resilience within local renewable energy cooperatives

Master thesis for Sustainable Development (30 ECTS)
By Gitte Mulder (3934144)

MSc: Sustainable Development
Track: Earth System Governance
Faculty of Geosciences
Copernicus Institute of Sustainable Development
Utrecht University

Supervisor: Carel Dieperink
Second reader: James Patterson

Abstract

With populations increasing and economies growing, energy demand is also rapidly increasing through the 21st century. However, in 2016, renewable energy only represented 24% of the global power output. To move to a more sustainable or even carbon neutral society, a radical energy transition is necessary. This calls for a global transformation of energy systems as we know them. A relatively new development within the renewable energy sector that has been gaining attention are community renewable energy organisations. This can be defined as an organisation that is originally set up and managed by actors from civil society. Their main aim is to educate on renewable energy use, help with collective renewable energy or technology procurement or to provide renewable energy for consumption by other local actors. However Community operated initiatives face several organisational challenges, including problems regarding effective team leadership, organisational continuity and increasing membership. Even though there seems to be a wide array of scientific literature that contributes to organisational challenges in local renewable energy cooperatives, and to organisational resilience in more traditional organisations, there is little to no research to be found that explores overcoming these challenges and promoting organisational resilience in local renewable energy initiatives specifically.

The main research question that this research project has aimed to answer is: *What are the main factors that contribute to organisational resilience within local renewable energy organisations in the Netherlands?* With the main objective being to generate more knowledge on organisational resilience within local renewable energy organisations in the Netherlands, and to make recommendations on the potential contributing factors and barriers for organisational resilience and how to utilize those contributing factors and barriers. First a theoretical framework on factors contributing to organisational resilience was developed. Five groups of factors were identified, namely contextual factors, knowledge and resource capacity, buffering and safety net, organisational structure and organisational values. Next, the theory was applied to local renewable energy organisations and an analytical framework containing factors for resilience was developed. Then 53 local renewable energy organisations were contacted and in-depth interviews were conducted for 16 cooperatives using these factors. Then, the way organisational resilience is perceived per case or organisation was assessed, and afterwards the comparative analysis between the different organisations was conducted. Then, main barriers and drivers for organisational resilience per case or organisation were assessed. Next, it was explored how to overcome these barriers and use the drivers to increase organisational resilience. Lastly, conclusions and recommendations on barriers and drivers regarding organisational resilience for future developments of local renewable energy organisations were formulated.

The main conclusions to be drawn were first of all: in theory, there seems to be a strong focus on the importance of buffering and safety net, but in practice cooperatives do not really concern themselves with it as much. Furthermore, in practice, most cooperatives focus on contextual factors. Next, accessibility of resources is often mentioned as either a strong contributor or a large barrier, and last, clearly defining and dividing roles and responsibilities helps planning for future uncertainties. This research also provides a set of recommendations for cooperatives. Formulate a clear organisational objective to improve internal alignment and increase transparency, improve ties with the community and stakeholders to strengthen resources, cooperate with others in the industry to share knowledge and experience and effective internal and external resource management is key to prepare for the future. When all these factors are in place, cooperatives should focus on planning strategy, risk awareness and communication and stress-testing to cope with future uncertainties and vulnerabilities.

Acknowledgements

Writing this thesis has been very challenging, exciting, at times difficult, but above all incredibly inspiring. It is truly wonderful to see and meet such inspirational people who truly believe in a better and more sustainable world, and who, above all, are willing to put in the work to make it happen. I would therefore firstly like to thank all of the energy cooperatives who were so kind and thoughtful to help provide the data on which this thesis is based. Thanks to all who sent me some information, and to everyone who lend me some of their time to answer questions about their knowledge, experiences and expertise. My gratitude goes out to: Hilverzon, Powered by Hattem, Rijn en IJssel Energie, Heuvelrug Energie, Lochem Energie, Duurzaam Nijeveen, Duurzaam Riel en Goirle, Zonnecoöperatie West-Friesland, Westfriese Windmolen coöperatie, Deelstroom Delft, ECTB, Energyport Peelland, Zummere power, Zeeuwind, Energiepioniers, EMEC, Drechtse Stromen, Drechtse Energie and Enschede Energie.

Furthermore, I would like to thank my supervisor Carel Dieperink for his patience during my endless stream of questions, as well as for his great advice, which often offered me a new viewpoint that I hadn't explored yet. I would also like to thank my second reader James Patterson, especially for his thoughtful notes on my research proposal.

I also want to thank Rogier Dinkla, for his tireless patience in my most stressful moments, and for always being incredibly positive and reassuring. The same is true for my parents, Jose Zeldenthuis and Jan Willem Mulder, whose endless confidence in my abilities greatly inspires me. I would furthermore like to thank Nadine Eekhout, particularly for possessing more creativity in her little toe than I have in my whole body, and for lending me a bit of that creativity by devising the title for this thesis.

Last but not least, I want to thank anyone who takes the time to read this thesis, as I put a great amount of hard work and effort into it. It is an honour to me to be able to contribute towards the strengthening of local renewable energy cooperatives, however little it may be.

Happy reading!

List of figures and tables

Figures

Tables

Table of Contents

1. Introduction

1.1. Introduction into the sustainability issue

Energy use is an important factor in economic growth and the advancement of society. With populations increasing and economies growing, energy demand is also rapidly increasing through the 21st century (Sadorsky, 2009). Within the different types of energy use (power generation, industry use, transportation and residential use), power generation seems to be one of the fastest growing sectors, both in energy demand and in carbon dioxide emissions (Sadorsky, 2009). According to the 2014 report of the Intergovernmental Panel on Climate Change (IPCC), power generation accounted for 25% of the total anthropogenic greenhouse gas emissions (IPCC, 2014). The report also states that anthropogenic greenhouse gas emissions are: "*extremely likely to have been the dominant cause of the observed warming since the mid20th century."* (IPCC, 2014). The past few decades there has been growing concern over the rate at which we emit greenhouse gases, global warming and the state of the environment. These concerns seem to indicate that we have reached a point at which future (energy) demands need to be balanced with both economic and environmental needs (Sadorsky, 2009). However, in 2016, renewable energy only represented 24% of the global power output (IEA, 2017). According to the IPCC, the share of renewable energy should rise to 80% bij 2050 and 90% bij 2100 to limit global warming to 2 degrees Celsius above pre-industrial levels (IPCC, 2014).

It has been increasingly noted, and rightly so, that to move to a more sustainable or even carbon neutral society, a radical energy transition is necessary. This in turn calls for a global transformation of energy systems as we know them (Kooij et al., 2018). Some scientists have noted that grassroots initiatives or bottom-up activities have the ability to rise beyond current institutional pathways, and have interesting transformational capacities (Kooij et al., 2018). In the Netherlands, the development of energy infrastructure has always been more or less centralized. However, a relatively new development within the renewable energy sector that has been gaining attention are community renewable energy organisations (Bauwens et al., 2015). An increasing number of people advocate for a more decentralized development of energy, which focuses on small-scale generation of energy located close to its users (Bauwens et al., 2015). Several advantages that have been mentioned include fewer costs for transmission and distribution, reduced grid losses and more efficient data management systems (Bauwens et al., 2015). Other beneficial factors that have been noted are a conscious focus on energy related issues, high levels of social acceptance and support from motivated individuals (Hasanov and Zuidema, 2018). In these community renewable energy organisations, energy users would take on a more active role within the process, becoming co-providers of energy services themselves (Bauwens et al., 2015).

In 2014, there were estimated to be thousands of energy cooperatives and other local non-profit initiatives in Europe, all committed to encourage the production and consumption of renewable energy (Oteman et al., 2014). These organisations tend to have similar characteristics in the sense that they all rely on the engagement of people with limited power and resources (Oteman et al., 2014). In contrast with conventional capitalist organisations, community cooperatives are owned by their users rather than their investors. Moreover, earnings are generally divided proportionally between members, according to their respective volume of

transactions instead of according to their shareholding (Bauwens et al., 2015). Their governance structure is in most cases largely democratic, with equal voting rights for each members and little to no barriers of entry for new members (Bauwens et al., 2015).

For clarity's sake, it is important to properly explore and define the concept of community renewable energy organisations. There are several different descriptions that are used, including but not limited to community renewable energy organisations, local renewable energy cooperatives, citizen energy and renewable energy communities. Boon and Dieperink (2014), use the concept of LREO, or local renewable energy organisation. This is defined as an organisation that is originally set up and managed by actors from civil society. Their main aim is to educate on renewable energy use, help with collective renewable energy or technology procurement or to provide renewable energy for consumption by other local actors (Boon and Dieperink, 2014). From this, five different types of services can be derived: collective procurement of energy, collective procurement of technology, education and facilitation, delivery of energy and collective generation (Boon and Dieperink, 2014). It is furthermore important to consider that these cooperation function as a company as well as a union or association. This means that there is a board of directors that has to answer to its members on one hand, but also that there is a large business component on the other hand. These boards often tend to be unpaid positions, and are often subjected to regular change of board members (Hier opgewekt, 2019).

Taylor (2015) links cooperative enterprises to stakeholder engagement amongst other things, using organisational principles of governance systems. He identifies factors such as: voluntary and open membership; democratic membership control; member economic participation; autonomy and independence; education, training and information; cooperation among cooperatives; and concern for community. He uses this to develop a so-called *Co-operative Institutional Model,* which can be seen below (figure 1).

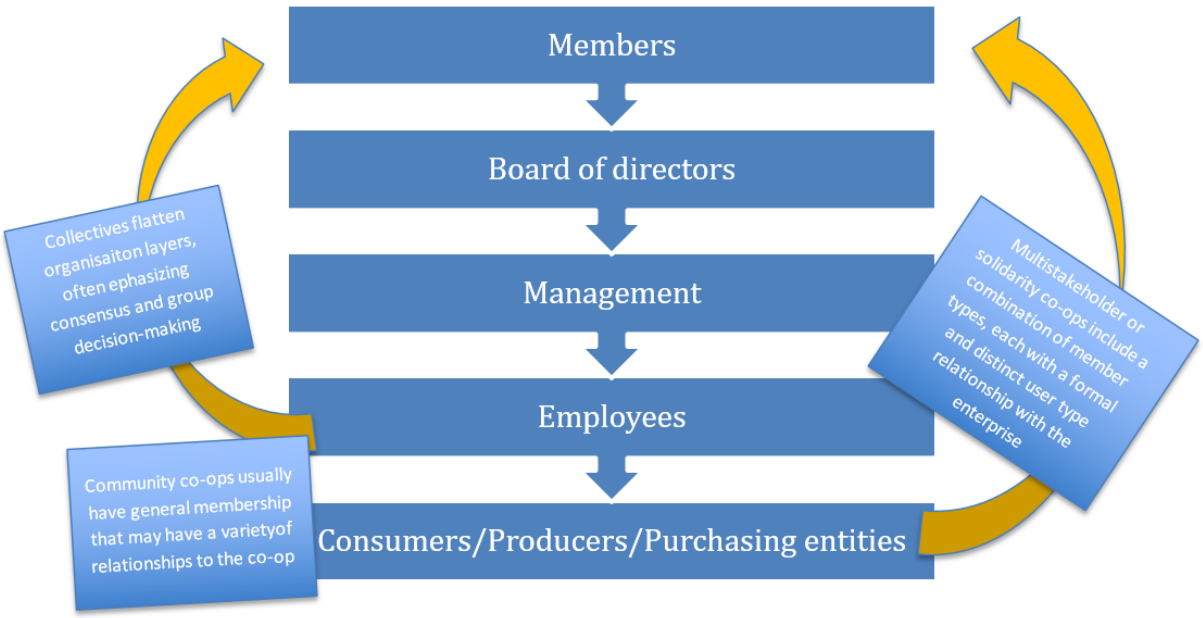

Figure 1: Co-operative Institutional Model by Keith Taylor (2015).

1.2. Problem definition and knowledge gap

The transition to a more sustainable energy sector in general has been especially slow in the Netherlands. The renewable energy share in the Netherlands was just 7.4% of total energy production in 2018 (CBS, 2019). Furthermore, the transition towards a decentralized system of energy production, and with it the emergence of community energy organisations has also been especially slow in the Netherlands (Van der Schoor and Scholtens, 2014; Kooij et al., 2018). The Netherlands counted 392 energy cooperatives in 2017, which only accounted for the energy needs of 85.000 households (HIER opgewekt, 2017). Community operated initiatives face several organisational challenges, including problems regarding effective team leadership, organisational continuity and increasing membership (Van der Schoor and Scholtens, 2014). These challenges result in community operated initiatives often being vulnerable.

To further these community operated initiatives, it is therefore vital that these organisational challenges and their contributing factors are explored and that potential interventions will be investigated. Organisational vulnerability, or vulnerability in general, is often associated with the concepts of robustness or resilience. Robustness and resilience often indicate, simply put, the potential to overcome adversity and/or adapt to changes (Nkwunonwo & Mafimisebi, 2015). Brummer (2018) states that more research is necessary to understand how community operated initiatives shape their own governance framework in response to their environment, as well as how the organisational form of these initiatives needs to adapt to the changing context. Even though there seems to be a wide array of scientific literature that contributes to organisational challenges in local renewable energy cooperatives, and to organisational resilience in more traditional organisations, there is little to no research to be found that explores overcoming these challenges and promoting organisational resilience in local renewable energy initiatives specifically. The main aim of this research project is therefore to make recommendations to local renewable energy organisations on how to increase organisational resilience by making an analysis of the drivers and barriers that contribute to organisational resilience in local renewable energy organisations.

1.3. Research Framework

The research objective is to generate more knowledge on organisational resilience within local renewable energy organisations in the Netherlands, and to make recommendations on the potential drivers and barriers for organisational resilience and how to utilize those drivers and barriers. The main research question is: *What are the main factors that contribute to organisational resilience within local renewable energy organisations in the Netherlands?*

The research was conducted according to the following steps. First a theoretical framework on factors contributing to organisational resilience was developed. Next, the theory was applied to local renewable energy organisations and an analytical framework containing factors for resilience was developed. Then 53 local renewable energy organisations were contacted and in-depth interviews were conducted for 16 cooperatives using these factors. Then, the way organisational resilience is perceived per case or organisation was assessed, and afterwards the comparative analysis between the different organisations was conducted. Then,

main barriers and drivers for organisational resilience per case or organisation were assessed. Next, it was explored how to overcome these barriers and use the drivers to increase organisational resilience. Lastly, conclusions and recommendations on barriers and drivers regarding organisational resilience for future developments of local renewable energy organisations were formulated. The figure (figure 2) below visually presents the steps that were described above.

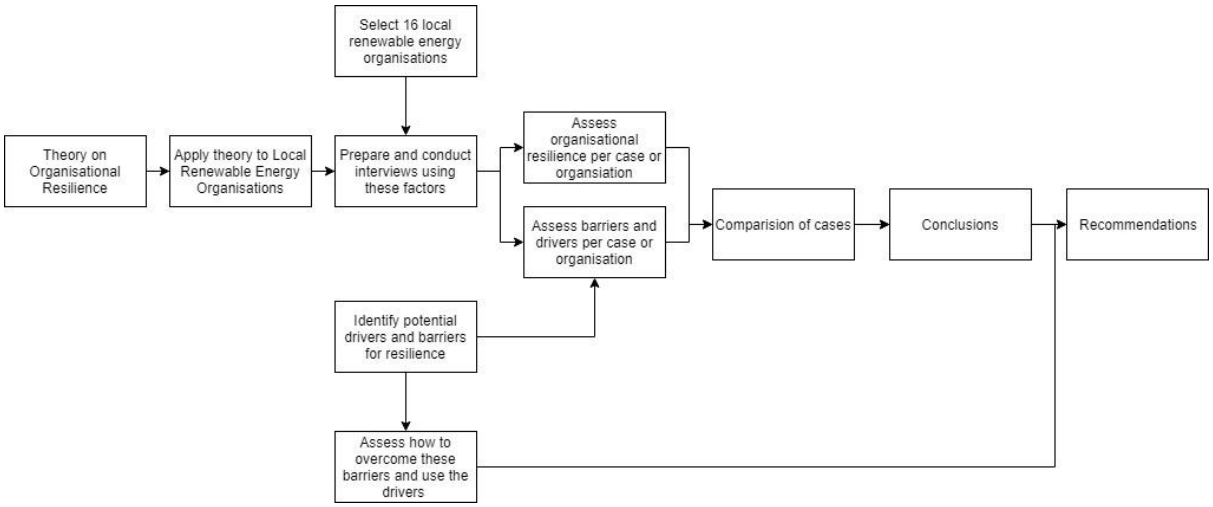

Figure 2: Research Framework

To aid in successfully conducting the research according to those steps, the main research question is split up in four different sub-questions, which will subsequently result in an answer to the main research question. These sub-questions are:

- What are the factors that according to literature contribute to organisational resilience within local renewable energy organisations?
- What contributing factors and barriers for organisational resilience by local renewable energy organisations in the Netherlands can be found in practice?
- How can these factors be influenced to increase organisational resilience within local renewable energy organisations in the Netherlands?

1.1. Outline of research

The first question will be explored by conducting a literature review, and will help arrive at a conceptual and analytical model that will be used as a basis for the empirical part of the research project (e.g. question 2, 3 and 4). This will ensure that the empirical part of the thesis has a solid theoretical basis, and is sufficiently embedded into scientific literature. The second chapter will discuss current literature regarding LREO's and organisational resilience, which provide a theoretical basis for the empirical part of this research. In the third chapter, the research strategy for the empirical part of the thesis will be discussed. The fourth chapter will discuss the results that have derived from the empirical part of the research. The fifth chapter will provide a comparative analysis between the different cooperatives. Chapter six will discuss and reflect upon the results, and the seventh chapter will provide concluding remarks, answers to the main research questions and finally recommendations.

2. Towards an analytical framework

2.1. Introduction

In this chapter, the theory and subsequent concepts that will be used during the research project will be set forth. The aim of this chapter is to provide a theoretical basis regarding local renewable energy organisations, and identify the factors that contribute to organisational resilience within these local renewable energy organisations. Mainly scientific literature was used as a source, which was found using Scopus and Google Scholar. The theoretical framework as presented in this chapter will aid in the development of these factors and their possible indicators. These will subsequently be applied to the case of local renewable energy organisations. This will provide insight on what different factors contribute to resilience and how they are organized. This chapter will provide a base on which the analytical framework has been formulated, and will provide insight on what types of drivers and barriers there are to expect. To find relevant literature, data was gathered via search methods, a literature survey and content analysis (Verschuren and Doorewaard, 2010). A search was conducted with the help of search indices such as Google Scholar and Scopus for literature, and google or google scholar for documents. To help guide the search, various keywords and search techniques were used. The main body of literature that was studied for this thesis is regarding organisational resilience. It should however be noted, that apart from the general theory on local renewable energy organisations, the rest of theory regarding resilience is based upon more commonly found organisational structures, instead of cooperatives specifically. This is due to the fact that there is little to no prior research on organisational resilience within cooperatives, or within local renewable energy cooperatives in general. However, the articles that were found regarding organisational resilience in "regular" organisational structures are very much applicable to the local renewable energy cooperatives, as the organisational problems and structures that were mentioned in these articles are largely similar. This means that the concepts that contribute to organisational resilience are expected to be similar. To account for the non-profit focussed character of the local renewable energy cooperatives, literature regarding resilience in non-profit organisations was used as well. First LREO's will be shortly discussed to provide some insights into renewable energy cooperatives and its organisational structure in general. Next, organisational continuity and change and their relation to organisational resilience will be shortly explored. Lastly, different relevant articles contributing to organisational resilience will be reviewed to provide a solid theoretical basis for the rest of the thesis.

2.2. Organisational continuity and change

As mentioned in the previous section, local renewable energy cooperatives often face several organisational challenges. These challenges include but are not limited to organisational development, cooperation, acquiring and utilization of knowledge, membership recruitment, complying with laws and regulations, connection to the electricity infrastructure and financing (Hier opgewekt, 2019). New LREO's are likewise often subject to rapid and radical change (Hufen & Koppejan, 2015). And even though for an LREO to be successful it is considered important to properly manage this change (Hufen & Koppejan, 2015), it is also important for these

organisations to maintain a certain sense of continuity. organisational continuity and change, however contradictory, are often seen as two sides of the same coin that should be managed together (Nasim and Sushil, 2011). As the concepts of organisational change and organisational continuity are heavily subject to interpretation, the next few paragraphs will aim to demarcate these concepts with the use of scientific literature.

Fry and Srivastva (1992) define continuity as "the connectedness over time among organisational efforts and a sense or experience of ongoingness that links the past to the present and the present to future hopes and ideals" (p. 2). Forces that contribute to organisational continuity can for instance include core ideology, core competence and organisational culture. Some scientist indicate that organisational continuity may eventually lead to or contribute to organisational inertia (Nasim and Sushil, 2011). It is however also noted that not all continuity forces necessarily contribute to inertia, and that some of these forces, such as core ideology and core competence, can even be considered desirable or even necessary to trigger and foster change (Nasim and Sushil, 2011). One can consider organisational continuity to be of importance for LREO's because their core ideology (e.g. providing sustainable energy) should largely remain unchanged. However, that does not necessarily mean that the LREO's in question are not and should not be subjected to any organisational change at all. Weick and Quinn (1999) define organisational change as: "change in how an organisation functions, who its members and leaders are, what form it takes or how it allocates its resources", which can be considered fitting for LREO's, as these factors are in fact quite often changing within their organisational structure. Change can be either externally or internally generated, meaning that change can either come from pressure from the environment, or that it could be management's conscious decision to implement change within the organisation (Tsoukas and Chia, 2002). When thinking about organisational change, and management's decisions to implement change, Lewin's (1951) organisational model of organisational change springs to mind, regarding his forces of change and forces resistant to change, as well as the unfreeze-change-refreeze strategy to implement change. However, in newer articles about change theory, these notions are often criticized. Tsoukas and Chia (2002) for instance, argue that organisational change is more an open-ended state of micro-processes, and Nasim and Sushil (2011) find that Lewin's theory of planned change is too "linear" and "one-dimensional", and argue a more emergent or dynamic approach to organisational change. As mentioned previously, they even go on to state that organisational continuity and change should be managed together, creating an interesting paradox. This is an interesting notion to consider when going forward to robustness and resilience.

2.3. Literature review on organisational Resilience

After discussing organisational continuity and organisational change, it has become apparent that neither is fully appropriate or thorough enough to assess the organisational challenges that the LREO's face. This is when the concept of organisational resilience comes in. Resilience is a concept that is initially often used when discussing risk or disaster management. Resilience is however increasingly used when addressing organisational challenges, and does often come forward when looking for literature on organisational continuity and/or change.

Organisational resilience stems from the social-ecological systems approach (Boyd and Osbahr, 2010). It is believed that both learning and adapting are key factors within resilience, and that strategic placement of people with appropriate knowledge helps foster continuity within organisations. Nkwunonwo and Mafimisebi (2015) furthermore investigate organisational robustness and resilience in an environmental risk context. They report that multiple studies have confirmed that environmental risk management practices are linked with benefits for firms. Others define resilience as a sociotechnical occurrence that explains how organisations manage uncertainty (Lee, Vargo and Seville, 2013). These many different interpretations and applications of organizational resilience can result in some ambiguity regarding how and when to use the concept (Gibson and Tarrant, 2010). While initially most organizational resilience theories focused on sudden shocks and disruptions, the focus is slowly shifting towards ongoing processes. According to Vogus and Sutcliffe (2007), organisational resilience can be defined as "maintenance of positive adjustment under challenging conditions such that the organisation emerges from those conditions strengthened and more resourceful". These challenging conditions are not necessarily composed of only direct shocks or crises, but can also be more slow growing ongoing risks, such as for instance competition or slow changes in the environment. Andersson et al. (2019) explain how balancing organisational structures can help promote organisational resilience. They categorise organisational resilience as a holistic and complex concept, and like other authors, underline the notion that organisational resilience theory should not only focus on sudden shocks, but also on daily processes.

Multiple studies have confirmed that developing an organisational resilience and robustness model is thought to help better understand resilience and robustness and their practical applications within organisations (Nkwunonwo and Mafimisebi, 2015). Gibson and Tarrant (2010) actually discuss a few existing models for organizational resilience in their article. Five models are discussed; the integrated functions model, the attributional resilience model, the composite resilience model, the herringbone model of resilience and lastly the resilience triangle model. The integrated functions model is based upon early business continuity management models and largely derives from process and management system thinking. It focuses on security management, business continuity management, emergency management and crisis management to foster resilience. The attributional resilience model is a more recent approach. It tries to explain key values for resilience by looking at highly resilient organisations. For the attributional resilience model, the key values that have been discerned are organisational values (which establish commitment, trust, strong internal alignment and common purpose) and leadership (which establishes a clear strategic vision while empowering others to implement said vision). These values should create an organisational culture which fosters change sensitivity and enable cooperation within different parts of the organization (Gibson and Tarrant, 2010). The composite model of resilience aims to fill a perceived downside of the attributional model, which is that is fails to set out the more concrete factors that contribute to resilience, such as processes, infrastructure, technology, resources, information and knowledge. It also pinpoints the importance of strategy and policy, and states that resilience can be improved by using emergent leadership. The herringbone model of resilience aims to combine the previous models into one comprehensive practical model. It splits the previously discussed concepts into activities & capabilities (e.g. what the organisation does) and characteristics (e.g. how the organisation

works), and describes how they both help improve organisational resilience. The authors (Gibson and Tarrant, 2010) also identified the most important factors, being acuity (the ability to recognise precedence), ambiguity tolerance (the ability to continue making decisions and taking action at times of high uncertainty), creativity and agility (operating in novel ways to work around problems), stress coping (continue to operate under increasing demands and uncertainty) and lastly learnability (the ability of the organisation to use the lessons of their own and others' experiences). The last model they propose is the resilience triangle model. It aims to incorporate the complex interdependence of all the previously discussed models, and tries to display it in a simple model. It is based on the idea that all three types of capabilities are equally important to resilience: process capabilities; resources and infrastructure capabilities; and leadership, people and knowledge capabilities. It also places a more distinct focus on the importance of context (Gibson and Tarrant, 2010).

More recent research regarding the factors contributing to resilience is to divide them into three sections: situation awareness, management of keystone vulnerabilities and adaptive capacity (Lee, Vargo and Seville, 2013). Situation awareness is a concept that according to the authors originates from the military, and can be defined as: "...being aware of what is happening around you and understanding what that information means to you now and in the future." It is mostly used in operational context, and can help in decision-making and evaluation of critical situations. Management of keystone vulnerabilities highlights the importance of organisational norms and values, and is based upon the evaluation of organisational vulnerabilities that have previously resulted in losses or failure. It is defined as "...components in the organisational system, which by their loss or impairment have the potential to cause exceptional effects throughout the system" (Lee, Vargo and Seville, 2013). Managing keystone vulnerabilities is also often discussed within business continuity management, and can aid organisations in assessing potential points of failure, essentially increasing robustness and resilience. The last section is adaptive capacity. Adaptive capacity is one of the key points when looking at organisational resilience. Adaptation is being increasingly covered by scientists as one of the leading concepts when addressing the balance between stability and change. Furthermore, this specific article also discusses the relation between adaptive capacity and competitiveness. They go on to explain that adaptive behaviour is not necessarily a direct consequence of physical facilities. structures or technological systems, but that it is more dependent on organisational culture and capabilities of the staff. It is concludingly defined as: "An organisation's adaptive capacity is their ability to continuously design and develop solutions to match or exceed the needs of their environment as changes in that environment emerge." (Lee, Vargo and Seville, 2013).

Another very recent trend across the literature is a focus on the concept of anticipating, especially regarding strategic capabilities such as flexibility and agility, and anticipation within the daily organisational processes (Andersson et al., 2019). The ability to be flexible and to anticipate is often also considered within its context. Andersson et al. (2019) therefore also site a few contextual factors, and aim to explain how exactly organisational structures can contribute to resilience by focusing on anticipating. Using previous literature, five major perspectives on organisational resilience are identified: organisational responses to external threats, organisational reliability, employee strengths, the adaptability of business models and resilient supply chains. Their article shortly discusses the five streams, and concludes that common feature

between all five perspectives is that there is a focus on competencies, processes, learning and culture. Again the importance of proactivity and anticipation is mentioned, and how the the daily management or organisation can promote resilience help organisations manage complexities, surprises and uncertainties, as well as being able to adapt to unexpected events.

The authors then propose a new analytical model, derived from the five streams or perspectives that were identified, and revolves around four main concepts: risk awareness, preference for cooperation, agility and improvisation. This analytical model partially builds on previous research by Sutcliffe, and places the previously mentioned concepts of preoccupation with failure, reluctance to simplify, sensitivity of operations and commitment to resilience under risk awareness, and puts deference to expertise under preference for cooperation (Andersson et al., 2019).

2.4. Conceptual model

For the purpose of this research, all these factors that were found to contribute to resilience, divided into five categories: contextual factors, knowledge and resource capacity, buffering and safety net, organizational structure and organizational values. Each factors contributing to organisational resilience were grouped under one of these categories.

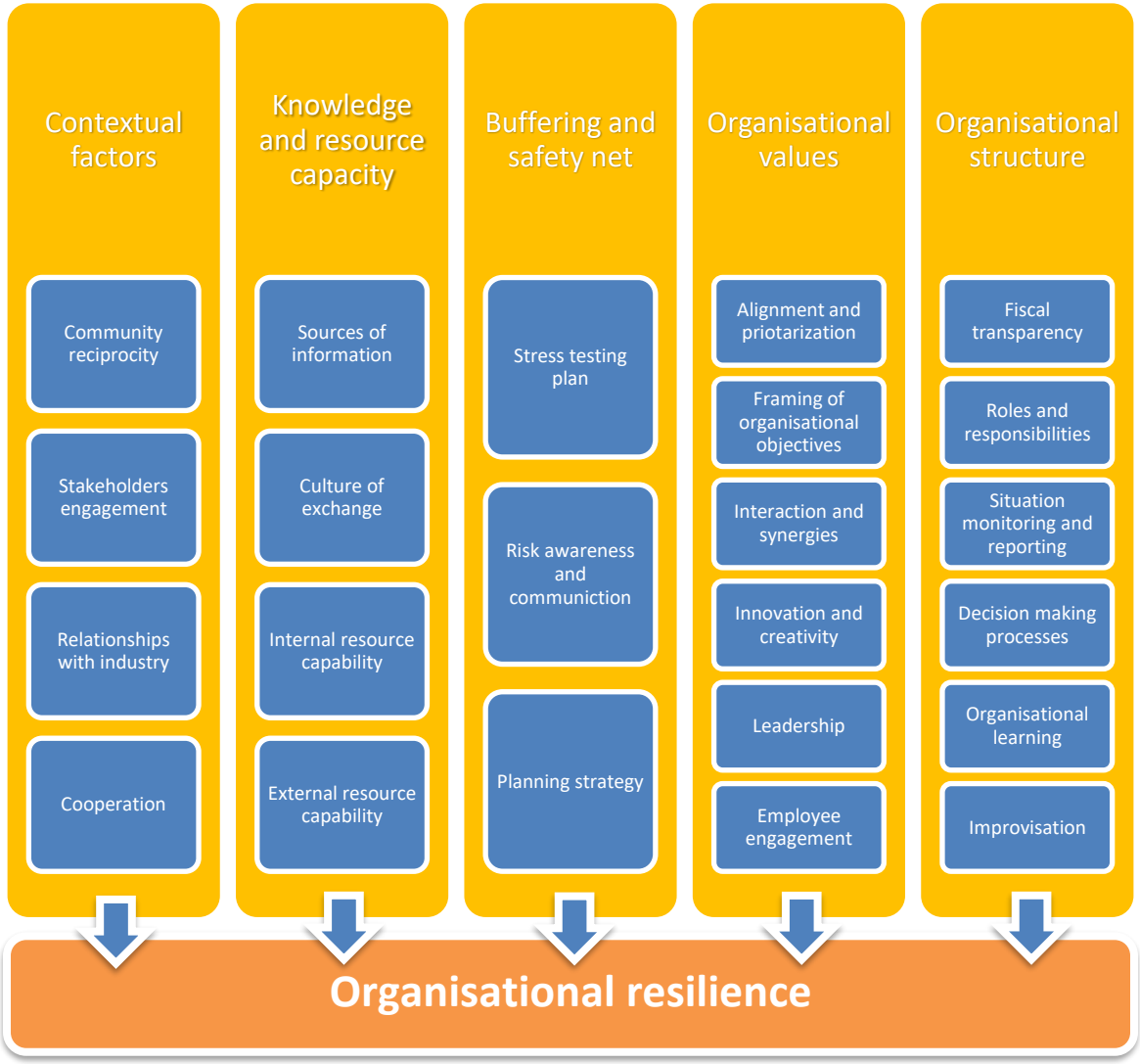

Figure 3: Conceptual model showing the different factors that contribute to organisational resilience.

2.5. Analytical framework

The analytical framework below was derived from the literature that has been assessed in the theoretical part of this thesis. Table 1 shows the factors that were included, the description according to the literature, the sources they were derived from, as well as how the factors were grouped.

Grouping	**Factor**	**Description**	**Source**
Contextual factors	Community reciprocity	The relationship with the community is reciprocal, collaborative and symbiotic.	Witmer and Mellinger (2016)
	Stakeholders' engagement	There is a high level of stakeholders' engagement.	Nkwunonwo and Mafimisebi (2015)
	Relationships with industry	The organisation is an active participant in industry and sector groups.	Lee, Vargo and Seville (2013)
	Cooperation	Frequent and helpful cooperation with other organisations.	Andersson et al. (2019)
Knowledge and resource capacity	Sources of information	Information is stored in a number of locations and formats and is easily accessible.	Boyd and Osbahr (2010); Lee, Vargo and Seville (2013)
	Culture of exchange	Sharing knowledge within the organisation is facilitated and encouraged.	Boyd and Osbahr; Lee, Vargo and Seville (2013); Andersson et al. (2019)
	Internal resource capability	Efficient and effective development of the organisation's resources when they are needed.	Lee, Vargo and Seville (2013); Gibson and Tarrant (2010); Boyd and Osbahr (2010); Vogus and Sucliffe (2007)
	External resource capability	There is an understanding of the relationships and resources that the organisation might need to access from outside sources.	Lee, Vargo and Seville (2013); Gibson and Tarrant (2010); Boyd and Osbahr (2010); Vogus and Sutcliffe
Buffering/safety net	Stress testing plan	Processes are in place that enables the organisation to continue operating under increasing demands and uncertainty.	Nkwunonwo and Mafimisebi (2015); Gibson and Tarrant (2010)
	Risk awareness and communication	Understanding and analysis of potential risks and their consequences.	Nkwunonwo and Mafimisebi (2015); Lee, Vargo and Seville (2013); Vogus and Sutcliffe (2007); Andersson et al. (2019)
	Planning strategy	There is development and evaluation of plans and strategies to manage vulnerabilities in relation to the business environment and its stakeholders.	Nkwunonwo and Mafimisebi (2015); Lee, Vargo and Seville (2013); Vogus and Sutcliffe (2007)
Organisational values	Alignment and prioritization (shared values?)	Strong internal alignment is established, creating a common purpose.	Nkwunonwo and Mafimisebi (2015); Gibson and Tarrant (2010); Witmer and Mellinger (2016); Vogus and Sutcliffe (2007); Andersson et al. (2019)
	Framing of organisational objectives	The organisational objectives are clearly and unambiguously framed.	Boyd and Osbahr (2010)
	Interaction and synergies	There is a strong interdependence, enabling different parts of the organisation to	Nkwunonwo and Mafimisebi (2015); Lee, Vargo and Seville (2013); Gibson

		cooperate effectively.	and Tarrant (2010)
	Innovation and creativity	Employees are encouraged to utilize innovative and creative approaches and to operate in new ways to work around problems.	Nkwunonwo and Mafimisebi (2015); Lee, Vargo and Seville (2013); Gibson and Tarrant (2010)
	Leadership	Leadership is mission focused and collaborative, and provides good management and decision making in times of crises.	Nkwunonwo and Mafimisebi (2015); Lee, Vargo and Seville (2013); Witmer and Mellinger (2016)
	Employee engagement	Engagement of employees in a manner that encourages understanding and involvement within the organisation.	Nkwunonwo and Mafimisebi (2015); Lee, Vargo and Seville (2013)
Organisational structure	Fiscal transparency	Open written and verbal communication about business decisions and regular meetings that communicate the fiscal status of the organisational operations	Witmer and Mellinger (2016)
	Roles and responsibilities	Roles and responsibilities are clear and well-defined.	Nkwunonwo and Mafimisebi (2015); Lee, Vargo and Seville (2013)
	Situation monitoring and reporting	Processes of ongoing monitoring and reporting are present within the organisation.	Lee, Vargo and Seville (2013); Vogus and Sutcliffe (2007)
	Decision making processes	Decision making processes are transparent and well-structured.	Lee, Vargo and Seville (2013); Gibson and Tarrant (2010)
	Organisational learning	There is an ability to learn from previous challenges and adapt to future challenges.	Boyd and Osbahr (2010); Gibson and Tarrant (2010); Vogus and Sutcliffe (2007)
	Improvisation	The organisation is able to adjust to change on an ongoing basis, and employees are encouraged to improvise when necessary.	Witmer and Mellinger (2016); Andersson et al. (2019)

Table 1: The analytical framework as derived from the theoretical part of the thesis.

2.6. Conclusion

This chapter has provided the theoretical base on which the rest of the research project will be based. The individual factors that contribute to organisational resilience according to the scientific literature has been grouped together in a conceptual and analytical framework and will be used to generate interview questions for the empirical part of this research. The effectively answers the first research question: *What are the factors that according to literature contribute to organisational resilience within local renewable energy organisations?* It furthermore provides a starting point for the next part of this thesis.

3. Research strategy

3.1. Introduction

This chapter will provide the strategy for the empirical part of this research. Firstly the research strategy will be discussed, aiding in taking concrete and structured steps within the research. Within this part, case selection criteria will also be discussed, ensuring an objective as possible approach to selecting cases. Next, research materials will be discussed, to map out which kind of sources will be used and why. Then, operationalisation of variables and the analytical framework will be touched upon, ensuring that there is a range of solid factors to base the interview questions upon, as well as ensuring uniformity and as much objectivity as possible. Lastly the process of data collection and processing will be explained.

3.2. Case study design

The strategy used in this research was a comparative case study, in which 16 local renewable energy organisations were examined. These organisations were carefully selected based on previously decided criteria which will be explained shortly. The choice for a comparative case study was made because the research questions at hand require in-depth knowledge about relations between variables (Verschuren and Doorewaard, 2010). A qualitative approach was taken by conducting a literature review on organisational resilience and its drivers and barriers, together with semi-structured interviews, resulting in mostly verbal and contemplative findings. The triangulation of methods and triangulation of sources are important to gain holistic picture (Verschuren and Doorewaard, 2010). Triangulation of methods was achieved by conducting both interviews and a literature review, while triangulation of sources has been achieved by retrieving internal organisational sources as well as external reports if available. When conducting the case study, a hierarchic method was used, in which cases were examined separately and independently from each other, as if they are single case studies. After this the cases were subjected to a comparative analysis, and similarities and differences have been examined. A comparative case study has as an advantage that it is relatively flexible compared to other research strategies (Verschuren and Doorewaard, 2010). This was beneficial for the research at hand, because the scope and contents of the factors that contribute to resilience may have been different than initially expected. A case study strategy with interviews provided the opportunity to adapt and expand the theory where necessary. It also provided room to identify possible drivers and barriers and their application in depth.

As has been mentioned in the previous section, 16 organisations have been selected to be studied in this research. This specific amount has been chosen because a reasonable amount of cases is needed to provide in depth knowledge regarding organisational resilience. Furthermore, this amount will ensure that there are proper grounds to conduct a viable comparison, by being able to select at least one organisation per Dutch province, with two in the provinces that have a relatively large amount of renewable energy cooperatives, as can be seen in the previous chapter. The selection criteria on which the organisations have been chosen are presented in table 2 and are based on the report from HIER opgewekt (2017).

Type of criteria	**Content of criteria**
Type of service	Must provide one or more of the following services: -Collective procurement of energy -Collective procurement of technology -Education and facilitation -Delivery of energy -Collective generation
Type of renewable energy	Wind and/or solar energy
Geographical	Situated in the Netherlands

Table 2. Case selection criteria based on the report from HIER opgewekt (2017).

The *collective procurement of energy* is the collective purchasing of energy from an energy supplier. The members of the cooperatives are customers of an energy supplier and benefit from favourable prices. *Collective procurement of technology* means that the cooperative aids in the collective purchasing of necessary technologies, such as solar panels for instance. *Education and facilitation* includes raising awareness and information provision, as well advice, guidance and support to residents about the possibilities for sustainability. *Delivery of energy* means that cooperatives join forces and operate itself as an energy supplier on the market. *Collective generation* means that cooperatives with their own production facilities sell their power and guarantees of origin to an energy supplier. In Appendix A a list can be found with selected potential organisations based upon the data from HIER opgewekt and Greenchoice (2019). In the next stage of this project, the list has been cross-examined with the case selection criteria, resulting in a list of organisations that were contacted for interviews. To account for non-replies or scheduling issues regarding interviews, around 53 organisations have been contacted, of which 16 were eventually scheduled and carried out. The figure below shows the geographical dispersion of the cooperatives within the Netherlands, as well as the geographical dispersions of the cooperatives that were actually interviewed.

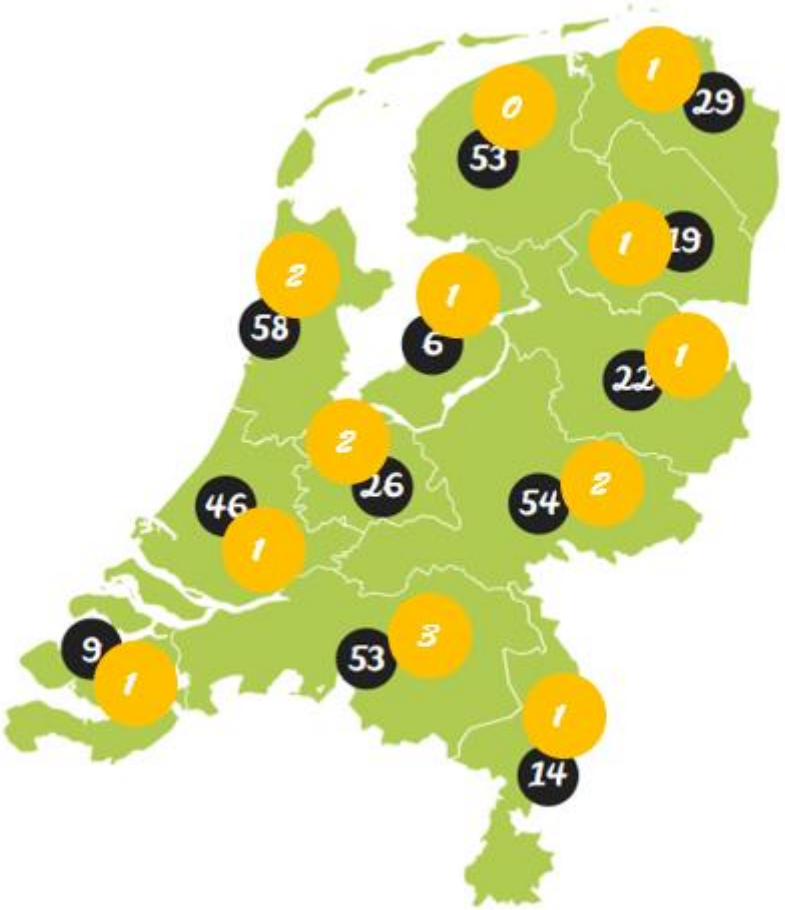

Figure 4: Geographical dispersion of Dutch cooperatives per province according to HIER opgewekt (black) and geographical dispersion of interviewed cooperatives (orange) (2019).

3.3. Research materials

What contributing factors and barriers for organisational resilience by local renewable energy organisations in the Netherlands can be found in practice?

For this question, mainly documents and individual people have been used as a source. The different factors that contribute to organisational resilience have been deducted through the literature study in the theory chapter, and have in some cases been expanded via internal reports by the organisations, websites by the organisations and external reports on the organisations. This was done through content analysis. Secondly individual people have been used as a source, namely board members of the organisation, to provide insight on how organisation resilience is experienced or given shape within local renewable energy organisations. This was done through face-to-face interviews. The contributing factors and barriers that were identified in the the theoretical chapter have been used to compile interview questions. Then individual people have been used as a source to provide insight on what actors perceive to be the main drivers and barriers for organisational resilience. This was done through face-to-face interviews.

How can these factors be influenced to increase organisational resilience within local renewable energy organisations in the Netherlands?

For the last sub-question, mainly individual people but also literature was used as a source. Participants have been asked to provide insight on how they perceive that the previously examined drivers and barriers for organisational resilience can be used to promote local renewable energy organisations. This has been done through face-to-face interviews.

3.4. Operationalization of variables

The variables that were identified in the theoretical part of this research have been qualitatively stipulated in the analytical framework, and were further operationalised using interview questions, as can be seen in table 3 below. There are two sets of questions, one in English and one in Dutch. Seeing as the interviewees are all Dutch-speaking people, the choice was made tot translate the English questions that stemmed from the analytical framework into Dutch. This resulted in the interviewees being hopefully more comfortable answering questions, and would allow them to provide more in-depth answers. This means that the transcripts are also in Dutch. To arrive at actual data that can be used for the purposes of this research project, the transcripts and the variables it contained were translated informally, but only after the coding in NVivo took place.

Grouping	**Factor**	**Interview question**
Contextual factors	Community reciprocity	How is the relationship with the community? Is it reciprocal? Is there often contact?
	Stakeholders' engagement	Is there stakeholder engagement? How much? In what ways?
	Relationships with industry	Is the organisation an active participant in industry and sector groups? In which way?
	Cooperation	Is there cooperation with other cooperatives? If so, how?
Knowledge and resource capacity	Sources of information	How is information stored and used? Is it easily accessible?
	Culture of exchange	How is sharing knowledge within the organisation facilitated? Is it encouraged?
	Internal resource capability	How are the organisation's internal resources managed and developed?
	External resource capability	How is the relationship with external resources?
Buffering/safety net	Stress testing plan	What processes are in place to enable the organisation to continue operating under increasing demands and uncertainty?
	Risk awareness and communication	What processes are in place for understanding and analysis of potential risks and their consequences?
	Planning strategy	How is development and evaluation of plans and strategies to manage vulnerabilities in relation to the business environment and its stakeholders organised?

Organisational values	Alignment and prioritization	Is there a strong internal alignment within the organisation? Is there a common purpose? What would you say is your common purpose?
	Framing of organisational objectives	How are the organisational objectives framed?
	Interaction and synergies	How is cooperation and interaction organised within the cooperative?
	Innovation and creativity	What is the view of the cooperative towards innovative and creative approaches and new ways to operate and work around problems?
	Leadership	What would you say the leadership is like? Is the leadership mission focused and collaborative, does it provide good management and decision making in times of crises?
	Employee engagement	How is employee engagement organised? Is there engagement of employees in a manner that encourages understanding and involvement within the organisation?
Organisational structure	Fiscal transparency	What is the communication about business decisions like? How is the fiscal status of the organisational operations communicated?
	Roles and responsibilities	How are roles and responsibilities divided and given shape?
	Situation monitoring and reporting	Is monitoring and reporting present within the organisation? In what way is it organised?
	Decision making processes	How are the decision making processes structured?
	Organisational learning	How does the cooperation cope with previous challenges? Would you say there is an ability to learn from previous challenges and adapt to future challenges?
	Improvisation	How does the cooperation deal with change? Are employees encouraged to improvise in unusual or changing situations?

Table 3: Operationalisation of the key factors that contribute to resilience into interview questions.

3.5. Data collection and processing

In this paragraph, the type of data and the way in which it was collected will be explained. For the sources literature and documents, data was gathered via search methods, a literature survey and content analysis (Verschuren and Doorewaard, 2010). A search was conducted with the help of search indices such as Google Scholar and Scopus for literature, and google or google scholar for documents. To help guide the search, various keywords and search techniques were used. Content analysis was used to extract relevant information regarding the services organisations provide. Literature review has been used to extract data on the possible barriers and drivers for organisational resilience, and ways to use these drivers and overcome these barriers.

There is one set of interview questions based on the theoretical framework that has been provided in the previous chapter. The interviews consist of mostly open questions, leaving the interviewee the possibility to elaborate on an answer. The interviews were transcribed using otranscribe, and were subsequently coded in NVivo, as has been stated above. Nodes were developed for each of the factors that contributes to organisational resilience, and were then grouped into the five categories, namely contextual factors, knowledge and resource capacity,

buffering and safety net, organisational values and organisational structure. Participants were also asked to weigh the five groups of variables, to determine were the focal point lies for each of the organisations. Afterwards the nodes in Nvivo were then examined to determine the state of the five groups of variables (contextual factors, knowledge and resource capacity, buffering and safety net, organisational values and organisational structure) within each of the cooperatives, and all factors were discussed within each of the five groups. In chapter four, all cooperatives will be discussed one by one, an afterwards in chapter five, the cooperatives will be compared using five tables, again one of each for contextual factors, knowledge and resource capacity, buffering and safety net, organisational values and organisational structure. The underlying factors were compared to the description given in the analytical framework, and were then assessed. The presence of the theoretical factors in practice was then assessed, ranging from no presence to high presence, and indicated with plus or min signs, as can be seen in table 4 below.

Very low presence	--
Low presence	-
High presence	+
Very high presence	++

Table 4: Legend for the comparative analysis

4. Results and comparative analysis

4.1. Introduction

As has been stated in the theoretical part of this thesis, the factors contributing to organisational resilience were divided into five groups: contextual factors, knowledge and resource capacity, buffering and safety net, organisational values and organisational structure. After carefully examining the factors that contribute to resilience for each individual local community cooperative, it is time to compare the cooperatives to each other, to see if there are any preliminary conclusions to be drawn. The sixteen local renewable energy cooperatives that were interviewed for this thesis are represented in table 5 below, along with their characteristics.

	Province	**Members**	**Established in**	**Procurement of Energy**	**Procurement of technology**	**Education and Facilitation**	**Delivery of Energy**	**Collective generation**	**Wind or Solar**
Hilverzon	Utrecht	500-	2015	Yes	Yes	Yes	Yes	Yes	Solar
Powered by Hattem	Gelderland	85	2016	Yes	Yes	Yes	Yes	Yes	Solar
Rijn en IJssel	Overijssel	276	2012	Yes	Yes	Yes	Yes	Yes	Wind and Solar
Heuvelrug Energie	Utrecht	140	2012	Yes	Yes	Yes	Yes	Yes	Solar
Lochem Energie	Gelderland	900	2011	Yes	Yes	Yes	Yes	Yes	Wind and Solar
Duurzaam Nijeveen	Drenthe	80-	2018	Yes	Yes	Yes	Yes	Yes	Solar
Duurzaam Riel en Goirle	Noord-Brabant	200	2015	Yes	Yes	Yes	Yes	Yes	Solar
Zonnecoöperatie West-Friesland	Noord-Holland	100	2014	Yes	Yes	Yes	Yes	Yes	Solar
Westfriese Windmolencoöperatie	Noord-Holland	100	1986	Yes	Yes	Yes	Yes	Yes	Solar
Deelstroom Delft	Zuid-Holland	155	2016	Yes	Yes	Yes	Yes	Yes	Solar
ECTB	Groningen	50	2016	Yes	No	Yes	Yes	No	Wind and Solar
Energyport Peelland	Noord-Brabant	500	2012	Yes	Yes	Yes	Yes	Yes	Solar
Zummere Power	Noord-Brabant	170	2013	Yes	Yes	Yes	Yes	Yes	Wind and Solar
Zeeuwind	Zeeland	2500	1987	Yes	Yes	Yes	Yes	Yes	Wind and Solar
Energiepioniers	Flevoland	50	2018	Yes	No	Yes	Yes	No	Solar
EMEC	Limburg	60	2014	Yes	Yes	Yes	No	Yes	Solar

Table 5: Overview of the interviewed cooperatives.

Comparisons will be made using tables for each of the groups of factors: contextual factors, knowledge and resource capacity, buffering and safety net, organisational structure and organisational values. Using the transcripts and the analysis in the previous chapter, empirical results for each of the factors will be compared to the original theoretical description as depicted in the analytical framework. There will be mainly assessed how present the contributing factors are, indicated with: --, -, + and ++, as can be seen below in table 6. This section will subsequently aim to answer the second and third research question: *What contributing factors and barriers for organisational resilience by local renewable energy organisations in the Netherlands can be found*

in practice? And: *How can these factors be influenced to increase organisational resilience within local renewable energy organisations in the Netherlands?*

Very low presence	--
Low presence	-
High presence	+
Very high presence	++

Table 6: Legend for the comparative analysis

4.2. Contextual factors

Contextual factors				
	Community reciprocity	**Stakeholder engagement**	**Cooperation**	**Relationships with industry**
	The relationship with the community is reciprocal, collaborative and symbiotic.	*There is a high level of stakeholders' engagement.*	*Frequent and helpful cooperation with other organisations.*	*The organisation is an active participant in industry and sector groups.*
Hilverzon	+	++	+	-
Powered by Hattem	+	++	--	-
Rijn en IJssel	++	++	++	+
Heuvelrug Energie	++	+	-	--
Lochem Energie	++	++	++	+
Duurzaam Nijeveen	-	-	-	-
Duurzaam Riel en Goirle	++	-	-	--
Zonnecoöperatie West-Friesland	+	+	-	-
Westfriese Windmolen coöperatie	-	-	--	--
Deelstroom Delft	-	+	++	++
ECTB	+	++	--	+
Energyport Peelland	++	++	--	--
Zummere power	++	++	+	--

Zeeuwind	**-**	**++**	**+**	**++**
Energiepioniers	**++**	**++**	**++**	**++**
EMEC	**-**	**-**	**+**	**+**

Table 7: Presence of each of the factors contributing to resilience within contextual factors within the cooperatives.

4.2.1. Hilverzon

When looking at contextual factors, it is apparent that the cooperative has a strong focus on both community reciprocity, stakeholder engagement and relationships with the industry. The participant often mentions contacts within the community, and cites having a large network as very beneficial to the cooperative. Especially the relationship with the municipality appears to be very strong and mutually cooperative, this can be partially contributed to the fact that the participant was a member of the municipal council until 2010. He states that the municipality trusts him, and that it is generally easy to come to agreements regarding subsidies or work. It is however also mentioned that the municipality is often very fragmented due to the different factions or sub-departments. It is even briefly described as appearing to be 18 little companies. This has as a consequence that even though the contact with a few of the factions might be good, it is still possible that if some of the other factions get involved it proves to be more difficult to come to an agreement. This is also true when some of the councilors change, which is a common occurrence within cooperatives. The general impression of the engagement between the cooperative and the municipality however appears to be good, and that when there are personal connections between the councilors and the members of the cooperative, contacts are generally easier to make and communications are more frequent. When looking at the engagement of the community itself and its reciprocity, it seems to be generally strong, provided there is a general interest in sustainability. It is mentioned that there are especially a lot of contacts within the network of the participant, with people that are generally socially concerned. The rest of the community however appears to be rather indifferent. Regarding relationships with industry, there are some mentions of relationships with and within overarching organisations such as Hier Opgewekt and EnergieSamen. It is however noted that these are not often utilized apart from the exchange of knowledge and experience. Regarding cooperation in general, it does seem that the cooperative has a collaborative approach, and underlines the importance of working together and helping each other thrive. There appears to be a lot of cooperation between the cooperatives within the region het Gooi.

4.2.2. Powered by Hattem

Powered by Hattem mentions that even though they have raised a lot awareness within the local community, it is still oftentimes difficult to explain what exactly the cooperative does. They find that a large part of their time goes to explaining how exactly a cooperative works and how people would get their financial returns, mainly using emails, workshops or other local meetings. The relationships with the municipality are good, so good that the municipality even has a few certificates from the cooperatives, and all the current projects are on municipal rooftops. They furthermore have excellent contacts with the province, mainly regarding bringing in subsidies. Powered by Hattem also is part of the association of energy cooperatives Gelderland, which facilitates knowledge exchange and cooperation between cooperatives. The cooperative does not really cooperate with any other cooperatives in terms of projects.

4.2.3. Rijn en Ijssel

Within the contextual area, the first factor that was discussed was community reciprocity. Much like other cooperatives, Rijn en IJssel seems to have strong contacts with some parts of the community, and little to none with other parts. There are a few areas that can be described as "leaders" when talking about sustainability, and those often seem to be more active. The participant however mentioned that they are looking to expand contacts with the community, and want to actively reach out to areas that have not been the most active regarding sustainable energy. She mentioned that they want to investigate which areas are lacking regarding sustainable energy, and that the cooperative has plans to brainstorm on how to aid those areas in their transition. Not all contacts were positive however. There was some resistance regarding the future windmill park, which not all community residents were positive about. It did however cause them to come to member meetings, and even led some residents to register with the cooperative and become members. When looking at stakeholder engagement in general, it seems to be that the focus is largely around the city of Arnhem. There are a lot of contacts with both the residents and the municipality of Arnhem, and a number of people that are involved with the cooperative are of used to be actively involved in local politics. There is also contact with other municipalities within the region Midden-Gelderland and with the province, but those are not of the same intensity as with the municipality of Arnhem. There is also a strong relationship with the other cooperatives, as there is a close-knit network with the energy cooperatives within Gelderland where knowledge is exchanged regularly. This is also facilitated by for instance Hier Opgewekt on a national scale. The relationships within the industry therefore seem pretty secure and far-reaching, even though it was not discussed how often these connections are generally utilized.

4.2.4. Heuvelrug Energie

Heuvelrug Energie seems to aim for a very strong relationship with the community. They organise informative evenings, a sustainable top 100, workshops and meetings at schools. It does however appear that not everyone within the community is as reciprocal as the cooperative would have liked. They try to actively recruit more members, something that has unfortunately yielded that much noticeable results yet. Regarding engagement of stakeholders, the participant stated that it is not as high or constructive as the would have liked. Especially in the beginning, relationships with the municipality are not that strong, but since a new councillor has been appointed this relationship has seen some improvement. Seeing as the cooperative has contacts with multiple municipalities, it is noticeable that some municipalities are far more engaged than others. This can make a big difference for the cooperatives, especially when they are in their starting stages. Contacts with the province are not as extensive, but are coming along as of late. Heuvelrug Energie is not really actively involved in any sector organisations, but does have some interaction with other local cooperatives, mainly regarding the exchange of knowledge and the organisation of mutual activities.

4.2.5. Lochem Energie

When examining the contextual factors, it becomes apparent that the cooperative has strong ties with the community. The participant rightly states that 900 members within such a small region as Lochem is very impressive, and is a sign that the contacts with the community are well-

established. There are around 60 volunteers within the cooperative, but there does not seem to be a lot of contact with the community next to the contact with members and volunteers. It is however mentioned that both the municipality and the cooperative have a goal of 50% local community engagement within sustainable energy and cooperatives. Regarding stakeholder engagement in terms of municipality and province, there is said to be a lot of intensive contacts, and generally a positive relationship. There are several arrangement and subsidies that are utilized by the cooperative, and will be further discussed under knowledge and resource capacity. The cooperative was also asked to consult the province on the regional energy strategy, in which the aforementioned 50% local engagement is one of the goals. There are also several contact with other cooperatives, mainly regarding knowledge exchange. The participant actually mentioned working on the concept of resilience with other cooperatives, amongst other dossiers, such as for instance the development of wind turbines. They also mentioned having established a joint venture, called IJsselwind, which is owned by four different cooperatives, including Lochem Energie. Besides those direct contacts, Lochem Energie also is a member of several sector groups, such as Hier Opgewekt and the Gelderse association of energy cooperatives.

4.2.6. Duurzaam Nijeveen

Duurzaam Nijeveen is mostly involved within the municipality of Meppel and the villages that are scattered around the area. There are not as much members as they would like, but seeing as they only have been existing for about a year, it is still a very reasonable number. They are actively trying to recruit more members and become more well-known within the community. When asked about reciprocity, the participant answered that some citizens were very enthusiastic, but that others did not really see the necessity. The participant mentioned wanting to take a more interactive and participatory approach, asking the community what they feel is necessary instead of just implementing projects as they go. They are quite close with the local council members, but do state that their municipality does little to nothing on the area of sustainability. The same is the case with the province. The participant states that when ranking all provinces and municipalities on their commitment to sustainability, Drenthe and Meppel would probably be somewhere at the bottom. This is somewhat of a challenge for the cooperative, seeing as a lot of cooperatives rely on support from the local government. The relationships with other cooperatives are fine, and Nijeveen is sometimes involves with sector organisations. There is however not a whole lot of cooperation, apart from some knowledge exchange.

4.2.7. Duurzaam Riel en Goirle

Within the contextual area, contacts with the community and its reciprocity seem to be outstanding. It is mentioned that whenever informative meetings or evenings are organised, there are well over 100 interested people on the regular. The participant states that the cooperative is strongly embedded within the community, and that they are able to connect with and reach out to people. It is however mentioned that most of the people that are connected with or have contacts with the cooperative are members. Non-member contacts seem to be low, and even though the meetings are openly accessible to anyone, it is mostly members or future members that show up. Membership is more or less viewed transactional, or as an investment. There are also a lot of contacts with municipality and the province, which are generally regarded

as positive. It is however mentioned that the course of events within the municipality are generally slow, and that they are often willing, but lack vigour. It is said to often take months to get certain subsidies or permits, which often halts development within the cooperative. There are also contacts with other cooperatives in the region. There is a group of 12 or 13 cooperatives within the heart of Brabant, that organise meetings every 6 weeks to discuss certain matters. Further contact via email also regularly takes place. The participant was aware of sector groups such as Hier Opgewekt, but did not really think those have added value. They mentioned that they did participate in the past, but that it takes up a lot of time.

4.2.8. Zonnecoöperatie West-Friesland

When looking at contextual factors, Zonnecoöperatie West-Friesland mentions that the cooperative members and the community in general have a positive outlook on solar panels in general. They mention that there is little to no resistance form the community regarding solar panels, and that they generally receive little to no reaction from the community. The contacts with the municipalities also seem to be good. It is mentioned that there are connections with several municipalities, and that those connections are perceived to be positive. They do mention having contacts with other cooperatives as well, and even mention the beginnings of a bigger project that would warrant a new cooperative, but the general thread seems to be that the cooperative is doing its own thing. This notion is confirmed when asked about Hier Opgewekt or other sector groups, on which is said that they do not intensively work together, and that the cooperative mostly operates alone. It is also mentioned that there is a slight lack of volunteers within the cooperative, and that a survey to investigate potential interested members did not bring on any new volunteers. Even though the general reaction was positive, there were very few people who mentioned wanting to actually help out. One other comment that was made was that there are plans to establish more contacts within the community, especially with people that are not within the current target audience. It was mentioned that there are plans to support low-income groups in investing in solar panels, and that they were developing a formula to achieve this in cooperation with a few other cooperatives. Contacts with companies are not existing yet, but might be on the list for the future. There are a few connections with a school community to see if they could start a new project there, but those are still at an early stage.

4.2.9. Westfriese Windmolen coöperatie

Contacts with the community are quite a difficult point for the Westfriese Windmolen coöperatie. There is generally a lot resistance toward wind-mill parks, especially from direct residents within the vicinity of the park. The participant mentioned a lot of resistance and protests prior to placing the windmills, and said that even the municipality assisted the resistance of local residents, which the cooperative found surprising. They did in the end overcome the local resistance and complete the park, but it did require a lot of lengthy juridical processes. Dealing with the resistance appears to be largely strict and juridical in its nature, instead of collaborative or moderating. It is safe to say that the contacts with the local residents was strained for a while. Of course the cooperative also has about a 100 local members who have invested in the park, so not all engagement is negative. Besides the contacts with locals, the cooperative operates largely on its own. Even though there are a few contacts with municipalities and the province, they are not extensive or

often utilized. Cooperation with other cooperatives is also not in the books, and it appears that the cooperative is more of a independent entity in that regard. Contacts within the industry are also seldom utilized, apart from the occasional exchange of knowledge.

4.2.10. Deelstroom Delft

When looking at community reciprocity, Deelstroom Delft still has room to improve. The participant mentioned that even though the contacts that they do have are very positive, there are still a lot of citizens that do not even know the cooperative exists. They believe this is due to the fact the first project was at capacity within two weeks, leaving little room for new members to sign up. Until today, there has not been a whole lot of publicity necessary. They do mention often being in the paper, and state that their notoriety within the community slowly but gradually improves, yielding about three or four new members every month. The engagement with the municipality is varying. Initially, the municipality promised to deliver nine roofs on which the cooperative would be able to establish solar panels. This offer was however withdrawn later on, and the participant mentioned having trouble getting new projects of the ground. This is partially due to the municipality not having a clear path towards sustainable policies themselves, leaving room for doubt on how to exactly tackle current challenges. The contacts with the municipality are however positive in general, and it is cited that they would like to confer with the municipality on different subjects, such as being gas-free in 2030, developing a thermal network and the support for electrical cars. The municipality however seems to be a bit reserved on this subjects, and mention not wanting to play favourites above commercial parties. The contacts with the province are an interesting case as well. It is mentioned that the province of Zuid Holland strongly encourages local cooperatives, and aims to support the professionalization of those cooperatives with subsidies and other arrangements. The province has awarded Deelstroom Delft with a subsidy as well, which will be discussed within knowledge and resource capacity. On the subject of cooperation with other cooperatives, it is mentioned that there is an especially close connection with other cooperatives in Zuid Holland. This is something that is also supported by the province and by the national organisation Hier Opgewekt. The cooperative mentioned that especially the exchange of knowledge and experience is valuable for Deelstroom Delft and other cooperatives in the area.

4.2.11. ECTB

The relationship with the community seems to be very good. The participant mentions the region being susceptible to earthquakes due to the extraction of natural gas as one of the factors why the local civilians are so favourable towards sustainable alternatives. They mention having a newsletter that goes out towards around 150 people, as well as easily surpassing the minimum of 10% community participation in their projects that the municipality demands. They also make a point of granting the project to local companies, leading to the money being earned within the cooperative being invested back into the community. The engagement of local stakeholders also is going well. They have good contacts with the municipality as well as with several village associations. There are also connections with the province regarding one of the larger projects. They also mention wanting to work with local companies and village associations in particular to establish a larger support within the local community. The cooperative also participates in a sector organisation, and exchanges ideas and

knowledge with other cooperatives in the area. There is however no direct cooperation in terms of actual projects.

4.2.12. Energypoort Peelland

Community reciprocity is held in high regard by Energyport Peelland. When realising their first big solar project, they were initially met with quite some resistance. However, due to their personal and participative approach, community resistance was overcome, and the project was realised. Engagement with stakeholders is also pretty high, not only by citizens, but also the municipality and (local) businesses. Contacts with the province are okay, but not very intensive or utilized often. Cooperation with other cooperatives is not one of the focus points, and neither are relationships with industry or sector groups. The participant mentions that the cooperative rather operates on their own.

4.2.13. Zummere Power

Community reciprocity is an important topic for Zummere Power. They mention having no problem connecting to citizens, however most contact is regarding the realisation of solar projects specifically. The cooperative is pretty well known within the community, and have recently made first contact with citizens who live around the area where the cooperative is aiming to establish a windmill project. Zummere power does expect some negative responses regarding these windmills, seeing as it is mostly a controversial type of project that generally generates some form of resistance within the local community. There are plans to increase communication and participation during the process to ensure the development of the project will be inclusive to citizens. Zummere power has also had close contact with the municipality to ensure this. The contacts with the municipality in general appear to be positive, and the municipality seems to be engaged in general. The participant does however note that not all factions within the municipality are equally positive about the windmill project. The province is very positive regarding the plans to realise the windmill project, seeing as they are planning to realise a certain amount of windmills within the province of Noord-Brabant, and are currently behind schedule. Zummere power also cooperates with other cooperatives, mostly in context of the regional energy strategy, but also to pool knowledge and expertise. They are currently not actively involved in any sector-groups.

4.2.14. Zeeuwind

When looking at community reciprocity, the fact that Zeeuwind specializes mainly in wind-energy plays a very large role. Wind-projects generally receive more negative attention from citizens than solar projects. The cooperative mentions having a good relationship with citizens, even though there often some resistance when establishing new projects. Zeeuwind always has informative evenings before they establish a project, and citizens who are against windmill projects are often way more vocal than citizens who are for windmill projects. Engagement from the municipality is rather high, and the participant mentions working together on several projects, such as collective solar panels and making houses more sustainable in general. The cooperative often discusses with the civil servant that is responsible for sustainability. Zeeuwind furthermore cooperates with

other cooperatives, and has helped to found several others. The focus seems to lie on exchange of knowledge and ideas. They also contribute to multiple working groups and the regional energy strategy, and are actively involved in branch- and sector groups.

4.2.15. Energiepioniers

Community reciprocity has been rising steadily in the past 1.5 years. The Pioniers van de toekomst has always been pretty well known, but in the past time the Energiepioniers have been becoming increasingly well-known as well. This can be attributed to increased marketing as well as the opening of a pop-up shop. Most reactions from citizens are predominantly positive, with a few exceptions here and there. The participant does mention that a few people were not really convinced of the necessity of the energy transition, or that some citizens do not have the funding to make the necessary changes. This is also something the cooperative wants to focus on: to be more inclusive to lower income families and starters. Stakeholder engagement is high, and especially contacts with the municipality and province are rather good. The Energiepioniers also cooperate with other cooperatives on a regular basis, and are part of several networks within the industry that promote local renewable energy cooperatives. They also contribute to hier opgewekt, and regularly exchange knowledge and information with other cooperatives.

4.2.16. EMEC

Community reciprocity appears to be relatively okay. The contacts that take place are mostly positive, but there are large parts of the community that are not being reached. Stakeholder engagement is present, but contacts with the province are often a bit stiff. The participant mentions having tight connections that are easily accessible, but that there are little actual actions or support from the municipality. Initially there were also plans to put solar panels on community centres, which would need support from the municipality. The cooperative made a proposal, but there is no clear reaction from the municipality as of right now. The participant describes this as being disappointing. Cooperation with other cooperatives is something that is slowly increasing, and mostly focussed on exchanging knowledge. There are some contacts with sector groups, both locally and nationally.

4.2.17. Concluding remarks regarding contextual factors

One of the first things that catches the eye is that cooperatives with strong, reciprocal ties to the community also often appear to have a high level of stakeholder engagement in general. This notion is not really surprising. Many cooperatives have stated that they found that initiating and actively focussing on positive contacts with the community and municipality have resulted in a higher level of engagement. Two outliers in that group are Duurzaam Riel en Goirle and Zeeuwind. Duurzaam Riel en Goirle has strong ties with the community, but generally works on its own as a cooperative, and contacts with the municipality and province appear to be slow. Zeeuwind has a high level of stakeholder engagement, but does sometimes encounter resistance from the local community when implementing new wind projects. The two other factors, cooperation with other cooperatives and relationships with industry, seem to work well together as well. Cooperatives that have strong relationships with industry and sector groups, seem to have a tendency to

cooperate a lot as well. Some cooperatives, especially those in smaller communities, actively choose not to cooperate or network a lot, mainly due to time constraints or doubts that those contacts are even beneficial at all.

4.3. Knowledge and resource capacity

Knowledge and resource capacity				
	Sources of information	**Culture of exchange**	**Internal resource capability**	**External resource capability**
	Information is stored in a number of locations and formats and is easily accessible.	*Sharing knowledge within the organisation is facilitated and encouraged.*	*Efficient and effective development of the organisation's resources when they are needed.*	*There is an understanding of the relationships and resources that the organisation might need to access from outside sources.*
Hilverzon	++	++	+	+
Powered by Hattem	-	-	++	--
Rijn en IJssel	++	++	++	++
Heuvelrug Energie	+	++	-	-
Lochem Energie	++	++	+	+
Duurzaam Nijeveen	++	++	--	--
Duurzaam Riel en Goirle	++	++	+	+
Zonnecoöperatie West-Friesland	--	+	--	--
Westfriese Windmolen coöperatie	++	++	++	++
Deelstroom Delft	++	++	++	++
ECTB	-	++	++	++
Energyport Peelland	++	++	++	++
Zummere power	+	+	--	--

Zeeuwind	**++**	**++**	**++**	**++**
Energiepioniers	**++**	**++**	**++**	**++**
EMEC	**+**	**++**	**+**	**+**

Table 8: Presence of each of the factors contributing to resilience within knowledge and resource capacity within the cooperatives.

4.3.1. Hilverzon

As was shortly stated in the prior section, knowledge exchange is viewed to be of great importance within the cooperative Hilverzon. This collaboration and exchange of knowledge mainly takes place both between Hilverzon and other stakeholders as well as within the cooperative itself. The emphasis herein lies on effective and efficient exchange of knowledge. As the participant put it: it is useless to try to reinvent the wheel. Or in other words: if other cooperatives already possess certain knowledge or know how to effectively achieve certain goals, you should not waste time trying to come to solutions on your own, but instead utilize the knowledge that is already there. It therefore seems that the main source of information for this cooperative is other organisations or people in its network. Within the cooperative there is also a lot of exchange of knowledge. This happens via whatsapp or in team-meetings. When someone reads something or finds something interesting that related to the cooperative, it is often shared and discussed with other members. Questions that are often asked are: What did we read? Is it useful or interesting to us? Can we utilize this information? These types of information are also often shared with members, as the main goal of the cooperative is to promote knowledge within the community. When looking at resources, the cooperative seems to largely generate those from members that have invested in collective solar roofs. Besides that there is also some income from other projects and subsidies. At the bottom line, the participant estimates that about one third of money is generated by the cooperative itself, and about two thirds comes from subsidies. When managing internal resources, one of the main pressure points seems to be who of the "volunteers" to pay, on what scale, and why. They did try to pay some people that were intensively involved in certain projects for two days in week. It did however often end up being three or four days, meaning that the person in question would be slightly underpaid. Even then, when the scale of the cooperative and the amount of projects began to increase, paying certain volunteers over others became increasingly difficult. The cooperative then tried to switch to a more commission-based approach, where people were paid based on what kind of projects they brought to the cooperative. This also did not end up working however, as often five or six people would work on the same project. It turned out to be difficult to determine who would be paid and why. In the end this is still a point of contention for the cooperative: to professionalise, without compromising its cooperative structure and community-oriented goals.

4.3.2. Powered by Hattem

When requiring knowledge or expertise, the cooperative always first looks at its members, to see if anyone has the required experience or knowledge. If they come up empty handed, other cooperatives or sector groups are often consulted. The exchange of information within the cooperative is encouraged, but does not appear to be one of the focal points. The internal resource capability of Powered by Hattem seems to be strong. The participants mentions utilizing existing human resources, and employing members within their area of expertise when possible. So far they have aquired someone with juridical experience, someone with experience in project management and someone with prior experience in finance. When asked about financial resources, it became apparent that those are not present in abundance. They do currently not

recieve any subsidies from the municipality, and their only income is selling certificates from projects.

4.3.3. Rijn en Ijssel

Rijn en IJssel has a large shared database with other cooperatives in Gelderland, which is operated by the Gelderse association of energy cooperatives. Internally within the cooperative, there is a registration system which enables people to register client relations and attach notations to the clients. When working on a project, different documents can be attached to those projects, enabling easy access for everyone working on the project. Dropbox is also used, to enable cloud-sharing of different files, for instance for member- or board meetings. When looking at resource management, subsidies are attached to the implementation of the "energy counter", which is one of the departments of the cooperative that provides information and expertise on the area of sustainable energy. The main sources of income for the cooperative are subsidies, investments by members and partially commercial funding. Often when starting projects this is supplemented by a loan, which later on can be paid of when the project starts generating income. Internal resources are managed by the treasurer and a financial committee that monitors all spending. Individual projects also often have one person assigned to finances, who checks back in with the board and the financial committee. All in all the cooperative seems to manage resources and operate as a small company, running projects efficiently and effectively.

4.3.4. Heuvelrug Energie

When needing knowledge or information, Heuvelrug Energie mainly finds those internally from within the members. They have working groups looking into different areas, and have one group that specialises in strategizing. Exchange of knowledge is encouraged, and articles are often shared within groups. Expertise is also sourced from within the cooperative, with allowing members to act within their current or previous areas of expertise. Financial resources are present, but mainly coming from members, with no subsidy from the municipality at all, apart from a small one at the start of the cooperative. This puts a strain on resources, which combined with the costs of some activities or projects might not provide a lot of stability.

4.3.5. Lochem Energie

As has been mentioned above, there is a great range of knowledge exchange between cooperatives within Gelderland according to Lochem Energie. Knowledge and expertise sharing is encouraged and facilitated by the Gelderse association of energy cooperatives, in which Lochem Energie has played an active role in the past few years. The cooperative itself uses Google Drive to store and access relevant files and information, which is then easily accessible to new volunteers. Apart from that there is a well-established and informative website, on which both members and non-members can find relevant information regarding the activities of the cooperatives. Volunteers can use this information to inform people who are not members yet, and members can use the site to orientate and read up on new activities. The cooperative also participates in international knowledge sharing and conferences, as well as an innovation program with other stakeholders that performs experiments. There are several working groups as well, al with different areas of expertise, which are often shared between groups. Financial

resources are accumulated from member contributions as well as subsidies from different areas, most thematically. The energy coaches that the cooperative delivers are paid from those resources, as well as certain office members that work one or two days a week. One of the main challenges within the cooperative according to the participant is how to effectively manage the resources they have, both human and financial. They mention lacking staff that can effectively coordinate volunteers and office members, and using subsidies from the municipality to hire such a person for two days a week. This would encourage continuity, and leave room for the board to actually govern instead of coordinate, according to the participant.

4.3.6. Duurzaam Nijeveen

Within the cooperative, different working groups are acquiring knowledge and information, all of which is centrally stored and organized using dropbox. They furthermore try to connect people from the community to certain subjects. If the cooperative lacks any knowledge they know how and where to find it, and exchange of knowledge within the cooperative is very active and highly encouraged. When starting a project, they always have some people working on it, and the participant mentions only putting full effort into project that have a high success rate. They currently do not receive any subsidies, but are looking into an SDE+ subsidy right now.

4.3.7. Duurzaam Riel en Goirle

Duurzaam Riel en Goirle is another cooperative that mainly stores their information within the cloud, enabling easy access to files when necessary for all people involved. Six people mainly access and use those files, and most discussions regarding information and knowledge take place between those people. This only happens about once or twice a month though, according to the participants. They state that most people involved within the cooperative are professionals who have worked in higher positions, which means they possess a lot of relevant knowledge, and are able to take quick decisions when necessary. The cooperative furthermore organises informative meetings for members and non-members, regarding topics that are recent and relevant, based upon what cooperative members think is interesting or necessary. Regarding resources, Riel en Goirle have obtained subsidies from the municipality, and are in the process of acquiring additional subsidy via the province. Besides that, members also invest into projects, generating additional resources. All member-invested money is currently tied up in projects according to the participant. They add on to that that most members view the cooperative as a transaction or an investment.

4.3.8. Zonnecoöperatie West-Friesland

As has been shortly discussed in the previous section, Zonnecoöperatie West-Friesland mostly prefer to operate alone. There is however certainly room for the exchange of experience and knowledge with other cooperatives. The participant also states that the exchange of knowledge within the cooperative is both facilitated en encouraged. Sources of information were not really mentioned. There is however mention of both internal and external resources, or mostly the lack thereof. The financial margins are said to be very thin, leaving little room for the hiring of experts or paid workers. This means that the volunteers and the board have to do a lot of the work themselves, leaving less time to govern or contribute in a more meaningful way. The focus

definitely lies on execution over content, causing tension amongst board members and volunteers. This is also an often discussed topic within meetings. There is a great need for more skilled people, both volunteers and board members, but there are very few people that are readily available. Furthermore, the participant explains that even though some positions are easier to fill, others, such as treasurer, require more skill and more specialised people.

4.3.9. Westfriese Windmolen coöperatie

There is no shortage of both knowledge and resources within the Westfriese Windmolen coöperatie. The large return of investment that wind-mill parks generally deliver ensures that there is no shortage of paid help and expert opinions, especially regarding juridical procedures and financial management. The treasurer of the board is a working position that gets paid, and when more help is needed, experts can be hired pretty easily. This means that the rest of the board actually has the time and space to govern, and do not have to do a lot of executional work within the cooperative. After the few decades that the cooperative has been around, it has accumulated a lot of specialised knowledge and expertise, enabling it to grow into a full-blown sustainable energy cooperative.

4.3.10. Deelstroom Delft

Deelstroom Delft also underlines the use and exchange of knowledge, as has been stated above. Whenever they gain experience regarding for instance project or juridical procedures, they aim to share these with other cooperatives. They also lend a helping hand within the energy transition platform of the municipality of Delft, an initiative by the municipality to involve citizens within the energy transition. Within the cooperative there is also room for sharing knowledge, and the participant said they found it important to aid in researches such as these, to help accumulate more knowledge for cooperatives in general. Regarding resources, the cooperative has secured a large subsidy from the province, enabling them to perform six feasibility studies regarding new projects in the next two years. This kind of income can support the costs at the start of new projects, which generally the cooperative itself is unable to carry. The board as well as the volunteers do not get paid for work they carry out within the cooperative.

4.3.11. ECTB

ECTB mentions sourcing a lot of their knowledge and expertise locally, either from within the cooperative or from related organisations. The exchange of knowledge within the cooperative is encouraged, but the main exchange of knowledge happens with other cooperatives within the province of Groningen, especially within workshops. The participants mentions wanting someone to take on administrative duties, to help lighten the load for current board members. This is something what could be achieved using subsidies. The cooperative mentions receiving local subsidies, and also states that there is a lot of subsidy going around in the area due to earthquake settlements. To keep project costs low for members, the cooperative further more takes out loans to complete projects, which they then pay back when the project starts delivering returns.

4.3.12. Energypoort Peelland

Sources of information are mainly the people involved within the cooperative, or with other words, the 3 people involved in the board. There was not really anything mentioned about gathering and keeping information, and the focus seems to mostly lie upon practical knowledge and expertise, something that has helped them realise multiple projects. They often do share their expertise with either the municipality or through local lectures. Financial resources are managed by an external accountant, and they have stipulated internally that all financial resources should always be spent on sustainable projects or goals. All board members and other people involved are working as volunteers. External subsidies are utilized as well, though not extensively.

4.3.13. Zummere Power

Zummere power sources most knowledge and expertise internally. Some members have a good amount of technical knowledge, which is being used to give advice. This knowledge is also collected and saved to be used later on. The participant also mentions using the national organisation for energy cooperatives to fill any gaps in knowledge. The cooperative mentions lacking internal resources, such as administrative help. All people currently involved are volunteers, which hinders the ability to take on more work and become a more professionally oriented organisation. Zummere power also does not receive any subsidy, making it more difficult to make the transition towards better internal resource management. Acquiring more financial resources may be a first step towards this goal.

4.3.14. Zeeuwind

Due to having been up and running for more than 30 years, Zeeuwind currently possesses a great amount of knowledge, expertise and experience within the organisation. This is continuously updated by keeping up with media, trade magazines as well as keeping in touch with members. Zeeuwind also promotes a culture of exchange. Regarding internal resources, Zeeuwind has no shortage on labour and financial resource, seeing as the return on wind-farms is generally a lot higher than for instance solar projects. The cooperative also has about 20 volunteers, a main office, and has every wind-farm brought under in separate organisations. Whenever expertise is needed that is not present within the cooperative, it is sourced externally, such as is the case with project developers and lawyers. Several projects are also receiving subsidies.

4.3.15. Energiepioniers

Exchange of knowledge and ideas appears to be one of the focus points of the Energiepioniers. They are part of multiple networks, and are actively trying to make knowledge accessible to the wider public. When filling gaps in their knowledge, the cooperative is trying to fill those externally as much as possible. The same is true for resources. The participant mentions wanting to make sure that the starting phase of projects will be handled externally from now on, on a no cure no pay basis. This will ensure less financial and administrative stress for the cooperative, will enable the volunteers to focus on more important things, and will increase meaningful participation. This will be enabled by provincial subsidies, as well as by making sure all costs of a project will be covered from the returns, from start to end.

4.3.16. EMEC

Knowledge and information play a big role within the cooperative. They have a large mailbox full of information, and personal knowledge of members is also being used regularly. The participant does mention that he regrets not being able to save knowledge and especially expertise from past board-members. EMEC has had the fortune of receiving a start-up subsidy from the municipality, which aided in getting the cooperative up and running. They furthermore have received a subsidy from the province to finance part of their new project. Internal resources are managed properly as far as can be said, seeing as they do not have a running project yet.

4.3.17. Concluding remarks regarding knowledge and resource capacity

Most cooperatives have a strong focus on knowledge exchange as well as collecting and storing information. Internal and external resource capability are often a bit precarious in terms of access, but the management is often fine. It does appear that internal resource capability and external resource capability are closely tied together, seeing as they often seem to yield similar results. This may be due to the fact that cooperatives that understand the importance of proper resource management also know how and where to access external resources. Furthermore, providers of subsidies/external resources often have strict rules as to how those resources must be managed by the cooperative. Most cooperatives stated that they thought that effective resource management was incredibly important to the resilience of the cooperative. Furthermore, all but a few cooperatives admitted to having some form of trouble or doubt when handling internal resources. Almost all cooperatives underlined the importance of exchanging knowledge and expertise, both internally as well as with other cooperatives. A main sentiment seemed to be that it is a shame to try to “reinvent the wheel”, especially if other cooperatives that have coped with the same problems already have found a solution.

4.4. Buffering and safety net

Buffering and safety net			
	Planning strategy	**Risk awareness and communication**	**Stress testing plan**
	There is development and evaluation of plans and strategies to manage vulnerabilities in relation to the business environment and its stakeholders.	*Understanding and analysis of potential risks and their consequences.*	*Processes are in place that enables the organisation to continue operating under increasing demands and uncertainty.*
Hilverzon	++	+	--
Powered by Hattem	-	+	--
Rijn en IJssel	++	++	+
Heuvelrug Energie	+	-	--
Lochem Energie	++	++	++
Duurzaam Nijeveen	-	+	-
Duurzaam Riel en Goirle	--	-	--
Zonnecoöperatie West-Friesland	++	+	++
Westfriese Windmolen coöperatie	+	++	--
Deelstroom Delft	++	++	-
ECTB	--	+	--
Energyport Peelland	+	--	--
Zummere power	+	--	-

Zeeuwind	**++**	**++**	**++**
Energiepioniers	**++**	**++**	**++**
EMEC	**+**	**++**	**+**

Table 9: Presence of each of the factors contributing to resilience within buffering and safety net within the cooperatives.

4.4.1. Hilverzon

When looking at buffering and safety net, Hilverzon seems to do well in the areas of risk assessment and communication and planning strategy. Right at the beginning of the interview, it was mentioned that the cooperative had a strategy session planned later that day, in which they would discuss how to continue with the cooperative, especially within the changing environment. Different factors were to be discussed, such as how they should upscale, what their place would be within the energy transition, and how to gain the resource necessary to make those steps. The participant also mentioned wanting to take different levels of knowledge and experience within the cooperative into account, especially when taking those strategic steps into the future. It is safe to say that this cooperative is therefore seriously considering its uncertainties and planning for those. Regarding risk assessment, mainly financial risks appear to be considered. It is mentioned that some people within the cooperative are very averse to risks. The cooperative also has an overseeing committee, that addresses financial stability amongst other things. The idea is that there would be no financial obligations for the cooperative that it would not be able to bear. Whenever the cooperative wants to invest about 50.000 euros, the committee has to sign off on it. On top of that, there is also an accountant that looks at day-to-day matters, and also considers several risks, such as preventing that the same person both makes and monitors the invoices. Regarding stress-testing plans, there does not seem to be a structure in place for when things start to go south. There are no contingency plans for when board-members step down, or for when other unforeseen events happen.

4.4.2. Powered by Hattem

When looking at buffering and safety net as given shape within Powered by Hattem, it does not appear that they are very concerned with stress testing plans or planning strategy. They do have a set schedule for when and how board members will step down, and are working to increase the amount of active members. But when asked about if there are any specific plans in place to enable the cooperative to keep on going, the participant stated that was not the case. They did mention it could be something they have to look into in the future. The cooperative did however seem to be quite aware of potential risks, and are transparently communicating those risks to their members.

4.4.3. Rijn en Ijssel

Rijn en IJssel energie appears to be very aware of their potential vulnerabilities. The participant mentioned that the cooperative currently is in a state of transition, and that they are actively considering their current and future strategies. They have “themed tables” at every general member meetings, and one of those had a strategic team, enabling members to join in thinking and voicing their opinion about the future of the cooperative. This sprouted a working group which sole purpose is to elaborate this strategy. Part of this is trying to evaluate were the strengths and vulnerabilities of the cooperative lie, and try to make long-term plans to account for those. One of the main vulnerabilities that the participant pinpointed is the lack of projects and steady financial resources. There is also a clear awareness of potential risks and professional project developers and managers are often enlisted to properly assess them. There furthermore

also appears to be a clear grasp on the importance of the changing political environment around the cooperative.

4.4.4. Heuvelrug Energie

Strategy-wise, Heuvelrug energie has been having meetings to determine strategies going forward. They investigate potential challenges, but do admit that it is difficult due to the cooperative not being all that professionalised yet. Already twice a chairperson has unexpectedly quit, leaving the board to scramble for a new chairperson and placing stress onto the organisation. There are no plans in place currently to prevent that from happening again, leaving the cooperative potentially vulnerable. When looking at risk assessment and communication, there has been some evaluation of past risks, but there does not really seem to be a whole lot of planning and awareness for future risks.

4.4.5. Lochem Energie

Planning strategy seems to be well established within Lochem Energie. They try to anticipate on how to deal with future directions within municipal policy, how to establish future projects that will contribute to the cooperative in a meaningful way, as well as on finding good future employees and board members. This ties into stress testing plans as well. It is clear that Lochem Energie has plans in place to account for future uncertainties, mainly regarding their organisational structure. When looking at risk assessment and communication, the participant mentions mainly considering larger risks, especially ones associated with large investments. They also have several insurance-policies for the cooperative and board-members in place, even though the participant is not really sure if it is necessary or even useful if anything ever happens. It can therefore be concluded that the cooperative seems to take the necessary precautions, and sometimes even too many.

4.4.6. Duurzaam Nijeveen

Duurzaam Nijeveen is involved with planning strategy and stress-testing. They appear to consider policy implications for the cooperative, as well as future planning regarding the replacement of current board members. However, even though it is part of their considerations, there seem to be no concrete plans in place to enable the cooperative to continue in case board-members ever leave unexpectedly. There are also still some double roles, something that has to be eliminated according to the participant. When looking at risk awareness and communication, there are certain plans in place when making business cases for new projects, but it for the cooperative in general there do not seem to be any concrete plans or strategies.

4.4.7. Duurzaam Riel en Goirle

When considering buffering and safety net, Duurzaam Riel en Goirle does not seem to very much concern itself with trying to plan for uncertainties. They do acknowledge potential changes in the political environment in the Netherlands, as well as locally, but are more or less reacting to this than anticipating in general. Regarding risk awareness, the participant mentions just having to accept some risks, inform the members, but that trying to anticipate for too many uncertainties is not possible and also not desirable. It is shortly mentioned that they try to attract more younger

people, because of the fact that the current members of the cooperative are generally older than 50 years old. So it can be concluded that there is general awareness of risks and uncertainties, but that there are no concrete plans in place to mitigate them.

4.4.8. Zonnecoöperatie West-Friesland

Zonnecoöperatie West-Friesland has much consideration for future uncertainties and vulnerabilities. They try to plan for the future, especially regarding potential financial risks and some technical risks, which are adequately insured according to the participant. There are also strategical plans in the works, such as for instance participating in larger projects in the future, as well as how to ensure that the cooperative is not only concerning itself with planning and execution, but also with strategy and governance. The participants also mentions taking future policy regarding solar projects into account, but underlines that current project will not suffer under future changes in policy.

4.4.9. Westfriese Windmolen coöperatie

Westfriese Windmolen coöperatie is actively looking at strategic opportunities for the future, mainly concerning future sustainable policy and new ways for citizens to participate. They are also looking at the outcome of the regional energy strategy. There is however not really a focus on stress-testing or concrete planning for the future. Risk awareness and communication however are very much present within the cooperative, and multiple insurance policies are in place in case it is necessary. The participant does acknowledge some uncertainties in future political decisions, but also states that it is difficult to anticipate those.

4.4.10. Deelstroom Delft

Deelstroom Delft mainly focuses on risk assessment regarding buffering and safety net. It mentions having several insurances in place to ensure proper coverage in times of uncertainties. After having some conflicts with the labour inspection on the first project, the cooperative acknowledges that some risks or situations can be unforeseen, and is planning accordingly. Regarding financial risks, there is mainly a focus on proper communication towards the members of the cooperative, that past yields are no indication for future yields. When looking at planning strategy, the participant mainly mentioned taking it step by step when going into the future. Planning strategically for the future appears to be embedded into the cooperative's foundations, as a notary specialized in cooperative's in the horticulture sector was consulted when establishing Deelstroom Delft. This ensured that there are statutes that are sound and clear, ensuring little to no uncertainties as to the form and state of the cooperative when undertaking more projects and upscaling. It clearly states who has the decision-making powers in what cases. When conducting future projects, the cooperative only has to decide how to divide future earnings. Will it be according to project, or will they allow smaller projects to benefit from bigger ones? This is a question that will be answered by the members of the cooperative at a meeting in the future. Lastly, when looking at stress-testing plans, it seems like there is little to no attention towards uncertain situations and times of stress. The participant does mention being one of the founders, and that they and the other founder want to take a different role in the future. A core team of enthusiastic board-members and volunteers is also mentioned, but it does not really look like

there is a contingency plan in case board-members step down or in case of other stressful situations.

4.4.11. ECTB

Regarding buffering and safety net, ECTB does currently not concern itself very much with planning strategy or stress testing. They do however recognize the need for planning for these types of things in the future. The participant mentions wanting to expand the board in the future, as well as seeing the importance of planning strategy when implementing larger projects. One solution that was offered is potentially fusing with other smaller cooperatives in the future, pooling resources and members, as well as eliminating difficulties regarding finding new board members. Risk awareness and communication is also currently present within the cooperative. They mention having risk assessments as well, but do reiterate that this is more applicable when the cooperative will start working on larger projects.

4.4.12. Energypoort Peelland

Planning strategy does receive plenty attention within Energyport Peelland, seeing as they actively are taking strategic steps towards their ultimate goal: utilizing the waste streams. There is however no real attention towards stress testing. And even though the participant did acknowledge that this was something that should receive some attention in the future, they also stated that none of the board members had any intention of quitting anytime soon, so that there was no real necessity or pressure to make those plans as of right now. The cooperative seems to be aware of certain risks, but also states that they have enough financial resources for it to not really matter.

4.4.13. Zummere Power

Regarding buffering and safety net, Zummere power seems to try to incorporate planning strategy within the cooperative. The main focus within this area seems to lie on acquiring new members. This is subsequently one of the main challenges the cooperative currently faces according to the participant. Not only finding more active members, but also finding members that are in the younger segment of society, which is something that is currently not really happening. Furthermore, Zummere power tries to plan for the fact that most of the active members and the board of the cooperative are currently a bit older, and may encounter problems regarding health in the future. It is however mentioned that they do not really have any structured strategies or plans in place, even though they are aware of the problem. Risk awareness and communication is something that is currently not addressed in a detailed matter, but it is suspected that this will come into play in the future, when the cooperative will start working on larger projects.

4.4.14. Zeeuwind

Zeeuwind does appear to concern itself a lot with strategic decisions and planning for the future. This is not surprising considering the age and the level of professionality of the cooperative. They try to actively map as much of the risks and uncertainties as possible, and have a biweekly consultation specifically to that end. One of the risks that was investigated is the decline of the amount of wind in general, which could potentially prove to be a risk in the future. They are also

trying to anticipate energy demands and prices, and are working with the technical university in Delft to see if there is any way to make predictions. There are also plans in place which enable the cooperative to keep working in times of uncertainty, but the participant does not really anticipate ever needing them, stating that the world will keep needing electricity, which will in term enable them to exist.

4.4.15. Energiepioniers

Energiepioniers are currently trying to plan for potential vulnerabilities. One of those main vulnerabilities is the fact that large scale sustainable energy is already in place in large parts of the Noordoostpolder, the area in which the cooperative operates. Even though the participant identifies that as positive, they do state that it could mean that there are less opportunities for the cooperative to expand. One more problem is the fact that citizens in the Noordoostpolder generally do not really have a positive association or experience with windmill-parks, which also can provide problems. The cooperative is also trying to plan for the future, in case board members step down, and are making concrete plans on how to proceed and fill the gaps. Direct risk assessment is also in place. The focus lies on both potential risks for the cooperative, as well as properly communicating risks towards members.

4.4.16. EMEC

EMEC has been planning for future uncertainties and vulnerabilities, mostly those that relate to projects. There are however no concrete plans in place to account for vulnerabilities within the cooperative itself. Risks are properly assessed and communicated, due to one of the board members having experience with project management in the construction business. The proper insurance policies are also in place, and on individual projects communication and agreements about certain risks are being made a priority as well. The cooperative has had problems in the past regarding the sudden departure of board members, and this is something that they actively try to plan for in the future.

4.4.17. Concluding remarks regarding buffering and safety net

Buffering and safety net appears to not be a really big priority to many of the cooperatives. Most cooperatives seem to be aware of straight-forward risks and are actively working on mitigating and communicating those risks. Planning strategy is a bit less popular, with about half of the cooperatives actively engaging. Stress testing plans however, or "*processes that enable the organisation to continue operating under increasing demands and uncertainty"* seem to be less in favour, with only a few cooperatives engaging at all. It should however be noted, that for small cooperatives who are often lacking resources, both human and financial, stress testing plans as well as planning strategy in general, are often more of a luxury than a necessity. When the main priority is keeping the cooperative up and running, as well as acquiring resources and new members, planning for uncertainties or for the future in general might feel a bit redundant. This is a shame however, because especially these small cooperatives are often less resilient due to the lack of resources, and therefore are more vulnerable, and as a result have an increased need for these plans as

4.5. Organisational structure

Organisational structure						
	Fiscal transparancy	**Roles and responsibilities**	**Situation monitoring and reporting**	**Decision making processes**	**Organisational learning**	**Improvisation**
	Open written and verbal communication about business decisions and regular meetings that communicate the fiscal status of the organisational operations	*Roles and responsibilities are clear and well-defined.*	*Processes of ongoing monitoring and reporting are present within the organisation.*	*Decision making processes are transparent and well-structured.*	*There is an ability to learn from previous challenges and adapt to future challenges.*	*The organisation is able to adjust to change on an ongoing basis, and employees are encouraged to improvise when necessary.*
Hilverzon	++	-	++	++	+	+
Powered by Hattem	++	-	-	++	+	--
Rijn en IJssel	++	+	+	++	+	--
Heuvelrug Energie	+	++	+	++	--	--
Lochem Energie	++	+	-	++	++	-
Duurzaam Nijeveen	++	-	++	+	+	-
Duurzaam Riel en Goirle	+	-	+	++	+	--
Zonnecoöperatie West-Friesland	++	--	--	++	-	+
Westfriese Windmolen coöperatie	++	++	+	++	+	--
Deelstroom Delft	++	+	++	++	-	++
ECTB	+	-	--	++	--	--

Energyport Peelland	**++**	**+**	**+**	**++**	**++**	**++**
Zummere power	**+**	**++**	**-**	**++**	**-**	**--**
Zeeuwind	**++**	**++**	**++**	**++**	**++**	**--**
Energiepioniers	**+**	**+**	**-**	**++**	**--**	**--**
EMEC	**++**	**-**	**-**	**++**	**+**	**--**

Table 10: Presence of each of the factors contributing to resilience within organisational structure within the cooperatives.

4.5.1. Hilverzon

The organisational structure within Hilverzon appears to be quite well established. The decision-making processes are based upon the statutes and internal guidelines, and are often referred to when discussions threaten to run astray. The participant also underlines the importance of having more structured decision making processes as the cooperative grows. Hilverzon has a general board, which concerns itself with day-to-day matters. The board is overseen by a supervisory board to ensure transparency and proper procedures. The final say in most matters is reserved for the general member meetings, in which they decide regarding budgets and general policy. The daily board does however retain a large autonomy, which is necessary to shorten certain processes regarding projects. They aim to stay 100% transparent during these processes, so that members can follow the process, ensuring fiscal transparency. Everything of note is put online for members to see, and if they want any more information they can come to the office and even take a look into the books. On top of that, monitoring and reporting also has a special place within the cooperative. Hilverzon has a yearly report and sends newsletters to members quite regularly. Members can furthermore use an app to monitor specific energy yields from certain projects. Regarding roles and responsibilities, the participant mentions still having some problems with those. There are some double roles within the cooperative, which is not desirable when wanting to ensure transparency and accountability. They are working actively to end all double roles as soon as possible. Besides that, people are given the space to develop their own responsibilities, according to the participant. Sometimes that works out fine, but other times it has been the source of some problems within the board, when it turned out that someone was not really fitting well within the position. It is also quite clear that the cooperative utilizes organisational learning. The participant seemed to have a clear grasp of the problems and challenges that the cooperative has faced in the past, as well as how to take those lessons into the future. It also seems that the cooperative is adequately able to improvise where necessary.

4.5.2. Powered by Hattem

The decision-making processes within Powered by Hattem appear to be quite clearly established. They have formulated clear internal regulations and statutes, which states which decisions have to go through the general member meetings. Besides those, there is a board of three people whom concern themselves with day-to-day matters, take business decisions, and answer for those to the general members. They have received special clearance from the members take certain decisions within certain boundaries without having to convene with al the members in a general member meeting, which should leave some room to take quicker decisions and establish projects more easily. All bigger decisions still have to be run by the general members. Regarding fiscal transparency, those decisions are accessible to members, and if they have any further inquiries they can do so by email. There is some monitoring of the amount of electricity that is generated per day or project. As has been the case within more cooperatives, Powered by Hattem also divides their roles and responsibilities based on prior experience and interests. It does also seem like the cooperative has an evaluative approach towards past challenges, and utilizes organisational learning to learn from those. It was mentioned that the cooperative has had some problems recruiting members and selling certificates to existing projects, and the participant

seemed to imply that the cooperative actively assess such challenges and identifies potential interventions. Improvisation or flexibility did not seem to receive a lot of attention within the cooperative.

4.5.3. Rijn en Ijssel

Roles and responsibilities within Rijn en IJssel are divided according to abilities and expertise of the member in question. If someone initiates a project, it does not necessarily mean that the same person will run point on that project. The decision-making within Rijn en IJssel is left to the board until an certain investment-threshold, the participant estimated it being 100.000 euro's, but was not entirely sure. Anything above or besides that should be left to a vote for the members at the general members meeting. The prefaces of a project are also left to the board autonomically. All decisions are eventually communicated to the members at the general member meetings, both at the meeting itself and using documents that are available to members beforehand. There is also a financial committee that oversees all financial decisions, and a yearly report on how the cooperative is doing. The cooperative seems to be aware of its challenges and ways to learn from them, and has strategic sessions to discuss certain problems. They often evaluate what can be learned from previous problems and how those lessons can be utilized in the future. Organisational learning seems therefore present within the cooperative. Improvisation seems to not be consciously promoted.

4.5.4. Heuvelrug Energie

Heuvelrug Energie has a structure that facilitates multiple working groups coming together every two months to discuss community solar projects. Whenever such a project would succeed, that project would then be brought under another separate cooperative. This has been decided to make sure that Heuvelrug Energie would be able to focus on its core principles, while still facilitating projects in the area. The cooperative also has a board, which has to answer to the general members, mainly regarding financial decisions. Regarding fiscal transparency and situation monitoring and reporting, members can read up on the state and progress of the cooperative in yearly reports. Roles and responsibilities are divided according to prior experience as well as interests, and often just "happens" according to the participant. Members are divided into working groups, each of which has their own area of interest or project. The working groups answer to the board and the general members. Organisational learning as well as improvisation does not seem to receive a lot of attention within Heuvelrug Energie. This is something that could be improved upon.

4.5.5. Lochem Energie

Lochem Energie has a quite well-oiled decision-making process, with regular general member meetings following a set structure. All formal decisions are taken by the general members. Besides that, there is a board that exercises day-to-day matters, a board that addresses more common matters, as well as several working groups that have different areas of interests. Lastly there is a financial committee that oversees the financial status of the cooperative, as well as an external accountant. Decisions are communicated towards the members during the general member meetings, as well as using newsletters. (Fiscal) transparency is an important point within the

cooperative according to the participant. Organisational learning also seems to receive adequate attention within Lochem Energie. It is clear that the cooperative ponders upon past challenges, and tries to make concrete plans on how to tackle those challenges in the future. They have strategical sessions in which these subjects are discussed, and seem to often reflect on the progress the cooperative is making. The cooperative does not seem to have the need to improvise often.

4.5.6. Duurzaam Nijeveen

The cooperative has four board members, overseeing daily or weekly tasks and making all business decisions. Officially, a three to one vote would be enough to make a decision, but unofficially, the participant mentioned that they prefer the vote being un-anonymous, and are otherwise inclined to keep exploring alternatives. The general members provide a mandate to the board during the general member meeting, allowing them to independently make decisions regarding the cooperative. At the end of the year the board then has to account for the decisions they have made during that year towards the members. There is also a advisory board that advises the daily board. When asked about transparency, the participant mentioned considering it of utmost importance. They also mentioned the members being generally disinterested, and not really using the opportunities they have to check on the board. So situation monitoring is in place, however it is very seldom utilized by members. There is no formal process for appointing roles and responsibilities, but it is mostly based upon feelings as well as the interest of the person in question. Organisational learning also seems to be present within the cooperative, allowing them to learn from challenges in their direct environment, such as less than ideal contacts with the municipality. Improvisation is sometimes utilized when necessary, but does not take a leading role.

4.5.7. Duurzaam Riel en Goirle

The roles and responsibilities within Riel and Goirle are mainly divided due to willingness. If someone is, pro-active, able and willing to commit to a task, that person will most often end up being responsible for said task. There seems to be no shortage of volunteers willing to take on roles. When talking about decision-making processes, Riel en Goirle has the general member meetings, the cooperative itself and a foundation called Duurzaam Gewonnen (Sustainably Sourced). The foundation is more or less a commercially structured business, in which two board members make all the decisions. This structure makes it easier to develop projects. Whenever a project is up and running, it will be brought in under the umbrella of the cooperative. This has as a second function that there is little risk for the cooperative itself. Members are informed of decisions at the general member meetings and via a newsletter. Besides that, projects can be monitored using an app. When looking at organisational learning, Riel and Goirle does seem to have a good grasp of how to reflect on past challenges, and use those going forward into the future. Improvisation does not really seem to receive any special attention.

4.5.8. Zonnecoöperatie West-Friesland

Roles and respponsibilties are not really clearly defined within the cooperative. Board-members often find themselves having to extra work besides their assigned tasks, and are often doing a lot

of project-work instead of actually leading the cooperative. Decision-making processes go mainly through the board, with the approval of the members in the general members meetings, which takes place once or twice a year. Decisions are communicated using a newsletter and the website. Fiscal transparency appears to be high. Organisational learning does concern the cooperative, and they seem to reflect on past challenges regularly. There do not seem to be a lot of concrete plans or sessions on how to learn from these challenges however. The cooperative seems to be adequately able to improvise.

4.5.9. Westfriese Windmolen coöperatie

Roles and responsibilities are very clearly defined within the cooperative. Board-members are able to stay within their assigned tasks, and have little to no extra work. The organisational struture in general appears to be very organised and professionally arranged. There are general member meetings in which a yearly report is presented to the members, and in which the members can voice their opinion on certain matters. The cooperative does not have a regular newsletter, but does have a website to communicate decisions to members. Organisational learning is mainly focussed on how to deal with resistance towards windmill parks from the citizens, as that is the main challenge the cooperative continuously faces.

4.5.10. Deelstroom Delft

When looking at organisational structure, the participant affirmed that all investment decisions first go through the general member meetings. The rest of the decision-making processes mainly go through the board. All business decisions are first consulted within a core team, which also has the final say on whether the decision should go through or not. The aim is to be as transparent as possible, and to have a layered decision-making process in general. Regarding fiscal transparency, they reiterate that notion. It is stated that members have open and easy access to the information regarding business decision, and that every now and then there is a newsletter to inform members of progress within the cooperative. There is furthermore monitoring in place to keep track of the amount of KWh that has been collected, as well as which panels are bringing in more or less electricity. When asked about roles and responsibilities, Deelstroom Delft mentioned the process of dividing those roles and responsibilities as being quite organic. They mentioned that it is often the case that people have different strengths or interested, and that those are often leading for the function they have within the cooperative. The cooperative does not seem to be actively working on organisational learning. It has been shortly mentioned that the cooperative has had tightened its processes regarding building supervision after problems with the labour inspection during the first project, but other than that it did not really seem to occur. Deelstroom Delft seemed to pride itself more on its ability to be flexible and to improvise, something that can also be deemed very valuable.

4.5.11. ECTB

The organisational structure of ECTB relies mainly on the three board members, who convene once every 4 or 5 weeks on average, and once every 2 weeks before general member meetings. The members grant the board permission on their general and financial policies during this meeting, which occurs once a year. The members have the opportunity to ask questions during

this meeting, but there seems to be little to no contact regarding decisions outside of this meeting. Fiscal transparency does therefore seem to be accurate, but not one of the focal points. When asked about the division of roles and responsibilities, the participant described a rather organic process, and did not really provide many details as to how these responsibilities are shaped or communicated. When asked about organisational learning, situation monitoring or improvisation, the answers were all in the same direction: it is something that should be considered, but it is not one of the priorities within the cooperative as of right now. This is not very surprising for a rather young cooperative, but these are subjects that definitely should be considered in the future.

4.5.12. Energypoort Peelland

Regarding decision-making processes, the cooperative generally installs new boards to oversee established projects, beside the three-headed board that spearheaded the projects in general. There is furthermore a supervisory board, to ensue fiscal transparency. All answer to the members via the general member meetings, who are generally critical, as they should be according to the participant. They are generally very transparent regarding business decisions, and communicate decisions towards the members using newsletter. Frequent monitoring or reporting does not seem to be in place yet. Organisational learning does seem to be utilized, as the participant briefly mentioned a failed project from the past, and seemed to be generally very reflective of what exactly went wrong. Roles and responsibilities are divided according to expertise and ability, and seem to be defined in a clear and structured manner. The cooperative also seems to have a tendency to improvise, something that has yielded them positive results in the past.

4.5.13. Zummere Power

Roles and responsibilities within Zummere Power are being registered in a clear and distinct manner, to ensure everyone knows what is expected of them. It is not really clear however how responsibilities and roles are divided in the first place. Decision-making processes go through the general member meetings, which are being held twice a year. Besides that, there is a daily board which convenes once every five weeks. Decisions are being communicated to members through yearly reports, as well as the website and newsletters. Monitoring and reporting is not really present within the cooperative as of now. There were some problems regarding communication during a past project, after which members prompted the board to be more forthcoming and clear in its communication. This is something that has been taken into account, and can be seen as an example of organisational learning. The participant furthermore mentions wanting to professionalise the cooperative in other ways as well, and is exploring ways to do so. It did however seem like no concrete plans were made yet.

4.5.14. Zeeuwind

When looking at organisational structure, Zeeuwind runs and feels like a “regular” business. Decision-making processes are very transparent and structured, roles and responsibilities are divided and defined clearly, and fiscal transparency seems to be very high. There is a director of the board which has to answer to a supervisory board, there is a financial committee that oversees all financial decisions, and finally there are the general member meetings in which members have

the final say. Communication to members is being done through newsletters, a magazine and sometimes also workshops about more specific subjects. Organisational learning is more or less a continuous process within the cooperative, enabling them to evaluate and correct for past challenges.

4.5.15. Energiepioniers

Roles and responsibilities within the cooperative are mostly divided according to competences. People are loosely assessed on their qualities, and that, combined with the available time one has, is the leading factor to divide roles and responsibilities. Regarding decision-making processes, all operational decisions are made by the board, while the yearly plan and budget are put up to a vote by the members in the general member meetings. Fiscal transparency is adequate, and communication mostly occurs through newsletters, the website and the yearly reports. Quantitative monitoring concerning energy yields does happen within the cooperative, but frequent management reports are not included. Improvisation was previously encouraged, but the cooperative is trying to consciously cut down on that, as it was seen as risky.

4.5.16. EMEC

The cooperative has general member meetings twice a year, in which the board offers ideas, and the members can then discuss and vote. Decision-making processes appear to be transparent and straightforward. Decisions are communicated towards the members using yearly reports and general member meetings. Monitoring and reporting is utilized, but only to monitor energy yield in future projects. Roles and responsibilities are divided according to interest and willingness. Organisational learning is utilized as well, and after certain projects or discussions they make a point to sit down and evaluate points of improvement. They also aim to learn from past challenges, such as the instance of the sudden departure of board members as was mentioned before.

4.5.17. Concluding remarks regarding organisational structure

When looking at organisational structure, it becomes very apparent that both decision-making processes as well as fiscal transparency are in very good shape within most cooperatives. This means that decision-making processes are generally well-structured, and that communication about those decisions and the fiscal state of the cooperative is generally very transparent. Seeing as these are community oriented organisations run by and for the local community, this is both desirable and expected. When the members are the highest power regarding decision-making, as is the case for most of these cooperatives, boards cannot do otherwise but be transparent about their decisions, as they have to answer to the members at the next meeting. Situation monitoring and reporting is in okay shape in most cooperatives, with almost every cooperative at least having some form of newsletter and a yearly report. Something that is in varying shape is the definition of roles and responsibilities. In some of the cooperatives, roles are defined on an ongoing basis, leaving room for misinterpretation and errors. Furthermore, some cooperatives still have members in double roles, meaning that it is possible that the same person that initiates a project also has final approval, or that someone who initially draws up invoices also checks and approves

them. This is really not desirable, and leaves room for errors as well as fraud. Organisational learning also varies, with the same cooperatives that are concerned with planning strategy in the previous section also incorporating some kind of organisational learning in the cooperative. Improvisation is not really actively encouraged within a lot of cooperatives, but it does appear that some of them fall back on it subconsciously.

4.6. Organisational Values

Organisational values						
	Alignment and prioritization	**Framing of organisational objectives**	**Interaction and synergies**	**Innovation and creativity**	**Leadership**	**Employee engagement**
	Strong internal alignment is established, creating a common purpose.	*The organisational objectives are clearly and unambiguously framed.*	*There is a strong interdependence, enabling different parts of the organisation to cooperate effectively.*	*Employees are encouraged to utilize innovative and creative approaches and to operate in new ways to work around problems.*	*Leadership is mission focused and collaborative, and provides good management and decision making in times of crises.*	*Engagement of employees in a manner that encourages understanding and involvement within the organisation.*
Hilverzon	-	++	-	--	+	+
Powered by Hattem	+	++	--	++	--	+
Rijn en IJssel	++	+	-	+	++	++
Heuvelrug Energie	-	-	++	++	--	-
Lochem Energie	++	++	++	--	++	++
Duurzaam Nijeveen	-	--	-	--	++	-
Duurzaam Riel en Goirle	-	-	--	--	--	--
Zonnecoöperatie West-Friesland	-	-	-	-	--	-
Westfriese Windmolen coöperatie	+	--	+	-	-	-
Deelstroom Delft	++	++	++	++	++	-
ECTB	+	-	+	++	-	+

Energyport Peelland	**++**	**-**	**+**	**++**	**-**	**+**
Zummere power	**+**	**++**	**+**	**--**	**++**	**+**
Zeeuwind	**++**	**++**	**++**	**-**	**-**	**++**
Energiepioniers	**++**	**++**	**++**	**-**	**+**	**++**
EMEC	**++**	**-**	**--**	**--**	**-**	**-**

Table 11: Presence of each of the factors contributing to resilience within organisational values within the cooperatives.

4.6.1. Hilverzon

The organisational objectives of Hilverzon are unambiguously framed in the statutes of the cooperative, leaving no room for doubts or misinterpretation. Alignment and prioritization is a bit more complicated, as some people within the cooperative want to adhere more strictly to previously made plans, while others advocate for a more flexible approach. That does sometimes lead to tension according to the participant, mainly between the people who want a more organisational approach versus the people who have a more entrepreneurial approach. They do however mention that in the end they always figure it out, and that it seldom leads to actual conflict. Engagement is often very high in some members and less in others, leaving room for questions such as: do you get paid more if you put in more effort? Innovation and creativity is something the cooperative rather leaves to other people. Leadership is mainly facilitating, trying to unite both the organisational and entrepreneurial spirits within the cooperative, as well as getting everyone together at one table and assess where the chances and the obstacles lie.

4.6.2. Powered by Hattem

Powered by Hattem defines its main organisational objective as attending local citizens on the necessity of sustainable energy, and Hattem being energy neutral by 2030. They do however note that especially the second part of the objective might be hard to reach. Alignment and prioritization seems to be in order, but does not receive any special attention. Engagement of volunteers appears to be good, with 15 people being intensively and actively involved within the cooperative. Furthermore, more than 40% of members generally show up to general member meetings, which is slightly higher than average. The participant does note that most members that are actively involved also often have a busy work or home life, making it somethings difficult to find the balance. Also interesting is the stark contrast between more active and less active members. The participant stated that he has often implored people to step up and help out during general member meetings whenever someone asked why this or that was not yet investigated. The reactions however are often not very enthusiastic, and people are generally not feeling inclined to step up. Regarding innovative approaches, Powered by Hattem seems to be more of a follower than a leader. Lastly, when looking at leadership, the participant describes themselves as being a initiator who really takes that extra mile, but is also able to properly delegate. They equate their leadership style to running a small company, and mainly ensuring that the whole cooperative is running smoothly.

4.6.3. Rijn en Ijssel

Rijn en IJssel energie defines its organisational objective as “providing as much sustainable energy as possible, in a way that ensures energy is accessible to everyone in the area, including lower income families”. They have working groups to develop strategies to achieve this goal, and there appears to be alignment regarding organisational objectives within the cooperative. Engagement has always been rather high, but the participant mentions seeing more variety in volunteers as of late. They mention that this might be due to the fact that the cooperative has launched more cooperative projects lately, in which members are easily able to participate. The cooperative also tries to promote interaction between the volunteers as well as the working groups, seeing as right

now it feels more like different “islands” instead of one integrated whole. There is also attention for innovation and creativity, especially innovations that allow members to participate. When asked about leadership, the participant described it as being very cooperative and community-oriented, with some people being more goal-oriented. This however was seen as a positive, because the differences allow for discussions, and fosters an interesting combination.

4.6.4. Heuvelrug Energie

The organisational objective of Heuvelrug Energie is not always clear and well-defined. The participant initially describes the goals as being: giving people the common goal and drive to strive towards a more sustainable village or city. It is however also stated that the cooperative is unsure of its role in the future, and actually sees itself more as a association or club instead of a standard cooperative. And even though there is plenty alignment within the cooperative, it does look like there is a slow shift in thinking and in formulating the cooperatives goals and objectives. Engagement of members is something that is rather difficult at times, with not enough people wanting to assume actives roles within the cooperative. Members do seem to engage when coming to general member meetings and informative evenings, but do not often want to assume any actual roles themselves. There is however a lot of interaction between the different working groups, which can be considered quite positive. There is also room for creative and innovative approaches, such as the sustainable top 100 Heuvelrug Energie organised to attract more popularity and active members. When asked about leadership, it became apparent that there have been some troubles in the past with chairpersons within the board, suggesting either conflicting leadership-styles or a lack of alignment in general. The current secretary seems to assume more of a dominant leadership role, even though that is actually not their position. This might also contribute to conflicts in the future.

4.6.5. Lochem Energie

The framing of the organisational objective within Lochem Energie is quite straightforward: providing as much sustainable energy as possible within the municipality of Lochem. The objectives are clearly defined within the statutes, ensuring agreement on the ways in which these objectives will be achieved. These clear-defined statutes also ensure proper alignment and prioritization within the cooperative. The board is described as being strong and stable, and the different boards, committees and working groups are said to rarely be in conflict. Engagement within the cooperative is stated as being rather high, with especially a good amount of members attending general member meetings. Members furthermore often volunteer or participate in working groups. Innovation is not something that is generally explored a lot. The leadership of the chairperson is described as being a real “director”, who knows how to guide processes, how to steer people but also when to give people space. They mention the chairperson solving a small crisis concerning some volunteers in a calm and constructive manner.

4.6.6. Duurzaam Nijeveen

Nijeveen does not appear to have a clearly framed organisational objective. Seeing as the cooperative is fairly young and not running any actual projects right now, that is not really surprising. It should however be one of the points for consideration going into the future. The

participant does however state that there is alignment within the board, but less so within and between the different working groups. Engagement is present but not extensive, and mainly limits itself to the previously mentioned working groups as well as the general member meetings. regarding innovation, the participant mentions not wanting to take a leading role, due to time and resource constraints. When asked to describe the leadership, the participant mentioned the chairperson being a person with a lot of ideas, but also being able to listen and give people the space to develop. They are able to connect people and have a feeling for content and is very pragmatic when necessary.

4.6.7. Duurzaam Riel en Goirle

The main organisational objective of Riel and Goirle is described as “using 0% fossil fuels”. With the objective being mainly derived from the Paris accords, and the policy goals of the municipality. The participant did however mention that with the current share of renewable energy, this goals was not really realistic. The cooperative is mostly goal-oriented, and the participant mentioned being straight-forward. Being member-friendly, and making sustainability easy and less complicated seems to be the main priority. These goals have not really been framed or nailed down properly, but according to the participant: “they knew what had to be done”. Members are generally not very much engaged in the cooperative, as membership is often seen as something transactional by most members. Regarding innovation and creativity, the main objective is innovating the current process. It is mentioned that it should be very easy and uncomplicated to have solar panels on your roof as a member, and that the process of doing so should be streamlined. The participant mentioned not wanting to be “inventors”, but wanting to focus more on making existing concepts more manageable. This also ties into the leadership of the cooperative. The participant mentions being an entrepreneur in his day-to-day life, and aims to be applying that concept to the cooperative as well. They describe themselves as being driven and pro-active.

4.6.8. Zonnecoöperatie West-Friesland

The main organisational objective within the cooperative is defined as “using solar panels on roofs to generate sustainable energy”. Besides that, there is not really a clearly framed goal or organisational objective. Members are moderately engaged according to the participant, but do not really offer a lot of new ideas or initiatives. Innovation and creativity is not one of the priorities within the cooperative. Leadership is also a bit of a difficult point. There has recently been a switch in chairperson, with the new chair having another obligation aside from the one within the cooperative. On top of that, governing the cooperative takes quite a lot of time at the moment, resulting in the fact that the chair has a lot of extra work, leaving less time to discuss strategies and future plans.

4.6.9. Westfriese Windmolen coöperatie

The cooperative does not really have a clearly framed organisational objective or goal, aside from generating sustainable energy from wind. They do often discuss strategies and short-term objectives during meetings, but are more or less using possibilities that present themselves and seem right at the time. Members are engaged within the cooperative, but that mostly limits itself

to general member meetings. Aside from that, there is little to no pro-active action from members. Innovation and creativity is discussed every now and then, but does not appear to have a special role within the cooperative right now. There are however plans to take a more innovative approach in the future. The chairperson of the cooperative leads in a democratic and "easy" manner, according to the participant.

4.6.10. Deelstroom Delft

The framing of the organisational objectives seems to be quite clear. The participant describes the objective as being: "not only being an administrative vehicle to enable projects and divide returns, but also to exchange knowledge and tips regarding sustainability in our own environment". The goals is mainly to help people establish their role within sustainability and provide clear and easy ways to implement a more sustainable home. The alignment on these objective seems to be un-anonymous, but is difficult to say just from the interview. Engagement within the cooperative seems to be a point of difficulty. At this point in time there are several people that are intensively involved within the cooperative, but the participant suspects that that would be more difficult to keep up when the cooperative will be growing, because extensive assistance would be necessary. Interaction between members that are actively involved seems to be harmonious, and new and innovative ways to explore problems is encouraged, though the participant had little to say regarding the subject. Lastly, when looking at the leadership within the cooperative, it is being described as informal and facilitating, enabling the members to find and use their own strengths.

4.6.11. ECTB

ECTB states its main objective as: "as much solar- and wind-energy as possible by 2030". It is furthermore stated that they have a secondary aim to invest as much of the returns as possible back into the local community, by utilizing local entrepreneurs for instance. There is sufficient alignment within the board and cooperative regarding the objectives. It is stated that this is relatively easy with just three board members, and the cooperation is described as good. Engagement and interaction in general is okay but does not seem to be a point of focus within the cooperative. They have contact with several working groups advising the board on a regular basis. Innovation and creativity plays a large role within the cooperative, and it is mentioned that they have several contacts with the university of applied sciences in the area regarding new approaches towards sustainable energy, especially regarding the storage of energy. The leadership within ECTB is described as quite "close", which is according to the participant to be expected within such a small group. They describe the leadership as being within the lines and according to the rules.

4.6.12. Energypoort Peelland

Organisational objectives within Energy Port Peelland seem to be clear on the one hand, but not really properly framed on the other. The main goal: establishing projects to utilize waste-streams, seems very clear. However due to the cooperatives side-projects, it might be a bit ambiguous how and when exactly to realise that goal. Alignment within the cooperative appears to be high, the board shares a vision, and members generally seem to agree. Members also seem to be generally

engaged and invested in an active manner. Proper and effective communication seems to be one of the focus points for the participant. When asked about leadership, they mention being a strong leader who can motivate, persuade and involve people. Innovative and creative ways to handle problems seem to be at the core of the cooperative. The participant mentions approaching a citizen who resisted their solar project personally, and asking him what exactly he was worried about. Interaction within the cooperative seems to be adequate, and communication appears to be efficient as well.

4.6.13. Zummere Power

Zummere power has had its organisational objectives drawn up by a notary, so that it would be clear and indisputable. Its most important goal is to play a role in making Someren more sustainable. There seems to be enough alignment within the organisation regarding this goal. When looking at engagement of members, there are about 15 to 20 people who are very active within the cooperative. Besides that, engagement of general members is not very high. They do have about 35 people coming to every general member meeting, and combine those meetings with an “energy cafe” to draw in more people. There is certainly interaction between members and working groups, but again, this depends on the few members that are already currently actively engaged. Regarding innovation and creativity, the participant mentions being more or less followers. They do discuss new and innovative techniques within the cooperative, and do inform the members of those, but are not really willing or able to take on any innovations themselves. The cooperative follows new developments, and suspects that innovations will play a large role in the future of cooperatives in general. When asked about leadership, the participant mentioned not having a very “traditional” leadership-style as can be seen in regular management functions, but instead being more focussed on social interaction and adding value to the cooperative.

4.6.14. Zeeuwind

The organisational objective of Zeeuwind can be described as: “as sustainable a Zeeland as possible”. The objectives are formulated according to strategic sessions with the supervisory board, and are written down in yearly reports. Specific yearly as well as long-term goals are formulated, and members get the change to voice their opinion about these goals during general member meetings. Engagement is rather high, with about 150 to 200 members being actively involved within the cooperative. Most of these people have been involved for a longer period of time, but every now and then new people become involved as well. Innovation and creativity is mainly given shape by finding new ways to enable citizens to participate. Leadership within the cooperative seems to be very organised, structured and business-like.

4.6.15. Energiepioniers

According to the participant, alignment within the cooperative is very high. There is a sense of a common goal, which is also clearly defined on the website. The participant mentioned that alignment did not always used to be this high, and that he made changes to ensure more alignment, interaction and synergy as well. They introduced weekly meetings, and encouraged

people to voice their opinion and interact. The organisational objective is broader than just sustainable energy in the traditional sense, and there is a strong focus on participation and education of the community as well. Member engagement is also pretty high, and there are plenty volunteers. Regarding leadership, the participant mentions having an approach focussed on development, communication and interaction, introducing the weekly meetings that were mentioned previously. Innovation and creativity is interesting to the cooperative, but the participant thinks that it is important to discern what is actually useful innovation and what is not.

4.6.16. EMEC

There is plenty of regard for the opinions and priorities of members, something that is taken into account when planning for the future. This ensures a high alignment within the cooperative, and promotes member engagement as well. Members that do engage are generally active, but there are not a lot of members that actively participate or engage. When asked about leadership, the participant mentions initially being worried that they would make mistakes that could have serious consequences for the cooperative. As a result, the leadership-style can generally be described as cautious and careful. They furthermore describe being focussed on keeping a generally overview and keeping up with social contacts. Innovation and creativity are not really something the cooperative concerns themselves with.

4.6.17. Concluding remarks regarding organisational values

Organisational values cover a wide range of factors, and has shown varying results within different cooperatives, as can be seen above. Organisational objectives and alignment and prioritization are in good shape in most of the cooperatives, and often yield similar results. This can be due to the fact that when organisational objectives are un-ambiguously framed, it is easier for the cooperative to align itself internally, as well as decide upon priorities. There are however a few outliers here and there, who either have high alignment and prioritization and low framing of organisational objectives, or the other way around. It is possible that there is consensus on what kind of goals to achieve and how to frame them, but no agreement on how to get there. Or it can be the other way around. Some cooperative reported having a high internal alignment, but not having a clearly framed objective. They deemed it unnecessary, as things were going well anyway. Interaction and synergies and employee engagement yield similar results as well. This too is not really surprising, as more actively engaged members may have more inclination to positively interact and cooperate well. Innovation and creativity really appeared to be a bit polarizing. Some cooperatives reported finding innovation very important, while others have stated that they really do not see the necessity, or otherwise do not have the time or resources to concern themselves with it. The last factor that was assessed was leadership. While most cooperatives appeared to have someone in charge who was at least somewhat mission focused and collaborative, some have leaders that really lean the other way, and are more traditional in their leadership styles. An interesting notion however is that for all but one or two cooperatives, this more traditional leadership style seemed to work really well within the cooperative and its members.

4.7. Conclusion

When looking at the results for each of the groups of factors, there are a few things that stand out. Firstly, there is a large difference in results between the cooperatives. Some cooperatives, mostly the older and larger ones, are generally seeing a higher presence of factors that contribute to resilience, while the newer and smaller cooperatives have some more trouble. This is especially true for time-consuming factors, such as intensive cooperation, fostering relationships with industry, stress testing plans, risk awareness and communication, planning strategy and organisational learning. This is, while not surprising, also kind of risky. Especially stress testing plans, risk awareness and communication and planning strategy enable smaller cooperatives to tackle future challenges and vulnerabilities in a structured manner, and will help plan for uncertainties. Many of these smaller cooperatives do not have any mechanisms in place which would allow them to continue working if anything happens to the current board members. These cooperatives often heavily rely on said board members, and would be very vulnerable without them. Fostering more contacts with other cooperatives or within the industry is also important for these cooperatives, as they often do not possess the knowledge or resources they need yet. Contacts with other cooperatives is an accessible way to gain access to knowledge and expertise that would otherwise be difficult to find. This brings us to organisational learning as well. While somewhat time-consuming, it is vital for these smaller and younger cooperatives to actively evaluate past challenges. This will prevent them from making the same mistakes over and over again, and will enable them to adapt more easily towards future challenges.

This section aimed to answer the second and third research question: *What contributing factors and barriers for organisational resilience by local renewable energy organisations in the Netherlands can be found in practice?* And: *How can these factors be influenced to increase organisational resilience within local renewable energy organisations in the Netherlands?* Almost all of the contributing factors that were found in the literature could be found in practice. It is however the case that not all factors are present in an equal manner or quantity. Where the main focus in the literature regarding organisational resilience seemed to be on buffering and safety net as well as organisational structure, in practice those factors seemed not to be one of the main priorities. Cooperatives often mentioned being aware of the necessity for stress testing, planning strategy and risk awareness and communication, but said they just did not have the time or resources to concern themselves with it. Most did however mention that they would consider it in the future. Another insight is that there seems to be a large focus upon community reciprocity and stakeholder engagement for most cooperatives, more than in the literature. This might be explained due to the fact that more traditional organisations do not have as much interaction with their respective communities compared to renewable energy cooperatives.

5. Discussion and reflection

5.1. Introduction

The main aim of this research project was to make recommendations to local renewable energy organisations on how to increase organisational resilience by making an analysis of the drivers and barriers that contribute to organisational resilience in local renewable energy organisations. This chapter will shortly discuss some practical limitations to this research, the relationship with current literature and will offer suggestions for future research.

5.2. Limits to theory

The knowledge-gap that this thesis aims to address is the lack of scientific literature on organisational resilience within local renewable energy initiatives. This brings us to the first point of discussion regarding the theoretical framework: it can be argued that some of the characteristics of local renewable energy cooperatives may differ from those of more traditional organisations, especially when considering organisational structure. The cooperatives generally have a structure with a foundation or association which recognizes the members as the highest decision-making power. When looking at the theory on organisational resilience within more traditional organisations, this aspect is rarely covered. It could be potentially very interesting to explore if the different organisational structure that cooperatives generally have will make a large difference in resilience, and which factors mainly contribute to that difference. Something that also should have been taken into account and was not reflected in the literature are other context-factors regarding local policy, composition of local community and other geographical or context dependent factors. The reason that these have not been taken into account is because the current literature on organisational resilience did not reflect them. This is possibly also due to the fact that the literature largely focuses on organisations in the traditional sense, instead of local renewable energy cooperatives in particular. As the name already suggests, local renewable energy cooperatives are largely operating within the local area, and are largely dependent on local resources, stakeholders and conditions. When conducting further research, these should definitely be taken into account, and it would be especially interesting to examine how these cooperatives can potentially influence those factors.

5.3. Practical limitations

As has been discussed in chapter 3, it was initially intended for the cooperatives to be evenly spread out geographically, as was discussed in chapter 3. A lot of the contacted cooperatives however did not reply, which concludes in the interviews not being as evenly spread out geographically as was initially intended. For instance, no cooperative was interviewed in Friesland, even though the province has a large number of cooperatives. However due to the fact that there is a large variety in the cooperatives that was interviewed, being from different provinces in both urban and rural areas, this should not have serious implications for the results. Another limitation while collecting data was the fact that not all participants were familiar with the factors that were asked about, or they were just not interested or preoccupied with them. This means that some

factors in those interviews received more attention than others, which may result in a slight bias towards those factors. It should however be noted that those were reasonably spread out across different cooperatives, resulting in no factors receiving disproportional attention. Even more so, the fact that some cooperatives were more preoccupied with some factors than others, is a result in itself. The last limitation within data-collection is that the participants were asked to review their own cooperative. Even though the interview questions and factors were designed to assess the situation as objectively as possible, it is still possible that participant presented a skewed or prejudiced view of the cooperative. This could have been mitigated by interviewing two people within the cooperative separately, however this is very difficult to organize. For instance, participants were asked to assess the leadership style of the chair of director in the cooperative. However, in some cases, this meant that the participant had to explain and review their own leadership style. In some cases this may lead to an unreliable account, which should be kept in mind when assessing the results.

When looking at the results, it becomes furthermore clear that there is a large difference between the cooperatives that mainly focus on solar projects, and the cooperatives that focus on wind projects (Zeeuwind and Westfriese Windcoöperatie). Especially internal and external resource capabilities yielded a large difference, but the organisational structure was also often very different. The wind cooperatives mostly appeared to be way ahead of the curve, and were more organised and professional in general compared to the solar cooperatives. While this may have yielded useful recommendations and can prove to be an example for the solar cooperatives, it might have been more transparent to focus on either just wind or just solar energy.

5.4. Implications for further research

Since starting this thesis, no new studies regarding organisational resilience within local renewable energy cooperatives have been published. It is therefore not really possible to compare the findings to current literature. This thesis did however yield a few implications as well as suggestions for further research. One of the first things that should be noted when discussing the implications of the results for current and future research, is that the organisational characteristics of these local renewable energy cooperatives are incredibly diverse. Even though the aim of this research is to provide recommendations on how to improve organisational resilience within these cooperatives, it should be considered that there is no one or two measures that work for all these cooperatives collectively. As was noted in the limitations, other context-factors regarding local policy, composition of local community and other geographical or context dependent factors were not really taken into account, even though it is suspected that they may heavily influence the organisational resilience. Even more than traditional organisations, local renewable energy cooperatives and their organisational structure heavily rely on local characteristics. Further research should see if it is possible to explore these local characteristics, and if it is possible to assess just how much they contribute to resilience.

Another point of discussion is the organisational objective or goal of the local renewable energy cooperatives. While most cooperatives stated some form of: *"generating as much sustainable energy as possible"* others voiced their intention to stay small and community-oriented on purpose, and did deliberately turn down bigger projects to be able to focus on the community in a more purposeful manner. According to this thesis, this should not really matter

for organisational resilience within the cooperative, as long as the objective is clearly and unambiguously framed. It can however be argued that this too makes it more difficult to provide generalized recommendations. It furthermore may have some influence on community reciprocity and stakeholder engagement, as well as the management of internal and external resources. Further research could take a closer look at different types of organisational objectives and its effect on organisational resilience.

Lastly, as has been shortly stated within the previous section, data collection through interviews has a few limitations, and asking participants to review their own cooperative could possibly provide a skewed or prejudiced view of the cooperative. Furthermore, due to the small sample size (16 cooperatives) it is very difficult to generalize the results and make general conclusions about the whole population. Even though this kind of in-depth knowledge is vital to contribute to the body of scientific literature regarding organisational resilience within cooperative, future research could see if these results can be corroborated by a survey with a larger sample size. This would enable researchers to draw more generalized conclusions regarding organisational resilience within local renewable energy cooperatives.

6. Conclusion and recommendations

6.1. Conclusions

The main research question that this research project has aimed to answer is: *What are the main factors that contribute to organisational resilience within local renewable energy organisations in the Netherlands?* With the main objective being to generate more knowledge on organisational resilience within local renewable energy organisations in the Netherlands, and to make recommendations on the potential drivers and barriers for organisational resilience and how to utilize those drivers and barriers. Firstly, this research discussed the contributing factors to organisational resilience that could be found in the literature. This helped establish a conceptual and analytical model, on which the interview questions were based. Then 16 cooperatives were interviewed, to see what factors that contribute to resilience could be found in practice. Lastly, it was explored how these factors can be influenced. The main research question was split into three sub questions, one to be answered in the theoretical part of the research, and two others to be answered in the empirical part of this research, chapter four. The theoretical part of this research answered the following question:

What are the factors that according to literature contribute to organisational resilience within local renewable energy organisations?

The main factors contributing to organisational resilience were extracted from scientific literature, grouped together in: contextual factors, buffering and safety net, knowledge and resource capacity, organisational structure, and organisational values. These factors were subsequently used to generate interview questions for the second part of this research, which then answered the following question during the individual case-study results, or chapter four:

What contributing factors and barriers for organisational resilience by local renewable energy organisations in the Netherlands can be found in practice?

In chapter four, each of the local renewable energy cooperative and the factors contributing to organisational resilience as identified in the theoretical part were shortly discussed according to each of the five groups. Then the different cooperative were also compared in terms of organisational resilience using the five respective tables, and see if it was able to distinguish differences and similarities for the cooperatives in the factors that contribute to organisational resilience. This was discussed in chapter four as well, arriving at the third research question:

How can these factors be influenced to increase organisational resilience within local renewable energy organisations in the Netherlands?

In chapter four, comparison and differences between the cooperatives were identified, as well as what were the strong points (drivers) and the weak points (barriers). We will now aim to answer the main research question: *What are the main factors that contribute to organisational resilience within local renewable energy organisations in the Netherlands?* Firstly, it came to attention how

important community reciprocity and stakeholder engagement is. Many cooperatives either stated that they had excellent ties with the community, resulting in higher engagement of stakeholders. Those cooperatives also often had better internal and external resources management, and better employee engagement as well. Furthermore, most cooperatives underlined the importance of internal and external resource capabilities. When asked to identify the most important points that contributed or hindered the resilience of their cooperative, most answered the accessibility of resources, both financial and human. The factors within buffering and safety net, namely planning strategy, risk awareness and communication and stress testing plans, did generally not receive a lot of attention within a lot of the cooperatives, even though almost all recognized the necessity of those factors. This furthermore ties into roles and responsibilities. It is apparent that in some cooperatives, roles and responsibilities are not properly defined, leaving room for double roles and errors. If planning for future uncertainties is properly incorporated into the cooperative, and resources are managed effectively and transparently, this ambiguousness regarding roles and responsibilities might be no longer necessary and even eliminated. Organisational learning is also a factor that should receive more attention. It is however true that actively involving organisational learning within the cooperative, as is the case with planning strategy, risk awareness and communication and stress testing plans, is very time consuming, and may not be achievable to the smaller cooperatives yet.

6.2. Five recommendations for enhancing the resilience of local renewable energy cooperatives

The general aim of this research project was to make recommendations to local renewable energy organisations on how to increase organisational resilience by making an analysis of the drivers and barriers that contribute to organisational resilience in local renewable energy organisations. It should however be noted that due to the diverse nature of the interviewed cooperatives, there is no one-size-fits-all approach, and regarding these cooperatives, as was stated before in the discussion. However, the most important recommendations for cooperatives , in order of priority include:

- Cooperatives should as a first priority un-ambigously frame their organisational objective, to make sure that internal alignment is high, and no discussion regarding future strategies will take place in times of uncertainty. Decision-making processes should be clear, and the cooperative should be as fiscally transparent as possible at all times.
- Then cooperatives should focus on their relationships with the community and with stakeholders. Seeing as most resources for cooperatives derive from the local community and stakeholders, a reciprocal and effective relationship with them is vital.
- Cooperation with industry and other cooperatives can provide vital knowledge and expertise, not only regarding practical and technical know-how, but will also prevent new cooperatives from trying to reinvent answers to problems that have already been solved.
- Effective and efficient internal and external resource management is key when carrying the cooperative into the future. Without these resources, the board will have to take on

too much work, potentially exhausting them in the process, and leaving little room to actually govern the cooperative.

- When all these requirements are in place, cooperatives should make it a priority to provide buffering and safety net. Planning strategy, risk awareness and communication and stress testing plans receive far too little attention in most of the cooperatives, leaving them vulnerable for the future. One of the key vulnerabilities includes the lack of planning for future board members, potentially leaving the cooperative without leadership and direction. Seeing as especially most smaller cooperatives lean and depend on a few active board members, this should be considered of utmost importance.

Bibliography

Andersson, T., Cäker, M., Tengblad, S., Wickelgren, M. (2019). Building traits for organizational resilience through balancing organizational structures. *Scandinavian Journal of Management*, 35(1), pp 36–45.

Bauwens, T., Gotchev, B., Holstenkamp, L. (2015). What drives the development of community energy in Europe? The case of wind power cooperatives. *Energy Research & Social Science,* 13, pp 136-147.

Boon, F.P., Dieperink, C. (2014). Local civil society based renewable energy organisations in the Netherlands: Exploring the factors that stimulate their emergence and development. *Energy Policy journal*, 69, pp 297-307.

Boyd, E., Osbahr, H. (2010). Responses to climate change: Exploring organisational learning across internationally networked organisations for development. *Environmental Education Research.* 16, pp 629-643.

Brummer, V. (2018). Of expertise, social capital, and democracy: Assessing the organizational governance and decision-making in German Renewable Energy Cooperatives. *Energy Research & Social Science,* 37, pp 111-121.

CBS. (2019). Aandeel hernieuwbare energie naar 7,4 procent. Retrieved from https://www.cbs.nl/nl-nl/nieuws/2019/22/aandeel-hernieuwbare-energie-naar-7-4-procent on 03-07-2019.

Duurzaam dichtbij opwekken (2019). Retrieved from https://www.greenchoice.nl/zelf-opwekken/energiecooperaties/ on 04-02-2019.

Fry, R., Srivastva, S. (1992). Introduction: Continuity and change in organizational life. *Executive and organizational continuity: Managing the paradoxes of stability and change* (pp. 1-16). San Francisco: Jossey-Bass.

Gibson, C.A., Tarrant, M. (2010). A 'conceptual models' approach to organisational resilience: Gibson and tarrant discuss the range of inter-dependant factors needed to manage organisational resilience. *Australian Journal of Emergency Management*. 25, pp6-12.

Hasanov, M., Zuidema, C. (2018). The transformative power of self-organization: Towards a conceptual framework for understanding local energy initiatives in The Netherlands. *Energy Research & Social Science*, 37, pp 85-93.

HIER opgewekt (2017). Lokale energie monitor 2017: De jaarlijkse voortgangsrapportage van, voor en over energiecoöperaties en -collectieven in Nederland. Retrieved from https://www.hieropgewekt.nl/lokale-energie-monitor-2017 on xx-xx-xxx

HIER opgewekt (2018). Lokale energie monitor 2017: De jaarlijkse voortgangsrapportage van, voor en over energiecoöperaties en -collectieven in Nederland. Retrieved from: https://www.hieropgewekt.nl/uploads/inline/2018%20PDF%20Lokale%20Energie%20Monitor%20DEF02.pdf on 08-04-2019

Hoefsloot, L. (2015). Sterke statuten: voorbeeldstatuten voor startende coöperaties. Retrieved from https://www.hieropgewekt.nl/sites/default/files/u8/sterke_statuten_voor_startende_organisaties.pdf

Hufen, J.A.M., Koppenjan, J.F.M. (2015). Local renewable energy cooperatives: revolution in disguise? *Energy, Sustainability and Society*, 5(18).

IEA (2017). Tracking Clean Energy Progress 2017: Energy Technology Perspectives 2017 Excerpt Informing Energy Sector Transformations.

IPCC (2014). Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

Kijk regelmatig in de spiegel (2016). Retrieved from: https://www.hieropgewekt.nl/kennisdossiers/kijk-regelmatig-in-spiegel on 04-02-2019.

Kolb, D.G. (2003). Seeking Continuity Amidst Organizational Change A Storytelling Approach. *Journal of Management Inquiry*, 12(2), pp 180-183.

Kooij, H., Oteman, M., Veenman, S., Sperling, K., Magnusson, D., Palm, J., Hvelplund, F. (2018). Between grassroots and treetops: Community power and institutional dependence in the renewable energy sector in Denmark, Sweden and the Netherlands. *Energy Research & Social Science*, 37, pp 52-64.

Lee, A.V., Vargo J., Seville, E. (2013). Developing a Tool to Measure and Compare Organizations' Resilience. *Natural Hazards Review*. 14, pp 29-41.

Lewin, K. (1951). Field theory in social science: selected theoretical papers (Edited by Dorwin Cartwright.). Oxford, England: Harpers.

Lokale duurzame energie-initiatieven (2019). Retrieved from: https://www.hieropgewekt.nl/initiatieven on 01-03-2019.

Nasim, S., Sushil (2011) Revisiting Organizational Change: Exploring the Paradox of Managing Continuity and Change, *Journal of Change Management*, 11(2), pp 185-206.

Nkwunonwo, U., Mafimisebi, O., (2015). Environmental risk: exploring organizational resilience and robustness. International Journal of Scientific and Engineering Research. *International Journal of Scientific & Engineering Research*, 6(1), pp 1103-1115.

Oteman, M., Wiering, M., Helderman, J.K. (2014). The institutional space of community initiatives for renewable energy: a comparative case study of the Netherlands, Germany and Denmark. *Energy, Sustainability and Society,* 4(11).

Sadorsky, P. (2009). Renewable energy consumption, CO2 emissions and oil prices in the G7 countries. *Energy Economics*, 31, pp 456-462.

Stephenson, A., Vargo, J., Seville, E. (2010). Measuring and comparing organisational resilience in Auckland. *Australian Journal of Emergency Management*. 25, pp 27-32.

Taylor, K. (2015). Learning from the Co-operative Institutional Model: How to Enhance Organizational Robustness of Third Sector Organizations with More Pluralistic Forms of Governance. *Administrative Sciences*, 5, pp 148–164.

Tsoukas H., Chia R.,, (2002). On Organizational Becoming: Rethinking Organizational Change. *Organization Science,* 13(5), pp 567-582.

Van der Schoor, T., Scholtens, B. (2014). Power to the people: Local community initiatives and the transition to sustainable energy. *Renewable and Sustainable Energy Reviews,* 43, pp 666-675.

Verschuren, P., Doorewaard, H. (2010). Designing a Research Project, *Lemma*, Utrecht, 2010.

Vogus, T.J., Sutcliffe, K.M. (2007). Organizational resilience: Towards a theory and research agenda. *2007 IEEE International Conference on Systems, Man and Cybernetics*, pp 3418-3422.

Weick, K.E., and Quinn, R.E. (1999). Organizational Change and Development. *Annual Review of Psychology*, 50, pp 361–386.

Witmer, H., & Mellinger, M.S. (2016). Organizational resilience: Nonprofit organizations' response to change. *Work*, 54(2), pp 255-65 .

Appendices

Appendix A: Literature review

Responses to climate change: exploring organisational learning across internationally networked organisations for development - Emily Boyd and Henny Osbahr

Boyd and Osbahr look at resilience in organisations using a social-ecological systems approach. It is believed that both learning and adapting are key factors within resilience, and that strategic placement of people with appropriate knowledge helps foster continuity within organisations. The authors state that a clear view of the larger picture, mainly regarding integrating knowledge on adaptation, resilience and risk, wil help generate reflexivity about learning practices and how to properly respond to potential shocks. Reflexive learning and continuity is believed to improve feedback loops and resilience within the organisation. The authors identify five key features of resilience; Framing of organisational objectives (objectives and aims), Knowledge and resource capacity (sources of information and culture of information exchange), Self-organisation (scale of operation or resources allocated across networks), Learning (tools and mechanisms for formal and informal learning) and lastly Buffering or safety net (mechanisms of continuity and reflexivity - measuring process).

Environmental Risk: Exploring organisational resilience and robustness - Nkwunonwo and Mafimisebi

Nkwunonwo and Mafimisebi investigate organisational robustness and resilience in a environmental risk context. They report that multiple studies have confirmed that environmental risk management practices are linked with benefits for firms. Developing an organisational resilience and robustness model is thought to help better understand resilience and robustness and their practical applications within organisations. A more robust organisation is considered to be better at incorporating lessons from previous situations, as well as innovative thinking and anticipating emerging threats. Furthermore, a more robust organisation is able to properly adopt effective feedback loops, which aids in understanding and adapting to changes in the business environment. The authors developed a model to help project the resilience, vulnerability and robustness of organisations, and to apply these concepts to organisational problems. A set of indicators was developed to assess the robustness or resilience for an organisation, and to potentially identify and apply suggestions to improve or strengthen these organisations. For the purpose of this research, the indicators for resilience and robustness were grouped together. The authors conclude that organisational robustness begins with identifying, recognizing and appreciating efforts and capacities of the employees, as well as identifying underlying vulnerabilities, addressing organisational belief and initiating and applying organisational learning. More essentially, robustness or resilience in an organisational context can be seen as the capacity to anticipate, adapt and create lasting value.

Gibson and Tarrant present a range of factors for organisational resilience, and discuss a few conceptual models to explain how effective resilience takes shape within organisations. They state that the concept of resilience has been used in a number of different ways, resulting in some ambiguity regarding how and when to use the concept. Resilience has been often applied at different levels, including individual, community, organisational and societal. It can be described as the ability to cope with sudden and/or dramatic change. It is a complex and multi-dimensional concept, which the paper tries to tackle by examining several models that describe different but related aspects of organisational resilience. Five models are discussed; the integrated functions model, the attributional resilience model, the composite resilience model, the herringbone model of resilience and lastly the resilience triangle model.

The integrated functions model is based upon early business continuity management models and largely derives from process and management system thinking. It focuses on security management, business continuity management, emergency management and crisis management to foster resilience. The attributional resilience model is a more recent approach. It tries to explain key values for resilience by looking at highly resilient organisations. For the attributional resilience model, the key values that have been discerned are organisational values (which establish commitment, trust, strong internal alignment and common purpose) and leadership (which establishes a clear strategic vision while empowering others to implement said vision). These values should create a organisational culture which fosters change sensitivity and enable cooperation within different parts of the organisation. The composite model of resilience aims to fill a perceived downside of the attributional model, which is that is fails to set out the more concrete factors that contribute to resilience, such as processes, infrastructure, technology, resources, information and knowledge. It also pinpoints the importance of strategy and policy, and states that resilience can be improved by using emergent leadership. The herringbone model of resilience in the article aims to combine the previous models into one comprehensive practical model. It splits the previously discussed concepts into activities & capabilities (e.g. what the organisation does) and characteristics (e.g. how the organisation works), and describes how they both help improve organisational resilience. The authors also identified the most important factors, being acuity (the ability to recognise precedence), ambiguity tolerance (the ability to continue making decisions and taking action at times of high uncertainty), creativity and agility (operating in novel ways to work around problems), stress coping (continue to operate under increasing demands and uncertainty) and lastly learnability (the ability of the organisation to use the lessons of their own and others’ experiences). The last model they propose is the resilience triangle model. It aims to incorporate the complex interdependence of all the previously discussed models, and tries to display it in a simple model. It is based on the idea that all three types of capabilities are equally important to resilience: process capabilities; resources and infrastructure capabilities; and leadership, people and knowledge capabilities. It also places a more distinct focus on the importance of context.

Developing a Tool to Measure and Compare organisations' Resilience - Amy V. Lee John Vargo and Erica Seville

Lee, Vargo and Seville define resilience as a sociotechnical occurrence that explains how organisations manage uncertainty. It contributes to business performance and requires organisations to be able to adapt and manage disruptive challenges. The paper aims to address these challenges, and highlights identifying factors that contribute to robustness and resilience. These indicators are considered important because they can inform organisations of potential weaknesses and vulnerabilities. The authors also also highlight the challenge of discussing the causal relationships between indicators to enable a fuller discussion of overall resilience. The identified factors that contribute to resilience are strong leadership, awareness of their operating environment and the ability to adapt to change. These characteristics are often found in competitive organisations that have leaders who are able to leverage strengths to adapt to changes in the market or industry, and are able to detect potential failure and signals of vulnerability.

The factors contributing to resilience are divided into three sections: situation awareness, management of keystone vulnerabilities and adaptive capacity. Situation awareness is a concept that according to the authors originates from the military, and can be defined as: "...being aware of what is happening around you and understanding what that information means to you now and in the future." It is mostly used in operational context, and can help in decision-making and evaluation of critical situations. Management of keystone vulnerabilities highlights the importance of organisational norms and values, and is based upon the evaluation of organisational vulnerabilities that have previously resulted in losses or failure. It is defined as "...components in the organisational system, which by their loss or impairment have the potential to cause exceptional effects throughout the system". Managing keystone vulnerabilities is also often discussed within business continuity management, and can aid organisations in assessing potential points of failure, essentially increasing robustness and resilience. The last section is adaptive capacity. Adaptive capacity is one of the key points when looking at organisational resilience. Adaptation is being increasingly covered by scientists as one of the leading concepts when addressing the balance between stability and change. Furthermore, this specific article also discusses the relation between adaptive capacity and competitiveness. They go on to explain that adaptive behaviour is not necessarily a direct consequence of physical facilities. structures or technological systems, but that it is more dependent on organisational culture and capabilities of the staff. It is concludingly defined as: "An organisation's adaptive capacity is their ability to continuously design and develop solutions to match or exceed the needs of their environment as changes in that environment emerge.".

Organisational Resilience: Towards a Theory and Research Agenda - Timothy J. Vogus and Kathleen M. Sutcliffe

Vogus and Sutcliffe discuss a theory of organisational resilience, a well as a research agenda. They aim to identify the ways in which resilience has become vital to current day organisations, as well as defining organisational resilience and its contributing factors. Lastly the article also provides some research questions further exploring the different mechanisms of resilience. According to the authors, organisational resilience can be defined as "maintenance of positive adjustment

under challenging conditions such that the organisation emerges from those conditions strengthened and more resourceful". These challenging conditions are not necessarily composed of only direct shocks or crises, but can also be more slow growing ongoing risks, such as for instance competition or slow changes in the environment. The challenging conditions mentioned by the authors include discrete errors, scandals, crises and shocks, disruptions of routines, ongoing risks and lastly stresses and strain. Resilient organisations will therefore need to be able to cope with anomalies and utilize learning to keep growing their capabilities to deal with these anomalies. One important underlying factor in this process is ongoing monitoring. It improves the ability to detect these unexpected events or anomalies and helps build the capabilities necessary to recover from these unexpected events.

According to the authors, resilience results from processes and dynamics that create or retain resources in a flexible, storable and convertible manner that enables the organisation to successfully cope with and learn from the unexpected. The authors then continue to explore the factors (or mechanisms as they call them) that contribute to resilience in a more in-depth manner, arriving at a theoretical model explaining resilience and the mechanisms that lie behind it. The factors that were found to promote resilience are proactive and preemptive analysis of vulnerabilities, reluctance to simplify interpretations, sensitivity to operations, commitment to resilience (or collective learning), deference to expertise and realistic appraisal of potential challenges. One last factor that is mentioned apart from these mechanisms is organisational learning, which the authors argue is both an input an outcome of organisational resilience. They do however mention that more research is necessary to adequately explore organisational learning within the realm of resilience. They lastly go on to conclude that: "Understanding how organisations positively adjust under conditions of adversity and emerge more resourceful (i.e., resilient) will help answer the most pressing questions facing today's organisations and organisation theorists.".

Building trait for organisational resilience through balancing organisational structures - Andersson, Caker, Tenblad and Wickelgren.

Andersson et al. explain how balancing organisational structures can help promote organisational resilience. They categorise organisational resilience as a holistic and complex concept, and like other authors, underscribe the notion that organisational resilience theory should not only focus on sudden shocks, but also on daily processes. It is argued that resilience is largely influenced by the concept of anticipating, especially regarding strategic capabilities such as flexibility and agility, and anticipation within the daily organisational processes. It is furthermore important to consider these concepts, and organisational resilience in general, within its context. The article therefore also sites a few contextual factors, and aims to explain how exactly organisational structures can contribute to resilience by focusing on anticipating. Using previous literature, five major perspectives on organisational resilience are identified: organisational responses to external threats, organisational reliability, employee strengths, the adaptability of business models and resilient supply chains. The article shortly discusses the five streams, and concludes that common feature between all five perspectives is that there is a focus on competencies, processes, learning and culture. Again the importance of proactivity and anticipation is mentioned, and how the the

daily management or organisation can promote resilience help organisations manage complexities, surprises and uncertainties, as well as being able to adapt to unexpected events.

The authors then propose a new analytical model, derived from the five streams or perspectives that were identified, and revolves around four main concepts: risk awareness, preference for cooperation, agility and improvisation. This analytical model partially builds on previous research by Sutcliffe, and places the previously mentioned concepts of preoccupation with failure, reluctance to simplify, sensitivity of operations and commitment to resilience under risk awareness, and puts deference to expertise under preference for cooperation.

Organizational resilience: Nonprofit organizations' response to change - Witmer and Mellinger

Witmer and Mellinger explore organisational resilience and the ability to change within non-profit organisations. They specifically apply the concepts of organisational resilience to non-profit organisations because their processes and capabilities differ from more "traditional" organisations. A multiple case study was conducted to try and identify characteristics within these organisations that promote or hinder resilience. Organisational resilience as defined by the authors is "individuals, groups, organizations, and systems that respond productively to significant disruptive change". They furthermore state that resilience is "a dynamic process that infers a symbiotic relationship within the system, and between the system and its environment". The main findings of the case study were that a commitment to the mission, ability to improvise, community reciprocity, a servant and transformational leadership style, hope and optimism and fiscal transparency were especially relevant characteristics. Improvisation enables the adaptation to changing demands from the outside. A reciprocal relationship with the community and an open and flexible organisation helps the organisation to adapt to information from the external environment. Servant and transformational leadership encourages collaborative problem solving, and helps leaders focus on organisational goals and challenges instead of personal gain. Hope and optimism helps bouncing back after setbacks, and fiscal transparency helps identifying fiscal and organisational problems in time, and ensures a quick response.

The authors suggest that these characteristics can be used to develop theories and strategies to increase organisational resilience and help non-profit organisations. These characteristics also provide insight into interactions within the organisational system, as well as how the system itself responds to the external environment. They suggest that strategies should be implemented at both tactical and operational level. It is also noted that due to the limited sample size (just two organisations), the research has some limitations, and more research is needed to reach strong and robust conclusions. It is however very interesting to note how nonprofit and for-profit organisations might differ on the concept of organisational resilience.

Measuring and comparing organisational resilience in Auckland - Stephenson, Vargo and Seville

Stephenson, Vargo and Seville discuss organisational resilience based upon their survey, on which 249 people representing 68 organisations have replied. They note that most of the research towards organisational resilience has been qualitative, and express the need for quantitative measurement of organisational resilience. The main aim is to answer the questions: how resilient are we, how does this differ from our expectations and those of our stakeholders, and what can we do to improve? They define resilience as "managing crises such as financial downturns,

pandemics, large scale product faults, supply chain failures, industrial accidents and staffing issues". The survey measured 21 indicators in 92 questions, with each indicator being averaged by at least 3 questions. The main areas of interest were: Situation Awareness, Management of Keystone Vulnerabilities and Adaptive Capacity. Situation awareness is described as: "organisation's understanding of its business landscape, its awareness of what is happening around it, and what that information means for the organisation now and in the future". Management of keystone vulnerabilities describes "the identification, proactive management, and treatment of vulnerabilities that if realised, would threaten the organisation's ability to survive." And lastly, Adaptive capacity describes "an organisation's ability to constantly and continuously evolve to match or exceed the needs of its operating environment before those needs become critical".

The participants were from different parts of the organisations, offering a cross-dimensional view of resilience within the organisation. They also examined different industry sectors, to provide a broader perspective. The main conclusion is that organisations should be able to measure their own resilience, so that they will be able to identify points of improvement and develop resilience management programs. It was also noted that organisations in Auckland, where the research took place, generally have a good level of resilience. Another interesting notion is that it could be potentially very relevant to compare the resilience of one organisation to other organisations, which would provide more detailed insights into differences and comparisons regarding resourcing, staff allocation, corporate processes, knowledge management and organisational culture.

Appendix B: List of cooperatives

Name	Location	Website	PoE	PoT	E&F	DoE	CG	W/S	GEO
Hilverzon	Hilversum	https://www.hilverzon.nu/	Y	Y	Y	Y	Y	S	UT
Powered by Hattem	Hattem	http://www.poweredbyhattem.nl/	Y	Y	Y	Y	Y	S	GE
Rijn en IJssel	Rijn en IJssel area	https://www.rijnenijsselenergie.nl/	Y	Y	Y	Y	Y	W/S	OV
Heuvelrug Energie	Utrechtse Heuvelrug	https://heuvelrugenergie.nl/	Y	Y	Y	Y	Y	S	UT
Lochem Energie	Lochem	https://www.lochemenergie.net/	Y	Y	Y	Y	Y	W/S	GE
Duurzaam Nijeveen	Nijeveen	https://www.duurzaamnijeveen.nl/	Y	Y	Y	Y	Y	S	DR
Duurzaam Riel en Goirle	Riel en Goirle	https://www.duurzaamrielgoirle.nl/	Y	Y	Y	Y	Y	S	NB
Zonnecoöperatie West-Friesland	West-Friesland	https://www.zonnecooperatiewestfriesland.nl/	Y	Y	Y	Y	Y	S	NH
Westfriese Windmolen coöperatie	West-Friesland	https://wfr-wind.nl/	Y	Y	Y	Y	Y	W	NH
Deelstroom Delft	Delft	https://deelstroomdelft.nl/	Y	Y	Y	Y	Y	S	ZH
ECTB	Ten Boer	https://www.ectb.nl/	Y	N	Y	Y	N	W/S	GR
Energyport Peelland	Deurne	http://www.energyportpeelland.nl/	Y	Y	Y	Y	Y	S	NB
Zummere power	Someren	https://www.zummerepower.nl/	Y	Y	Y	Y	Y	W/S	NB
Zeeuwind	Zeeland	https://www.zeeuwind.nl/	Y	Y	Y	Y	Y	W/S	ZE
Energiepioniers	Noordoostpolder	https://www.energiepioniers-nop.nl/	Y	N	Y	Y	N	S	FL
EMEC	Maastricht	https://www.emec.nu/	Y	Y	Y	N	Y	S	LI

Appendix C: Interview questions

English

1. General
    a. How old is the energy cooperative?
    b. How many members do you have?
    c. Can you shortly describe what your role within the cooperation is?

2. Contextual factors
    a. How is the relationship with the community? Is it reciprocal? Is there often contact?
    b. Is there cooperation with other cooperatives? If so, how?
    c. Is there stakeholder engagement? How much? In what ways?
    d. Is the organisation an active participant in industry and sector groups? In which way?

3. Knowledge and resource capacity
    a. How is information stored and used? Is it easily accessible?
    b. How is sharing knowledge within the organisation facilitated? Is it encouraged?

c. How are the organisation's internal resources managed and developed?
d. How is the relationship with external resources?

4. Buffering/safety net
    a. What processes are in place to enable the organisation to continue operating under increasing demands and uncertainty?
    b. What processes are in place for understanding and analysis of potential risks and their consequences?
    c. How is development and evaluation of plans and strategies to manage vulnerabilities in relation to the business environment and its stakeholders organised?

5. Organisational values
    a. Is there a strong internal alignment within the organisation? Is there a common purpose? What would you say is your common purpose?
    b. How are the organisational objectives framed?
    c. How is cooperation and interaction organised within the cooperative?
    d. What is the view of the cooperative towards innovative and creative approaches and new ways to operate and work around problems?
    e. What would you say the leadership is like? Is the leadership mission focused and collaborative, does it provide good management and decision making in times of crises?
    f. How is employee engagement organised? Is there engagement of employees in a manner that encourages understanding and involvement within the organisation?

6. Organisational structure
    a. What is the communication about business decisions like? How is the fiscal status of the organisational operations communicated?
    b. How are roles and responsibilities divided and given shape?
    c. Is monitoring and reporting present within the organisation? In what way is it organised?
    d. How are the decision making processes structured?
    e. How does the cooperation cope with previous challenges? Would you say there is an ability to learn from previous challenges and adapt to future challenges.
    f. How does the cooperation deal with change? Are employees encouraged to improvise in unusual or changing situations?

Dutch

1. Algemeen
    a. Kun je even kort aangeven wat jouw rol binnen de organisatie is?
    b. Hoe oud is de energiecoöperatie?
    c. Hoeveel leden hebben jullie op het moment?

2. Contextuele factoren
    a. Hoe is de relatie met de gemeenschap? Is die wederkerig? Is er vaak contact?

b. Is er sprake van samenwerking met andere coöperaties? Zo ja, op welke manier?
c. Is er betrokkenheid van andere belanghebbenden/partijen? Hoe veel en op welke wijze?
d. Is de organisatie een actieve deelnemer in branche- en sectorgroepen? Op welke manier wordt er deelgenomen?

3. Kennis en middelencapaciteit
    a. Hoe wordt informatie opgeslagen en gebruikt? Is het gemakkelijk toegankelijk?
    b. Hoe wordt het delen van kennis binnen de organisatie gefaciliteerd? Wordt het aangemoedigd?
    c. Hoe worden de interne middelen van de organisatie beheerd en ontwikkeld?
    d. Hoe worden externe middelen verkregen?

4. Buffering / vangnet
    a. Welke processen zijn er om de organisatie in staat te stellen verder te werken onder toenemende eisen/stress en onzekerheid?
    b. Welke processen zijn er voor het begrijpen en analyseren van potentiële risico's en de gevolgen daarvan?
    c. Hoe wordt de ontwikkeling en evaluatie van plannen en strategieën om kwetsbaarheden in relatie tot het bedrijfsmilieu en de belanghebbenden te beheren georganiseerd?

5. Organisatorische waarden
    a. Bestaat er een sterke interne afstemming binnen de organisatie? Bestaat er een gemeenschappelijk doel? Wat zou u zeggen dat uw gemeenschappelijke doel is?
    b. Hoe worden de organisatiedoelstellingen opgesteld of omkaderd?
    c. Hoe is samenwerking georganiseerd binnen de coöperatie?
    d. Hoe staat de coöperatie tegenover innovatieve en creatieve benaderingen en nieuwe manieren om problemen te beheersen?
    e. Hoe zou je zeggen dat het leiderschap eruit ziet? Is de leiderschaps-missie gefocust en coöperatief, levert dit een goed management en besluitvorming op in tijden van crises?
    f. Hoe is de betrokkenheid van medewerkers georganiseerd? Is er betrokkenheid van medewerkers op een manier die begrip en betrokkenheid binnen de organisatie bevordert?

6. Organisatiestructuur
    a. Hoe is de communicatie over zakelijke beslissingen? Hoe wordt de fiscale status van de organisatorische activiteiten gecommuniceerd?
    b. Hoe worden rollen en verantwoordelijkheden verdeeld en vormgegeven?
    c. Is monitoring en rapportage aanwezig binnen de organisatie? Op welke manier wordt dat georganiseerd?
    d. Hoe zijn de besluitvormingsprocessen gestructureerd?

e. Hoe gaat de coöperatie om met eerdere uitdagingen? Zou je zeggen dat er een mogelijkheid is om van eerdere uitdagingen te leren en je aan te passen aan toekomstige uitdagingen?
f. Hoe gaat de coöperatie om met verandering? Worden medewerkers aangemoedigd om te improviseren in ongewone of veranderende situaties?