Who takes the lead in battling climate change?

A case study in the northern part of the Netherlands regarding civic sustainable place-based initiatives in urban and rural environments.

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Summary

Citizen initiatives arise within the spatial planning domain since the last years. Changing circumstances, like climate change and the erosion of the welfare state, lead to enthusiastic citizens who strive to participate in and share their visions about, topics that interests them, such as the energy transition.
The global energy transition, in line with increased governance capacity for the local level, brings several challenges, which leads to the following research question:

How do citizen initiatives in various urban and rural contexts, in the north of the Netherlands, take the lead in sustainable place-based development to mitigate climate change?

This research focuses on local civic sustainable place-based development and local leadership capabilities. The four dimensions addressed in this research are; how energy cooperatives are internally organized, how they collaborate and interact with (governmental) actors, what the geographical influence of place on cooperatives is and how they take the lead to reach their goals and influence higher-level policy development and decision-making. Six urban and rural cooperatives in the Dutch provinces Drenthe, Friesland and Groningen were selected, semi-structured interviews were conducted and the cases were analyzed. A key conclusion is that places with more social cohesion and physical benefits are better able to reach their goals, influence other parties and take the lead in the energy transition. Eventually, this comparative case study research presented local sustainable place-based lessons that could be transformed into strategies to adopt elsewhere, to boost the energy transition and reach climate change adaptation.

Keywords: *Citizens initiatives, Leadership, Energy transition, Sustainable place-based development, Climate change*

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Table of contents

List of tables and figures

Tables

For this research, there is deliberately chosen to use no abbreviations. Except for the abbreviations of the cases, these are displayed in table 4.

Figures

1. Introduction

This chapter covers the background in relation to the topic of interest in this research. In addition, the problem is defined and the relevance of this research is also addressed within this chapter. The research questions are presented and the hypothesis is discussed as well.

1.1 Background and problem definition

1.1.1 The trigger: climate change

Global warming, melting ice caps, loss of biodiversity, greenhouse gas emission, storms and droughts are all effects of one the most booming topics these days: climate change. There are multiple visions about this topic with lots of contrasting opinions. That we are in a changing environment is something that is noticeable and clear. However, why climate change is taking place and the causes of climate changes are still not designated. This research does not focus on the causes or the ones to blame, it does not seek to find the solution for this problem. Nevertheless, climate change is undoubtedly one of the most urgent problems at this time. Climate change is relevant for this research because it links to the sustainable development of citizens. Also, one of the reasons why the energy transition is taking place, next to scarcity of resources for example, is determined by a changing climate. Green solutions, initiated by citizens, to tackle climate change are the main subject of this research. How the initiatives in the end positively contribute to the adaptation or mitigation of the climate is also a point of interest.

1.1.2 Interlinking movements: energy transition and shift in planning

As mentioned before, in times of a changing climate, a long-term period of a transition in the field of energy is taking place. There is an ongoing shift from the use of fossil fuels to the use of renewable energy sources. These sources mostly induce solar, wind and biomass energy. Bridging between the second-generation energy landscape and the third generation energy landscape including the new energy types which belong to this landscape, leads to challenges and barriers. In line with the energy transition, bottom-up planning or the communicative turn is gaining in importance (Van Aalderen, 2018; Van der Schoor & Scholtens, 2015). Top-down planning is more often substituted by hybrid spatial governance types, like self-governance and cooperation between state, market and society (Soares da Silva et al., 2018). The energy transition and the shift in planning interact, resulting in sustainable spatial developments. In other words, there is a connection between these movements (shift in spatial planning and the energy transition). As a result, challenges start to arise, which could possibly turn into implications (Soares da Silva et al., 2018). For example, renewable energy needs increased site-specific (local) space in the landscape for energy production. Moreover, renewable energy sources are most often location bound (De Boer & Zuidema, 2013). The question arises if these implications could be turned into possibilities and opportunities.

1.1.3 Second to last: renewable energy share compared to EU member states

The Netherlands is lagging behind compared to other European Union nations with their relative use of renewables in relation to fossil fuels. In 2017 only 6,6% of the total energy use was originating from renewable energy; mostly from solar, wind and biomass energy (Eurostat, 2018). The technology is there, however the pace in which the energy transition is moving from fossil towards renewables is happening extremely slow in the Netherlands (Van der Schoor & Scholtens, 2015). Partially, the reason for this is explained by the regulative barriers that are in place in current Dutch legislation (Van der Schoor & Scholtens, 2015). At the local level, there are also implementation constraints because within the spatial planning domain, on the municipal level, climate change mitigation policies are often not incorporated in their plans (Measham et al., 2011). Therefore, the right leadership in the context of sustainable (place-based) developments could ensure climate change mitigation (Meijerink & Stiller, 2013). This is needed because past and current efforts are not sufficient to mitigate climate change, argued by Meijerink & Stiller (2013).

1.1.4 Citizens take the matter in their own hands: sustainable place-based development

Because of the high urgency of the energy transition to battle climate change, a recent trend of participation by citizens is taking place at larger scales. Citizens emerge within spatial planning processes and have incremental (legal) powers (Van Meerkerk & Igalla, 2015). Self-governance and cooperation are well-known forms of governance in spatial planning since the last decades (Soares da Silva et al., 2018). Because citizens are attached to places where they live and work, they link these initiatives to these places (Van Aalderen, 2018). Place-based developments are (re)considered important because they tend to have a positive influence on the specific dynamics and characteristics in these regions (Horlings et al., 2018). Based on this, regional sustainable and innovative developments are within reach. In addition, these developments will result in increased liveability in that area (Horlings et al., 2018). Hambleton (2015) states that these local place-based innovative developments, in an increasingly globalizing world, are essential in order to be able to achieve the ideas of a community. Also, to be able to remain powered as a community, in constrained situations, against place-less organizations (Hambleton, 2015). Wilson (2006) argues that spatial planning at the local level has a critical role in the promotion of innovative projects and sustainable development in order to achieve robust adaptation to climate change. However, on the local level, this could lead to difficulties because of the short-term horizon and interests of citizens, in contrast to the long-term processes and consequences of climate change (Wilson, 2006). These phenomena result in a lack of engagement with citizens and thereby a missing need to adapt to climate change. That is why well-balanced community engagement and communication, next to collaborative network leadership and learning together, are necessary components to achieve place-based sustainability, according to George & Reed (2017). Besides, these developments could eventually lead to the conversion of higher-level governance processes and regulations (Measham et al., 2011). This is the case when sustainable place-based development takes a leading role and, with their performed activities, is able to change policies and regulations within the place and the network.

1.1.5 New trend: energy cooperatives

Focusing on the energy sector, also within this sector citizens start to take the matter in their own hands (Hawkins & Wang, 2012; Van Meerkerk & Igalla, 2015). Place-based developments result in local energy cooperatives. These organizations start to arise globally, on the local and regional level. Citizens initiate developments that contribute to the amount of renewable energy used for our energy consumption (Van der Schoor & Scholtens, 2015). Thereby, citizens have energy-neutral and zero-emission ambitions resulting in projects which contribute to the realization of a more sustainable future (Soares da Silva et al., 2018). Zooming in, these innovative projects even pop up in the smallest villages across the Netherlands (Van der Schoor & Scholtens, 2015). In 2018, the number of energy cooperatives in the Netherlands increased by 85 cooperatives to a total of 484 energy cooperatives. These cooperatives collectively induce over 74,5 megawatt peak of solar energy and 159 megawatts of wind energy, which corresponds to green energy for over 140.000 households. Not only green energy facilities are realized, new developments and pilots in relation to sustainable or carbon-dioxide free mobility and green energy storage are further explored by these local initiatives in the upcoming years (Hier opgewekt, 2018). Summarizing, within the energy sector an urge to act arises, where energy cooperatives fill in the blanks that are left out by the market and the (governmental) authorities (Elzenga & Schwenke, 2015).

These sustainable place-based developments and energy cooperatives raise questions, which will be addressed throughout this research. Questions such as: “Who is taking the lead within the cooperatives?”, “Are these initiatives durable and still effective in the future?”, “How do these local initiatives influence the regional and national networks?”, and typical for this research: “Are there differences between regional open rural environments and crowded urban environments in terms of a difference in institutions and available space?”. The relevance of these potential differences will be discussed in chapter 1.2.

1.2 Relevance of the research

In order to be sustainable and to cope with climate change for future generations, sustainable spatial place-based developments led by citizens are inevitable. Why it is relevant that these developments need more in-depth research, will be discussed in this chapter.

1.2.1 Scientific relevance

Horlings et al. (2018) state that the role of civic leadership is important in the development of place-based sustainable practices. Within the changing governance strategies of regions because of the environmental challenges, the role of community-led planning is required. Mainly because the community has increased desires and reasons to participate in these planning processes, since communities try to speed up the transition with their own contributions, for example (Bakker et al., 2012, Van Aalderen, 2018, Van der Schoor & Scholtens, 2015). Agrawal (2010) and Measham et al. (2011) even argue that the local level must be leading the climate adaptation debate. One of the reasons for this is that the local level also causes climate change and problems related to that. The local level could be able to foster a change of the governance system concerning climate change, with their participation in planning and contribution to the energy transition.

Therefore, additional research on various differing local level sustainable developments is useful and will contribute to research which already has been done on the topic about the role and influence of citizen initiatives on sustainable place-based development, with regard to the energy transition. Furthermore, the possible difference between the kind of citizen initiatives in different regional urban and rural environments is something which has not been investigated yet. In other words, this is the knowledge gap related to the topic of sustainable place-based development. A deeper understanding of the possible difference between local urban and rural environments is interesting because the initiatives and their activities or measures to mitigate climate change could lead to much-needed lessons. These lessons contribute to scientific knowledge about how to deal with climate change and who must be leading this transition, in varying (geographical) environments. For instance, one initiative is successfully contributing to the energy transition in a distinct way compared to other initiatives, based on their own place-based characteristics, qualities and activities, which leads to successful leadership in that case. This context-specific knowledge, dependent on and determined by place and urban or rural environmental characteristics, is relevant for science related to climate change and energy transition management (also see hypothesis, chapter 1.4). Concluding, it is necessary to get a full in-detail understanding of these important processes and their possible positive and differing effect, in contrasting contexts, for climate change mitigation. These insights could provide a framework to guide further place-based sustainable developments successfully. The results of this comparative case study research and thereby provided strategies, guidelines and/or lessons to achieve climate adaptation can be seen as the academic relevance of this research.

1.2.2 Relevance for spatial planning

Participation by citizens in planning is considered crucial and gaining importance in time because collaborating with local residents and their knowledge, can result in solving complex problems and altering the current way of handling these issues. In other words, citizen initiatives and their influences on spatial processes at local developments are positive and needed, argued by Hawkins & Wang (2012). Not only individual citizens themselves, but also communities play a progressively important role within the governance strategies, related to planning, in the area. A shift from top-down planning to room for ideas and plans of inhabitants (bottom-up) is proposed to be useful and contributing to local developments (Hawkins & Wang, 2012; Soares da Silva et al., 2018; Van Aalderen, 2018; Van der Schoor & Scholtens, 2015). These local place-based developments result in desired outcomes for that particular region (Horlings et al., 2018). In the end, the local developments could result in altered institutions and governance processes, policies and regulations, related to spatial planning, on higher levels.

This research adds to get a comprehensive understanding of the role and influence citizen initiatives can have on the leadership within governance processes in a particular area. Furthermore, the goal is to be able to grasp the possible difference, and the consequences of this possible difference, between the regional urban and rural practices regarding sustainable development. This could be beneficial for planning, by providing insights, strategies and approaches retrieved from these consequences. These could influence future (institutional) developments in spatial planning, accordingly. Therefore, this study contributes to planning practice by providing information about the influence of citizens initiatives on governance processes. These findings will result in recommendations about possible governance or leadership strategies in planning practice related to

sustainable place-based development. This can improve climate change mitigation and adaptive strategies in particular areas. The outcomes of this research will potentially result in useful information for planning and insights for planners which could lead to the incorporation of adaptive strategies for climate change mitigation in the case study research areas and similar places.

1.2.3 Societal relevance

Climate change and its effect on the world are seen as a tremendous problem that occurs on a global scale. However, climate change is most often caused on the local level, where it spreads to higher levels (Measham et al., 2011). Therefore, measures to alter climate change should be locally oriented. That is why the literature states that not only higher-level authorities, but also the local level authorities have to deal with the battle against climate change (Hawkins & Wang, 2012; Measham et al., 2011).

Therefore, the results of the case study in the northern part of the Netherlands (provinces of Drenthe, Friesland and Groningen) can be valuable for other areas or regions in the Netherlands and areas or regions around the world, which also have to deal with climate change. Only under the prerequisite that the contexts of those cities or regions have similar social, cultural, physical and institutional circumstances and characteristics, this will be discussed in chapter 5. These local cities or villages could draw lessons from this case study and adopt the same or other strategies and activities, based on other local and regional civic (energy) cooperatives/incentives. Case learning will provide possibilities for approaches and frameworks which could take off in comparable regions if and when there is a demand for sustainable place-based development.

The discussion about the relevance of this research will be addressed in chapter 5, discussion and reflection.

1.3 Research design and objectives

The aim of this study is to get a comprehensive understanding of the urban and rural governance practices on the local/regional scale with regard to the theme of sustainable development in coping with climate change, to clarify the role and influence of initiatives by citizens. In this way, the reasons for possible differences between the geographically varying cases can be explored. Thereby, the purpose is to define the current state of the planning system in these contexts. The ultimate goal is to draw lessons from this comparison between regional urban and rural environments, which may be valuable for future development of these governance processes where citizen initiatives, regarding sustainability, are meaningful to reach climate change adaptation.

For this research, a combination of main theories and models will be used. These are derived from the work of Meijerink & Stiller (2013), Soares da Silva et al (2018) (PlaCI model), Sotaurata (2010), Van Aalderen (2018) and Van der Schoor & Scholtens (2015).

1.3.1 Research questions

Primary research question:

How do citizen initiatives in various urban and rural contexts, in the north of the Netherlands, take the lead in sustainable place-based development to mitigate climate change?

Secondary research questions:

- How are energy cooperatives in rural and in urban environments organized, what are their visions and which sustainable place-based activities are undertaken to mitigate climate change?
- What is the difference between energy cooperatives, in urban and rural environments and in different regional contexts? If so, what are the reasons for these differences and do these differences influence energy cooperatives and the effects they have?
- How do actors involved in these processes interact to reach desired outcomes and how do energy cooperatives influence the (higher-level) authorities and policies and vice versa, within the spatial planning domain?

1.4 Hypothesis

Presumably, a difference between urban and rural environments related to green energy is perceptible. This can be explained with the dissimilarity of the community feeling of these two environments, the availability of space and resources, but it also relates to the differences in budgets within these areas.

Generally, rural environments do have more space available for renewable energy purposes, such as green space, farmland, fallow land and nature areas. However, there are also restrictions in terms of land use purposes and there are other relevant policies in place. Available budgets and other resources are assumed to be fewer in rural environments. Because of the smaller size, there are less facilities, businesses and people. Following the article from Horlings et al. (2018) and the book chapter from Horlings (2018), communities are attached to their place with their own characteristics and dynamics. Because rural areas, like villages, are much smaller than cities, a community feeling or social cohesion between inhabitants could fairly easy arise. Inhabitants often know each other and this creates chances and opportunities to start green energy processes, resulting in energy cooperatives.

Contrastingly, urban areas have less space available for renewable energy production facilities. Within these environments, there is competition about this available space, which also results in higher land prices. Moreover, urban structures, like cities, have significantly less community feeling because of the large number of people who live and work in these cities. Residents do have less capacity to be part of a compact system of individuals who know each other, therefore social coherence is less in the urban context in comparison with the rural context. (Steenbekkers & Vermeij, 2013; Vermeij & Mollenhorst, 2008). That is why shared visions about potential sustainable developments for geographical spaces, such as cities, are hard to establish with many people.

However, in urban environments because of their larger scale, resources and financial means are often sufficient for certain developments to start happening.

The difference between urban and rural depends upon the above-mentioned aspects and can be context specific. Nevertheless, the presumed outcome of this research is that rural environments do potentially have more opportunities and possibilities regarding renewable energy, compared to urban areas. This is because of the reasons mentioned above, where some factors can be of more determining value than others. Therefore, in rural contexts, more, larger and better-established energy cooperatives, in relation to their context, probably start to organize themselves. The determining factors like the amount of space available in rural surroundings and the high degree of social cohesion and social capital in rural areas result in energy cooperatives with better connections to other networks. Furthermore, higher-level governance processes will be more evident and present in rural environments. How these cooperatives take the lead also depends on their success in relation to their activities. It is plausible that a better-established cooperative with good network relationships and capabilities, is better able to bring about mitigation or adaptation developments for climate change.

1.5 Outline of the research

In the following chapters, the next parts of this research are addressed. Chapter 2 comprises a literature study of the literature related to sustainable place-based development and leadership. Deriving from this study, the theoretical framework and the conceptual model will be presented. The methodology of the research will be elaborated on in chapter 3. The empirical results of the research are presented in chapter 4. Chapter 5, the discussion and reflection, displays the link between results and theory and reflects back on the research. The closing chapter 6 entails the conclusions of this research.

2. Theoretical framework

This chapter consists of the relevant theoretical subparts which are useful as a theoretical perspective to construct a conceptual model at the end of this chapter, which will be used as a guiding framework for the empirical part of this research.

This research mainly elaborates on the work of Horlings et al. (2018), Soares da Silva et al. (2018), Van Aalderen (2018) and Van der Schoor and Scholtens (2015), in which the authors stress the importance to further examine the influence which citizens may have on their (local) environments in relation to sustainable development, in order to battle the ongoing climate change. In addition, in the article by Hawkins & Wang (2012) the authors state that further research should be done in order to investigate if, because of citizen participation or initiatives, there will be an increase in the number of activities undertaken on the theme of sustainability. Also, the article by Measham et al. (2011) stresses the influence which local level authorities have in altering current policies at higher levels to effectively adapt to climate change. However, this could also be the other way around, where high-level organizations have their influence on the local community (Sotarauta & Beer, 2017). In other words, the main focus of this research is on local citizen initiatives and their organizational development. Next to that, the collaboration of the energy cooperative with other stakeholders in the networks is an important aspect of the research. Additionally, the comparison between urban, rural and provincial contexts, regarding sustainable place-based development, is made. At last, the possible leadership effect, which these contrasting initiatives within differing contexts may have on (higher-level) policies and regulations and vice versa, is a point of interest. These four main pillars are important to further elaborate on.

2.1 Citizen initiatives

In the last decades, many forms of spatial planning have been leading in this field. The communicative turn resulted in increased participation of citizens. In the past, top-down planning mechanisms were the dominant practice. This kind of planning is still important in developments, however citizens make their way into planning as well (Hawkins & Wang, 2012; Soares da Silva et al., 2018). Top-down planning can accomplish solutions for simple problems, and collaborative planning can provide opportunities for long-term 'wicked' problems. The participation ladder by Arnstein (1969) already discussed the different levels of involvement of inhabitants. Currently, society is facing hybrid forms of planning. Soares da Silva et al. (2018) state that communicative planning is evolving in processes of self-governance and grassroots initiatives, where citizens decide for themselves what will happen to their place, to which they are attached. Besides, cooperation between citizens, business and NGOs without the involvement of governmental authorities comes about (Soares da Silva et al., 2018). Wilson (2006) argues that spatial planning must stimulate these civic engagements and participation of inhabitants. Nevertheless, this process of promotion can be difficult because of the long time span of issues as climate change. The short-term horizon of citizens and their interests hinder the involvement of communities in planning problems. Yet, emerging trends like self-governance start to grow in presence. That is why spatial planning should accompany and support these groups and initiatives. In addition, promotion of engagement is necessary, also for long-term

projects like climate change adaptation (Soares da Silva et al., 2018; Wilson, 2006). This support is increasing in countries like the Netherlands.

For this research, the focus is on these trends or the self-governance side of planning. Citizens initiate developments in their surroundings and this process is intensifying. Inhabitants of various places are often involved in developments related to these specific environments. Sustainable developments in these places are occurring on larger scales. These citizens initiatives are growing because residents want to speed up the energy transition in combination with additional beneficial outcomes for their environments (Measham et al., 2011; Van Aalderen, 2018). Citizens find that the pace in which the transition is currently going, steered by authorities, too slow (Bakker et al., 2012). In addition, they want to increase the liveability and quality of their places. Furthermore, the renewed interest in community, place and local identity drives citizens to participate in planning (Horlings, 2017; Soares da Silva et al., 2018). Another reason why people come up with initiatives is because they are against projects or plans with negative consequences and therefore want to stop these developments. Also, the role of the state is shifting and declining, processes like decentralization are happening. Hence, citizens do not want to be dependent on the (lack of) services and facilities of the government. The consequences are grassroots initiatives or self-governance processes (Van Aalderen, 2018). In this research, these types of developments will be referred to as 'citizen initiatives'.

Van der Schoor & Scholtens (2015) discuss a few aspects which are important drivers for an established organization. An organization could be an outcome of citizen initiatives. The citizens and institutions within the place can become part of the energy cooperative (Soares da Silva et al., 2018) The center of interest for this research are these organizations, so-called energy cooperatives on the local level. Important aspects are explained by Van der Schoor & Scholtens (2015) and divided into two types. First: 'relation with outside networks' and second: 'commitment of members'. The connection to outside networks is indispensable because these organizations operate in a certain place and are thereby part of a larger network. For instance, an energy cooperative has bonds with the corresponding municipality and province. Moreover, the energy cooperative is also linked to businesses and national NGOs in the network. Through this network, knowledge and opportunities can be gathered in order to be successful in realizing the aims and ambitions of the organization (Van der Schoor & Scholtens, 2015). The connections between parties in the network help the organization to achieve its goals.

The other type 'commitment of members to the project' consists of three aspects. These are: 'organizational development', 'shared vision' and 'types of activities'.

Organizational development is related to the type and size of the organization, including involved people like, (possible) leaders and members. Furthermore, the formality of the organization is enclosed within this aspect. Van der Schoor & Scholtens (2015) state that organizations with sustainable leadership are more successful to be durable and are able to sustain themselves. An example of an organization could be a small informal village initiative with local leaders. The aims, ambitions and goals of the organization correspond with the aspect of 'shared vision'. In other words, the collective of agreed targets of the organization. For instance, the project wants to achieve an energy neutral village in 2022. All the activities of the organization correspond to the third aspect of the organization. This could be, the installation of solar panels or wind turbines. Next to that, the

promotion of renewable energy facilities through various communication methods like; meetings, social media and websites can also be part of the activities of an organization (Van der Schoor & Scholtens, 2015).

2.2 Sustainable place-based development

The importance of local places and their developments is intensifying, which is discussed in the previous sections. Within these places, place-based developments related to social, economic and environmental processes can occur. In this section, the focus will be on the environmental processes, with the aim to unravel sustainable place-based development.

Recently, organizations arise where locals gather along with shared visions and goals, they together built up the capacity to change the current pathway which is often in a state of 'lock-in'. In other words, it is hard to alter ongoing processes or establish a transition in such institutional systems, related to energy. Mostly, these are ambitions on the theme of renewable or green energy and sustainability (Van der Schoor & Scholtens, 2015). Sustainability is a core concept that has plenty of varying definitions. However, the main message of these definitions resembles the balance between economic development, equity and environmental protection. Social and ecological goals are driving factors here (Hawkins & Wang, 2012). The improvement of quality of life is central, where there is a mix of sufficient economic growth, distribution of resources and care for ecology and the environment.

Next to the sustainability component, there is place-based development. Place-based development aims to strengthen the place (local or regional) with the use of its own characteristics and dynamics (Horlings, 2018; Horlings et al., 2018). Hence, it is possible to achieve a place where social, economic and physical resilience is increasing. In order to obtain place-based development, multiple factors are useful to stimulate the liveability and developments of certain places;

"We have argued here that a place-based approach requires capacity building, collaboration, collective agency and place-specific institutional arrangements to start and support joint learning and innovation."
Horlings et al. (2018).

Connecting this sustainability factor to developments at certain places on the local level, this results in sustainable place-based developments. The rising appearance of organizations which are concerned with these developments, results in increased sustainable developments, noticeable on a global scale (Van der Schoor & Scholtens, 2015). Energy cooperatives are taking off in villages and cities to mitigate climate change effects. This trend draws attention to the local level where these energy cooperatives are settled.

Reasons why the local level is seen as significant in altering current pathway, is because there is a lack of responsive actions to climate change at the national and global level (Bakker et al., 2012; Measham et al., 2011; Van Aalderen, 2018). The slow progress of reducing the impacts of climate change ends in additional willingness of local communities and organizations to contribute to climate

change adaptation themselves. In other words, it provokes citizens to come up with a response to climate change, leading to citizens initiatives. That is why local communities are exploring diverse ways of reducing greenhouse gases in combination with developments that are beneficial for that particular community (Measham et al., 2011).

Another explanation of why the local level is acquiring a leading position, is the fact that adaptation of these pathways is local (Agrawal, 2010). Measham et al. (2011) argue that the impacts of climate change processes can be experienced at the local level. Because regions differ and the impact of climate change is also partly dependent on these geographical differences, the attention of adaptation has to be on the local level, resulting in place-based developments (Agrawal, 2010). Furthermore, the local institutions have to deal with the problems and challenges which emerge because of the increase of greenhouse gases. The global institutions, but moreover local institutions, like municipalities and other organizations, must ensure the mitigation of climate change problems and are responsible for their communities. In other words, the local level has to act against the problems and challenges which they started at this level (Measham et al., 2011, Wilson, 2006). Because of these two reasons a shift is happening, where community-led planning is potentially speeding up and taking the lead in the fight against climate change.

2.3 Leadership

Within this research, the focus will be on place leadership as the main leadership approach. Many authors claim that place leadership is important when there are spatial developments taking place on local and regional scales (George & Reed, 2017; Horlings et al., 2018; Sotaurata & Beer, 2017; Van Aalderen, 2018; Van der Schoor & Scholtens, 2015). Place leadership is crucial for these developments vested in certain places. Sotarauta & Beer (2017) state that place leadership is hard to define because it is an elusive concept. Nevertheless, Sotarauta & Beer (2017) define place leadership as the following concept:

"Place leadership may comprise many different leadership approaches but is essentially concerned with (1) facilitating interdisciplinary development strategies and practices across institutional boundaries, technology themes and professional cultures; and (2) ensuring the comprehensive engagement of various communities so that they would be able to contribute to, and benefit from, development processes and outcomes"
Sotarauta & Beer (2017).

Sotarauta & Beer (2017) mention that when areas are in a developing phase, regions or local places need competent (regional) actors who are able and capable to lead social, economic and environmental processes. Actors can be powerful individuals, like politicians. But also collective local initiatives, which merge together into an organization, can occupy the function of a leading actor. This can be a combination of different leading actors in one organization, but it can also be one actor who is leading the organization. These actors have to deal with the vested interests and collaboration spirit, which characterize place leadership (Van Aalderen, 2018). Place leadership is considered important because it matches and links formal and informal (governance) processes and institutions with each other (Sotaurata & Beer, 2017). Next to that, place leadership equals to connections

between people, institutions and other domains. Horlings et al. (2018) argue that understanding place leadership on the sub-national level is the missing link in enabling local social, economic and environmental developments which are in nature place-based. If the understanding is there, place leadership is considered vital for local and regional developments. Within these developments, new institutional arrangements could arise. Moreover, collaboration between different stakeholders, people and sectors could be established. Furthermore, capacity building can take off (Horlings et al., 2018). The processes concerning place leadership are multi-level, multi-agency and multi-faceted, this interlinks with the various layers and levels of institutions and stakeholders. Place leadership supports networks of knowledge in a way that boundaries can be bridged. These boundaries could be in the form of thematic, organizational and administrative boundaries (Van Aalderen, 2018).

Place-based leadership is essential on the local level because leaders bring parties like communities together, this will result in 'spiraling-up' processes in which the community gets actively engaged with certain topics, aims and goals (George & Reed, 2017). Leaders coach and guide the citizens through the collaboration process and thereby co-production of knowledge and collective action can be facilitated. This could be, the realization of renewable energy facilities on the local level (George & Reed, 2017).

Place leadership is more open than other forms of governance, as mentioned before, the goal is to pursue collaboration, consensus-seeking and trust. However, current governance strategies are often associated with leaders who direct others to execute certain tasks (Sotarauta & Beer, 2017). Instead, place leadership is dependent on local resources and knowledge, and therefore more open for engagement with different sectors, including the local sector itself (Horlings et al., 2018). In this way, place leadership is also not as hierarchical as the current (top-down) bureaucracy or traditional governments at the national level. It is however very complex to match place leadership with national government processes because the processes on distinct levels (local, regional, national and global) are always changing and are therefore unstable (Sotarauta & Beer, 2017).

The article by Meijerink & Stiller (2013) investigated many different leadership approaches and theories. The authors came up with a model of five divergent functions which are part of leadership. These functions can be seen as roles with tasks, which belong to these roles. These tasks can be fulfilled by local leaders. Local leaders could be positional leaders, such as elected politicians or other non-positional leaders, like individuals or collective organizations who have a voice and therefore matter. These different functions and tasks of leadership are needed to achieve climate change adaptation, argued by Meijerink & Stiller (2013) and Van Aalderen (2018). The combination of place leadership with the tasks of leadership presented by Meijerink & Stiller (2013) resulted in the accommodative leadership style (Van Aalderen, 2018). For this research, the focus is on the place leadership tasks. The leadership tasks that are used are displayed in table 1 and derived from the article of Meijerink & Stiller (2013) and the master's thesis of Van Aalderen (2018).

Leadership task	Description
'Strategic awareness'	Creating a focus and urgency about specific topics of interests, related to climate change and the energy transition, by strategically sharing of and drawing attention to information and deadlines.
'Coordination'	Creating new, flexible institutions/structures to overcome current policy/governance lock-ins ('frozen shapes'), institutional renewal. Creating trust, solidarity and mutual interdependence through integration, connectivity and transparency. Creating shared knowledge.
'Framing'	Creating a shared understanding and vocabulary about the issue. Approaching and communicating about the issue.
'Common vision'	Creating joint, focused and inclusive vision (documents) that contribute to a common goal/vision.
'Mobilization & Recruitment'	Mobilizing individuals with different backgrounds. Use and allocate locally available skills and resources. Attract, interest and stimulate actors to participate and bring actors together.
'Span boundaries'	Influencing actions of other organizations/stakeholders, in the place or in the network. Collaborate with other parties (which may have a different logic/vision). Accept new ideas/visions at various levels/scales.

Table 1: Leadership tasks for energy cooperatives (based on Meijerink & Stiller, 2013; Van Aalderen, 2018)

2.4 Connection to the network: governance processes

Barriers and challenges of sustainable place-based development initiated by citizens are often related to the connection to the network (Measham et al., 2011; Van der Schoor & Scholtens, 2015). This connection to the outside network is already briefly discussed in chapter 2.1 (Van der Schoor & Scholtens, 2015). Hawkins & Wang (2012), Measham et al. (2011) and Van der Schoor & Scholtens (2015) claim that this link with other actors and parties is essential in accomplishing the modification of current policies and the creation of new sustainable policies. This can be achieved because parties like national governments are executing the tasks which are coupled to higher-level governance processes, e.g. policy development on the national level. Where the local community tries to speed up the energy transition with the establishment of regional energy cooperatives, the higher-level governance processes and regulations hinder the effective incorporation of these initiatives (Measham et al., 2011). While it is argued that the local level must be the leading party to reach a paradigm shift, they are dependent upon other parties within the network. Because of an 'institutional void' where local parties, like municipalities, operate, the development of policies and regulations about sustainable energy can be obstructed. This is caused by complex governance processes, where within this void, clear roles and responsibilities of the involved actors are lacking. Hence, institutional challenges, vague roles and unclear responsibilities start to originate (Measham et al., 2011). The institutional void works as a barrier, the same with phenomena like lock-in or path dependency, and limits the current system to make a transition to a new level. In this case the energy

transition from fossil fuels to renewable energy. Therefore, it is needed to collaborate between the involved parties, on all the scales and levels within the network, to reach desired outcomes.

Next to this, the 'diversely filled agenda' of local level authorities amplifies the lack of resources in order to implement measures with regard to sustainable development (Elzenga & Schwenke, 2015). Moreover, decentralization processes, where higher-level authorities relocate tasks and activities to lower levels, lead to fewer chances to incorporate climate change mitigation measures into policies (Measham et al., 2011). These two constraints, the 'institutional void' and the 'diversely filled agenda', explain the lack of new sustainable place-based development policy implementation at the local level.

2.5 Conceptual model

The leading concepts of this chapter are merged together, resulting in the conceptual model (figure 1). The conceptual model consists of concepts and theories regarding leadership, as well as citizen initiatives, stakeholder collaboration and sustainable place-based development. The model is derived from the literature and mostly based on the work of the following authors; Meijerink & Stiller (2013), Soares da Silva et al. (2018), Sotaurata (2010), Van Aalderen (2018) and Van der Schoor & Scholtens (2015). The conceptual model consists of three layers and four dimensions, these will be discussed in the upcoming paragraphs. Hereby, the main theoretical concepts for this research are simplistically visualized.

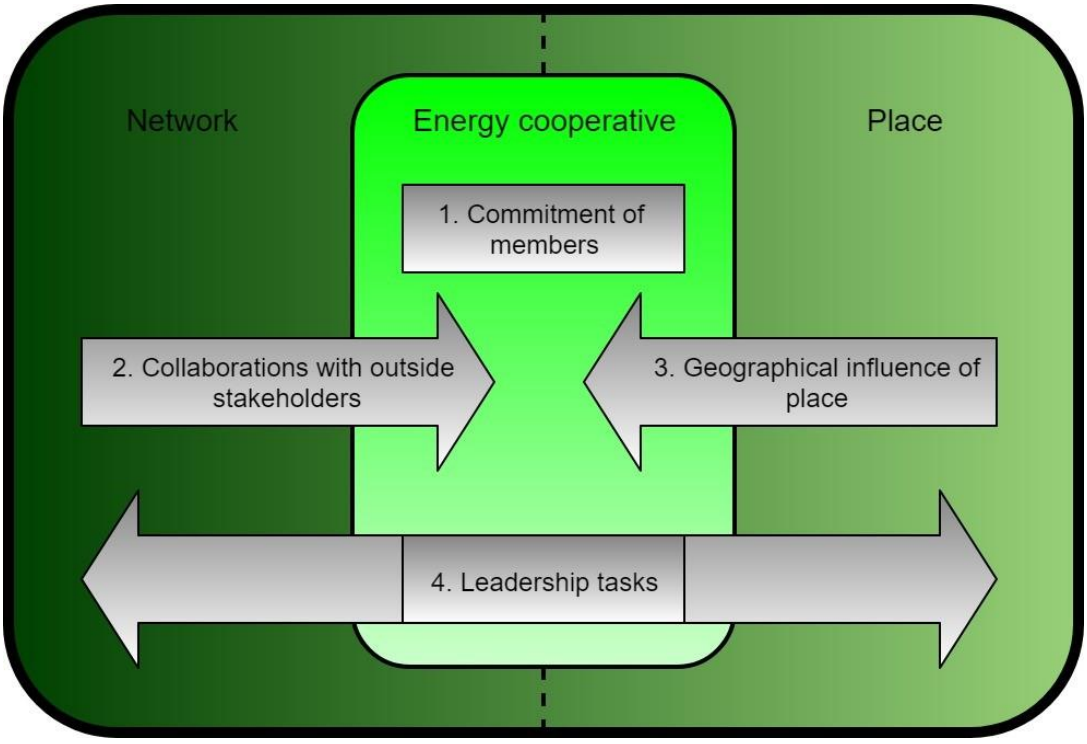

Figure 1: Conceptual model

2.5.1 The layers

The bright green layer in the center of the conceptual model is the 'energy cooperative'. An organization which is in further detail discussed in chapter 2.1. The green layer at the right of the conceptual model represents a geographical area, this is a local area like a city or village, called 'place'. Within this place institutions, formal and informal regulations and rules, are in practice. Furthermore, citizens live in this place, where some of these citizens start sustainable place-based initiatives (discussed in chapter 2.2). These citizens and institutions interlink, as a result, an energy cooperatives could take off within the place. The citizens and institutions within the place can become part of the energy cooperative (Soares da Silva et al., 2018). The cooperative endeavors to realize climate change mitigation, adaptation and sustainable developments. The other level around the energy cooperative and next to the place, is the 'network' layer at the left (dark green). The network level interlinks with the place layer because the place or geographical level is also connected to the (bigger) network. Within the network layer, different stakeholders interact, where for example a political body is in collaboration with the energy cooperative. In this way, the energy cooperative is also part of a network in the topic of the energy transition (also see dimension 2). Summarizing, these three layers are interlinked and these level(s) influence processes of other level(s). For instance, the provincial level situated in the network layer influences the local organization level, in other words, the energy cooperative layer.

The processes within and between the three layers which are relevant for this research are highlighted in the following section, referred to as dimensions 1, 2, 3 and 4. Processes of dimension 1 are within one layer, the energy cooperative, processes of dimension 2, 3 and 4 are between the three layers.

2.5.2 The dimensions

Dimension 1, presented in the grey box at the top, is referred to as: commitment of members. Aspects of energy cooperatives are their organizational development, shared vision and types of activities, discussed in chapter 2.1 (Van der Schoor & Scholtens, 2015).

Dimension 2, is visualized with the left grey arrow and is discussed in chapter 2.1 and 2.4. This dimension displays the connections outside of the energy cooperative. The cooperative could have relations with other organizations and authorities within the network, for instance with the municipality or local businesses. Therefore, the network layer is also linked to the place layer. Next to that, collaborations or relations could take off between the cooperative and parties in the bigger network, for example with national level governments or NGOs. Decisions of stakeholders in the local or regional network could have an effect on the activities or goals of the energy cooperative.

Dimension 3, discussed in chapter 2.2 and presented at the right of the conceptual model, is the geographical influence which the place has on the cooperative, based on sustainable place-based development. The place has its own characteristics and dynamics, the difference between rural and urban environments is one example of this. Next to that, the differences or similarities between the provinces could be an influential factor. These influences could define the cooperative or could have an effect on this organization and its undertaken activities. Therefore, factors like the kind of environment shape the organizations' identity.

Dimension 4, represents leadership and the corresponding tasks of leadership of the cooperative (also see chapter 2.3). The initiative or energy cooperative can take the lead in the battle against climate change, which is presented in the conceptual model with the grey arrows at the bottom. Through leadership, energy cooperatives have their influence on the place in which they operate. In addition, they can have an effect on the network (discussed in chapter 2.1 and 2.4). Potentially, energy cooperatives could achieve adjustments to and renewal of policies and regulations on higher governance levels (in the network). Leadership has a variety of tasks (strategic awareness, framing, coordination, common vision, mobilization & recruitment and span boundaries) which can be executed by the energy cooperative. The leadership tasks and how they can influence or relate to the place and network, is already discussed in chapter 2.3 (Meijerink & Stiller, 2013; Sotaurata, 2010; Van Aalderen, 2018).

This conceptual model helps to carry out the empirical part of the research.

3. Methodology

Within this chapter, the research framework, the research approach and how the empirical part of the research is organized, are discussed. The case study data collection techniques with case selection and semi-structured interviews will be addressed and the cases will be explained. Additionally, the stakeholders, the data analysis process and the ethical considerations are mentioned in detail.

3.1 Research approach

Table 2 shows the research framework which guides the processes needed in order to fully conduct the empirical part of the research. This table summarizes, per sub-question, the entire empirical research. The empirical part of the research consists of three qualitative methods: semi-structured interviews, document analysis and GIS mapping. Together with the literature study, this will result in a case study research of the three northern provinces of the Netherlands (Drenthe, Friesland and Groningen).

Questions	**Information**	**Time of data collection**	**Sources and method of data-collection**	**Method of documentation**	**Method of analysis**
How are energy cooperatives in rural and in urban environments organized, what are their visions and which sustainable place-based activities are undertaken to mitigate climate change?	Literature review: Theories, frameworks, approaches and insights of citizen initiatives, sustainable place-based development, leadership and climate change mitigation governance.	Jan 2019 - Mar 2019	Literature review by an in-depth study of journals/articles.	Theoretical framework derived from work, useful to this research, of other authors.	Desk research
What is the difference between energy cooperatives, in urban and rural environments and in different regional contexts? If so, what are the reasons for these differences and do these differences influence energy cooperatives and the effects they have?	Interviews: Information from energy cooperatives and other stakeholders involved in those areas related to the spatial context (citizens, community groups, provinces, municipalities, etc.).	Mar 2019 - May 2019	Semi-structured interviews (SSI) with involved stakeholders. GIS map of researched regions.	Transcripts (SSI). GIS map (GIS).	Transcription and manual coding (SSI). ESRI ArcMap software (GIS).

How do actors involved in these processes interact to reach desired outcomes and how do energy cooperatives influence the (higher-level) authorities and policies and vice versa, within the spatial planning domain?	Interviews/Documents: Information from energy cooperatives and other stakeholders involved in those areas related to the spatial context (citizens, community groups, provinces, municipalities, etc.) and from documents, about cooperation and interaction between involved institutions/actors, available for analysis related to these projects.	Mar 2019 - May 2019	Document review of case-related documents and semi-structured interviews with involved stakeholders.	Document analysis of institutions linked to this sustainable place-based development. Transcripts (SSI).	Transcription and manual coding (SSI).

Table 2: Research framework (with data collection techniques)

The research is conducted in a transparent way, this means that up front a clear research approach/framework, based on theoretical concepts, was designed (also see table 2). This predefined research is referred to as deductive research. The transparent use of data and the on forehand structured and organized data collection and data analysis processes of the research, helps being able to achieve clarity and increases the reliability of the research. Next to that, the provision of good referencing contributes to this. Moreover, a (digital) case study database will be kept (this will consist of: data which is collected, results of analysis and useful literature/theories/concepts). That is why, the line throughout the research and the subsequent steps and procedures are understandable and clear for the reader (Yin, 2003).

3.2 Data collection

The primary data equals a case study research with semi-structured interviews as the main data collection technique. The secondary data consists of a literature review of articles, papers, websites and other relevant (grey) literature related to the concepts of *leadership, sustainable development, place-based development, climate change, renewable/green energy (solar and wind), citizens initiatives and governance strategies,* in the context of local and regional urban and rural environments. Rural areas are defined as environments with less than 150 inhabitants per square kilometer (European Commission, 2014). Next to the literature review, a document analysis is part of the secondary data. This analysis consists of documents/reports/websites which are related to the energy cooperatives and their projects. Furthermore, a GIS map will be produced to clearly present the energy cooperatives and to link this to the geographical place and locations. The use of multiple sources of data, from varying sources and with the use of different methods, leads to the fact that the data validity is ensured. Figure 2 summarizes the multiple sources which will contribute to the final outcomes of the research (logic of the research), the data collection steps and the other relevant subparts related to the methodology.

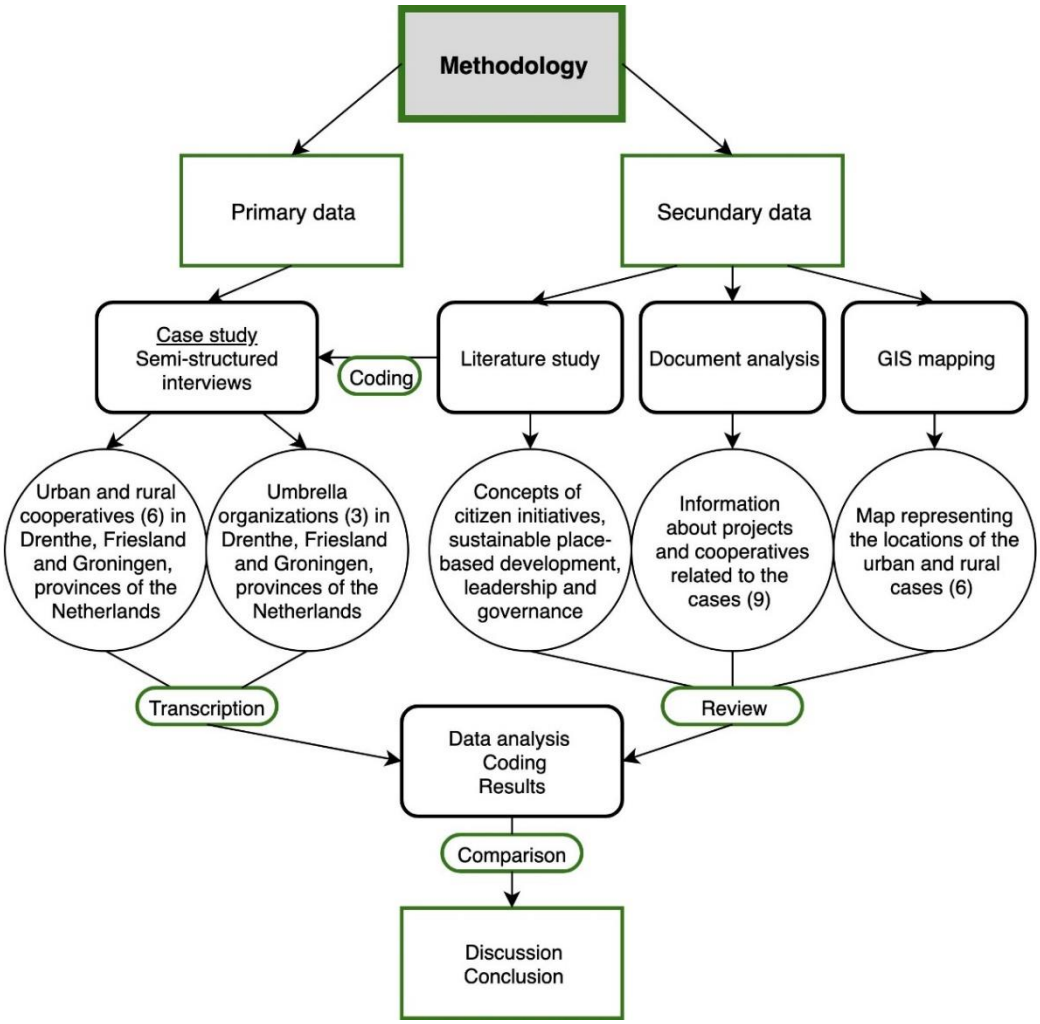

Figure 2: Methodology

3.2.1 Case study

A case study research design is chosen to be able to get a clear view of various context-dependent cooperatives in relation to their place and the relevant governance processes. In order to fully grasp the various types of citizen initiatives concerning sustainability on local and regional scales and their possible leadership capabilities, case study research is necessary. Case study research is in one sense very flexible since it can be based on any mix of qualitative and quantitative evidence (Yin, 2003), also known as triangulation. But to responsibly deal with this flexibility a researcher is required to make deliberate choices in defining the type of case study, the logic of research design, the data collection techniques, the approaches to data analysis, the interpretation and the reporting which are discussed throughout this chapter (Yin, 2003).

To conduct this research, the focus will be on the qualitative case study method which will result in empirical evidence about the specific contemporary phenomenon (also see 3.2.2.). A qualitative research method is useful in this case because in-depth context-dependent data is assessed which requires a thorough understanding of the cases and in detail knowledge about the interaction between relevant involved stakeholders. This can be obtained with the use of qualitative methods. The use of quantitative data collection (a questionnaire) was considered for this research. However, this method cannot contribute to findings which provide deeper insights because of the specific data

which is complex and depends on the context of the few cases and the cooperatives. That is why a qualitative case study method is applicable and preferred for this research, to gain intense in-depth knowledge about the local urban and rural leadership in relation to its geographical context, the energy transition and climate change, which corresponds to the aim of this research.

Within the provinces Drenthe, Friesland and Groningen various cases are selected in order to outline a broad view about these areas. Three cases within each province are deeply investigated. The three cases are divided into one urban case, one rural case and one overarching organization case in each province. Ultimately, this results in nine cases: three urban cooperatives, three rural cooperatives, three organizations.

3.2.2 Case selection

The unit of analysis, or the case, is determined by defining spatial boundary, theoretical scope, and timeframe (Yin, 2003). The spatial boundaries of this case study are the regional/local (energy) cooperatives within the borders of the cities/villages of the provinces of Drenthe, Friesland and Groningen (northern part of the Netherlands). The theoretical scope is defined based on a literature study. *Leadership, citizen initiatives* and *sustainable place-based development* are the key concepts that guide this research theoretically. These concepts help to establish the ability to investigate the cases.

Especially in studying governance processes it is relevant to define a timeframe. The relationships between actors and the attitudes of actors can change over time. This research took place from 11-2018 until 07-2019. The data are collected from the beginning of 03-2019 until mid 05-2019. The results are based on the literature research, the case study and on the eventual outcomes of the interviews with the involved actors and respondents during that period. The data collection period defines the specific time boundaries of the case.

The nine urban, rural and organization cases are selected because they are different in relation to a variety of aspects. Not only do they differ because of the place in which they are situated and the type of environment (urban/rural/overarching province) they are in, they also contrast in size, goals, date of foundation (existence), type of projects, and future planned projects. The selected cases are chosen in order to be able to research a mix of various energy cooperatives. There are some back-up cases available if necessary, for instance, if an EC does not want to participate in the research. This was also the case with the urban cases in Friesland and Groningen. The cases Noordenwind and Grunneger Power were not able, due to lack of time, to participate in the research.

3.2.3 Case explanations

Al the energy cooperatives (ECs) discussed below are partners of the organization ‘Energie VanOns’, the organization and energy company, which connects all the ECs in the three northern provinces of the Netherlands, is providing and distributing members of the ECs with green energy originating from the energy sources of the ECs. Per province, the urban cases are discussed at first, the rural cases after that and last the overarching organizations are shortly addressed. Figure 3 visualizes the locations of the ECs.

Cases Drenthe

Located in the inner city of Assen the energy cooperative 'EC Duurzaam Assen' (ECDA), even has its own 'energy store', where residents can gather extra information about renewable energy. The EC is founded in 2016 with two people who took the initiative to explore concepts such as sustainability and energy neutrality in Drenthe. This EC focuses on the awareness of energy use, the generation of renewable energy, the creation of energy neutral households. They especially try to increase the number of sustainable and liveable neighbourhoods in Assen. The EC has one project in operation, this project consists of solar panels on the roof of a warehouse in the city of Assen. These solar panels generate electricity for households who are members of the EC. In addition, two other similar projects are planned. Next to these, another solar panel park is discussed for the future (Energiecoöperatie Duurzaam Assen, n.d.).

In the village Hooghalen (Drenthe), the energy cooperative 'Energiecoöperatie Hooghalen' (ECH) was established in 2011. ECH wants to guide the citizens of Hooghalen through the process of making an energy neutral village in 2040. ECH has started a collaboration with the business Solarcentury about a planned solar park situated around the village 'Hijken' near the highway (A28). The planned solar park has a number of 47.000 solar panels, resulting in 13 megawatts which will connect 3.250 households to the green grid. At the new solar park, there will also be room for flora and fauna. The inhabitants of Hooghalen can participate in the project by buying obligations from the solar park (Energiecoöperatie Hooghalen, n.d.).

Cases Friesland

'Energie coöperatie Westeinde' (ECW), is an energy cooperative, which was founded in 2014. The main goals of the EC are to save energy and restrict the usage of energy. The cooperative is planning to construct a solar park near their own neighbourhood at the location of the old N383 road between Leeuwarden and Marssum. Next to this proposed solar park, the cooperative wants to invest in the establishment of an energy neutral Westeinde district in Leeuwarden, doing this step by step. The cooperative also helps members and inhabitant to isolate their houses. The energy cooperative is situated in Leeuwarden, Friesland (EC Westeinde, n.d.).

'Enerzjy Koöperaasje Garyp' (EKG), has ambitions to be the first energy neural village of the Netherlands. The cooperative wants to abandon gas out of 80-90 % of the houses in Garyp in the upcoming five years. EKG also helps citizens to save energy, isolate their houses and guide them through the energy transition. EKG turned an old dumping ground into solar park 'de Griene Greide' with 27.000 solar panels. The generated renewable energy from this solar park is more than enough for all the 600 households in Garyp (Enerzjy Koöperaasje Garyp, n.d.).

Cases Groningen

'Paddepoel Energiek' (PE), started their projects in 2012 and is now grown to an association which is well-known in the neighbourhood Paddepoel in the city of Groningen. In contrast to the other cooperatives, Paddepoel Energiek is not a cooperative but a foundation. They collaborate with Grunneger Power, which is a large energy cooperative in the city of Groningen, that promotes the use of local green energy for its citizens. The foundation PE is located in the Paddepoel district in Groningen and has a variety of projects in operation, such as ambitions for multiple windmills and

solar panels. Furthermore, they also provide energy coaches who can give advice to inhabitants. Also, workshops or meetings are organized by the foundation. Next to that, they want to make their neighbourhood gas free for 2035 Paddepoel Energiek, n.d.).

'Energiecoöperatie Midwolde' (ECM), is a small cooperative in Midwolde, Groningen. The EC wants to achieve an energy neutral Midwolde in the future. The EC has one small windmill (height of 15 meters) which produces green energy for the members of the village. They want to place a second and perhaps even a third windmill, as soon as possible. The windmill was installed at a farm in July 2018. The EC chooses the location for the windmills themselves to keep a clean 'environmental view'. The windmill generates 29.000 kWh per year, which resonates with the provision of green energy for 10 households (Energiecoöperatie Midwolde, n.d.).

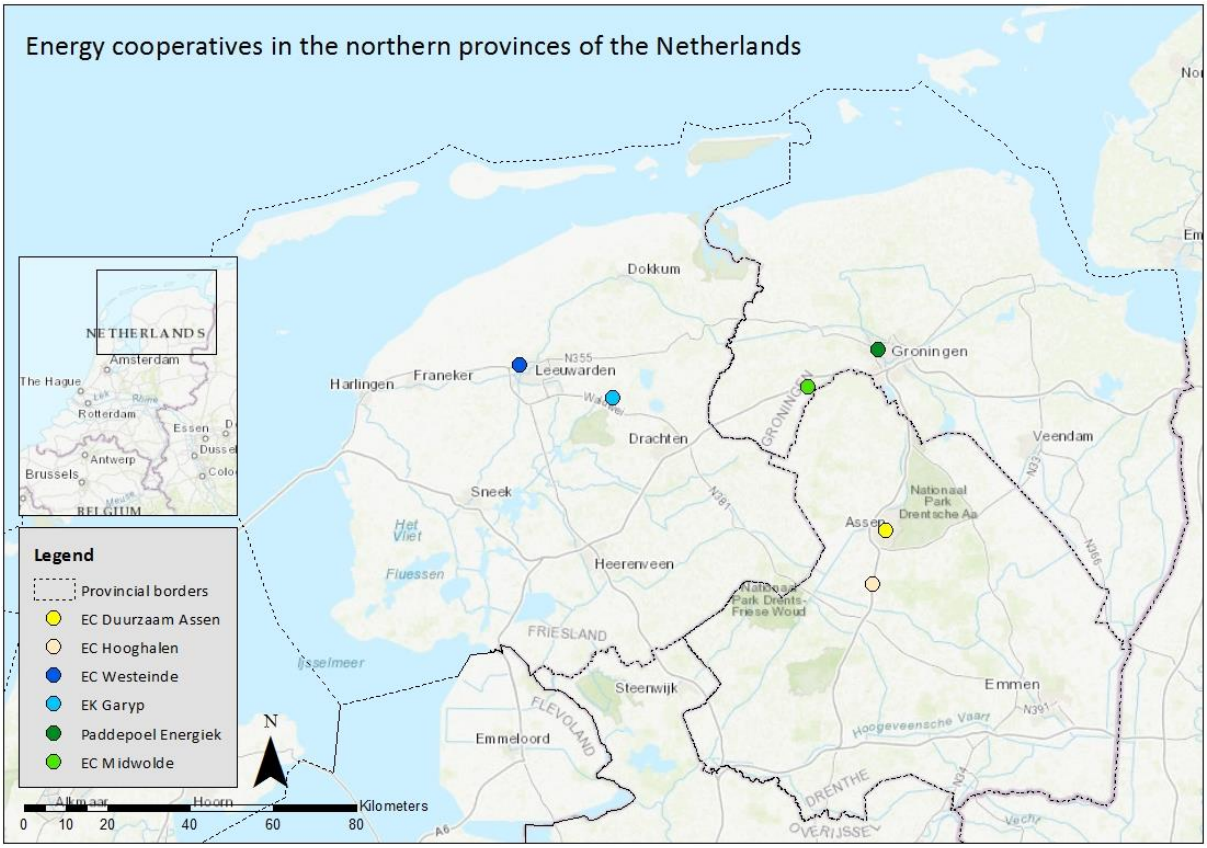

Figure 3: GIS map of the energy cooperatives as cases for this research

3.2.4. Semi-structured interviews

Because of the case study design, semi-structured interviews with the relevant involved stakeholders from the energy cooperatives and provinces are conducted, to explain and indicate the potential differences and similarities between the separate cases in the three northern provinces of the Netherlands (Drenthe, Friesland and Groningen). Next to this, in detail insights of local leadership approaches and knowledge about cooperatives in relation to their place and the stakeholders in the network are gained. Semi-structured interviews allow the interviewed stakeholders to come up with their own important input like; points, visions, ideas and critiques (Longhurst, 2010). In addition, they could provide additional information which could also be relevant for the research. In other words, flexibility is obtained by discussing topics or matters which were not listed. However, upfront there is a structured interview question list with, in general, the main and guiding interview questions. A list of (adaptive) interview questions is displayed in Appendix 1. Following this interview list, the different cases can be compared with each other on the basis of the needed knowledge, derived from collected data through the semi-structured interviews. Appendix 2 displays the informed consent which was filled in by the interviewed stakeholder at the start of the interview. An extra document (appendix 3) was presented to the interviewees during the interviews. This document contains the six leadership tasks for local energy cooperatives. With help of the document, the interviewees could indicate which tasks were carried out or not and which tasks could be performed in the future by their energy cooperative. These appendixes are English language versions, for the interviews Dutch language versions of the documents are used.

The semi-structured interviews were held face-to-face. This leads to an increased value of the data because the answers of the stakeholders are more meaningful. Furthermore, their emotions could also be identified fairly easy, which could also have a contributing value to the research. In the end, face-to-face interviews result in better outcomes, compared to interviews by phone. Face-to-face interviews also lead to the fact that the interviewees are more comfortable, mainly because they are interviewed in their own environments (Longhurst, 2010). Combined with the possibility to stay anonymous throughout the research, this confidentiality will help the participants to feel more freely in answering the interview questions (Longhurst, 2010). The interviews will be recorded to help the data analysis process.

The respondents were selected based on the cases in the northern provinces. Via mail, the energy cooperatives were contacted and respondents were asked to participate in the research, in total nine respondents are interviewed (see table 3). The interview question list was also enclosed as an appendix in the mail if the respondent requested this. In this way, the respondent was able to explore and study the questions beforehand.

3.2.5 Stakeholders

The stakeholders who are leading in this research are the energy cooperatives, which are shown in table 3. These diverse energy cooperatives are selected with the differing factors *geographical environments, size* and *type of renewable energy* as main criteria. In this way, a mix of a variety of energy cooperatives can be investigated. Next to these energy cooperatives or foundations, the overarching organizations of the three provinces are of great importance for this research and are therefore also cases, where relevant persons of these organizations were interviewed. The

Groningen urban case (PE) is, compared to the other cases, no cooperative. Instead this case is a foundation. However, in general in this research, all the cases are referred to as (energy) cooperatives or organizations.

Province	Geo-context	Name organization	Function	Date, time, location	Duration
Drenthe	Urban	EC Duurzaam Assen (ECDA)	Secretary	May 18, 09:00h, By phone	00:20h
	Rural	EC Hooghalen (ECH)	Secretary	March 18, 10:15h, Hooghalen	01:26h
	Organization	De Drentse Kei (DK)	Chairman	April 10, 14:00h, Assen	01:05h
Friesland	Urban	EC Westeinde (ECW)	Chairman + Board member	April 18, 10:30h, Leeuwarden	00:44h
	Rural	EK Garyp (EKG)	Chairman	April 12, 09:15h, Garyp	01:02h
	Organization	Ús Koöperaasje (UK)	Advisor + Co-operator	May 15, 11:30h, Raerd	01:11h
Groningen	Urban	Paddepoel Energiek (PE)	Chairman	April 25, 14:00h, Groningen	01:28h
	Rural	EC Midwolde (ECM)	Chairman	March 19, 10:00h, Midwolde	00:54h
	Organization	Groninger Energie Koepel (GrEK)	Project manager	April 25, 11:00h, Groningen	00:54h

Table 3: Conducted semi-structured interviews and respondents

Besides the energy cooperatives and organizations, there are other relevant stakeholders who are involved in the local processes related to green civic developments, such as the northern energy company and distributor of energy 'Energie VanOns'. The provinces (Drenthe, Friesland and Groningen) are, next to the municipalities of the relevant projects and their inhabitants, important and indispensable stakeholders. In the background, also other parties such as community groups, support networks or groups and businesses or private parties related to sustainability/climate change could be of essential value. These parties, described above, were frequently mentioned in the interviews and are therefore contributing to the results of the research. However, these parties are in itself not interviewed.

3.3 Data analysis and data quality

The data collected from the semi-structured interviews are analyzed with the use of codes and transcriptions. After each interview, a separate transcript has been written, directly afterwards or as soon as possible. The interview transcripts were analyzed using the codes. The codes are derived from the literature, but also from the collected data itself. The scheme with the used codes can be seen in Appendix 4. Codes help to see patterns in the given answers during the interviews. In addition, codes help to better categorize all data on certain themes. The general interview question list is made up of these themes. By applying codes, meanings of the interviewee's answers can be better understood (Clifford et al., 2010). The codes and themes for the interview questions originated from the literature and the conceptual model. This is a form of descriptive coding (Clifford et al., 2010). During the analysis and review of the collected materials, data and transcripts of the interviews, these codes and new codes (inductive coding) were used to categorize data and to keep a clear overview of the data. Based on these codes, which structure the data analysis, the main research question and the secondary questions could be answered. The coding and transcription processes were done by hand, without the use of any software.

For the literature review, the focus was on scientific articles and papers which are of good (scientific) quality. The project documents and reports related to the cooperatives which are researched are original and therefore also of good quality. The GIS mapping method provided a GIS map, which is produced with ESRI ArcMap software to visualize the place-based cooperatives in the regions in the northern provinces of the Netherlands, as a result of citizen initiatives. The GIS map provides clarity for the reader because the cases are now visually connected to their geographical context.

3.4 Ethical considerations

For the sound recording of the interview, prior permission was given by the interviewee. The same applies to the quotes and results that could potentially be used in the outcomes of the research. The data collected with the interviews will only be used for this research. If requested, the identity of the interviewee remains anonymous for privacy reasons. Despite this, in any case there will be referred to the function of the interviewee within the results chapter of the research. Moreover, the interviewee had the right to stop the interview at any time. Both before, during and after the interview, the interviewee could withdraw from the research, the interviews were therefore completely voluntary. The intercommunication between interviewer and interviewee was obviously with respect and care, following norms and values. All files concerning the interviews are stored in a secure and confidential manner on a safe and password locked laptop (Clifford et al., 2010). Appendix 2 contains the informed consent sheet which is, in advance, filled in and signed by the interviewee to grant permission for the above-mentioned aspects and for participating in this research in general.

4. Results

This chapter comprises the findings of this research, originating from the literature and document review in combination with the data analysis from the empirical part of the research: the semi-structured interviews. The content of this chapter is ordered based on the four dimensions, the dimensions guide this research theoretically (also see the conceptual model, chapter 2.5). The cases resemble six cooperatives of the provinces Drenthe, Friesland and Groningen (table 4), where the three umbrella organizations of the provinces are providing additional knowledge and information about these cases, or about the province in general.

Province	**Urban**	**Rural**	**Organization**
Drenthe	EC Duurzaam Assen (ECDA)	EC Hooghalen (ECH)	De Drentse Kei (DK)
Friesland	EC Westeinde (ECW)	EK Garyp (EKG)	Ús Koöperaasje (UK)
Groningen	Paddepoel Energiek (PE)	EC Midwolde (ECM)	De Groninger Energie Koepel (GrEK)

Table 4: Energy cooperatives and umbrella organizations (including abbreviations per province)

4.1 Dimension 1: Commitment of members

Dimension 1, the commitment of members, includes three aspects which correspond to the information about the energy cooperative itself. These are: organizational development, shared vision and types of activities. These aspects will be discussed in this order. Table 5 provides an overview and summarizes these three aspects for the six cooperatives.

Cooperatives	**Organizational development**	**Shared vision**	**Types of activities (Maximum of 7)**
ECDA, Assen *~67.000 inhabitants*	Cooperative, 3 board members, 83 members, Projects started: 2016 Founded: 2016	Help and support to make Assen energy neutral in 2040.	1. Solar panel roof 'Warenhuis Vanderveen', 213 panels 2. Planned solar park, 75.000 panels 3. Development of 4 'postcoderoos' projects 4. Own energy store 5. Energy coaches 6. Presentations, lectures, meetings 7. Website
ECH, Hooghalen *~1400 inhabitants*	Cooperative, 5 board members, 22 members Projects started: 2012 Founded: 2015	Creating a sustainable environment in any way. Collectively inducing and maintaining energy. Promotion of green energy.	1. Planned solar park, 47.000 panels 2. Campaign to promote solar panels collectively 3. Installation solar panels village house and school 4. Energy coaches 5. Educating children about energy 6. Presentations, lectures, meetings, workshops 7. Website

ECW, Leeuwarden *~108.000 inhabitants*	Cooperative, 7 board members, 150-170 members Projects started: 2014 Founded: 2014	Making the neighbourhood more sustainable. Becoming energy neutral.	1. Planned solar park, 10.000 panels 2. Campaign to promote solar panels collectively 3. Custom advice ('Maatwerk advies') 4. Exploring options for solar panel roofs on nearby companies 5. Isolating houses, ('project kier jachten') 6. Presentation, lectures, meetings 7. Website
EKG, Garyp *~1900 inhabitants*	Cooperative, 6 board members, 180 members Projects started: 2012 Founded: 2014	Energetic sustainability. 'Mienskip', social sustainability. Becoming a gas-free village in several years.	1. Solar park, 27.000 panels 2. Gas-free village project 3. Planned windmill 4. Pilot energy storage 5. Pilot geothermal heat 6. Presentations, lectures, meetings 7. Website
PE, Groningen *~200.000 inhabitants*	Foundation, 5 board members, no members Projects started: 2012 Founded: 2016	Making the neighbourhood more sustainable. Becoming energy neutral in 2035.	1. Planned windmills 2. Campaign to promote solar panels collectively 3. Energy coaches 4. Isolating houses, ('project kier gluren') 5. Exploring local energy grid in the neighbourhood 6. Presentations, lectures, meetings, conferences 7. Website
ECM, Midwolde *~380 inhabitants*	Cooperative, 3 board members, 11 members Projects started: 2017 Founded: 2018	Inducing clean energy, step-by-step sustainability. In the long term: becoming energy neutral.	1. Windmill 2. Planned windmill(s) 3. Exploring options for solar panel roof(s) 4. DuurZSaam Actief Midwolde ● Biodiversity program ● Electric car sharing ● Energy-saving measures 5. Conferences 6. Presentations, lectures, meetings 7. Website

Table 5: Dimension 1: Commitment of members

4.1.1 Organizational development

The energy cooperatives have a diverging number of members, these numbers do differ to a substantial extent, ranging from multiple members to nearly 200. ECM has 11 members, where EKG has already 180 members. The reason for this discrepancy in members is dependent on a few factors: the time when the cooperative was founded, the sense of place (covered in chapter 4.3.1), and the types of activities (covered in chapter 4.1.3).

Organizational development is also related to the type and division of the organization. The set-up of these cases is roughly the same. They all have a board with several board members, between 3 and 7 persons. One case stands out because it is not a cooperative, PE is a foundation and therefore has no members. For their planned windmill project, they are ready to start a cooperative (EPEC) which will be connected to the foundation. In this way, people can become a member and therefore are able to participate in the projects (Chairman PE). Next to the boards of the cooperatives, many cooperatives do, or are willing to, split off in certain working groups which exercise tasks which are belonging to themes or individual projects, such as 'windmill', 'solar park' or 'becoming a gas-free village' (Chairman EKG). Thus, these themes or projects are labelled as working groups. This leads to a focused way of working and less workload for the board members (Chairman EKG).

The investigated cooperatives started because generally, there was an enthusiastic group or a few people, who wanted to promote sustainable development in their own environment or place. This can happen anywhere and is most often dependent on a group of several people who are motivated to come up with sustainable initiatives (Secretary ECH, Chairman ECM). ECH started a long time ago as a sustainable foundation. EKG was formed as a result of a local informal interest group that focused on (social) sustainability. PE was established out of people from a homeowner association. ECDA, ECW and ECM were borne out of a local group that promote sustainable initiatives. This means that either there already was some kind of institution which evolved into a formal cooperative, or that the people who started the grassroots initiatives already had the ambition to promote green energy for a sustainable local environment. These kinds of people who started to cooperate, resulting in a citizen initiative, can be categorized as leaders within the cooperatives. The people who initiated these initiatives do have a leading role, most often on the boards of the cooperatives. However, the energy cooperative as a whole could adopt a leading role as a non-positional leader in the energy transition (discussed in chapter 4.4.)

"Then we (enthusiastic club of board members) already had some sustainability virus because we had been busy within our own association three years earlier. It is local, but we already had a certain institution, the homeowners association".
Chairman, PE.

A mix of various background is visible in most of the cooperatives, often there is some relation to energy, management or governance. Most of the interviewees or board members have backgrounds in the energy, financial, planning/architecture or political sector, which is the case with ECDA, ECH, DK, EKG, UK, PE, GrEK. The chairman of EKG and the project manager of GrEK argue that the more diverse the board is, the better it is for the cooperative. Even if you do not know anything about energy as a board member, this can be seen as a good thing.

"Find the right people. Also not only identical people… with the same background. Preferably, they don't need to know anything about energy. They must think straight and they must be able to think ahead".
Chairman, EKG.

It is noticeable in the local energy sector, that mostly men in the age category 50+ are board members, the chairman of EKG, the advisor of UK and the project manager of GrEK also acknowledge

this. They prefer and call for more women and younger people for these positions. Mainly, older men are interested in these roles when they have a background in the energy or corresponding sectors. Moreover, older people have more time than people with other non-voluntary fulltime jobs.

4.1.2 Shared vision and motivations of members to participate

The six cases have developed their goals and targets since their foundation. Because most cases are cooperatives, the established visions are discussed upon and shaped by the members of the cooperative. The board often steers this vision in a certain direction. Decisions about the pace and timing are often also considered by the board. These visions include in all the cases the word 'sustainability' in some way. Cooperatives like ECDA, ECH, ECW, EKG, PE do have ambitions to become energy neutral cities, villages or neighbourhoods with more concrete deadlines, for instance before 2035 or in several years. These targets are set to create points to focus on (Chairman EKG). On the other hand, the cooperatives keep the following principle in mind: every step in the right sustainable direction is one we have to take. This principle remains vague, in contrast to concrete deadlines, but the cooperatives argue that also the small steps have to be made to achieve the bigger picture (Chairman ECM). Several visions, adopted by many cooperatives, are to a large extent identical. One recurring purpose is that revenues from induced energy, originating from solar parks or windmills, are reinserted into the neighbourhood or village to be able to finance additional sustainable activities (Chairman EKG). ECW wants to buy an electric vehicle to transport elderly people from the local care home to the city center of Leeuwarden, for example. In general, revenues from induced energy are more often put in the local economy to enhance social and/or energetic sustainability or to realize more locations or methods to induce green energy. This phenomenon is also part of increasing the social and economic resilience of places, which is often also a goal for most of the local cooperatives, to increase the liveability of (small-scale) places (Chairman EKG, Project manager GrEK). In the province of Friesland, increasing resilience is known under the name 'Mienskip', the more detailed definition of 'Mienskip' is further explained under dimension 3, chapter 4.3.2..

The reasons why people participate in local initiatives are mostly because they already have an affinity with sustainability or because they are motivated to contribute to a more sustainable future, according to all interviewees. Nevertheless, people in doubt about participating in sustainable developments, are convinced to participate and are brought on board by the fact that these energy cooperatives are initiated in the first place. But also because neighbours join the initiative (Chairman ECM). For some people, financial motives are an important driver which leads to participation (Secretary ECDA, Chairman ECW). Nevertheless, activating (other) people to become a member remains a hard and long-lasting process, according to all interviewees.

"Most often, these are people who are already working on and dealing with this problem. Some of them are somehow a bit preoccupied with it or are thinking about it. As a cooperative, you will mobilize those people".
Chairman, ECM.

4.1.3 Types of activities

There are various kinds of activities which are undertaken by the cooperatives. Varying from energy inducement to meetings and campaigns to promote solar panels. Every inquired case explained that they produce green energy as a cooperative or are planning to do so. Three cooperatives, ECDA, ECH and ECW are already in the end phase of a planned solar park near the village and the neighbourhoods. At Assen Zuid, the planned solar park of 75.000 panels on 20 hectares of land is ready to take off. This park which is developed in collaboration with ECDA, will generate enough energy for around 6.500 households. The solar park where members of ECH can buy obligations is planned near the A28 highway, next to the village of Hijken. Up until this point, it is unknown when the park will be finished. The solar park is covering 21 hectares of ground with enough room for 47.000 solar panels. The location of the proposed solar park of ECW is an old road part (N383 from Leeuwarden to Harlingen), which will be turned into a solar park of 10.000 solar panels at the end of this year. EKG transformed an old landfill between Garyp and Sumar into a solar park with 27.000 solar panels in 2017. This park produces 6 megawatts of green energy. It is unique because this is the first cooperative in the Netherlands which has a total (100%) ownership of the property. The goal with the yield of the solar park is to reinvest it in the local region and economy. Not only solar energy is produced by the cooperatives, ECM has installed their own windmill in 2018. The windmill is located on the property of a farmer and it is 15 meters in height. When new members participate in the initiative, they will place a second or even a third windmill. The possible second windmill is already agreed upon with the (local) supplier of the windmills, situated in Hoogezand. Although the cooperative is also exploring options to plan and construct a solar panel roof, this did not succeed yet. PE is also interested in setting up multiple windmills (two or three), due to delay in legislation and lack of participation from the neighbourhood and region, the project shifted to the background for now.

Next to the production of green energy, energy cooperatives have more activities on their agendas. Becoming energy neutral is one key goal for some cooperatives. A way to achieve this is by abandoning gas from the houses of the village or the neighbourhood. EKG is now in progress with a pilot, hence in several years, 80% of the houses in Garyp should be made gas free. Another way to become energy neutral is by placing solar panels on individual houses and roofs, this is promoted with campaigns by cooperatives like ECH, ECW and PE. Similar campaigns to isolate houses and to search for spots and cracks where warm air leaks outside, are organized by almost all cooperatives. Other types of innovations like local energy storage facilities (Chairman ECW, Chairman EKG) and a local neighbourhood energy grid (PE) are explored. This means that not only green energy is induced, but also innovations and energy-saving programs are shared within the community and people are informed about how to save energy in daily life. Furthermore, custom advice is given to households (Chairman ECW) or energy coaches are checking and improving houses to save energy, which is present within the cases ECDA, ECH, ECM via DuurZSaam Actief, PE. The cooperative ECH educated children about energy as well. With presentations, talks, conferences, workshops and meetings for members or interested people, all the cooperatives are trying to explain in ‘normal language’ how to act in the field of energy (usage). Moreover, all the cooperatives have a website, members or inhabitants can visit those websites to get more or additional information about the cooperative, its goals and its projects.

Summarizing, the initiatives are organized as cooperatives with dissimilarities in the number of members. The shared visions are all related to 'sustainability', where some have concrete deadlines to become energy neutral. Cooperatives can arise anywhere independent of the place or the environment, but dependent on an enthusiastic group of people with a feeling for sustainability and a range of differing backgrounds. Mobilizing members happens step-by-step. The composition of the types of activities includes for all cooperatives (planned) energy inducement facilities and several energy-saving measures and methods to persuade citizens to participate in various projects. Nevertheless, these processes and activities are hard to achieve for the cooperatives. Within this dimension of the research, the cooperatives are in general rather equal in their organizational development, visions and activities, without outstanding differences in these aspects.

4.2 Dimension 2: Collaborations with outside stakeholders

Dimension 2 comprehends the collaborations of cooperatives with stakeholders in the network. Collaborations between stakeholders are indispensable for energy cooperatives to successfully achieve their goals. The three umbrella organizations (De Drentse Kei, Ús Koöperaasje and De Groninger Energie Koepel) are helping and guiding the energy cooperatives in the right direction with knowledge and frameworks. Cooperatives need their political bodies, like the municipality and the province. In the first place for permits and environmental licenses, etc. The municipality or the province is providing these permits for solar parks and windmills. Energy VanOns, the energy company founded as the distributor of local green energy by the provinces and the umbrella organizations, is also attached to the cooperatives. The company operates in Drenthe, Friesland and Groningen. The cooperatives supply their induced green energy to Energie VanOns, who divides and delivers the energy over the members of the cooperatives in the northern part of the Netherlands. Other organizations, such as energy network companies are essential players in the network.

4.2.1 Umbrella organizations and provinces

De Drentse Kei (Drenthe), Ús Koöperaasje (Friesland) and GrEK (Groningen) steer the local initiatives with information, guidelines and strategies about how to set up a cooperative or a project. Sharing knowledge is one of their key responsibilities and tasks. These organizations argue that cooperatives do not have to reinvent the wheel themselves when starting a cooperative. Not only knowledge sharing, but also enhancing collaboration, coordination and communication between cooperatives and other (governmental) parties, is done by these organizations in sessions or meetings. Indirectly, the energy cooperatives are hereby putting pressure and influencing political bodies, like the provinces. DK, UK and GrEK are representing the energy cooperatives in regard to the province, the national umbrella organization and Energie VanOns. The overarching organizations are providing advice about subsidies from the municipalities or provinces, for instance. Furthermore, achieving a uniform, clear and accessible policies and legislation is supplied by DK, UK and GrEK. In short, DK, UK and GrEK want to share knowledge, give advice and create clarity about regulations for its members, the energy cooperatives in the corresponding provinces.

"What you actually want to prevent is that every village will reinvent its own wheel. One of our goals is to make a connection with each other. We have become a kind of knowledge platform. We are able to steer and guide cooperatives from A to Z with this".
Project manager, GrEK.

The role of the province is limited in relation to the energy cooperatives. Indirectly, via the umbrella organizations, there are contacts with the provinces about the energy transition. The organizations are trying to influence the provinces about this topic, mainly by influencing their decision-making, related to sustainable place-based developments. This is done in order to enhance energy cooperative development and to achieve increased green activities. The ultimate goal is to foster and reach policy renewal and development, regarding sustainable place-based developments of citizens initiatives and energy cooperatives. However, these goals can sometimes be restricted by the province, this is elaborated on in chapter 4.3.2.. On the other hand, ECH was supported by the province for a research project 'Energieneutraal Hooghalen' which eventually led to a study of the region and eponymous report. Another example from ECH, was that the province of Drenthe

subsidized the education of energy coaches. These coaches visit residents to give advice about their home in relation to energy usage and possible saving measures.

4.2.2 Municipalities

Next to the provision of permits and licenses, the municipality (and sometimes the province) also support the cooperatives with subsidies. ECW received a subsidy from the municipality to become an energy neutral neighbourhood and was stimulated as a sustainability pioneer with help of the municipality. EKG also received SDE+ subsidies from the government, just like ECW. Many of the cooperatives explained that the municipality was very enthusiastic and supportive in the first place, they were stimulating green initiatives of solar parks and windmills. For example, the municipality of Leeuwarden did everything in their power to help ECW with the environmental permit request to the government. ECM encountered no restricting factors because of regulations, their windmill is situated on the property of a farmer, which is allowed in the province of Groningen. EKG was extremely supported by the municipality with the establishment of the solar park too because the chairman had contacts with former colleagues, who are now employed at the municipality. This informal contact was beneficial for the pace of developments, according to the chairman of EKG.

However, (old) municipal policies can restrict new developments. This was the case by ECH, ECW and PE when they tried to install solar panels and windmills. For instance, with ECH the municipality had no fitting policies for new developments. Additional examples are that ECW is in a debate with political bodies about property taxes for the solar park and PE was not allowed to install windmills at various locations because of environmental permits. This delayed these green developments. DK and ECW explained that the municipalities have to make a RES (‘Regional Energy Strategy’) before 2021, but noticed that municipalities did not start with the development of these visions yet. In general, most of the cooperatives acknowledge that policy lags behind on practice. The above-mentioned barriers are example of restrictions originating from municipalities, the following paragraph contains a brief comparison of obstructions between the municipalities.

Municipalities differ in terms of their support to help and stimulate local energy cooperatives. First of all, the municipalities are willing to support energy cooperatives. In Assen, the municipality lacks a clear framework in relation to the energy transition and therefore they do not know exactly what to do. This stalls the processes of the cooperatives. In Hooghalen, the municipality did not want any windmills, they have problems with aged policies and have difficulties with a lack of infrastructure to handle the energy capacity. In Leeuwarden, at the beginning, the mayor even contacted the province to speed up the procedure to get a license for the solar park. However, there were more barriers in their policies later on because they have no clear direction and miss coordination. In Garyp, the municipality was very active and supportive in helping with the licenses of the solar park, this led to the fact that the licenses were rapidly available. In Groningen, the municipality supported PE with activities, but the municipality Zuidhorn (now: municipality Westerkwartier), who was in charge of the licenses for the windmills, took a half year longer for this procedure. In Midwolde, the municipality was stimulating, they were enthusiastic and positive about the undertaken activities.

“Because the municipality does not really have a good idea, what they should and should not do. There is no clear frame yet”.
Chairman, DK.

The chairman and the board member of ECW emphasize that, as a cooperative, you must always try to keep the attention of the municipality. Because when the cooperative does not keep track and maintain a certain degree of contact and relationship between the cooperative and the municipality, the connection between the two will get weaker. That is why the focus of the municipality can shift towards other (upcoming) initiatives in other villages or neighbourhoods. In general, it can be concluded that the willingness of municipalities is far-reaching. Nevertheless, they are sometimes not able to help the cooperatives with their projects because policies and regulations are lagging behind the developments. Next to that, there is no clear line in municipal decisions. The chairman and board member of ECW, the chairman of PE and the advisor of UK, claim that the different sectors or civil servants of municipalities are contradictory in terms of directions of decisions, which results in stalled processes. Moreover, the tasks for civil servants increase, also because of decentralization, which causes scarcity of time and manpower devoted to matters related to the energy transition. This leads to an increased workload for municipalities, argued by several interviewees. Progress of planning or constructing a green energy production facility or other sustainable activities are hereby hindered, resulting in a reduced numbers of activities.

"It could have gone smoother if the governments were better prepared for the energy transition”.
Advisor, UK.

4.2.3 Energy (network) companies

Greenchoice, Solarcentury, Engie, Eneco or similar companies are frequently mentioned by the cooperatives or umbrella organizations and are important stakeholders for the construction of solar parks in Assen, Hooghalen, Leeuwarden and Garyp. Energy network businesses, like Liander and TenneT, are in all cases involved in the connection of solar parks or windmills to the national or regional energy grid. Recent developments in the energy transition are rapidly transforming the landscape in the Netherlands because of more and more initiatives. This has consequences, not only the visible landscape is changing, but also the infrastructure of the energy distribution throughout the Netherlands needs to be adapted to the rising amount of electric current, which is induced by these initiatives. Multiple energy cooperatives and umbrella organizations state that problems arise with the network connection of the green energy production locations to the network. For example, in Hooghalen, the lack of capacity for the planned solar park is a fundamental problem. Heavier infrastructure, like underground cables and power lines, are needed in the northern part of the Netherlands (Secretary ECH). Because of insufficient infrastructure, green developments are obstructed (Chairman DK). Because of this barrier energy cooperatives are not able to achieve the maximum efficiencies which are technically possible to achieve with their local solar panels or windmills (Chairman ECM).

"The network capacity in the northern part of the Netherlands is full. So these cables here are fully used, to their maximum potential. As a first step, they must be fully reinforced, this could take around 10 years".
Secretary, ECH.

Summarizing, this chapter about the collaborations between the cooperatives and the parties in the network clearly shows that energy cooperatives work together with diverse other stakeholders. The municipality and the umbrella organizations are the most important partners. The overarching organizations provide the cooperatives with knowledge and support them throughout the whole process through coordination. Besides, their aim is to influence the provinces about the energy transition. How municipalities stimulate and support or restricted the cooperatives differs, although the willingness of the municipality to help the cooperatives with their activities is present. However, due to ageing policies, unclear roles, wait-and-see attitudes and contradictory visions within the authorities, developments are hindered and interfered. Weak power infrastructure and lack of network capacity contribute to this.

4.3 Dimension 3: Geographical influence of place

Dimension 3 consists of two main aspects which define the geographical influence of place. The empirical research focused on the influence of the environmental context, in other words, whether the initiative was situated in an urban or a rural environment. Hereby, social and physical differences and similarities between the urban and rural environments are discussed as the first aspect. Next to this aspect, the influential social, physical and political characteristics of the provinces were a topic of interest. These characteristics are compared between the northern provinces.

4.3.1 Urban and rural factors

Typical for this dimension is that the respondents of all nine cases are unanimous about the experienced dissimilarities between the urban and rural context. Following their experiences from their own cooperatives and from other cooperatives, all interviewees argue that the village initiatives are in some way more successful than the cooperatives operating in cities. The way in which the degree of successfulness is defined is a matter of debate. In general, it is argued that villages in rural settings are better in establishing widely accepted support for their activities (in Dutch: 'draagvlak') (Chairman EKG, Chairman ECM). These initiatives do relatively have more members than the urban cooperatives in relation to the population size (Advisor/communication co-operator UK), which can also be seen in table 5, chapter 4.1.1.. Another main aspect that contributes to the successfulness is the pace in which the developments or projects of the initiative can be realized (Chairman DK, Advisor/Communication co-operator UK). Rural inhabitants are more often concerned with new green developments in their villages and are therefore better approachable for potential membership or participation in projects (Chairman DK, Project manager GrEK). Summarizing, the support and involvement, number of members, the pace of the activities and the approachability are the main aspects that define the successfulness of a cooperative. These aspects are dependent on the social and physical characteristics of the environment which are discussed below.

"In the city, you have more social mass, so you would expect that you can also create more connections, but that is more difficult than it seems at first glance".
Chairman, DK.

Social characteristics

The social environment has its effects on the activities which are undertaken by the cooperatives. It is clear that the social characteristics of the urban neighbourhood restrict the potential developments of the urban cooperatives ECDA, ECW and PE. On the other hand, the social characteristics of the rural environment provoke and amplify local activities. The social fabric and social cohesion of the areas can have an impact on the degree of participation, which has an effect on the undertaken activities of cooperatives.

Social fabric

Because of the many elderly people in the districts of Assen, Leeuwarden and Groningen, certain projects like the local windmills (Chairman PE) lack participation because people do not know how long they might stay in the neighbourhood. In addition, questions arise if ongoing participation is still possible if (older) people want to move (to care homes). The same phenomena also apply to ECW,

where the district rejuvenates. They experience that sustainability is of greater importance within the younger generation in comparison to older residents, which leads to less participation in older neighbourhoods, like in Assen, Leeuwarden and Groningen (Secretary ECDA, Chairman ECW, Chairman PE). The social fabric is a determining factor in other areas of Leeuwarden, such as the district 'Achter de Hoven'. Many students live in this district, who do not have a connection to the neighbourhood itself (Communication co-operator UK). Therefore, the long-term bond between citizens and the place is weaker. Next to students, young families are living in Assen, who do not have spare time anymore to invest in matters related to sustainability (Secretary ECDA). Besides, the social diversity of inhabitants living in cities has effects on the participation level. In cities, there are relatively more poor people than in villages. These income groups abstain from taking a share in collective energy inducement because of financial reasons (Secretary ECDA).

Summing up, people with a strong connection to their neighbourhood or village are needed for sustainable place-based developments to happen. Because poorer people, elderly people and younger people, like students, have other priorities and motivations or weaker bonds, these groups are not as active in pursuing sustainable place-based activities as other middle-aged groups. For the reason that many elderly people and students live in cities like Assen, Leeuwarden and Groningen, cities are in a disadvantaged position, compared to villages.

Social cohesion

The secretary of ECDA states that urban citizens need to be targeted in other ways then rural citizens. Because in the urban setting the social cohesion component is missing, people must more actively be made aware of the benefits and advantages to encourage people to become a member of a cooperative and participate in activities (Secretary ECDA). Partly because of less social cohesion, the respondents of the urban cases argued that recruiting members to participate is complicated.

"I think that a city as a phenomenon is a somewhat more anonymous environment. The people are a bit further away from each other. If you come into high-rise buildings, like in Assen, then that bond is considerably less and the groups are also much more diverse. Not only diverse in income, but also in social and social-psychological composition. The willingness to help the weak in villages is somewhat greater than in the cities. You see that this translates into the willingness to participate in, for example, an energy cooperative".
Secretary, ECDA.

The reason why rural cases are more successful than urban cases, based on the social coherence of the place, is the strong connection between the people living in the villages. Next to that, the residents are also more attached to their place, which means that they are willing to put an effort in (green) developments for their own villages. The close bond between the citizens themselves and the place are key characteristics of the rural environments, which leads to higher participation of citizens. That the bond in a city is weaker than in a village is also seen as a limitation by the chairman of PE:

"Of course our limitation is that we work in a neighbourhood, even though we know each other, it remains a city of course, right?".
Chairman, PE.

The social cohesion nowadays in villages is still noticeable, although this has decreased over time due to less participation in (religious) associations, it is still a positive contributing factor to initiatives (Chairman EKG). This togetherness or solidarity in the present is partly explained from the past, where people living in villages needed to be self-reliant (Secretary ECH). The conservation of the existence of villages and belonging services triggers citizen participation in small-scale places and causing place-based initiatives (Chairman EKG, Project manager GrEK). This self-reliance is a motivational driver for people to proactively do something for their own environments in which they are embedded, argued by the chairman of EKG and the chairman of ECW.

"Farming communities work more cooperatively. You have to see it as an association in the past (in Dutch: Boermarke), which is a collective of local farmers who worked together. Actually, the objective was self-reliance. We must help each other to survive".
Secretary, ECH.

Another social explanation of why participation lacked, is explained by the chairman of PE and the project manager of GrEK. With the urban windmill project of PE, many inhabitants already had solar panels on their roof, which led to less necessity for additional wind energy. Grunneger Power, the biggest cooperative in the city of Groningen, also exploits large solar field projects where people can buy shares of green solar energy which is more beneficial than wind energy, leading to less interest in the neighbourhood windmills (Chairman PE). This shift of interest to other projects in neighbouring areas is also mentioned by the project manager of GrEK. In rural settings, there are fewer neighbouring projects, which means that this factor is more influential in the urban context.

Physical characteristics

The urban landscape can also be a restricting and complicating factor for developments to take place. PE experienced a search for a suitable location for their windmills, which took several years. The land which was appropriate for windmills was scarce in the surroundings of the city and due to regulations of the province, two municipalities and two waterboards, the process was slowed down. The pace of the examined urban grassroots initiatives is therefore dilatory in comparison to the rural practice which is explained by the chairman of PE and the secretary of ECDA. In Groningen many farmers install windmills on their property, like the windmill of ECM, this takes significantly less time, which became clear with the project of PE. The rural environment is in advantage because there is more space for renewable energy facilities which demand space. Windmills, for example, need open space to operate with full efficiency, which is abundant in the region of Midwolde (Chairman ECM).

As mentioned, the rural cooperatives are in a way better equipped to start with projects. Several small-scale villages in Drenthe, Friesland and Groningen are presented as examples by the interviewees, where the cooperatives are part of the place and where almost all residents are members of these organizations. The cooperative in Garyp has many members and the coherence and collaboration between the residents is high, resulting in close relationships and strong connections between people. Moreover, because almost all the residents know each other in the village (Chairman EKG). The village of Midwolde rapidly placed a windmill as a collective, after the foundation of the cooperative. Before the foundation, announcements about a sustainable vision and several proposed projects, to the community at the village association, were happily received in the area. The association, where almost every inhabitant of Midwolde is member, further

strengthened the bond between the inhabitants. In bigger villages, like Hooghalen, it is more laborious to reach people and to get enough members to initiate new projects (Secretary ECH). This difference in successfulness between villages is seen in practice and relates to the size and close community feeling or togetherness of the village (Project manager GrEK, Communication co-operator UK).

"We also use the formula: the smaller the village, the more successful the cooperative".
Communication co-operator, UK.

4.3.2 Provincial factors

Social characteristics

Every province in the northern part of the Netherlands has its own character. In Drenthe, the community has a wait-and-see attitude of mind, argued by the secretary of ECDA, the secretary of ECH and the chairman of DK. There are not as many cooperatives in Drenthe, in comparison to the other northern provinces. This reserved character leads to a weaker potential of undertaken activities in contrast to cooperatives in Friesland and Groningen (Secretary ECDA, Secretary ECH). Additionally, the chairman of DK explained that in the first place, knowledge was still missing in the context of Drenthe to establish cooperatives and activities. Friesland and Groningen do have a stronger identity in relation to the aspects which are discussed below; these aspects were brought up by the interviewees.

Friesland is within the Netherlands often seen as a more separate province with its own culture and language. The population of Friesland is seen as an active and collective society (Secretary ECH, Chairman DK). This behaviour corresponds to the undertaken green initiatives. Their focus is on their own places and villages, inhabitants, therefore, have a strong connection to place and the Friesian identity. All revenues deriving from the projects and induced solar and wind energy are flowing back into the communities. This process is also noticeable in Drenthe and Groningen. However, this way of working, as a part of Mienskip in the context of Friesland, is emphasized in all three cases of Friesland (EKG, ECW, UK). The definition of Mienskip is that through the collaboration of the entire local community, the self-reliance, social cohesion, solidarity and resilience of small-scale villages is enhanced. Mienskip represents togetherness, it is characteristic and part of the identity of local communities in Friesland. In the case of an energy cooperative, the notion of Mienskip is broader than only renewable energy as a topic and many activities can be implemented based on this social connectedness. Examples are school buses for children and retaining and maintaining social housing in rural areas (Chairman EKG, Chairman ECW).

"Well, I think the originally Frisian population is very cooperative minded, in terms of club life and with each other. It is also typical for a village".
Chairman, EKG.

Physical characteristics

There is also a difference between certain regions, for example in Friesland, where the southern villages are located closer to each other than the northern villages. An effect of this is that the

southern villages are more often collaborating with each other. Moreover, they have an influential power on other neighbouring communities which instigates and encourages groups of people to start with multiple green developments resulting in a reinforcing trend of new place-based activities (Communication co-operator UK).

Institutional and policy characteristics

A good example of a difference in policy and regulations between the northern provinces is about legislation and regulations concerning windmills. The consequences of gas extraction in Groningen for the cooperatives is also described. Solo placed small windmills (heights of 15 meters) are not allowed in Friesland. Also, in Drenthe authorities are reserved in terms of installing windmills (Secretary ECH, Chairman DK). In Groningen, the small mills are allowed nearby farms and on farmers' properties. The result of this is that in Groningen many 15-meter-high windmills from local manufacturer EAZ, are popping up all across in the landscape initiated by local cooperatives. In Friesland, several cooperatives want to place or renovate windmills, which is until now not allowed. This is seen as an obstructing factor (Chairman EKG, Chairman ECW, Advisor/Communication co-operator UK). This difference in legislation leads to contrasting numbers of activities between the northern provinces. For solar energy, the provinces are more aligned. The provincial visions entail that solar panels must be installed on roofs in the first place. After that, solar panels on land must be allocated in a way that it fits the environment and corresponding zoning plans.

Furthermore, the contestation of people against the natural gas extraction in Groningen have their influences on cooperatives in these areas in Groningen. These initiatives and citizens are much more motivated and the civic bond is, due to these gas problems, much stronger (Chairman ECM, Project manager GrEK, Chairman DK). Cooperatives in these areas are therefore also more successful with a higher number of members and quicker executed projects. Moreover, partly explained by the fact that the government is providing more accessible subsidies for projects in this region with lower interest rates (Advisor UK) and the umbrella organization GrEK is providing free of charge support (Project manager GrEK).

"The natural gas problem also plays a part in this. People in Groningen are mainly concerned with the fact that less natural gas has to be extracted".
Chairman, ECM.

"There is an extra motivation to take such a step: I am going along in the energy transition. The willingness to do something with each other is just greater there, they really feel the disadvantages of our current energy consumption system, which you might not notice in the Randstad".
Project manager, GrEK.

Summarizing, it is clear that rural cooperatives do have social and environmental benefits in comparison to the urban context, which helps to establish sustainable place-based activities and projects. A strong bond between citizens, high levels of social cohesion, advantageous in the landscape, a distinct provincial identity and specific provincial (institutional) characteristics can provoke boosts for green initiatives. These characteristics lead to increased successfulness of cooperatives. This turns into more and better approachable members, increased (pace of) activities, and widely accepted support for the energy cooperatives.

4.4 Dimension 4: Leadership tasks

Dimension 4 focuses on the leadership of the cooperatives. Who should take a lead in the energy transition is an important question throughout this research and will be elaborated on within this section. During the interviews, the respondents were confronted with an overview of leadership tasks for energy cooperatives based on the conceptual model. The interviewees responded to this by indicating whether these tasks were executed (now, future or not at all) and to what extent. Moreover, based on their opinion and knowledge they came up with the most important leadership task(s). There was also an opportunity to come up with own additional tasks or roles. The leadership tasks, based on Meijerink & Stiller (2013), will be discussed throughout this section with contributing remarks and notions brought up by the interviewees per task. However, in the first place the most important tasks, substantiated by the respondents, are displayed per case (cooperative or organization) in table 6.

Case	Most important task	Own description
ECDA	Strategic awareness	We want to convince people to take the energy transition in their own hands.
ECH	Strategic awareness	We want to promote sustainability in any form.
ECW	Common vision	We want to get everyone in the same direction.
EKG	Common vision	We want and need to create a focal point in the future.
PE	Common vision	We want to achieve our goal, that is our drive.
ECM	Strategic awareness	We want to create a discussion about the energy transition, which is very important. That you will think about it.
DK	Framing	We want to frame the matter in the right way, so that people understand it and that people will get in motion.
UK	Span boundaries	We want to enhance the relation and communication with governments.
GrEK	Mobilization & Recruitment	We want to stress the importance of establishing a stable basis including a good group of people on forehand.

Table 6: Most important leadership tasks per case

Strategic awareness: This task is clearly executed by all cooperatives, with their informational campaigns, presentations, newsletters and websites, cooperatives want to make the communities aware of what they do against climate change and how to foster the energy transition. So the focus and urgency is not only on inducing energy, but is much broader and also refers to energy-saving measures and other sustainable developments, for instance, electric car sharing.

"They (energy cooperatives) are not only busy with: 'we are an energy cooperative, this is our project and participate'. But they often feel responsible for the bigger picture. They actually want to include their members or interested parties in the transition. They want to inform people, give information".
Project manager, GrEK.

Coordination: Small-scale coordination and knowledge sharing are done by the cooperatives. However, there is also an important role for the umbrella organizations here. Cooperatives, like ECM, argue that coordination between governments and cooperatives can be supported by these organizations. This process is clearly happening, for instance at ECM. Also, some cooperatives are stronger in coordination, as the pioneers in Friesland and therefore also EKG, according to the chairman of EKG.

"I think that we are very much involved with this, but mainly with the help of GrEK. I think on a small scale within Midwolde and on a larger scale via GrEK. Because we are a member of GrEK, we therefore indirectly play a role in it".
Chairman, ECM.

Framing: It is important that cooperatives have a message for their communities, which they all have. The chairman of EKG, communication co-operator of UK, chairman of ECM and project manager of GrEK emphasize that it is important that this message is not too direct or compelling. This can have negative impacts on the degree of participation because people are not attracted (anymore) by this demarcated message. Also, the power of repetition of the story could also work the opposite (Chairman ECM). Communicating this message in a well-balanced way towards the citizens is therefore essential, GrEK supports cooperatives with this process. By framing the energy transition as a necessity, the main goal for cooperatives is to make people aware of the need to shift to renewables and to frame energy as a tangible product that needs to be taken care of by citizens themselves. The consciousness of citizens related to the use of energy needs to be recovered and reinforced, like in the past. Citizens must take energy production into their own hands (Secretary, ECDA). This social and institutional task is a key, but also a very difficult mission for the cooperatives to reach.

"You also have to be careful, as an energy cooperative we are quite assertive in certain things and that is also a warning to ourselves. Framing can be quite explicit then, it is a good thing because you have to provide clarity and direction. But do not jump to conclusions".
Chairman, EKG.

Common vision: Developing a common vision is seen as a key task for the cooperatives. In order to stimulate citizens to participate, there has to be a common vision. Because cooperatives are set up as organizations where the members have determining votes and are therefore able to guide the way, this common vision also relates to the shared goals of the cooperatives. These goals are established out of the wishes, ideas and motivations of the local community. All cooperatives are undertaking the activities for their community, the phenomenon 'we' instead of 'I' is clearly perceptible here. These common visions are founded during debates about the direction and aims of the cooperative, but the members are aligned in their ideas about the aims. People do participate when they adhere to the vision of the cooperative, therefore conflicts between members were not witnessed within these cooperatives.

"Actually, it is, by all means, our goal: 'what do we want?'. For that, we use our resources. The objective is our drive".
Chairman, PE.

Mobilization & Recruitment: The mobilization of an enthusiastic group of people who are motivated, able and willing to set up a cooperative is increasingly taking place throughout the provinces. These are often diverse groups with backgrounds in related fields to governance, planning or energy. This mix of people is also dependent on the local qualities and backgrounds available in relation to the willingness and ability of people to start a cooperative. The recruitment of citizens, to become a member of a cooperative, is harder to accomplish (also see chapter 4.1.2.). However, the recruitment of citizens is seen as a major task by all cooperatives. Cooperatives actively engage with citizens, to attract and persuade people with the help of strategic awareness and framing, in order to increase participation in their projects. How cooperatives mobilize and recruit individuals is explained in chapters 4.1.2 and 4.1.3.).

"We try to emphasize the importance to make sure you have a good group around you on forehand, a strong group with varying characteristics. That is also very important to contrive".
Project manager, GrEK.

Span boundaries: Spanning boundaries is essential and critical in the process of taking the lead in the energy transition. Collaborating with other partners in the network and the place is what is happening with the cooperatives. They mostly collaborate with municipalities and the umbrella organizations. The more influential the cooperative is, regarding successfulness and size, the more they are able to span boundaries. Other parties are faster and more interested in successful cooperatives with presence and well-known projects (Chairman EKG, Chairman PE). When boundaries are spanned, these cooperatives are even more successful, because they are better able to reach their aims with the help of other stakeholders. In this way, cooperatives share their knowledge and their voices are heard. In order to span boundaries, spreading own ideas, projects and visions are essential. So, spanning boundaries is based on communication with other parties in the network. In other words, obtaining influential power towards higher-level (governmental) authorities, in order to impact decision-making in light of the energy transition. This is also done, with the help of the umbrella organizations. To put pressure on the authorities, meetings, presentations and congresses on the national level are critical, but also through participating in foreign conferences boundaries are crossed. Former connections of the work field do have a contributing value in this (Chairman EKG, Chairman PE).

"It is of vital importance that you keep and maintain the contacts you have within the authorities. Constantly, keep the municipality alert, well-informed and involve them. Take a leading role as a cooperative".
Chairman and board member, ECW.

The cooperatives argue that this transition of energy systems needs to be achieved with collaborations between governments on higher levels and local stakeholders and cooperatives. The main reason why these cooperatives were founded is that they want to fulfill their share in the debate and that they want to make their contribution to the energy transition. This also links to the motivation that initiatives want to speed up the transition because the current pace is too slow. In essence, cooperatives want to take that leading role; because of unclear policies, lack of frameworks regarding the energy transition and missing opportunities, cooperatives are not able to coordinate and span boundaries to the extent they potentially want to do.

"If you want you to go to a sustainable society, in which an energy transition is going to ground in a good way, then you have to fight for that too".
Adviser, UK.

Summarizing, local cooperatives are mainly focused on the tasks, strategic awareness, framing and the common vision. Mobilization & recruitment is in some ways seen as a self-evident process, where a motivated group of people with shared ideas comes together, to instigate participation and urge people to become a member. For all cooperatives, this is not an easy task to fulfill. Coordination and span boundaries are tasks which are to a certain extent undertaken, depending on the cooperatives and their voice in policy arenas on higher levels. Cooperatives like EKG, have more influence than ECM because they are better able to communicate and span boundaries with less support of an umbrella organization. Furthermore, because of the number of members, the support, the presence and the (pace of the) well-known projects of such successful cooperatives. But, even if they are influential, this will only have an effect on the more local and regional level (municipalities and sometimes the province). Influencing decision-making and policy development on the national level is very difficult to achieve as an individual energy cooperative. So, to take the lead in the energy transition and to become a non-positional leader as a cooperative, tasks like coordination and span boundaries, meaning influencing other stakeholders, policy renewal and knowledge sharing, need to be enhanced. This can be achieved through communication towards and collaboration with higher-level authorities. This role is also more often fulfilled by the umbrella organizations to reach goals and guide the energy transition in the right direction.

5. Discussion and reflection

In this chapter, the results of the research (chapter 4) are discussed. Reflection on the data with the use of the theoretical perspective, described in chapter 2, is substantiated within this chapter. Furthermore, this chapter contains a methodological reflection of the research. Additionally, recommendations will be given for further research, with the same topics of interest, in chapter 5.2.

5.1 Discussion

This research aimed to provide lessons and strategies for the leadership of place-based citizen initiatives in the light of the energy transition within the spatial planning domain. The collected data shows that the six cooperatives in terms of organizational development, shared vision and types of activities align well with the literature (Van der Schoor & Scholtens, 2015). Organizational development is comparable in all cooperatives. A local group of enthusiastic leaders emerged out of locally available skills and resources (Meijerink & Stiller, 2013). Their shared vision also entails sustainability in the broadest sense of the word, including the reinforcement of social and economic resilience. Some cooperatives have more concrete deadlines, regarding these visions. The set-up of activities is for all the cases also similar, with (planned) energy inducement, energy-saving measures and ways to stimulate and attract people. Presentations and websites are examples of these methods of communication, to make citizens aware. Comparing the collected data with the literature, it is clear that this dimension corresponds to the commitment of members aspects discussed by Van der Schoor & Scholtens (2015). For dimension 1, this research hereby presented similarities in practice compared to the theory.

Literature shows that other stakeholders in the network are of essential value for local cooperatives to be able to undertake green activities and in the end take the lead in the energy transition. This need to collaborate with umbrella organizations and municipalities was also found in this research. Theory shows that there are two main restrictions that effect the influence of citizen initiatives on the governance system, policies and regulations. These are the ‘institutional void’ and the ‘diversely filled agenda’ of the authorities, according to Elzenga & Schwencke (2015) and Measham et al. (2011). In light of this research, the institutional void means that in practice authorities and governments do have a wait-and-see attitude, without clear roles and responsibilities (Measham et al., 2011). Leading to the fact that current old policies and regulations obstruct new activities of cooperatives, policies are lagging behind on practice and energy is seen as an inferior topic. Also, local cooperatives do not really have the influence to change these processes yet, resulting in a lack of adaptive capacity to overcome the state of ‘lock-in’ of these processes or to reach new policy development. Mainly, the municipality is brought up by the interviewees as a governmental organization with an institutional void. The interviewees also argued that, partly because of decentralization, the agenda of civil servants is filled to the maximum and that there is very little time left to work on matters in relation to the energy transition. This means that there is a lack of civil servants, capacity and time for the energy transition or the civil servants have too many tasks. Because of this, the workload for the municipality is far too high to deliver input into matters regarding the energy transition and related policies. With these findings, the research contributes to knowledge about citizen initiatives and their collaboration with other stakeholders in the network.

This research presents several barriers and obstructions in the collaboration. This research tries to emphasize that the coordination and communication need to be enhanced to obtain a uniform, consistent and flexible policy platform. Hereby, this research provided lessons and strategies to overcome these barriers.

In this research, the main knowledge gap in the literature about local energy cooperatives (the comparison between urban and rural cases) is addressed (also see chapter 1.2.1). Literature about sustainable place-based developments argued that these developments aim to strengthen the place with use of own local characteristics and dynamics (Horlings, 2018; Horlings et al., 2018). The collected data shows that this corresponds to the goal of the local cooperatives. Because the cooperatives aim to reinsert revenues, deriving from green developments, into the local community. Places with strong community bonds, high levels of self-reliance and intense social cohesion are better equipped in achieving sustainable place-based development. Cooperatives operating in places with strong local characteristics and dynamics often have relatively more support and members, also these members are easily approachable. Next to that, in these places, more activities start to arise, and activities are faster in operation. Places with strong physical and social characteristics are most often villages situated in rural environments. Beneficial provincial social, physical and institutional/policy characteristics, can become an influential factor for increased activity too. For instance, strong social bonds in Groningen because of the gas extraction issues. Hereby, this research presented new findings regarding the important effects of place-based dynamics and characteristics (socially, physically and institutionally) and therefore contributes to the debate about local sustainable initiatives by gaining more insight knowledge about how these characteristics influence the energy cooperatives. This knowledge contributes to the topic about citizen initiatives because it unravels critical factors that influence the performance of local cooperatives. These insights and lessons can be used in comparable regions, to improve the processes concerning energy cooperatives and hereby intensify the successfulness of cooperatives.

Focusing on leadership, the literature used in the theoretical framework states that local level cooperatives should take the lead in the energy transition. Literature provided leadership tasks for organizations which are necessary in order to be able to take the lead (Meijerink & Stiller, 2013; Van Aalderen, 2018). Many cooperatives execute most of the tasks, they also see these six tasks as a duty for local cooperative to undertake. The interviewees came up with their own ideas and opinions about certain leadership tasks and roles, which need to be accomplished. These tasks accord with the six leadership tasks of the research. So, the interviewees did not mention any other essential leadership tasks for local energy cooperatives. The extent to which these tasks are performed by the cooperatives differs. More influential cooperatives, in size and presence, are better able to execute the tasks ‘coordination’ and ‘span boundaries’. For the less influential cooperatives, the umbrella organizations play a facilitative role. Next to that, mobilizing diverse actors or members is a task which is necessary for all cooperatives to acquire (‘mobilization & recruitment’). Nevertheless, ‘strategic awareness’, ‘framing’ and ‘common vision’ are seen as the most important and key tasks, argued by the interviewees. These tasks are essential to attract members with one shared vision to be able to start with activities based on the local context and are therefore executed by all local cooperatives. Within the leadership debate, this research contributes to additional knowledge about which tasks are considered as important and to what extent these tasks are nowadays implemented in the strategies of the local cooperatives. With these insights, the research shows that certain tasks

for local cooperatives could be enhanced, in the case for most of the cooperatives 'coordination' and 'span boundaries' in order to become more influential in the energy transition. How these tasks could be enhanced also links to dimension 2, where it is mentioned earlier that communication and knowledge sharing between stakeholders should be improved, in order to gain more influential power for cooperatives to steer decision-making and policy renewal on higher levels.

This research presented the positive and negative effects of and on energy cooperatives within the spatial planning domain. It became clear in this research that, within spatial planning, a more flexible and consistent policy platform needs to be developed, where local citizen initiatives can operate more freely and pursue their green goals. Therefore, this research claims that the importance of the social, physical and institutional characteristics should be acknowledged and incorporated into spatial plans. Moreover, within the spatial planning domain in relation to the energy transition, communication and coordination between stakeholders are important points to improve. In this way, energy cooperatives can improve their leadership capabilities.

5.2 Reflection and recommendations for further research

The theoretical framework of the research has led to a clear image of the six cases, with the help of the three supportive umbrella organizations. The qualitative data collection method used has proved suitable for this research. A survey could not have provided the meaningful answers that were important in the study. The process of scheduling the interviews and approaching the right involved stakeholders went, in general, fast and as expected. Because two cooperatives were not able to participate, two other equivalent cases were selected. Extra interviews with the municipalities or the provinces might have been of added value to the research. This could have provided useful additional information, in relation to dimension 2, the collaboration with outside stakeholders. However, due to the short period of time, wherein this research had to be conducted, this was not possible to attempt. The conducted interviews are of good quality, they have provided the necessary information. Due to the many questions, for some interviews, there was a lack of time because of the length in time of the interviews. The interviews had a planned length in time of one hour, most of the interviewees lasted for that amount of time also. However, it became apparent that to get answers on all questions, additional time was needed. Sometimes this was possible but with some cases, the interviews had to be around one hour in time, because of the reserved time of the interviewees (also see table 3). Therefore, with several cases, this led to the fact that not all questions were really discussed. In those cases, some of the questions, which were less urgent, were not asked. These questions, which were in advance already categorized as less urgent, were therefore not used in the research. With the exception of the less urgent questions, all other questions were asked in the interviews and the answers and data regarding these questions is used in the research. So for these questions, the interviews were identical in set-up. Hence, the impact on the empirical part of the research was limited. Because of the many different aspects of this research (the four dimensions), this research provided an overview with inside knowledge about these aspects. However, because of many aspects and not many cases, the research did not provide in-depth detailed insights regarding the individual aspects. This led to less generalizability of the results of this research.

For future research, it is advisable to look at how citizen initiatives develop themselves in terms of their (proposed) activities and influential power in the energy debate because this growth of cooperatives in the last years, is happening at an extremely rapid pace. Given some time, for example, the collaboration with municipalities and provinces will significantly be improved, which is potentially leading to fewer obstructions of policy and regulations. The leadership tasks which are performed by the cooperatives could be examined after some time to be able to conclude if cooperatives progress in relation to the extent to which they execute tasks like 'coordination and 'span boundaries'. As mentioned above, this study did not have a large scope (three cases studied per province), it is recommended to examine various citizen initiatives in more urban and rural environments focusing on fewer aspects or dimensions. In this way, a more complete understanding can be created by investigating multiple initiatives. As a result, better-substantiated conclusions can be drawn about the differences between the regional environments and provinces, dependent on the geographical influences caused by social, physical and institutional characteristics. A future comparison between different initiatives, for example between initiatives in the Randstad and other international examples, with the northern part of the Netherlands, could contribute to our understanding. A comparative case study with the Randstad area can be valuable because many interviewees mentioned the Randstad as a region, which differs significantly in terms of social, physical and institutional characteristics, from the northern provinces of the Netherlands. This comparison could contribute to more inside knowledge about the effect of these local and differing characteristics on the performance of energy cooperatives. Because this research only specifies energy cooperatives, comparative research of different types of grassroots initiatives in other sectors, meaning without the focus on mere energy, can also be a possibility.

6. Conclusion

In this final chapter of the research, the primary and secondary research questions will be answered, starting with the three secondary questions. The research questions are answered with knowledge retrieved from the analyzed literature and the empirical data.

How are energy cooperatives in rural and in urban environments organized, what are their visions and which sustainable place-based activities are undertaken to mitigate climate change?

The organizational development of the examined energy cooperatives is similar to a local enthusiastic group of people surrounded by a diverging number of members. Energy cooperatives share the willingness to fulfill their part in the energy transition. That they want to contribute to more renewable energy is also their main motivation to start a cooperative or to become a member of one. The visions correspond to this motivation, cooperatives want to create a more sustainable and resilient living environment for their own places. Cooperatives want to achieve this by implementing various energy-saving measures, constructing and planning green energy production facilities and with lots of communication towards the community. The cooperatives selected for this research, are to a large extent identical in their organizational development, ideas, visions and (proposed) activities.

What is the difference between energy cooperatives, in urban and rural environments and in different regional contexts? If so, what are the reasons for these differences and do these differences influence energy cooperatives and the effects they have?

It is clear that citizen initiatives in various geographical contexts differ in terms of the level of support, the number of members, the pace in which activities are undertaken and the degree of approachability of citizens. When these aspects are easier to achieve, the cooperative is seen as more successful, with well-known contributing activities, presence and an increased influence on higher-level decision-making and collaborations with other stakeholders. Places with more social cohesion, where people know each other, and with specific landscape characteristics, such as more open space, are better equipped to contribute to the energy transition. Therefore, the rural environment has advantages in comparison to the urban environment, where urban activities are to a higher extent obstructed because of less beneficial social and physical characteristics. This phenomenon also applies to the regional context, where provinces with stronger identities, or other social, physical and institutional factors that stimulate sustainable place-based development, such as Mienskip in Friesland or the gas extraction issues in Groningen, are a step ahead in contrast to other regions. This influences the energy cooperatives because they are more successful in terms of the above-mentioned aspects, which leads to (even more) accrued activities and influence on other stakeholders in the network, through coordination and boundary spanning. With this spiraling-up process, in the end, higher-level decision making and new policy development, concerning the energy transition, could be influenced by cooperatives.

How do actors involved in these processes interact to reach desired outcomes and how do energy cooperatives influence the (higher-level) authorities and policies and vice versa, within the spatial planning domain?

Cooperatives witness that governments, mainly the municipalities, due to decentralization, a lack of time and manpower and an increased workload, are lagging behind the developments. This has two main consequences. The municipalities are not able to keep up with the activities of the cooperatives, which potentially leads to fewer developments because authorities hinder activities. Furthermore, cooperatives are themselves not entirely able to take the lead and influence stakeholders in the network because the governance arrangements regarding this topic are not up to date. In other words, there is no local or regional consistent and uniform policy structure in terms of the energy transition, and it is unclear who should do what because of the wait-and-see attitude and the workload. The willingness of all parties can be considered as sufficient. However, the interaction and collaboration between cooperatives and municipalities need to be enhanced through communication. Moreover, the decision-making process has to be made more clear and flexible in order to stimulate sustainable place-based development. The umbrella organizations of the provinces help to achieve this, for instance through coordination and with creating a uniform policy platform. To help the (less influential) cooperatives, the umbrella organizations are busy with enhancing communication and knowledge sharing between all levels of government, mainly on the provincial level but also towards the national level. This communication and knowledge sharing between stakeholders, is now a focal point for the umbrella organizations, in the past they were busy with setting up the citizen initiatives.

Energy cooperatives are trying to exert influence over other organizations and governments in order to speed up the energy transition via sustainable place-based development. The interviewees argue they want to contribute to the energy transition and that they want to take a leading role. Nevertheless, most cooperatives are until now, not fully able to take that leading position. They are mainly focusing on strategic awareness, framing, common vision and mobilization & recruitment. The leadership tasks coordination and span boundaries, are to a lesser extent executed by the individual cooperatives. This is the case because some cooperatives are too small and lack network connections. Cooperatives can have some effects on municipal decision-making and new policy development, and more influential cooperatives (with well-known projects and more members) also on the provincial level to guide developments in the right direction. However, due to limiting municipalities and provinces, but moreover, restricting old policies and regulations, the cooperatives do not achieve this influence to the extent that they want and are able to handle. Therefore, the interviewees argue that the authorities should provide opportunities for the cooperatives to become more influential.

How do citizen initiatives in various urban and rural contexts, in the north of the Netherlands, take the lead in sustainable place-based development to mitigate climate change?

This research indicated that there are various differences between urban and rural contexts. These social and physical differences between cities and villages have their effects on the success of a cooperative. Strong social cohesion and beneficial physical characteristics of a place matter. Local dynamics and characteristics define the commitment of members, mostly the motivations of

members to participate and the (proposed) green activities. Moreover, provincial benefits can contribute to this. More successful cooperatives are better able to collaborate with other parties in the network, where the umbrella organizations are of great importance in enhancing coordination and boundary spanning. However, because of old governance structures, policies, 'institutional voids' and 'diversely filled agendas', cooperatives are held back in their developments. That is why they are also limited in their non-positional leadership abilities. Coordination between actors and spanning boundaries are therefore present, although not influential. But, cooperatives are willing to take this leading role. With their input, efforts and lots of dedicated time, they already have taken major steps in the right and sustainable direction. To better reach their goals and in order to be more influential in the energy transition, a consisting framework should be applied and provided by the authorities, where cooperatives can take the space, possibilities and opportunities they need to become effective non-positional leaders in the energy transition, in order to achieve climate change adaptation on the local level.

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Appendix 1: Semi-structured interview question list

The interview questions are divided into categories of questions related to the four dimensions of the research. Where needed, the interview questions can be modified or removed regarding the relation of the interviewee to the case/cooperative. The interviews are in Dutch, therefore a Dutch interview question list will be used during the interviews. Grey coloured questions are less important/urgent.

Introduction

1. *Introduction of myself*
2. *Explanation of the research*
3. *Thank the interviewee for participating in the research*
4. *Draw attention to ethical considerations/ sign informed consent*

General questions

1. Please explain in short what '*…name of cooperative/organization…*' is?
2. What is your role in relation to the case/organization?
    - What are your responsibilities?
3. When did the cooperative and relevant projects take off?
4. What are the reasons why the cooperative started?

Dimension 1: Commitment of members

1. What are the main aims/goals of the cooperative?
2. Which types of renewable energy are realized, induced or promoted by the cooperative?
3. What kind of other relevant activities does the cooperative undertake?
    - What activities in relation to this place can we expect from the cooperative in the upcoming years?
4. Does the cooperative itself only consist of citizens of this place or are there other parties which are member of the cooperative?
    - In relation to background (discipline, education), which (different) persons are members of the cooperative?
5. What are the reasons why citizens participate in the cooperative?
    - If this are short term reasons, how to deal with this and how to keep members stimulated/active within the cooperative for the long term? [Climate change/sustainability = long term problem].
6. Do all the members of the cooperative have the same (shared) visions? What do these visions mean?
7. Are there possible conflicts or contradictions between local participants in the cooperative and other residents of the place? [For example, conflicts about visual pollution in the landscape because of new wind mills or solar panels].

Dimension 2: Collaborations with outside stakeholders

1. How is the municipality (and province) involved with the cooperative and its projects/plans?
    - Do you feel supported or constrained by the municipality/province?
    - Do these parties stimulate activities of the cooperative by facilitating them or are they opposing against/constraining activities?
2. Is there a link/collaboration with a national government or national organization regarding sustainability?
    - If yes, how is this association/organization involved?
3. Which other parties do have a relation/collaboration with the energy cooperative and how are they involved?
4. How would you describe the collaboration with all the stakeholders?
5. Are the involved stakeholders temporarily connected to the cooperative or is there a more permanent connection?

Dimension 3: Geographical influence of place

1. Does the existence of the cooperative depend on the place/environment?
    - Why did it start at this place?
    - Could the initiative have been started, in the same way, in another place or part of the province? Why?
    - Do you think that the cooperative and its activities also could take off in a(n) urban/rural environment? Why?
2. What distinguishes this cooperative/initiative from other initiatives?
3. How does the environment (urban/rural/place) influence the cooperative in terms of its goals, shared vision and activities?
    - Are certain developments/activities of the cooperative determined by the environment? [For example, by availability of community feeling, resources, space].
    - What are the unique qualities and characteristics of the area which determine the goals and way of working of the cooperative and therefore make it successful?
4. Following your experiences, are there possible differences between projects/cooperatives in urban and rural environments and between the different northern provinces (Drenthe, Friesland, Groningen)? [For instance, because of their institutional context].
    - If yes, what could be reasons for this difference and does this have effects on the (performance of the) cooperatives?
5. Which local formal and informal rules or regulations play a key role in sustainable place-based developments of the cooperative?

Dimension 4: Leadership

1. Do the activities of the cooperative contribute to a more sustainable future (globally)? If yes, in what way?
2. How can local cooperatives take a leading role in sustainable developments? Till what extent are they able (or not) to take on this role?
    - Do you think that local initiatives have to take a leading role in battling climate change? Why?
    - How would you describe the style of leadership of the cooperative?
3. Which (leading) actions or tasks are carried out by the cooperative and how are they performed/fulfilled?

    Belonging to this question, is a separate document (in Dutch) 'Leiderschap taken met betrekking tot energiecoöperaties'. On this list, the tasks which are executed by the cooperative (regarding possible leadership

tasks: strategic awareness, framing, coordination, common vision, mobilization & recruitment, span boundaries) and the relevance of this tasks, can be assigned.

- Are there other relevant tasks for an/the energy cooperative? If yes, which?

4. Did the cooperative experience barriers or limitations, from stakeholders or higher-level authorities, in executing these tasks? If yes, which?
    - If yes, was the cause for this the appearance of unclear roles and vague responsibilities within those cases? [Institutional void].
    - If yes, how did the cooperative handle and/or overcome these barriers or limitations?
5. Do you think that local initiatives are able to mitigate climate change trough altering policies and/or regulations related to sustainability/climate change on higher levels? Why?
    - (How) did the cooperative achieve this or how is this possible to achieve?
6. How does the cooperative succeed to guide and combine all opinions/ideas, from within the cooperative and from other stakeholders in the network, into the direction of a joint desired outcome?
    - Who decides what this direction/vision is, to achieve this result?

Closing

1. Do you have anything else to add?
2. *Thank the interviewee for participating in the research*
3. *Reminder ethical considerations/informed consent form*
4. Do you have relevant documents/reports of the cooperative/projects which could contribute to the research?
5. Do you know other important stakeholders, who are concerned or collaborating with the cooperative and who can be valuable for this research?
6. Are you interested in the results of this master thesis?
    - *Possibility to mail the final version of this research*
7. *Again, thank the interviewee for participating in the research*

Appendix 2: Informed consent

Subject: a case-study in the northern part of the Netherlands regarding civic sustainable place-based development in urban and rural environments.

I hereby declare that I have been informed in a clear and understandable manner about the nature, method and purpose of the research.

I understand that:
O I can stop my contribution to this research without consequences, at any time and without giving any reason
O data are processed confidentially and anonymously, without being traceable to the person
O the recording of the interview will be destroyed after the research has been completed

I declare that I:
O be voluntarily willing to participate in this research
O the results of this interview may be processed in a master thesis or scientific publication
O give permission to have the interview recorded with use of recording equipment

Signature:

Name: ……
Place and date: ……

Researcher: I have provided oral explanation about the nature, method and purpose of the research. I declare that I am prepared to answer any upcoming questions about research, as far as I am able to do so.

Signature:

Name: ……
Place and date: ……

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Appendix 3: Document leadership tasks

Leadership task	Description	Implementation [Yes: Now]	[Yes: Later]	[No]
'Strategic awareness'	Creating a focus and urgency about specific topics of interests, related to climate change and the energy transition, by strategically sharing of and drawing attention to information and deadlines.			
'Coordination'	Creating new, flexible institutions/structures to overcome current policy/governance lock-ins ('frozen shapes'), institutional renewal. Creating trust, solidarity and mutual interdependence through integration, connectivity and transparency. Creating shared knowledge.			
'Framing'	Creating a shared understanding and vocabulary about the issue. Approaching and communicating about the issue.			
'Common vision'	Creating joint, focused and inclusive vision (documents) that contribute to a common goal/vision.			
'Mobilization & Recruitment'	Mobilizing individuals with different backgrounds. Use and allocate locally available skills and resources. Attract, interest and stimulate actors to participate and bring actors together.			
'Span boundaries'	Influencing actions of other organizations/stakeholders, in the place or in the network. Collaborate with other parties (which may have a different logic/vision). Accept new ideas/visions at various levels/scales.			

Degree of importance for an EC to fulfill the task	Leadership task
1 *Highly important*	
2	
3	
4	
5	
6 *Not/less important*	

Appendix 4: Coding scheme

Deductive codes and *inductive codes*

General
• Sustainability/Place-based sustainable development • Leadership/Take the lead • Citizens initiatives/Grassroots innovations/Bottom-up movement • Climate change/Energy transition • Provinces/Drenthe/Friesland/Groningen • Local/Urban/Rural

Dimension 1 Commitment of members	**Dimension 2** Collaborations with outside stakeholders	**Dimension 3** Geographical influence of place	**Dimension 4** Leadership tasks
• Organizational development • Aims/Goals/ Targets	• Network • Municipality • Province • Stakeholders • Authorities • National government • Organization • *Network companies* • *Umbrella organizations*	• Place(-based) • Environment/ Context • Local/Regional • Urban/Rural	• Functions/Tasks • Strategic awareness • Framing • Coordination • Common vision • Mobilization/ • Recruitment • Span boundaries • *Communication* • *Knowledge sharing*
• Shared vision • Participation of members • Reasons to participate • Conflicts/ Contradictions • *Motivations/ Priorities*	• Linkages/ Relations/ Connections/ Attachments • Communication Interaction/ Involvement/ Participation/ Collaboration	• Influence of place/environment • Dependence on place/environment • Difference/ Distinction • *Self-reliance* • *Togetherness/bond* • *Resilience*	• Global/Higher level • Policies/ Regulations/ Measures/Rules • Adaptive/Mitigate • Altering/Change/ Transition • *Policy renewal* • *Decision-making*
• Types of activities • Projects • Types of energy • Relevant activities	• Barriers/Limitations • Facilitation/ Stimulation/Support • *Obstructions/ Restrictions*	• Unique qualities/ dynamics/ characteristics • *Social/Physical characteristics* • *Institutional/Policy characteristics*	• Barriers/ Limitations • Unclear roles • Vague responsibilities • Institutional void • *Filled agendas*
	• Temporair • Permanent	• Energy cooperative • Projects • Institutions • Citizens • Community/Society	• Able to achieve/ Contribution • Desired outcomes • *Consistent framework/Support*