

# **Citizen participation: going from renewable energy initiatives towards an energy cooperative 2.0**

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## Colophon

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## Summary

Climate change is one of the main challenges of this century. To address this issue, climate change mitigation is needed and in particular one of the main challenges the energy transition. The role of citizen participation is increasingly important. When talking about citizen participation in the energy transition, a key role is played by energy cooperatives. This research aims to investigate the barriers that energy cooperatives encounter as an organization and explain how these barriers can be overcome. This is done by comparing different energy cooperatives. For this research seven different energy cooperatives in the Cleantech region in the Netherlands are interviewed, next to this, three expert interviews are conducted.

Firstly, the comparison is made through seven dimensions, namely; legal, organizational, personal, cultural and economic dimensions, the relation with the local government and the relation with market actors. A literature study has been done to identify these dimensions. Following during the literature study the indicators that have to be investigated to measure these dimensions are identified. The results are shown in a visual representation of a wheel diagram. Each energy cooperative is positioned in their own wheel diagram. This results in seven different wheel diagrams that can be compared. After this, the different wheel diagrams can be analyzed per dimension. Similarities and differences are analyzed to indicate that barriers that energy cooperatives encounter. Secondly, in-depth interviews are done to explain the differences and similarities between the energy cooperatives, in light of the seven dimensions. These interviews are meant to argue why these differences or recurring patterns appear. The next step of the research is to try and explore how the barriers encountered can be overcome.

This leads to answering the main research question: *What are the barriers encountered by energy cooperatives in the energy transition, and how can these be overcome?* As for the political dimension, the barriers encountered by energy cooperatives are that they experience conservative municipalities and lack of capacity within municipalities. Legal barriers appear with too open, too regulated or lacking policy frameworks of municipalities. To overcome this, municipalities, market actors and energy cooperatives can involve each other earlier and make task divisions right away.

The barriers for the personal dimension are the struggle to find balance between transformational and transactional type of leadership, and missing marketing and communication knowledge. An option to overcome this is to work together with energy cooperatives in the region on marketing campaigns. Organizational barriers encountered are energy cooperatives missing embeddedness in the local community and the difficulty with rejuvenation. For overcoming these barriers it is important to strengthen the communication part of energy cooperatives by using social media to attract younger people and using concrete projects to enthuse people of larger parts of society. The cultural dimension is accompanied with the barrier that energy cooperatives want more active members.

As for the economic barrier, energy cooperatives have difficulty to ensure financial stability. For the branch of renewable energy it is important to take risks by entering new projects and in the other branch of energy saving energy cooperatives can consider to consult non-governmental organizations to create a mix of products. Another option is to make structural partnerships with the municipality to provide more stability. The barrier encountered for the market dimension is that energy cooperatives can feel like market parties are trying to take advantage of them. An option to overcome this is to make a list of criteria that the market party has to comply to.

During the interviews the barrier of hiring paid workers was mentioned, this issue not being one of the dimensions identified in the literature. The challenge whether and when to hire paid staff can be

overcome by more efficient use of paid staff with regional collaboration. This can lead to more professionalization to be able to engage in more projects which results in more financial stability. This brings us to importance of regional collaboration between energy cooperatives. Next to exchanging paid staff, regional collaboration can also be used to exchange knowledge.

## Preface

I hereby present my master thesis on the barriers encountered by energy cooperatives. The goal was to gain more insight into the way energy cooperatives operate through interviews and to get a good picture of the energy cooperative landscape. This master thesis is the final component before completing my master's degree in Cities, Water and Climate Change for the Spatial Planning Program at Radboud University. Over the past seven months I have written this thesis and I look back at an intense yet pleasant period from which I have learned a lot. For this research I have to thank many people for their help and support.

First, I would like to thank Joep Koene who was my supervisor from my internship at Oost NL. I have always felt welcome to discuss issues or ask questions, which I valued a lot. It has been very helpful that he introduced me to a lot of people, such as Wouter Kamp and Els Holsappel. I want to thank both of them for helping me contact the energy cooperatives in the Cleantech region and helping me throughout the process of my thesis.

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Enjoy reading!

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# 1. Introduction

## 1.1 Introduction to the research field

Climate change is one of the main challenges of this century (Aldy et al., 2010). Drastic measures must be taken in the spatial domain in order to keep living in a healthy and safe environment. Climate change will impact our living environment by, for example, urban flooding and urban heat islands and for this reason we will have to adapt our public and private spaces; this is known as climate adaptation (Uitenbroek et al., 2019). On the other hand, we will in turn have to adjust our way of living to reduce the causes of climate change. This research will focus on the latter, so-called climate change mitigation, and in particular on one of the main challenges, the energy transition (Oteman et al., 2014). In order to keep up with our changing climate the Dutch government agreed upon the 'Climate Agreement' in 2019, which includes an agreement concerning the energy transition, whose main statement is the following: "in 2030 the CO<sub>2</sub> emissions have to be reduced by 49% compared to 1990" (Rijksoverheid, 2019, p.4).

The goals formulated in the Climate Agreement are delegated in a rather decentralized way (Beauchampet & Walsh, 2021). This is done by dividing the country into 30 different regions; each of these regions is required to come up with its own research and strategy on how to generate renewable energy and stop using fossil fuels (Nationaal Programma Regionale Energie Strategieën, 2021). According to the so-called Regional Energy Strategy, local governments are left to implement practices for the energy transition. The aim of this strategy is to make the solutions tailored to local contexts. In order to do that, citizens are involved in the process of the energy transition.

Involving citizens has become increasingly considered a key component in the energy transition (Beauchampet & Walsh, 2021). This is important because windmills, solar parks and new heat networks create a new physical environment. The change in spatial planning requires a lot from citizens since the physical environment, as we know right now, will be changed entirely (Uitenbroek et al., 2019). Citizen participation is both necessary and insightful for climate mitigation for several reasons. First, it is necessary to involve citizens for the legitimacy of the process of these implementations. Fiorino (1990) proposes that this instrumental argument results in more effective decisions because participation makes decisions more legitimate and leads to better results. This argument is also supported by the new Environment and Planning Act in the Netherlands (Omgevingswet), which states that participation is mandatory for developments in the spatial domain (Informatiepunt Omgevingswet, 2019). Secondly, citizens can be of significant value because of their local expertise (Uitenbroek et al., 2019). Next to the instrumental argument of participation increasing legitimacy, a substantive argument emphasizes the role of participation in improving the quality of decision-making (Fiorino, 1990). Citizens' input can be of value because non-experts see problems or have (practical) information about the neighborhood that experts sometimes miss (Beauchampet & Walsh, 2021). This is especially the case for local interventions in the energy transition like making neighborhoods energy neutral by generating renewable energy. For such projects, it is essential to consider context-specific factors for which the local knowledge of non-experts is needed (Beauchampet & Walsh, 2021). The importance of citizens' input is confirmed in the Climate Agreement in the Netherlands; the goal is to have 50% of local ownership for renewable energy projects (Rijksoverheid, 2019). This means that the government strives for citizens to have more involvement in renewable energy projects.

Citizen participation can be achieved in different ways; as an example, citizen participation can be triggered by organizing information evenings for residents or participatory budgeting in neighborhoods instead of central city budgeting (Fung, 2006). Another example of how citizens

participate in the energy transition is through community initiatives. When it comes to the energy transition, the most common community initiatives involved are focused on renewable energy (Oteman et al., 2014). When talking about these renewable energy initiatives, in the Netherlands, the term energy cooperative is most commonly used in the field (Overbeek, 2021). From now on, this research uses the term energy cooperative.

### *Problem statement*

The importance of citizen participation is increasingly recognized (Newman et al., 2004). In the Netherlands, involving citizens in the energy transition is not only recognized but also necessary because citizen participation has been incorporated into several policies in the Netherlands, like the Environment and Planning Act and the Climate Agreement (Rijksoverheid, 2019). When talking about citizen participation in the energy transition, a key role is played by energy cooperatives (Beauchampet & Walsh, 2021). There is a growing interest from initiators, policymakers and academics in the role that energy cooperatives have in the energy transition because of the increasing focus of the government to engage citizens in climate change issues (Middlemiss & Parrish, 2010).

Energy cooperatives are an example of how citizen participation can take place in the energy transition (Oteman et al., 2019). While the importance of citizen participation through energy cooperatives in the energy transition is increasingly recognized, in practice it can be difficult for energy cooperatives to operate (Middlemiss & Parrish, 2010). Energy cooperatives consist of motivated people but with limited power and resources (Middlemiss & Parrish, 2010). This can cause these initiatives to face obstacles when participating in the energy transition (Proka et al., 2018). It is thus crucial to understand the barriers that energy cooperatives face and investigate how to overcome them.

This research aims to better understand how the implementation of citizen participation, in the form of energy cooperatives currently works, by looking at what barriers they encounter and how these can be overcome. This research will look at different cases of energy cooperatives in the Cleantech region in the province of Gelderland in the Netherlands.

### 1.2 Research aim and research question(s)

This research aims to investigate the barriers that energy cooperatives encounter in the energy transition. Through the empirical research of comparing case studies, this thesis first attempts to identify barriers that energy cooperatives encounter, and second, provide recommendations on how energy cooperatives can operate better in the energy transition in the Netherlands by overcoming those barriers.

This research contributes to the scientific literature on energy cooperatives in the energy transition. Next to that, getting more understanding of the obstacles that energy cooperatives face can be insightful for different stakeholders. This is also the case for the development company Oost NL in Apeldoorn. This research is carried out in association with this organization, that by order of the provinces of Gelderland and Overijssel, tries to stimulate regional economic growth for sustainable initiatives by providing knowledge and funding. Oost NL also has also invested in energy cooperatives in the region in order to contribute to the energy transition.

The research aims are achieved by analyzing seven cases of energy cooperatives in the Cleantech region in Gelderland in the Netherlands. In-depth interviews with representatives of the seven energy cooperatives are done to gather information on how they operate. This is done in the light of seven different dimensions: political, legal, personal, organizational, cultural, economic, relation with

market actors. The dimensions are based on earlier research on community initiatives on renewable energy (Oteman, 2014). How the dimensions are identified to fit for this research is later explained in Chapter 2.

After the information is gathered, a comparison is made across the seven cases for these dimensions. That way energy cooperatives are investigated in the broadest sense. To make the interpretation easier, the comparison is done with a visual representation of each energy cooperative. This is done by a visual representation of a wheel diagram where the different dimensions will display each case—this way the differences can be revealed. The comparison is meant to identify recurring patterns concerning the bottlenecks that energy cooperatives encounter.

Based on the aforementioned research aims, the following research question and sub-questions can be formulated:

The main question is phrased as follows: *What are the barriers encountered by energy cooperatives in the energy transition, and how can these be overcome?*

1. How can energy cooperatives be defined and what are their characteristics?
2. What are the political barriers encountered by energy cooperatives?
3. What are the legal barriers encountered by energy cooperatives?
4. What are the personal barriers encountered by energy cooperatives?
5. What are the organizational barriers encountered by energy cooperatives?
6. What are the cultural barriers encountered by energy cooperatives?
7. What are the economic barriers encountered by energy cooperatives?
8. What are the barriers encountered in the relationships with the market by energy cooperatives?

### 1.3 Scientific and societal relevance

#### *Scientific relevance*

Existing scholarship draws on different participatory models, and different theories exist to analyze citizen participation. Schrögel and Kolleck (2018) have compared different participatory models and theories in their research. Although they state that no single descriptive framework covers all the approaches, their comparative character helps reveal the differences. The comparison they develop happens along the following variables: normative focus of the decision-making, the reach of a project beyond institutionalized scientists, and epistemic focus in the process of knowledge generation. Research by Kalandides (2018) proposes a framework to analyze participatory policies. The analytical framework encompasses tools to measure the presence of the intentionality, objectives, scale, form, locus, history, and interconnections of different participation policies (Kalandides, 2018). The three-dimensional model of Fung (2006) covers a more precise visual framework through which a comparison of different participation models can be made. Three dimensions are depicted by three axes, representing the mechanisms of participation: who participates, how participants communicate with one another, and how discussions are linked with policy or public action (Fung, 2006). This research has a different angle of investigating citizen participation than the formerly explained theories. This research does not focus on comparing different forms of participation, but on comparing differences within one form of participation. In this research that is the example of citizens participating through energy cooperatives.

The research by Oteman et al. (2014) adopts an institutional perspective on community initiatives for studying renewable energy. Whereas the research provides a good overview of the different

characteristics that influence how energy cooperatives operate, it focuses very much on institutional arrangements on different national levels (Oteman et al., 2014). That makes the research very abstract and on an institutional level, for which there is less focus on how community initiatives operate on a local level. In that regard, the research by Hoppe et al. (2015) focuses on a more local level by investigating participation possibilities for energy cooperatives provided by the local government. Their research examines energy cooperatives from the characteristics of the local government. This research has another angle, which is the perspective of citizens. The same point of view is supported by Beauchampet & Walsh (2021), who suggest that future research should investigate how citizens experience their role in the energy transition at the household and community level in the Netherlands. This research puts citizens at the center by focusing on citizen organizations in the form of energy cooperatives. Therefore this research can contribute to the aforementioned statement of looking more into the role citizens play in the energy transition by investigating how energy cooperatives operate (Beauchampet & Walsh, 2021).

Other than looking at how energy cooperatives work, increasing research try to unravel the key factors that makes these energy cooperatives successful or not. The master thesis of Bessems (2021) looks at how community initiatives should operate to be most successful. One of the drawbacks of that thesis is that less successful or smaller energy cooperatives were not involved in the research. This research encompasses a wider spectrum of energy cooperatives, because not only successful energy cooperatives are investigated but also smaller starting energy cooperatives. Another point is that Bessems (2021) solely focuses on what is needed in order to be successful. The starting point of the present thesis is fundamentally different. The focus does not lie on the best practices but on which barriers are encountered by already existing energy cooperatives. As an example, Brummer (2018) has focused on the barriers that energy cooperatives encounter in different categories that are presented to elaborate on how energy cooperatives are constrained (Brummer, 2018). Also Tarhan (2015) discusses how the impact of energy cooperatives can be limited by various barriers, such as economic and social factors; he states the importance of understanding the experiences of the barriers of energy cooperatives to learn. Both pieces of research focus on the barriers encountered by energy cooperatives in different countries; this research contributes to provide a better understanding of the Dutch institutional context.

This research uses a wheel diagram to compare different dimensions of energy cooperatives. Using these kinds of diagrams is a common way of researching issues more deeply (Kaczynski et al., 2008). In the field of studying communities, research with a visual model has been done to represent communities (Laverack, 2006; Roughan, 1986). While there are several commonalities, this research narrows it down to energy cooperatives rather than communities. Therefore the diagrams used before have to be tailored to this research. This is elaborated on in Chapter 2.

### *Societal relevance*

As mentioned in the problem statement, climate change affects citizens worldwide (Uitenbroek et al., 2019). The last IPCC report (2023) discusses that global warming will proceed to 3.2 degrees Celsius without action. This would have consequences for both natural and human systems. Examples are a 20% risk of species losses in most parts of the world and in some parts even a 100% risk of species losses (IPCC, 2023). In this scenario the coral reef declines will be >99%. This scenario of global warming also affects humans, such as the projections of more than a 100 days a year that pose risk of mortality to individuals due to heat in large parts of the world (IPCC, 2023). But also risks like wildfire damage and declining food production.

We are called to take action to avoid these projections by changing our living environment (Uitenbroek et al., 2019). One of the main challenges of climate mitigation is the energy transition. In order to minimize the impacts of climate change, renewable energy needs to be increased to prevent global warming with the additional drawbacks for our society such as biodiversity loss and food insecurity (IPCC, 2023). These renewable energy projects will have an impact on our physical living environment by, for example windmills and solar parks, that is why it is important to involve citizens in the process of mitigation of climate change (Uitenbroek et al., 2019). In 2019 the Dutch government agreed upon the 'Climate Agreement', which includes the following: in 2030 the CO<sub>2</sub> emissions have to be reduced by 49% compared to 1990 (Rijksoverheid, 2019). One of the ways to achieve that is to strive for 50% local ownership for renewable energy projects. Involving citizens is also acknowledged by the new Environment and Planning Act (Omgevingswet), where participation is mandatory (Informatiepunt Omgevingswet, 2019). Citizens' local expertise can be of value for the implementation of renewable energy projects, making the decisions in the process more legitimate (Beauchampet & Walsh, 2021). For these reasons, citizen participation is now incorporated into Dutch law (Rijksoverheid, 2019).

The urgency of accelerating the energy transition has been made clear. In order to achieve citizen participation and 50% local ownership, project developers and municipalities are forced to involve citizens in renewable energy projects and energy saving projects, for which energy cooperatives are involved in most cases. However, a lot of energy cooperatives face obstacles during the process of these projects (Proka et al., 2018). This research contributes to this problem by not only uncovering the barriers that energy cooperatives encounter during the participation process of projects in the energy transition, but also visually representing how the energy cooperatives operate. The clear and comprehensible way of depicting the characteristics of energy cooperatives is beneficial (Laverack, 2006). This is not only helpful for the researcher but also for the energy cooperatives (Laverack, 2006). This way the differences between the cases appear and the barriers experienced are uncovered. To answer the second part of the research question, there is explored how the barriers encountered can be overcome. This part of the research can be seen as a recommendation on how energy cooperatives could improve in the future. This recommendation is the societal relevance of this research.

## 2. Theoretical chapter

### 2.1 Theories

#### 2.1.1 Climate change mitigation

Climate change is one of our world's leading challenges today. Widespread changes are already experienced by nature and people, like droughts, floods, and heat stress (IPCC, 2023). The last IPCC report (2023) stated that without a strengthening of policies, global warming of 3.2 Celsius degrees is projected. Therefore, climate change mitigation is needed, which is defined the following in the IPCC report of 2007: "implementing policies to reduce greenhouse gas emissions and enhance sinks" (p. 84). One of the policies to reduce greenhouse gases is the use of renewable energy and the reduction of energy consumption. This is a big challenge and complicated enough, considering scientific uncertainties, climate skepticism and disagreement on what policies to adopt (Aldy et al., 2010).

The energy transition will change however our living environment entirely. Windmills, solar parks and heat networks are going to change the spatial domain, which is why it has been gradually acknowledged that including the voice of citizens could help legitimize climate mitigation policies (Uitenbroek et al., 2019).

#### 2.1.2 Citizen participation

According to Arnstein (1969), citizens can invoke change in current society. Zheng (2015) considers citizen participation a fundamental characteristic of the modern governance structure where the government should incorporate participation. Fung (2006) contends that public participation has a beneficial effect on the values of contemporary governance. Citizen participation can be seen as a categorical term for citizen power (Arnstein, 1969). It can be defined as: "the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberately included in the future" (Arnstein, 1969, p. 216). By participation they can invoke change which enables citizens to share in the benefits of current society (Arnstein, 1969). Citizen participation can be carried out in several forms, one of the central theories in participation sciences is the 'Ladder of Citizen Participation' by Arnstein (1969).

Arnstein (1969) describes different forms of citizen participation in democratic decision-making by ranking them in a ladder (Figure 1). It starts with nonparticipation, which is depicted on the ladder as the rungs *manipulation* and *therapy*. This displays no power for the citizens. Climbing higher on the ladder the categories *information*, *consultation* and *placation* appear. For these rungs there can be seen that citizens get more power in the participation process. This means that citizens have a counterfeit power, because they do participate but mostly do not have actual power (Arnstein, 1969). Examples of the most frequent forms of citizen participation in this category are neighborhood meetings, attitude surveys or resident advisory committees (Arnstein, 1969). Going some steps higher on the ladder actual citizen power is depicted in the rungs of *partnership*, *delegated power* and *citizen control* (Arnstein, 1969). Forms of citizen participation in these categories concern community initiatives, the rung on the ladder depending on the power distributed to the community from the powerholders. Most community initiatives are based on a partnership, but sometimes projects can be outsourced to community initiatives which gives them more power (Arnstein, 1969).

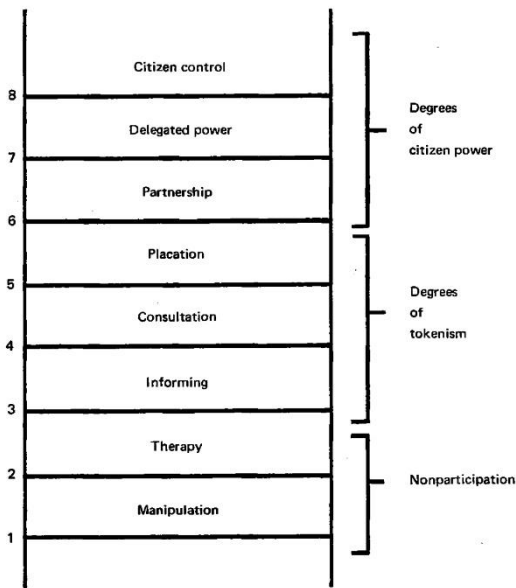


Figure 1: Ladder of citizen participation (Arnstein, 1969).

There are different benefits of citizen participation, the three main benefits derived from the literature are pointed out. Firstly, the inclusion of citizen participation can make public policy more legitimate (Beauchampet & Walsh, 2021; Fung, 2006). The second merit of citizen participation is that it can make decision-making more just; this happens either by replacing authorities by direct citizen participation or citizens can create pressures to make powerholders act more justly (Fung, 2006). Thirdly, the expertise citizens have can make the decisions more effective (Fiorino, 1990; Fung, 2006). The local expertise of citizens can be of value for the quality of decisions (Beauchampet & Walsh, 2021). Public hierarchies might lack the know-how, commitment or resources, where local citizens see things that experts sometimes miss, which can be insightful for both the design and maintenance aspects of the public space (Uitenbroek et al., 2019).

### 2.1.3 Collaborative governance

In order to achieve public participation, ‘collaborative governance’ is advocated (Newman et al., 2004). The role of the state shifts from a controlling government to a form of governance where the state has to collaborate with a wide range of public, private and voluntary actors (Newman et al., 2004). Collaborative governance is defined the following way:

“The processes and structures of public policy decision-making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished” (Emmerson et al., 2011, p. 2).

This indicates that structures can cross the boundaries of public agencies in order to carry out public purposes. Governance is spanning across public, private and civic spheres. To understand how collaborative governance takes place, we have to comprehend the different relationships between public and non-public actors (Steurer, 2013). The governance theory of Steurer (2013) describes how the interactions between government, business and civil society can be comprehended. Also, Waddell (2002) elaborates on the collaborations between government, business, and community organizations. The baseline of these theories is depicted in figure 2, where three categories are represented as overlapping diagrams: government, business, and community organizations (could also be named ‘the civil society’).

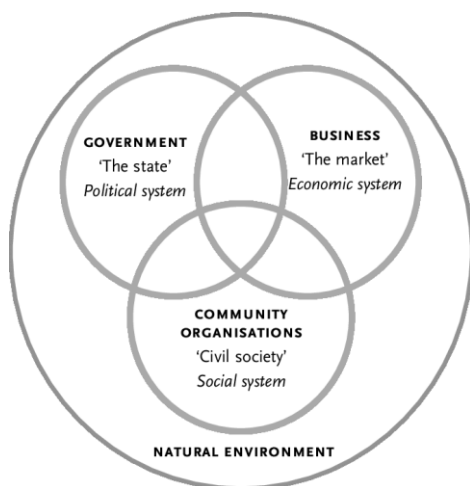


Figure 2: interdependent world between government, business and community organizations (Waddell, 2002).

The *government domain* is the political system with different levels and competencies like ministries, provinces, and municipalities. This can be complex because they can have conflicting interests. The *business domain* revolves around the economic world and can operate solely or in groups or trade associations (Steurer, 2013). Actors in the business domain can invoke change, but in the corporate world, different values appear when some prioritize making profits and others want to accept societal responsibilities better. *Civil society* consists of different function systems to fight for social and environmental concerns. For them values are more important than profit or regulations (Steurer, 2013).

This fragmentation of different types of governing can lead to less structured but also more organized ways of governing. Each domain has its weaknesses, but with collaborations, mitigation of the impact of externalities is allowed. Creating collaboration can strengthen the sectors (Waddell, 2002). So while this contemporary governance system can be characterized as fragmented, it contradictorily creates a more interdependent world. This can create a mutual-gain collaboration that increases innovation and effectiveness (Waddell, 2002). The danger of this is that relationships can develop in such a way that one party will overrule (Waddell, 2002). This unavoidable interdependency can be seen as a challenge in contemporary governance. However, the hierarchical top-down government structure is transitioning to a form of collaborative governance, that opens up windows for new forms of interactions between state and citizens (Newman et al., 2004). An example is the interaction of community initiatives and government. Community initiatives operate in civil society. Figure 2 shows how civil society is interdependent on governmental and business actors in the contemporary governance system.

#### 2.1.4 Community initiatives

Community initiatives is one of the modalities through which citizen participation can take place. Community-based initiatives are an overarching term for initiatives created by community members (Oteman et al., 2014). They operate in the social domain (or civil society). They are characterized as initiatives where the local community participates actively in the organization and decision-making process of projects, but also profits from the revenues or other accomplishments (Oteman et al., 2014). Community initiatives can vary in different themes, from waste generation to heat networks (Overbeek, 2019). This research focuses solely on community initiatives that focus on the energy transition.



Many terms are used in the literature to indicate (approximately) the same phenomenon like 'local renewable energy organizations' (Boon and Dieperink, 2014), 'community initiatives for renewable energy' (Oteman et al., 2014) and 'local renewable energy cooperatives' (Hufen and Koppenjan, 2015). In the Netherlands these phenomenon are mostly referred to as energy cooperatives. While community initiatives imply the same thing, a cooperative is the legal form used that is used in practice (Overbeek, 2019). Over the last years energy cooperatives in the Netherlands tend to have gained a broader scope than only focusing on generating renewable energy, but they also focus on energy saving and energy poverty (Elzenga and Schwencke, 2014). Therefore this research defines the more overarching term energy cooperatives instead of other commonly used terms in the literature as elaborated above.

### 2.1.5 Energy cooperatives

This research uses the following definition of energy cooperatives: "decentralized, non-governmental initiatives of local communities and citizens to promote the production and consumption of renewable energy" (Oteman et al., 2014, p. 2). The paper emphasizes that reduction of energy consumption is also one of the main focus points of energy cooperatives (Oteman et al., 2014). Characteristics of energy cooperatives is that they are run by motivated people, but have limited resources and power (Middlemiss & Parrish, 2010). They are established on a non-profit basis. Guiding principles for energy cooperatives are that they are democratically owned by its members, members can participate financially and any profits should go back to the community (Elzenga and Schwencke, 2014). This way, everything stays within the community and energy cooperatives provide action perspective for citizens (Elzenga and Schwencke, 2014). The activities that energy cooperatives are involved in are generating renewable energy, selling renewable energy and energy saving (Elzenga and Schwencke, 2014). The importance of the local community by local employment and social cohesion is central to this. Even though Oteman et al. (2014) state that the role of community initiatives in the Netherlands is a young phenomenon, in 2019 there are already 676 energy cooperatives created in the Netherlands accompanied with almost 112.000 members (Overbeek, 2019).

As the definition poses, energy cooperatives consist of citizens that want to invoke change in their local environment by promoting the production and consumption of renewable energy (Oteman et al., 2014). That means that participation and energy cooperatives are inseparably linked (Radtke, 2014). However, in this research, energy cooperatives are considered an example of citizen participation. This research tries to dive deeper into the way energy cooperatives operate.

### 2.1.6 Energy cooperative dimensions

Oteman (2014) defines seven dimensions that influence renewable energy community initiatives. The dimensions Oteman (2014) describes are: political, legal, personal, organizational, cultural, economic, and socio-cultural. These dimensions are used to characterize how energy cooperatives operate in the examined cases of this research.

This master thesis draws upon these seven dimensions; however, slightly changed to fit this research more as follows:

- The political dimension focuses on the relationship energy cooperatives have with governmental actors such as the municipality.
- The second dimension by Oteman (2014) is the legal dimension, which entails the legal framework that each cooperative is involved in.

- The personal dimension encompasses the individual capacities of members of the cooperative.
- The organizational dimension involves to what extent energy cooperatives are embedded in the local community.
- The cultural dimension focuses more on the motivation of the members and how they participate.
- The sixth dimension has more emphasis on the financial aspects of the cooperatives.
- The last dimension formulated by Oteman (2014) is the socio-cultural dimension. This research does not handle this as a separate dimension, as it is very similar to the cultural dimension. Oteman (2014) distinguishes structure and agency approaches, for which he identifies cultural and socio-cultural separately. This research does not distinguish structure and agency and therefore only uses the cultural dimension and not the socio-cultural dimension.
- While Oteman (2014) did not include this next dimension, this master thesis adds a dimension that investigates the relationship of energy cooperatives with market actors. As emphasized in paragraph 2.1.3 on collaborative governance, contemporary governance results in interdependency of different domains. Energy cooperatives in the civil society are interdependent on governmental actors (political dimension) and market actors. Therefore this research includes next to the political dimension, a market dimension. Because this research only investigates the Dutch context, the market-oriented institutional space in the Netherlands asks for more focus on the market actors.

Seven dimensions have been thus used for this research. The defined dimensions have several indicators to measure each dimension's influence on the energy cooperative. A wheel diagram is created to compare the different energy cooperatives through the defined dimensions. The wheel diagram used to identify the differences between energy cooperatives is depicted in figure 3. Each dimension is measured by one or more indicators to measure each dimension. The way these indicators are measured is derived from the literature and will be further explained below.

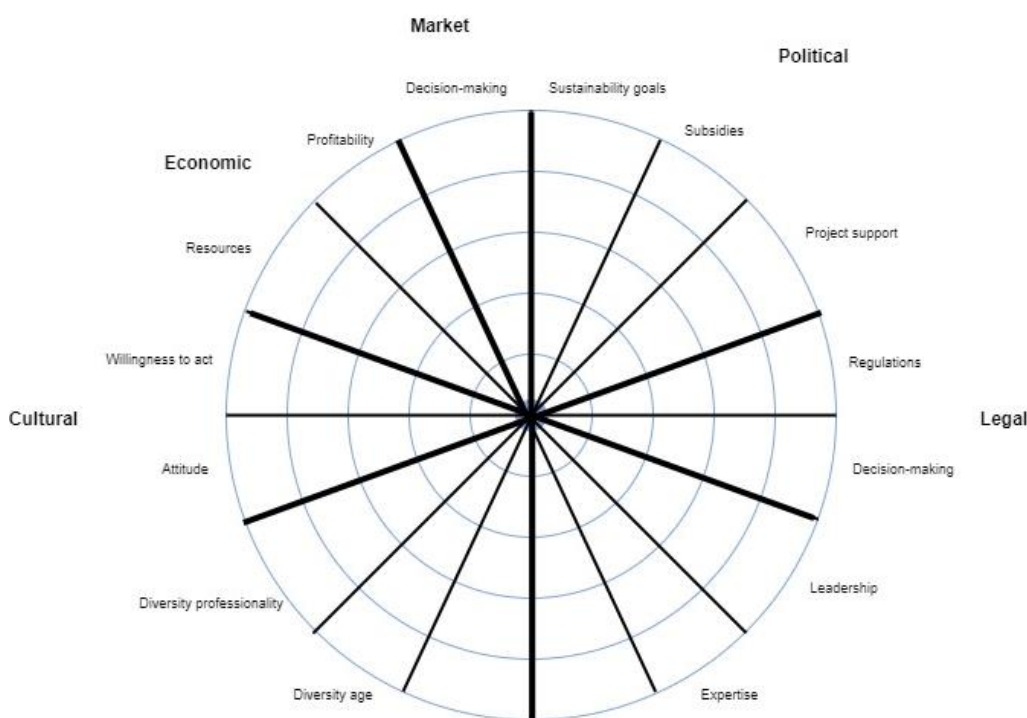


Figure 3: modified wheel diagram for energy cooperatives (Smulders, 2023).

1. **Political dimension:** political characteristics encompass 'softer' characteristics in politics like subsidies, schemes and the political will to enable renewable energy projects (Oteman, 2014). The institutional support a community initiative receives from the public actors can be of influence of how likely it is to succeed (Oteman, 2014). This is measured by the following indicators:
  - Priority for sustainability goals: this entails to what extent the government takes on the role for these sustainability goals as opposed to society. To measure this the quadrant designed by Martijn van der Steen is used (Van Der Steen et al., 2014). He defines four different roles the government can take. It starts with a wait-and-see attitude of governments to prioritize sustainability goals to a regulating attitude for achieving sustainability goals:
    - Responsive government: the government is not the leading party to sell their goals, but joins movements that are already out there.
    - Collaborating government: the government moves more externally, to work with civil society organizations or other partners in the field. This also means that those parties bring their own goals into the process in which the government must be able to negotiate with other parties.
    - Performing government: government actions are also central, but more focused on efficiency in the implementation instead of focusing on the legal system.
    - Legitimate government: government actions are central. Political objectives are incorporated by legal regulations.
  - Subsidies: subsidies are one of the ways resources are provided by public actors (Oteman, 2014). The attitude and role the government takes on with regard to granting subsidies can vary. To measure this the ladder of government participation by (Mees et al., 2019) is used. They define five steps on a ladder for differentiations for government participation (Mees et al., 2019):
    - Non-participation: government is not participating in any direct way.
    - Facilitating: government helps energy cooperatives to find its way by providing information, but the initiative coordinates and decides independently from the municipality.
    - Stimulating: government actively stimulates energy cooperatives by structurally providing (financial) support, but the initiative still coordinates and decides independently from the government.
    - Network steering: government has a mediating role and coordinates the decision-making process which results in them co-deciding.
    - Regulating: government initiates, coordinates and decides.
  - Project support (advice, financial): next to subsidies, public actors can have an influence on energy cooperatives by providing project support, this can be by providing an advisory role or financial resources for the renewable energy project (Oteman, 2014). This is also measured by the ladder of government participation with the same five steps on the ladder as explained in the above paragraph (Mees et al., 2019).

Following from the information introduced above, an overview of the indicators that will be used to measure the political dimension is shown below.

Table 1: indicators for the political dimension.

Political dimension	Indicators
	Priority for sustainability goals
	Subsidies
	Project support

2. **Legal dimension:** legal characteristics include both formal rules and regulations as informal structures like decision-making procedures. The legal dimension will be measured through the following indicators:

- Formal rules and regulations: formal rules and regulations can be imposed from different levels, like European, national to local levels (Streurer, 2013). Because the case studies in this research are all located in the same nation and region, the only differences appear at the local level. Therefore this research focuses on municipal policies and regulations. The extent to which the municipality enables energy cooperatives affects the production of renewable energy projects (Elzenga & Schwencke, 2014). This is again measured by the ladder of government participation (Mees et al., 2019).
- Procedures for collective decision-making: the informal structures such as procedures for decision-making, affect how energy cooperatives operate in renewable energy projects (Elzenga & Schwencke, 2014). The role the government plays in the decision-making process is once more measured by the ladder of government participation (Mees et al., 2019).

The aforementioned indicators that are used to measure the legal dimension are presented in the overview below.

Table 2: indicators for the legal dimension.

Legal dimension	Indicators
	Formal rules and regulations
	Procedures for collective decision-making

3. **Personal dimension:** This includes the resources of individual members of the initiative. Community projects typically rely on the voluntary contributions, intrinsic motivations, and collective action capacities of their members. This includes their skills, knowledge, leadership qualities, values and enthusiasm. To measure the indicators for the personal dimension the energy cooperatives are investigated on the board level, not the level of individual members. This is because the in-depth interviews are conducted with board members and the information they share cannot reflect the resources of all individual members of the energy cooperative. The following indicators are investigated (Oteman, 2014):

- Leadership: leadership strategies can be categorized from transformational to transactional (Sarros & Santora, 2001):

- Transformational: this type of leadership is rather idealistic. A transformational way of leadership is characterized by trying to appeal to higher ideals and values by creating an organizational vision.
  - Transactional leadership: this type of leadership is more secure and corporate. A cost-benefit is pursued and maintaining the status quo is more important than trying new innovations.
- Expertise: the expertise that an energy cooperative possesses contains the practical application that the cooperative has explored by projects so far (Bere et al., 2017). For community initiatives on renewable energy in the Netherlands that includes most commonly (Energie Samen, n.d.):
- Energy production solar on roof
  - Energy saving
  - Energy poverty
  - Energy production solar parks
  - Energy production wind

If the interviewees indicate there is another expertise, the option of ‘other’ can be included.

- Knowledge: while the former indicator ‘expertise’ concerns the practical application an energy cooperative has collected, the indicator ‘knowledge’ regards substantive knowledge that individuals in the organization possess on different themes (Bere et al., 2017). It includes the development of technical knowledge and of project finance. But also the understanding of the complex process of the legal system like permits and ownership or more soft skills like social capacities such as engagement and communication (Bere et al., 2018). The categories used in this research to measure what kind of knowledge is possessed by an energy cooperative is (Bere et al., 2017; Berka & Creamer, 2018):
- Other knowledge
  - Financial knowledge
  - Technical knowledge
  - Social knowledge
  - Juridical knowledge

An overview of the indicators that are used to measure the personal dimension is given below.

*Table 3: indicators for the personal dimension.*

Indicators for the personal dimension	
	Leadership
	Expertise
	Knowledge

4. **Organizational dimension**: organizational characteristics include the position of energy cooperatives within the wider local community (Oteman, 2014). Social support and engagement from the wider community positively influences energy cooperatives, because it also increases the local acceptance which is needed to be able to develop projects (Peters, 2010). Oteman (2014) measures the organizational characteristic by the indicator ‘social support of the wider community’. Next to this,

this research includes board diversity (Wollebæk, 2009). The diversity of the board is an indicator for the extent to which an energy cooperative has the ability to engage with the social surroundings (Wollebæk, 2009). The indicators are measured the following:

- Social support of the wider community: to measure the social support of the wider community, it is important to look at the position of the energy cooperative within the community (Oteman, 2014). According to Shrestha (2013) civic engagement can be measured by the extent of members in local organizations in the community. This is the ratio of the sum of the number of members of the local organization to the total number of people in the community (Shrestha, 2013). This is categorized as:
  - Very low (0-0.99 percent)
  - Low (1-1.99 percent)
  - Neutral (2-2.99 percent)
  - High (3-3.99 percent)
  - Very high (4-5 percent)
- Board diversity: ensuring diversity in the board is an indicator for more ability to engage with the wider community (Wollebæk, 2009). This is measured by two indexes; age and professionalism diversity. First, age diversity is measured by the number of different age cohorts of ten-year cuts of the members in the board. Second, the professionalism number of different occupational groups in the board. This can be categorized from homogeneous to heterogeneous.

Following from the explanation of the indicators that will be used to measure the organizational dimension, an overview of the indicators is shown below.

Table 4: indicators for the organizational dimension.

Organizational dimension	Indicators
	Social support of the wider community
	Board diversity

5. **Cultural dimension**: cultural characteristics represent the socially defined meaning of sustainability objectives and their embeddedness in the community. Peters (2010) emphasizes that the pro-environmental attitude and motivation to act can be seen as a precondition for success of community initiatives. This includes why people are motivated to be involved in a renewable energy community initiative, but also to what extent they have a willingness to act in the energy cooperative (Oteman, 2014). Oteman (2014) distinguishes a cultural and a socio-cultural dimension. The socio-cultural dimension is defined by Oteman (2014) as the public perception of energy. This is very similar to the definition of the cultural dimension which also encompasses the attitude on renewable energy. The socio-cultural dimension is therefore eliminated because it is mostly covered in the cultural dimension. The following indicators are measured:
  - Pro-environmental attitude: the attitude of citizens towards renewable energy is measured by citizen motivation for participation in renewable energy initiatives (Radtke, 2014). The paper distinguishes three typologies of motivations for people to participate in renewable energy initiatives:

- Structural conservatism attitude: this focused on localism and is characterized by the motivation to establish professional management and be independent from other organizations (Radtke, 2014).
  - Investor attitude: this is motivated by a financial incentive to profit from producing your own energy (Radtke, 2014). The goal is to produce the highest possible income return in the renewable energy initiative.
  - Ecological attitude: this attitude is characterized by an intrinsic motivation to achieve environmental goals (Radtke, 2014). The way that is done is by making sure to supply renewable energy.
- Willingness to act: the attitude of people implies why they want to participate in an energy cooperative, their willingness to act is something different (Oteman, 2014). The ways in which they want to act can differ, this is measured by the different types of modes for how you participate in the community initiative (Radtke, 2014). The paper presents three types of participation modes:
- Social participation: during events, the participation is collaborative and social (Radtke, 2014).
  - Financial participation: in the form of financial shares (Radtke, 2014).
  - Political participation: participation is done by decision-making by incorporating ideas and issues (Radtke, 2014).

An overview of the indicators that are used to measure the cultural dimension is shown below.

*Table 5: indicators for the cultural dimension.*

Cultural dimension	Indicators
	Pro-environmental attitude
	Willingness to act

**6. Economic dimension:** encompasses the division and allocation of financial resources among the actors in the energy sector, which partly depends on the expected profitability (Oteman, 2014). If the financial resources are insufficient, energy cooperatives become limited in their options (Oteman, 2014). The indicators to measure the economic dimension with are explicated below:

- Division of material resources: for the development of a renewable energy project, numerous forms of capital are involved (Sonntag-O'Brien & Usher, 2004). There will be looked which of these forms of capital are used by the energy cooperatives. The conventional development includes the following forms of capital (Sonntag-O'Brien & Usher, 2004):
- Equity
  - Member shares
  - Subsidies
  - Loans
  - Other financial resources

- Expected profitability: the expected profitability refers to the cost-benefit ratio (Gurau, 2012). The profitability is negative when there are more costs than benefits (Gurau, 2012). Equal when the costs

and benefits are similar and positive when the benefits are more than the costs (Gurau, 2012). The expected profitability for energy cooperatives is measured by the expected cost-benefit ratio for this year in the following categories:

- Negative
- Slightly negative
- Neutral
- Slightly positive
- Positive

Following from the explanation of the indicators used to measure the economic dimension, an overview of the indicators is given below.

*Table 6: indicators for the economic dimension.*

Economic dimension	Indicators
	Division of material resources
	Expected profitability

**7. Market dimension:** The general economic climate is an important factor for how an energy cooperative operates. Even though this dimension is not categorized as a separate dimension in the paper by Oteman (2014), this research does consider it an individual dimension. The reason is the market-oriented institutional space in the Netherlands. This economic rationale causes that energy cooperatives in the Netherlands are influenced by market actors to a large extent (Oteman, 2014). Because this study focuses on Dutch cases, the market actor is added. This dimension analyzes the extent to which market actors affect how energy cooperatives operate:

- Decision-making process: during the decision-making process of renewable energy projects, Oteman (2014) emphasized the involvement of government, market and civil organizations. The political dimension mentioned earlier focusses on the relation between civil society, like energy cooperatives, and the government. This market dimension entails the relation between civil society and market actors. The proportion of power between market actors and citizen organizations are investigated to imply how the relationship relates. This is measured by the ladder of citizen participation in ‘the guide to effective participation’ by Wilcox (1994). The idea of the ladder is to try and think about who has the most influence. It can be used for illustrating the power of citizens in decision-making for different applications, so also for renewable energy projects (Wilcox, 1994). The categories on the ladder are (Wilcox, 1994):

- Information: citizens are informed of the plans, mostly there is no room for negotiation.
- Consultation: citizens are offered some options where they can give feedback on this, but no new ideas.
- Deciding together: there are opportunities for joint decision-making.
- Acting together: not only joint decision-making, but a partnership is formed to carry out the plans.
- Independent community interests: local organizations can develop their own agendas with guidelines.



To measure the market dimension only one indicator is used as presented below.

Table 7: indicator for the market dimension.

Market dimension	Indicators
	Decision-making process

2.2 Conceptual model

In order to answer the research question “What barriers are encountered by energy cooperatives and how can these be overcome?”, the conceptual model in figure 4 is made. The dependent variable researched is energy cooperatives. Every case of an energy cooperative is first analyzed through the wheel diagram. The independent variables that are investigated are seven dimensions, namely; political dimension, legal dimension, personal dimension, organizational dimension, cultural dimension, economic dimension, and the market dimension. Each of these dimensions is measured by different indicators, shown by the slices of the wheel.

This results in the fact that each individual energy cooperative that is analyzed in the research is reflected by an individual wheel diagram. When all of these wheel diagrams are made, a comparison across the cases is made in order to see what barriers are encountered. The conceptual model shows that the dependent variable ‘energy cooperative’ will first be analyzed for the independent variables of the seven dimensions of the wheel diagram. When the differences across the energy cooperatives have become clear, recommendations on overcoming the encountered barriers are given which results in an ‘energy cooperative 2.0’.

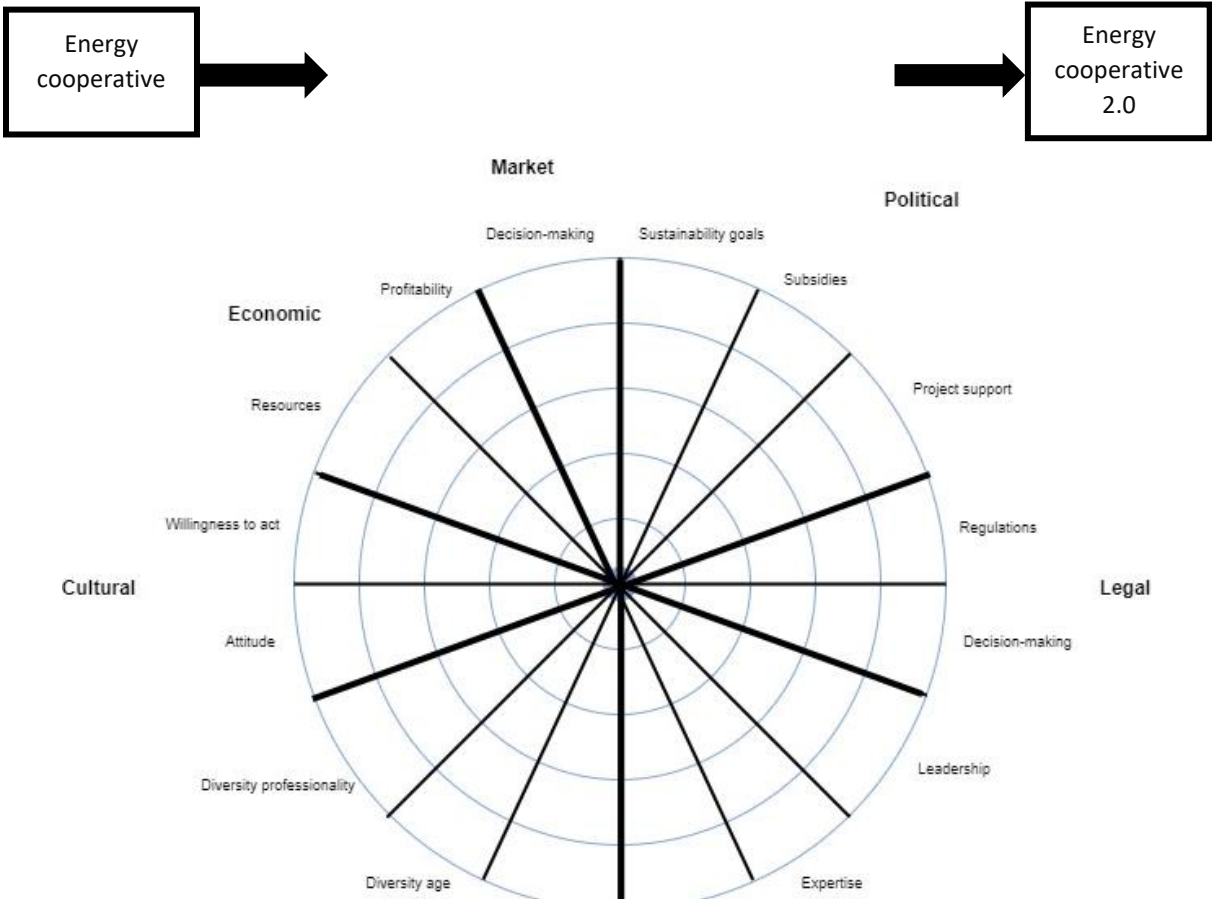


Figure 4: conceptual model (Smulders, 2023).

### 3. Methodological chapter

#### 3.1 Research strategy

The research strategy consists of different phases as depicted in figure 5. First, desk research is done to gather all the information needed to assemble the dimensions for the wheel diagram. When the wheel diagram is composed, the information of the different cases can be gathered. This is done through in-depth interviews with representatives of the energy cooperatives selected in this research. This gives answers to the first part of the main research question about what barriers are encountered by energy cooperatives. To find out why the barriers appear and how they can be overcome, another set of in-depth interviews is done with experts. These interviews are focused on discussing the outcomes of the analysis of the first set of interviews. This answers the second part of the main research question about how the barriers can be overcome.

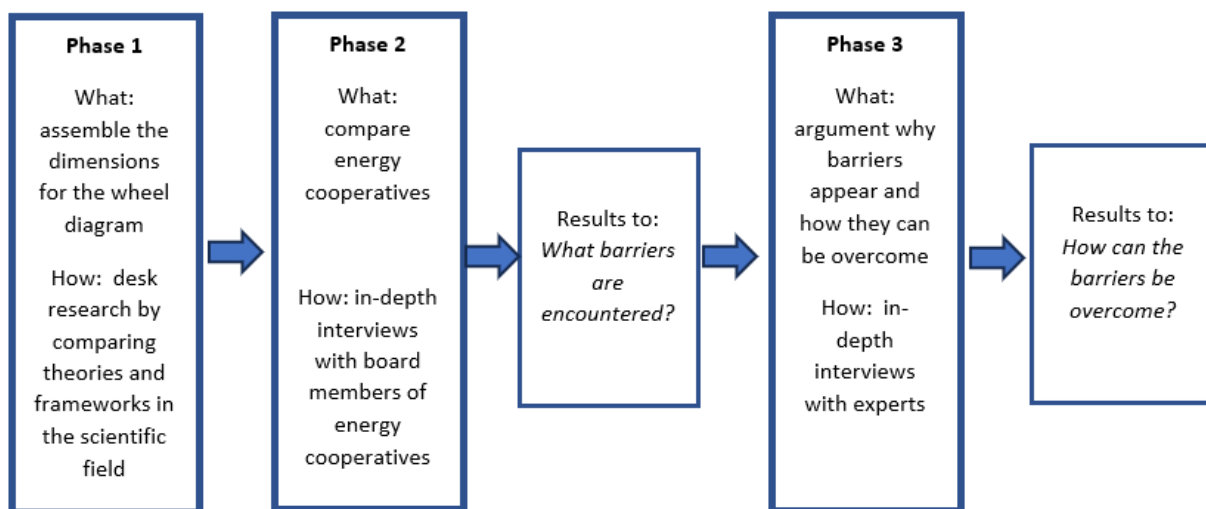


Figure 5: research strategy (Smulders, 2023).

The first phase is aimed at assembling a wheel diagram for the research. The approach of using visual representation as evaluation can be used for analyzing qualitative data and also as a means to share information with different stakeholders (Laverack, 2006). It can help clarify a comprehensive data set (Kaczynski et al., 2008). This is useful for this research because it investigates energy cooperatives in the broadest sense and not on one aspect. On the one hand, the research aim is to dive deeper into the barriers that energy cooperatives encounter for which an elaborate framework is suitable. The data assembled can be extensive and detailed, which can be hard to clarify (Kaczynski et al., 2008). On the other hand, to achieve the aim a comparison is made, for which a clear and comprehensible framework is more suitable and easy to compare different dimensions. A visual representation provides an outcome for both arguments. The extensive data set can be simplified to summarize the results (Kaczynski et al., 2008).

Several authors have used visual representation as a tool to compare factors that influence communities (Laverack, 2006; Roughan, 1986). The paper of Laverack (2006) describes the use of visual representations for the evaluation of, in specific, community capacity. The paper of Laverack (2006) entails community capacity, which is a rather broad concept. This thesis entails the capacities of community initiatives, specifically energy cooperatives. For this research, the dimensions to analyze community capacity are tailored to apply to energy cooperatives. Each dimension is measured by different indicators derived from the literature. Some indicators have several categories

in their scale that can apply. This means the spiderweb diagram as presented by Laverack (2006), is not suitable for this research because that spiderweb diagram can only represent one point on a scale. In order to use a diagram for which different categories for one indicator can be represented, the representation of the spiderweb diagram has to be slightly changed to a wheel diagram. An example of a wheel diagram is shown in figure 6. This model gives the opportunity for each indicator to fill in several categories. Therefore, this model is most suitable for this research.

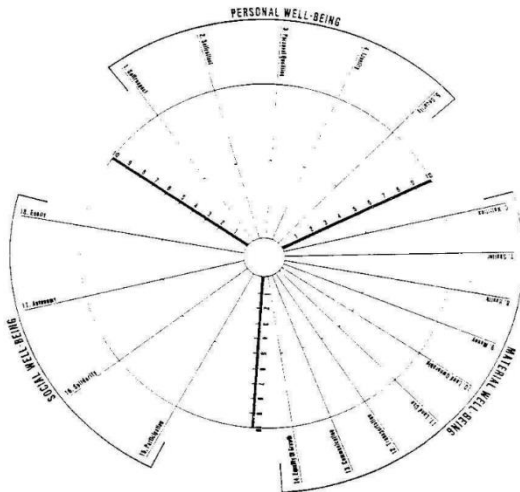


Figure 6: wheel diagram for the development of villages (Roughan, 1986).

The research is done by a comparative analysis in a qualitative way. The research is conducted qualitatively because detailed information is needed to position energy initiatives in the model. It is essential to consider the contextualities and interpretations involved to understand energy cooperatives. Therefore, the research will be qualitative and not quantitative.

This way of research is mainly related to interpretivism. Interpretivist researchers try to get a deeper understanding of a particular phenomenon and its complexity in a specific context (Pham, 2018). This research focuses on the specific context of energy cooperatives in the Cleantech region in Gelderland in the Netherlands. The perspectives of people in the field are used to understand this specific context. While the investigated dimensions are predetermined, the interviews in phase two and three will result in different meanings and interpretations of how energy cooperatives operate. One of the advantages of interpretivism is that the researcher can investigate things we cannot observe by collecting values and perspectives (Pham, 2018). As a researcher, this means that the differences between objects and people are taken into account (Pham, 2018). Therefore it is crucial to be aware of the viewpoint of the relation of the researcher to the individuals in the context.

The research strategy can be represented as a funnel technique, as depicted in figure 7. The funnel technique encompasses an approach that starts very broad and narrows down to a very specific way of operating (Rosala & Moran, 2022). In this research that is translated by starting very broadly with the desk research. After the desk research is done, the modified wheel diagram is assembled. The research has gone from a broad theory to a tailored framework. To make a visual model of the characteristics of each energy cooperative, in-depth interviews are done with the different energy cooperatives. This creates the first set of data to analyze. While this does not yet answer the entire main research question, the first set of data ensures that the research is getting more narrowed down to the specific information needed. In order to answer the main research question and the sub-research questions, more specific information is needed, like how and why energy cooperatives operate the way they do. The information is gathered by conducting in-depth interviews with experts to grasp more detailed information. Ultimately the research question can be answered, and

recommendations on overcoming the barriers energy cooperatives encounter can be given. The research strategy is structured by the funnel technique to start broadly and end specifically to answer the main research question (Rosala & Moran, 2022).

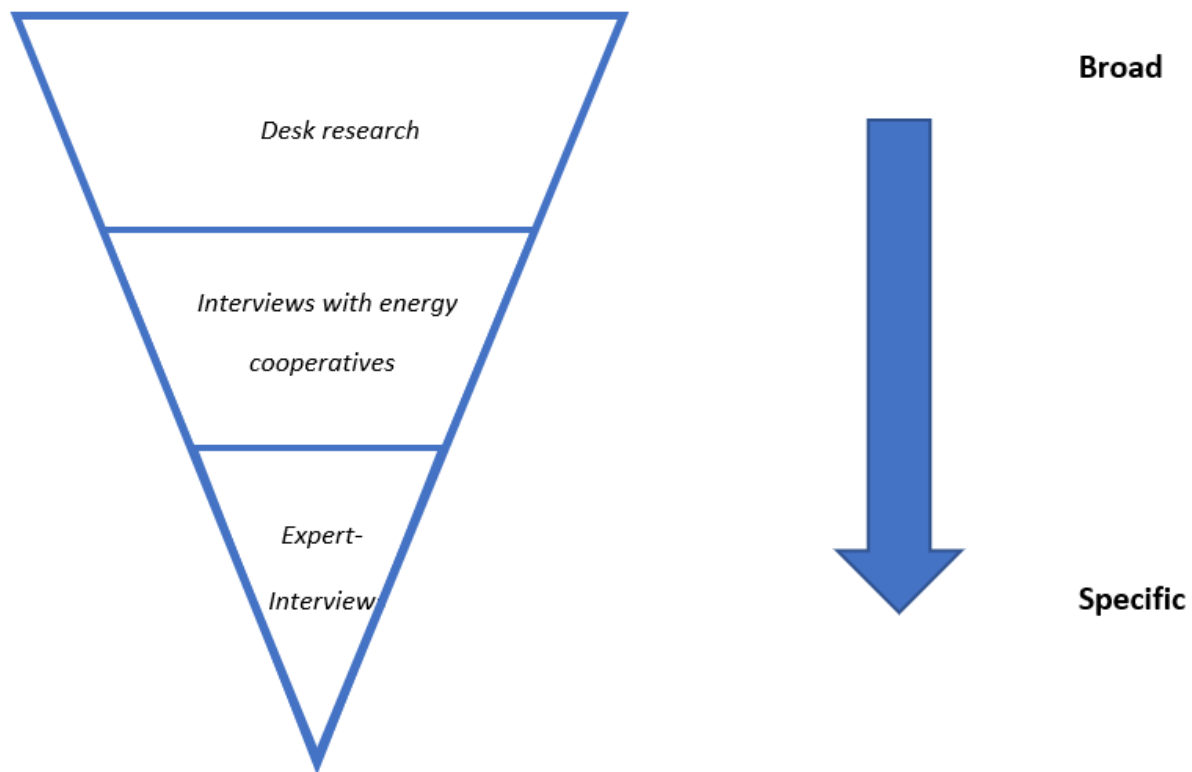


Figure 7: funnel technique in qualitative research (Smulders, 2023).

## 3.2 Data collection

### 3.2.1 Case study selection

This research is focused on the Cleantech Region in the province of Gelderland in the Netherlands. The Cleantech Region is an administrative partnership of eight municipalities near and including the three cities of Apeldoorn, Deventer and Zutphen, hence the nickname 'urban triangle' (Provincie Gelderland, n.d.). Next to the administrative partnership of the eight municipalities, a similar partnership is created in the energy sector in this region. All nine energy cooperatives in the Cleantech Region are aligned in a partnership (Elzenga & Schwencke, 2014). They exchange knowledge and expertise to increase the acceleration of the energy transition. They strive to create an overarching energy cooperative for the region, which all energy cooperatives in the region can be part of. Because of this partnership, these energy cooperatives are very keen on learning from each other and collaborating. Therefore, this research of comparing different energy cooperatives is very suitable for the region.

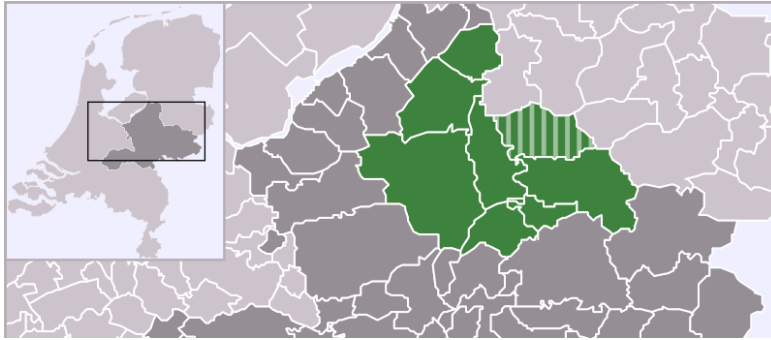


Figure 8: locator map of the Cleantech region by Centraal Bureau voor Statistiek (CC-BY-SA 2.5).

The cases are different in size and professionalism, which makes it interesting to uncover the differences in their role in the participation process. The cases being different can be a positive thing because it can give a broader picture of the concept (Vennix, 2016). The investigated cases are seven out of the nine energy cooperatives in the Cleantech Region. This provides a very reliable data set for the region.

### 3.2.2 Desk research

The desk research entails an elaborate set of scientific literature and policy documents about citizen participation and energy cooperatives. Chapter two contains a theoretical framework that starts with broad theories and narrows it down to what this specific research entails. Other than scientific sources, policy documents are also reviewed for the desk research. To begin with, the latest IPCC report is reviewed to identify the urgency of the research. Other policy documents such as the Climate Agreement and the Environment and Planning Act in the Netherlands are researched to identify the frameworks for citizen participation in the energy transition. Next to policy documents, scientific literature is examined on citizen participation and collaborative governance. The desk research is later narrowed down to different scientific theories specifically on energy cooperatives. These theories are reviewed to define energy cooperatives and identify the right dimensions needed to investigate energy cooperatives for this research in a justifiable way. Finally, the research of Oteman (2014) is used as a guideline for the dimensions used. The dimensions presented by Oteman (2014) are slightly changed in order to be tailored to what is needed for this research. The result is presented in the wheel diagram (see figure 4). The dimensions are each tested with indicators that measure the dimension. After the dimensions and indicators are assembled, the wheel diagram is completed to continue to the next research step.

### 3.2.3 Interviews

After the wheel diagram is ready to be filled, the data can be gathered. Data concerning how different energy cooperatives operate is gathered through in-depth interviews. The interviews are done with representatives of the energy cooperatives in the Cleantech region. Out of the nine energy cooperatives in the Cleantech region, seven were available to participate with this research. Two different representatives are interviewed for each energy cooperative. This is done in order to guarantee the validity of the research. The interviews were between 45 and 60 minutes each, some online and some in real life. Informed consent was dealt with in the beginning of each interview, where they all granted permission to use the data of the interview for this research. Later permission to use the respondents' name as reference is asked through email.

### *In-depth interviews with energy cooperatives representatives*

The interviews with energy cooperative representatives from the Cleantech Region aim to gather information about how energy cooperatives operate. The questions aim to generate information to position the initiatives along the dimensions of the wheel diagram. To measure that, the following dimensions are investigated: legal conditions, personal characteristics, organizational capacities, cultural dimension, economic characteristics, relationship with local government, and relationship with market players (Oteman et al., 2014). The aim is to conduct two interviews per energy cooperative, each interview conducted with a board member of the energy cooperative. After these two interviews, a wheel diagram is filled in for each energy cooperative. All the different diagrams are subsequently compared. This way the first part of the research question can be answered. One interview is conducted with an energy cooperative representative that is not located in the research area of the Cleantech region. This was an explorative interview that served as a practice to oversee what should be paid attention to in the follow-up interviews. In the early stages of interviewing, there is often uncertainty about what type of information is available and needed and what respondents' reactions will be. Because it was an explorative interview and the energy cooperative of the representative is not located in the research area, the data of the interview is not included in the analysis of chapter 4. The data of the interview is included in the discussion in chapter 5.

### *In-depth interviews with experts*

To answer the second part of the research question, in-depth interviews with experts are done. The knowledge and insights of experts are used to explain why the barriers appear and how these can be overcome. The diagrams of the energy cooperatives are used as a motivation for what subjects to dive deeper into in the expert interviews. Some recurring elements can be further investigated, but also some remarkable outcomes can be deeper questioned with the interviews. These interviews can give a broader and other perspectives than representatives from energy cooperatives, like from a governmental organization, a project developer or a network organization. A list of all respondents is shown below.

*Table 8: overview of the respondents of the interviews.*

<b>Interviewee</b>	<b>Occupation</b>	<b>When</b>
Evert Obdeijn	EcoBuren (exploratory interview)	25-05 at 10.00
Joep Koene	Development agency Oost NL	21-06 at 10.30
Wouter Kamp	Network organization GEA	26-06 at 11.00
Sander Veltmaat	Project developer Zebra	04-07 at 9.30
Jan Emmerzaal	Brummen Energie	13-06 at 13.15
Els Holsappel	Brummen Energie	16-06 at 10.00
Fun Hendriks	DeA Apeldoorn	09-06 at 10.00
Michael Boddeke	DeA Apeldoorn	21-06 at 13.30
Marcel Paques	Energiecoöperatie Epe	26-06 at 10.00
Erik Visser	Energiecoöperatie Epe	12-06 at 9.00
Otto Hettinga	Energierijk Voorst	21-06 at 9.00
-	Energierijk Voorst	No second interviewee
Tonnie Tekelenburg	LochemEnergie	13-06 at 11.00
Paul Stolte	LochemEnergie	04-07 at 10.00
Sanne van Hoogmoed	ZutphenEnergie	12-06 at 11.30
John Verheijden	ZutphenEnergie	14-06 at 13.30
Gert de Vos	Heerde Energiek	22-06 at 13.00
Willie Fikken	Heerde Energiek	06-07 at 10.00

### 3.3 Data analysis

The interviews are first transcribed, and second, the transcripts are analyzed. Analyzing the transcripts is done with the software of Atlas.Ti. This tool can be used to code transcripts in order to select the most important information for the research (Friese, 2019). This gives an overview of the most essential information to answer the research question. This is done through a coding scheme based on the theoretical framework. This makes the research deductive because the researched dimensions are predetermined based on the literature (Vennix, 2016). This top-down approach of coding results in an initial set of codes (Saldaña, 2021). For the data analysis, the transcripts are read through, and excerpts of the data are assigned to codes. At the end of the process, the codes still have to resemble the coding scheme closely (Saldaña, 2021). The coding scheme is shown below.

For the interviews with energy cooperative representatives, the analysis of the transcripts results in a wheel diagram. The substantive dimensions and indicators that are used and the theories behind it are elaborated in chapter 2. Following these indicators and the way they are measured, there can be observed that almost all scales are qualitatively measured with different categories instead of numerical scales. With the exception of the organizational dimension where the three indicators are measured in a quantitative manner. Each energy cooperative results in their own completed wheel diagram. Each dimension in the diagram is marked with the category that applies to the energy cooperative. For some scales, multiple categories may apply hence for these indicators more categories can be marked.

The wheel diagram is compiled to point out differences between energy cooperatives for a predetermined set of dimensions. For reading the wheel diagram there has to be emphasized that this research does not contain a qualitative assessment. This means that the scales are on a nominal level of measurement where the data can only be categorized, with no clear ranking. For example, if an indicator is measured by a certain scale that exists of five categories, it means that the fifth category on the scale is not better than the first category on the scale, nor the other way around. The scales and the marking of the categories are meant to point out the differences and not to make a qualitative assessment. Each question in the interviews represents an indicator to measure a dimension. The content of each interview question results in a particular position in the wheel diagram. All the questions together compile a complete wheel diagram for each energy cooperative.

For the expert interviews no wheel diagrams are compiled. These interviews are based on the results of the interviews with board members. The interviews are meant to build on the first findings in the first part of the interviews. After analyzing the transcripts of the expert interviews the important quotes and findings emerge from the data in order to answer the second part of the research question.

*Table 9: overview of the dimensions, indicators and sub-indicators that are used in this research to investigate energy cooperatives.*

<b><i>Dimension</i></b>	<b><i>Indicator</i></b>	<b><i>Sub-indicator</i></b>
<b>Political</b>	Priority for sustainability goals	Other
		Responsive
		Collaborating
		Performing
		Legitimate
	Subsidies	Non- participative
		Facilitating
		Stimulating

		Network steering
		Regulating
	Project support	Non- participative
		Facilitating
		Stimulating
		Network steering
		Regulating
<b>Legal</b>	Formal rules and regulations	Non- participative
		Facilitating
		Stimulating
		Network steering
		Regulating
	Procedures for collective decision-making	Non- participative
		Facilitating
		Stimulating
		Network steering
		Regulating
<b>Personal</b>	Leadership	Transformational
		Slightly transformational
		Balance transformational/ transactional 50/50
		Slightly transactional
		Transactional
	Expertise	Energy production solar on roof
		Energy saving
		Energy poverty
		Energy production solar parks
		Energy production wind
	Knowledge	Other
		Financial knowledge
		Technical knowledge
		Social knowledge
		Juridical knowledge
<b>Organizational</b>	Social support of the wider community	Number of members
	Board diversity age	Number of age cohorts
	Board diversity professionalism	Number of professionalism's
<b>Cultural</b>	Pro-environmental attitude	Structural conservatism
		Investor
		Ecological
	Willingness to act	Social participation
		Financial participation
		Political participation
<b>Economic</b>	Division of material resources	Equity
		Member shares
		Commercial loans
		Subsidies
		Other financial resources
	Expected profitability	Negative



		Slightly negative
		Neutral
		Slightly positive
		Positive
<b>Market</b>	Decision-making process	Information
		Consultation
		Deciding together
		Acting together
		Independent community

### 3.4 Validity and reliability

The internal validity of the research refers to the degree to which the results are valid and reflect reality. The measurement instruments should be valid in order to measure the right data. This research encompasses a large number of dimensions analyzed within cases that are all based on literature. The elaborate theoretical framework on the defining the dimensions and indicators in chapter 2 strengthens the validity. Each indicator has its own measurement scale based on literature.

Doing in-depth interviews could have an effect on the external validity of the research. External validity refers to the fact if the results of your research can be generalized. Generalizing means that the conclusions can apply to a larger group or more general situation rather than just the group or situation being studied. Because in-depth interviews generate less quantities of data in comparison to quantitative research which involves a lot of data, qualitative research can be harder to generalize (Vennix, 2016). Strengthening external validity can be done by doing the research with a sufficient number of case studies and a sufficient number of interviews. This research investigates seven out of nine energy cooperatives within the Cleantech region. Next to this, two respondents are investigated for each case. Both of these arguments strengthen the external validity of the research (Yin, 2003).

Reliability refers to maintaining a certain level of quality of the research. It is about the consistency that the results are the same if the entire study is carried out in exactly the same way again. And about the accuracy, that is about the degree of the quality being precise or exact. To ensure the accuracy of the research, each indicator is measured by a scale that is identified by theories that are derived from the literature in chapter 2. The consistency of the research is ensured by choosing for interviews instead of surveys and conducting the interviews with a structured interview guide instead of a semi-structured interview guide. The reliability is dependent on how the respondents define and explain their evaluations. To strengthen the consistency respondents can be asked for reasons to justify their evaluation for each dimension (Laverack, 2006). This can serve as a way for respondents to illustrate the reasoning behind evaluations with experiences and examples. Hence there is chosen to conduct interviews to gather the data instead of surveys or other methods. Secondly, the reliability of this research is secured because the interviews were structured. In qualitative research semi-structured interviews can weaken the reliability because if the interview is conducted again the data outcomes can be very different from other interviews. The structured interviews guarantee a consistent course of the interviews.

## 4. Empirical findings

In this chapter the results of the empirical research are presented. This chapter focuses on describing the findings of the interviews per dimension. For every energy cooperative two interviews have been conducted, for one energy cooperative only one interview is done. Each interview provided information to result in a separate wheel diagram. For the sake of the analysis, these two separate wheel diagrams of the two different interviews are combined. This results into one wheel diagram for each energy cooperative. This is done because for the analysis, the energy cooperatives are compared, not the separate interviews. These combined wheel diagrams for each energy cooperative are shown below from figure 9 till figure 15. If you want to look at the different wheel diagrams per interview separately, then these can be looked up in annex I. After displaying the combined wheel diagrams below, the data is presented by following each dimension on the diagram through each corresponding indicator(s).

DeA Apeldoorn

Zutphen Energie

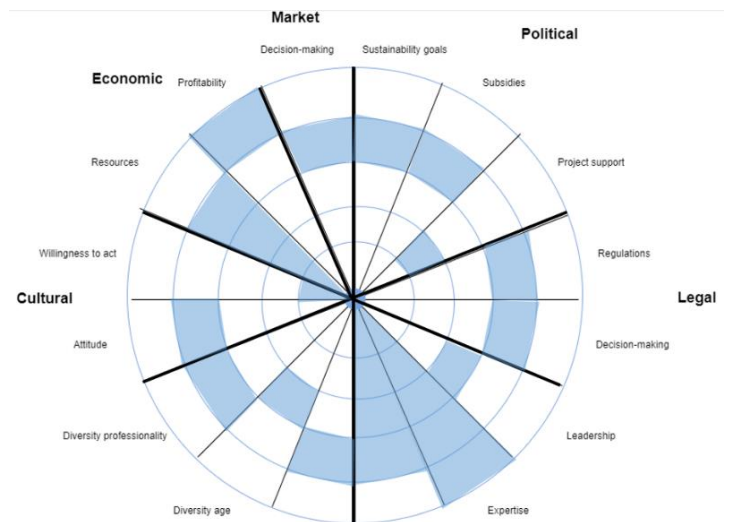
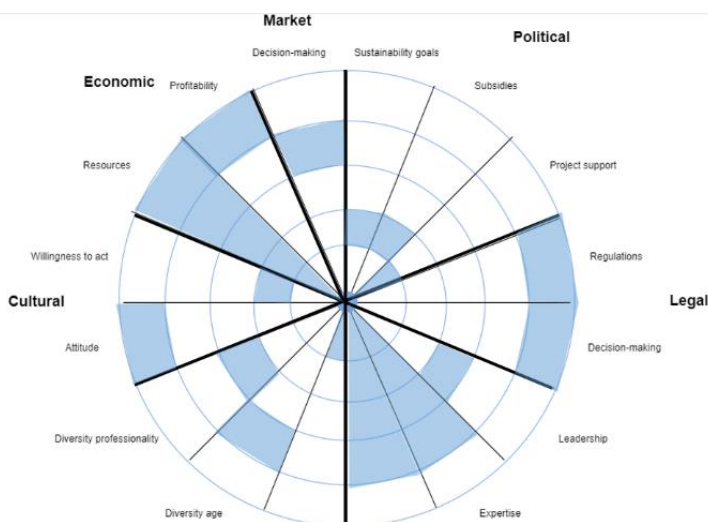


Figure 9: wheel diagram of DeA Apeldoorn (Smulders, 2023).

Figure 10: wheel diagram of Zutphen Energie (Smulders, 2023).

Heerde Energiek

Lochem Energie

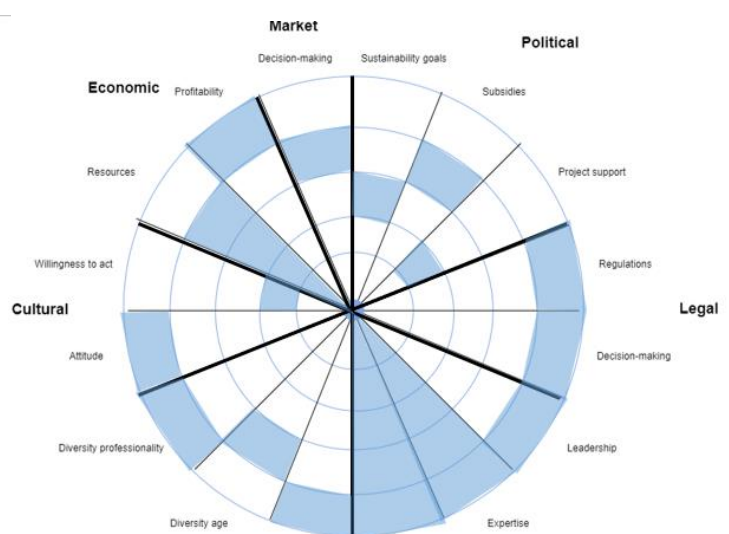
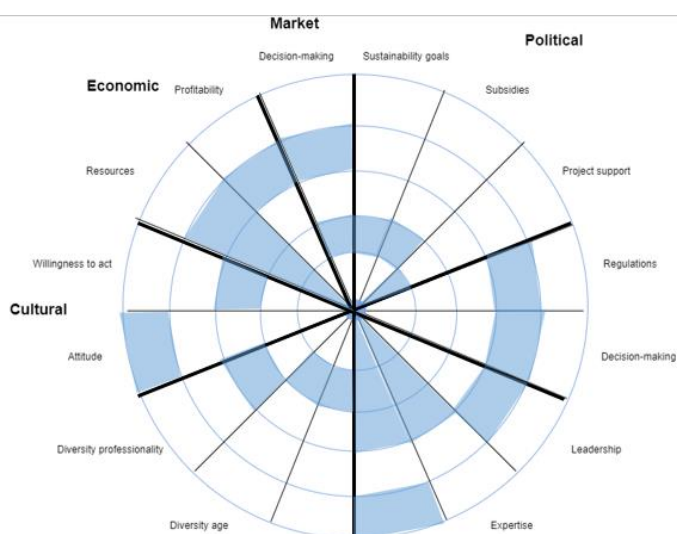


Figure 11: wheel diagram of Heerde Energiek (Smulders, 2023).

Figure 12: wheel diagram of Lochem Energie (Smulders, 2023).

## Energiecoöperatie Epe

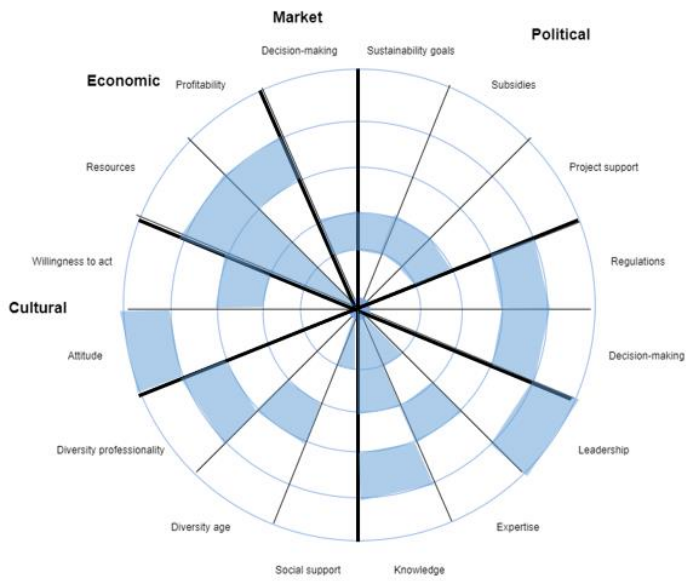


Figure 13: wheel diagram energiecoöperatie Epe (Smulders, 2023).

## Brummen Energie

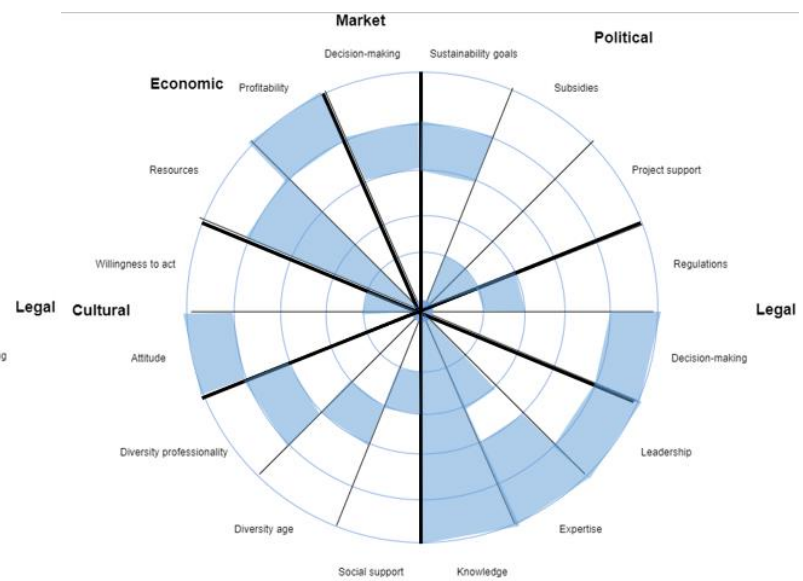


Figure 14: wheel diagram Brummen Energie (Smulders, 2023).

## Energierijk Voorst

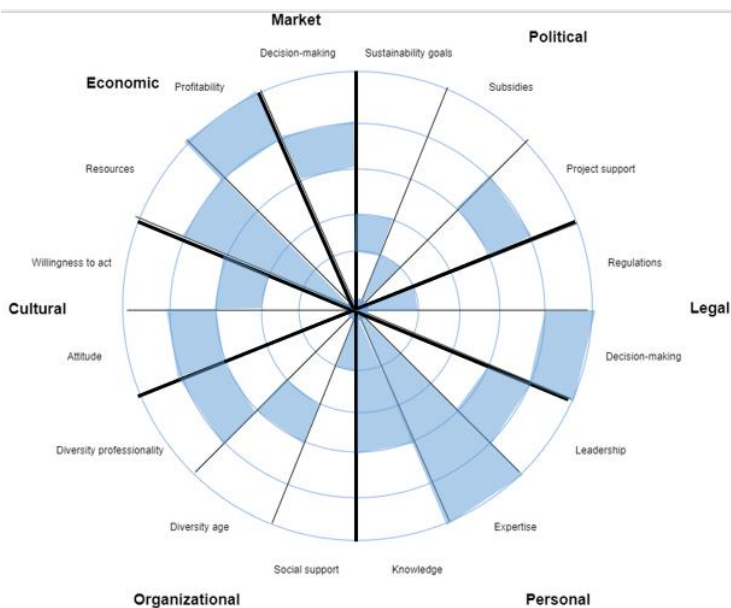


Figure 15: wheel diagram Energierijk Voorst (Smulders, 2023).

Each paragraph starts with an explanation of which indicators are measured for the relevant dimension. After that, each indicator is displayed in a bar graph to illustrate the differences between the energy cooperatives. This is then elaborated with information of the interviews to explain the similarities and differences.

## 4.2 Political barriers

The political barriers are measured by three different indicators. There is examined to what extent local governments have a priority for sustainability goals, there is looked at subsidies energy cooperatives receive and the project support energy cooperatives receive from governments.

The first indicator **priority for sustainability goals** is measured from a scale that goes from a passive attitude of the government to a more active government when it comes to giving priority to sustainability goals. Starting with responsive governments that have a wait-and-see attitude, to collaborating governments that cooperate with other parties, to more active forms such as a performing government where the government takes the lead and a legitimate government where the government not only takes the lead but also incorporates this in their legislation. The diagram below shows how the energy cooperatives that are interviewed are distributed along the scale of this indicator. Each bar shows how many energy cooperatives correspond with the particular sub-indicator on the scale.



Figure 16: diagram of how the energy cooperatives investigated are distributed on the scale of priority for sustainability goals.

Two out of the seven energy cooperatives perceive their municipality as performing to the priority for sustainability goals. In Zutphen sustainability is one of the focal points of the municipality's program (John Verheijden, personal communication, June 14, 2023). Five out of the seven energy cooperatives perceive their municipality as responsive to the priority for sustainability goals. This means that the municipality is not the leading party to achieve sustainability goals, but joins movements that are already out there. Municipalities not prioritizing sustainability goals in their activities is recognized in two different ways by these five energy cooperatives.

First, energy cooperatives indicate that they have the impression that their municipality is rather conservative. This expresses itself in the fact that they are not progressive on sustainability goals. Municipalities are described as fearful for the consequences. This fear originates from sounds of opposition. The municipality wants to keep everyone satisfied. There has to be enough social acceptance in the community and the persistent resistance has municipalities act conservative. They are way too persecutory on sentiment (Otto Hettinga, personal communication, June 21, 2023). This results in a risk-averse way of governing that can be experienced as a barrier for energy cooperatives (Michael Boddeke, personal communication, June 21, 2023). Municipalities are not making clear

decisions or are making conservative decisions, which results in energy cooperatives not being able to proceed with their plans.

Another argument given by energy cooperatives on why municipalities do not perform on achieving sustainability goals but act rather ‘responsive’ to the actions of other actors, does not have to do with their ambitions, but with the lack of staffing capacity. Lots of municipalities have the ambitions to prioritize sustainability, but they are not forceful enough to make this happen due to the lack of capacity. These capacity issues apply to both the number of staff and the substantive knowledge of the staff. This makes their possibilities limited. Because they can formulate goals, but if no one tackles it or they lack sufficient staff, nothing will be accomplished (Paul Stolte, personal communication, July 4, 2023). Too little people are working on too much issues, which results in officials having too much on their plate to really get anything substantial done (Otto Hettinga, personal communication, June 21, 2023).

“You run into decelerating delays again. That was the case for the preparation of the policy, which was not fast. Now some time later the policy is there and now we see that implementation is again very slow” (personal communication, anonymous source, 2023).

To follow, there is looked at the next dimension regarding the **subsidies** provided by the local government. For this the ladder of government participation is used, that starts with no government participation to active government participation. Logically, the most passive form is a non-participative government, followed by a facilitating government that provides information and options. To take it a step further, a stimulating government does not only facilitate, but structurally stimulate energy cooperatives. A network steering government is collaborating with the energy cooperative. And the most active form is a regulating government that takes the lead to initiate, coordinate and decide.

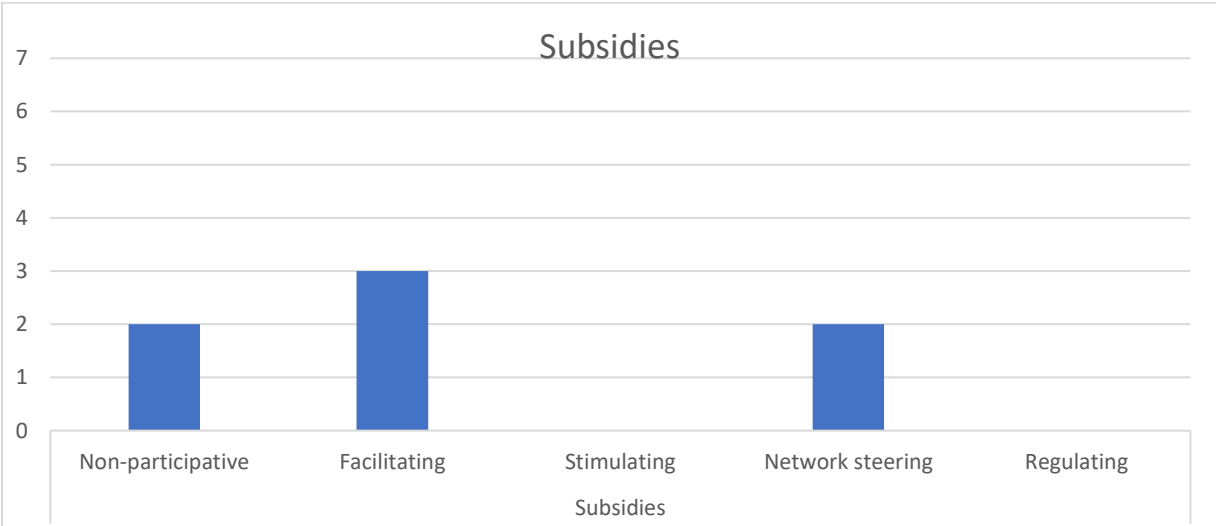


Figure 17: diagram of how the energy cooperatives investigated are distributed on the scale of subsidies.

Two energy cooperatives have not received any subsidies from the municipality. Five out of the seven energy cooperatives receive subsidies from the municipality. Three energy cooperatives that receive subsidies from the municipality, did receive them through general subsidy schemes without a collaboration, this is indicated as a facilitating government. The other two energy cooperatives describe that some of the subsidies are established by cooperating with the municipality, which is labeled as a network steering government.

Three energy cooperatives receive subsidy from the municipality. In most cases it is attributed to the implementation of issues of energy saving and energy poverty. The subsidies are used for energy poverty trajectories and the education and supervision of energy coaches to accompany people on how to save energy (Tonnie Tekelenburg, personal communication, June 13, 2023). Subsidies are mostly given to these issues because for these issues there is no revenue model behind it (personal communication, Michael Boddeke, June 21, 2023). But the municipality thinks it is an important issue and therefore raises funds to address these issues that are on the political agenda. In Heerde the energy cooperative has received a subsidy for the supervision of a solar park (Willie Fikken, personal communication, July 6, 2023).

Zutphen and Lochem explain that the energy cooperative and the municipality looked together at where the need for financial aid was and as a result a subsidy scheme for the energy cooperative was established. As an example Paul Stolte of Lochem energy cooperative discusses that they proposed a subsidy scheme for the reinforcement of roofs and the municipality had in fact created this subsidy opportunity. In Zutphen they collaborate with the municipality on several subsidy schemes. They state that if the energy cooperative and the municipality are aligned in their objectives, it can be easy. The municipality can shift some tasks to the energy cooperative, which can reduce pressure on the municipality (John Verheijden, personal communication, June 14, 2023).

Brummen and Voorst do not receive any subsidies. Els Holsappel explains that the municipality is very much aimed at market-forces (Els Holsappel, personal communication, June 16, 2023). This results in the municipality not supporting civil society organizations like energy cooperatives with subsidies. While energy cooperative Brummen managed to operate and grow, the lack of subsidies is considered as a barrier.

The last indicator to measure the political dimension is **project support** by the government. This is measured by the same scale as subsidies, respectively; non-participative government, facilitating government, stimulating government, network steering government and a regulating government.

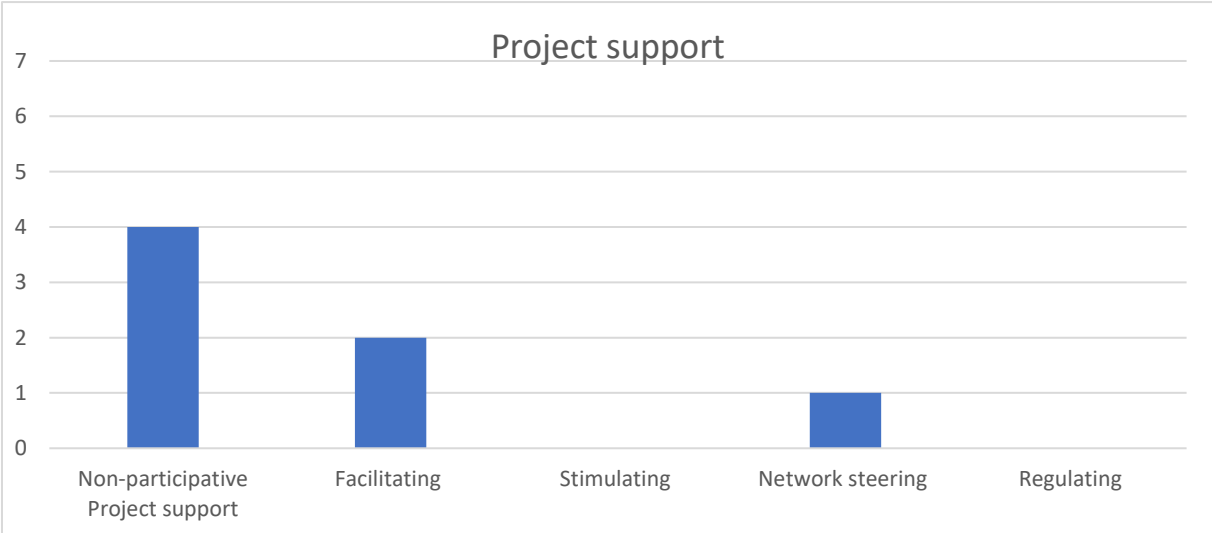


Figure 18: diagram of how the energy cooperatives investigated are distributed on the scale of project support.

Four out of the seven energy cooperatives receive no project support from the municipality to renewable energy projects. This is mostly due to the formerly mentioned lack of staff and expertise within municipalities. Tonnie Tekelenburg agrees that consultancy predominantly occurs from the



direction of the energy cooperative to the municipality instead of the other way around (Tonnie Tekelenburg, personal communication, June 13, 2023).

Three municipalities receive advisory help from the municipality, one of the three describes the support established from collaborating together. This collaboration takes place in the communication department with for example reserved space in the local newspaper or the municipality answering phone calls for interested residents. John Verheijden describes the collaboration with the municipality the following way: “We don't have all the pieces of the puzzle in our own corporation, so those from the municipality should also be included. So ultimately this has become a game in which everyone contributes their expertise” (John Verheijden, personal communication, June 14, 2023).

The perception of energy cooperatives however is that project support from the municipality seems irrelevant, no energy cooperative considers not receiving project support from the municipality as a barrier.

### 4.3 Legal barriers

The legal barriers are examined by two indicators; rules and regulations and decision-making process. The **rules and regulations** refer to the local policy framework of the municipality and is measured by the same scale as the former indicators, respectively; non-participative government, facilitating government, stimulating government, network steering government and a regulating government.

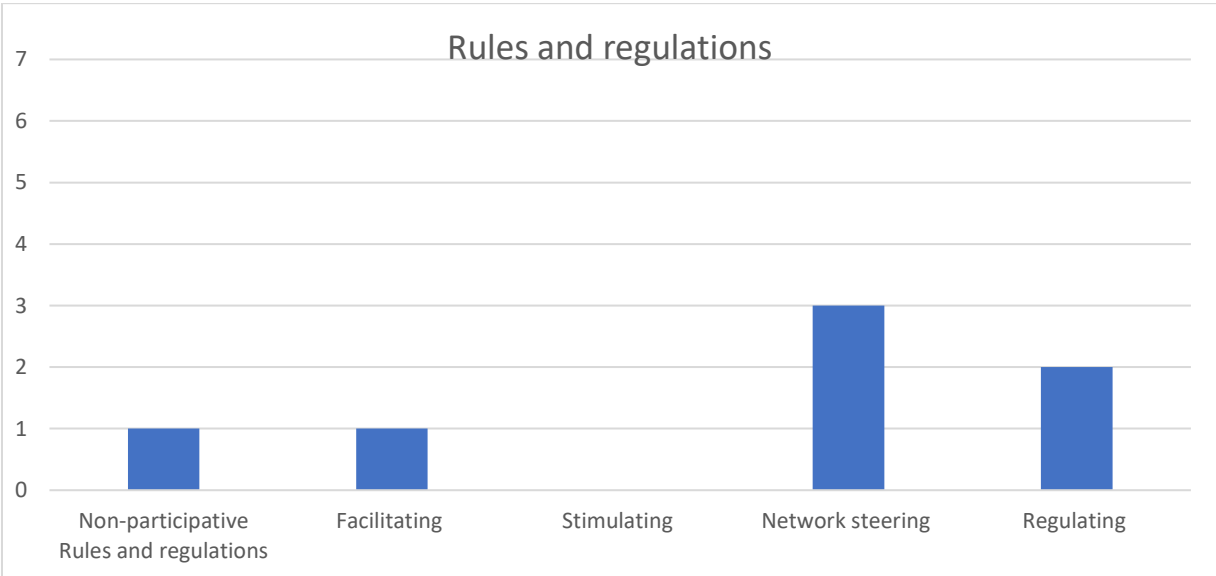


Figure 19: diagram of how the energy cooperatives investigated are distributed on the scale of rules and regulations.

The municipal rules and regulations are very fragmented between the interviewed energy cooperatives. Three out of the seven energy cooperatives describe that the regulations of the municipality have come together through network steering. Epe and Heerde describe that during the process of making the policy, the municipality invited the energy cooperative to give their input. They participated in formulating and bringing about the policy framework (Gert de Vos, personal communication, June 22, 2023). Marcel Paques elaborates that they included the issues that the energy cooperative suggested, based on earlier experience from the field (Marcel Paques, personal communication, June 26, 2023). For municipalities it can be a struggle to decide whether the local energy cooperative is of added value or not (Marcel, personal communication, 2023). In the case of

Epe, Heerde and Zutphen the municipality has taken the stand of seeing the energy cooperative as a partner.

In Zutphen the partnership has become documented: “We finally succeeded in making a lasting commitment, a partnership with the municipality, where they are going to pay us every year. And why do they want that? Because we can be a huge value and the municipality is lacks workforce so actually we are becoming some kind of operating company of the municipality” (John, personal communication, 2023). The space and support that the municipality is giving energy cooperative Zutphen is essential (John Verheijden, personal communication, June 14, 2023). At this point, the collaboration between the municipality and the energy cooperative is successful, but if this dissolves this would be a big obstruction for the energy cooperative. It is always fruitful to have that in mind and always try to become independent by generating and selling renewable energy (John Verheijden, personal communication, June 14, 2023).

The energy cooperative of Brummen perceives the policy of the local government as facilitating. They perceive it as a barrier that the municipality does not see the energy cooperative as a partner (Els Holsappel, personal communication, June 16, 2023). The policy provides options for energy cooperatives, but the policy is not steering towards a beneficial position for the energy cooperative but leaves everything open for market-forces: “The municipality works with tenders, if we bid on three projects, we are one of the ten bidders and we are treated that way. That is not necessarily wrong. We are one of the parties participating” (Jan Emmerzaal, personal communication, June 13, 2023).

That market-oriented thinking is very strong in the municipality. So they have not set the right requirements for example in terms of local ownership, so now solar parks are being developed where there is only an area fund but not where residents have partial ownership (Els Holsappel, personal communication, June 16, 2023). That market-oriented thinking is caused by the fact that they embrace the volunteer side of an energy cooperative, but that new branch of energy cooperatives being more professional and corporate is difficult for a lot of municipalities (Els Holsappel, personal communication, June 16, 2023). The motivation of energy cooperatives is to put the earned money back into the community instead of making profit. Accepting this way of thinking can be difficult for municipalities and that can be a struggle for energy cooperatives (Els Holsappel, personal communication, June 16, 2023). This results in an understanding where there is no real partnership between the municipality and the energy cooperative. There is no close involvement during project implementations (Jan Emmerzaal, personal communication, June 13, 2023). At some point, they saw the energy cooperative as a spare bank that only comes in action when they are needed and that is not what you aim for (Jan Emmerzaal, personal communication, June 13, 2023).

Two energy cooperatives that also do not feel a partnership between them and the municipality are Lochem and Apeldoorn. They perceive the policy of the local government as regulating. In Apeldoorn the energy cooperative would prefer that the municipality would look at the energy cooperative DeA as the partner in the field of sustainability (Michael Boddeke, personal communication, June 21, 2023). At this point they are one of the many more partners, becoming the only partner is an small but crucial difference (Michael Boddeke, personal communication, June 21, 2023).

The rules and regulations of the local government are strictly regulated for these energy cooperatives, which cannot provide them with all options needed. This results in obstructing energy cooperatives to operate because there is too little room for new projects. Tonnie Tekenburg



elaborates how energy cooperatives are not legally secured in the Netherlands (Tonnie Tekelenburg, personal communication, June 13, 2023). The trend is that energy cooperatives are attractive and proving to do a good job. However, they are not provided with a permanent role in the legal framework. He gives an example to illustrate this: “As an anecdote the municipality of Lochem has given us 2 million euro credit to build a solar park for energy poverty alleviation. The money has been virtually approved, but there is no possibility to build a solar park, because they are against them” (Tonnie Tekelenburg, personal communication, June 13, 2023).

Voorst does not have a proper policy on renewable energy. The municipality is not rejecting initiations because of policy implications. But if there is any resistance in the local community, the municipality is not willing to cooperate (Otto Hettinga, personal communication, June 21, 2023).

The second indicator investigated for the legal barriers is the **decision-making process** between the local government and energy cooperatives. This is measured by the same scale as the former indicator rules and regulations, which is; non-participative government, facilitating government, stimulating government, network steering government and a regulating government.

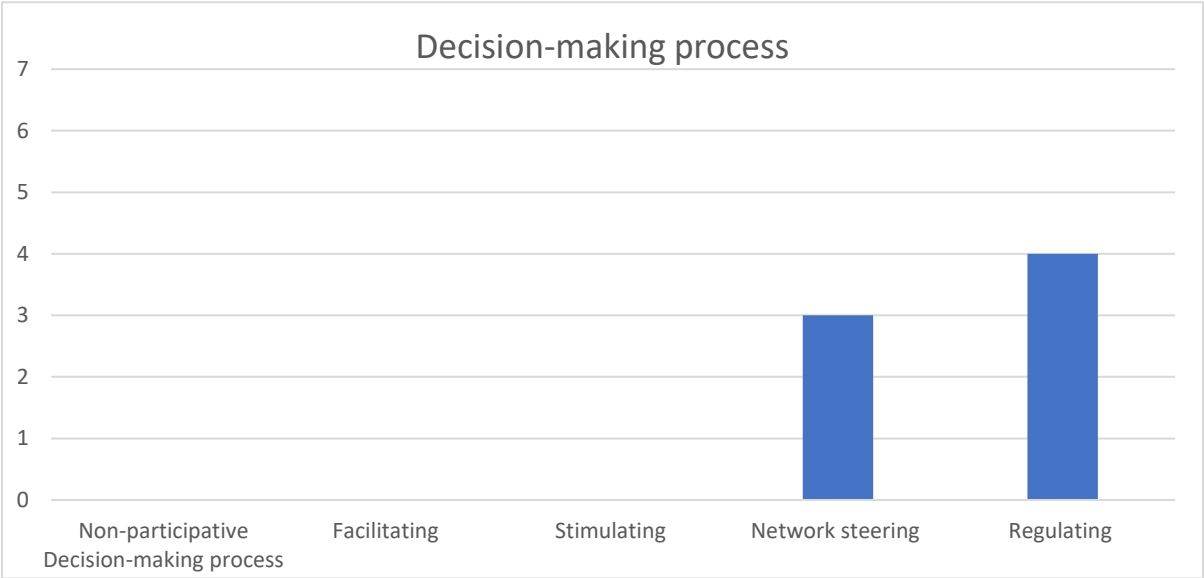


Figure 20: diagram of how the energy cooperatives investigated are distributed on the scale of decision-making processes of the government.

In practice, the municipality is the decision-maker on granting permissions or rejecting plans. However, the role they take on can differ. Three energy cooperatives feel that the municipality takes on a network steering role in decision-making; this is more focused on collaborating with the different stakeholders. While the municipality decides, the attitude of the municipality can be more tended towards a collaboration. While they cannot decide whether permissions are given, they feel that they have an equal position during decision-making processes (John, personal communication, 2023; Gert, personal communication, 2023). The municipality has a positive stance towards the energy cooperative in Heerde, which results in the municipality having a supportive attitude in decision-making process (Willie Fikken, personal communication, July 6, 2023). In Epe the municipality establishes a road map to document the collaboration in perspective together. This way you set in motion the different steps as soon as possible, for example: “There we set out a joint trajectory with the municipality, Statkraft (project developer) and the energy cooperative. Who, when, has to do what. And that fits together in that respect. And also that cooperation is actually going extremely well” (Marcel Paques, personal communication, June 26, 2023).

Four energy cooperatives feel that the local government takes on a regulating role in decision-making processes. The municipality can view at the energy cooperative as an implementation counter of their own policy (Jan Emmerzaal, personal communication, June 13, 2023). This is again where some kind of partnership is missing. For energy cooperatives it can be difficult to initiate and proceed their plans, because municipalities have the tendency to state what is not allowed and not help and search for options that are allowed (Tonnie Tekelenburg, personal communication, June 13, 2023). There has to be taken into account that the executives of the municipality are constrained by the decisions and agreements of a board. This makes them maneuver within these frameworks.

#### 4.4 Personal barriers

The personal barriers are not aimed at outside relationships that energy cooperatives have, but at the individuals of the energy cooperatives themselves. The personal barriers are measured on the level of the boards of the energy cooperatives. This is done by the following three indicators: leadership, knowledge and expertise. The first indicator **leadership** is measured by a spectrum that goes from transformational to transactional. Transformational implies more idealistic and value-oriented leadership in order to achieve (environmental) goals. Transactional concerns a more secure, business-oriented and solid way of leadership. Logically the middle of the scale represents a balanced situation of a combination of transformational and transactional leadership.

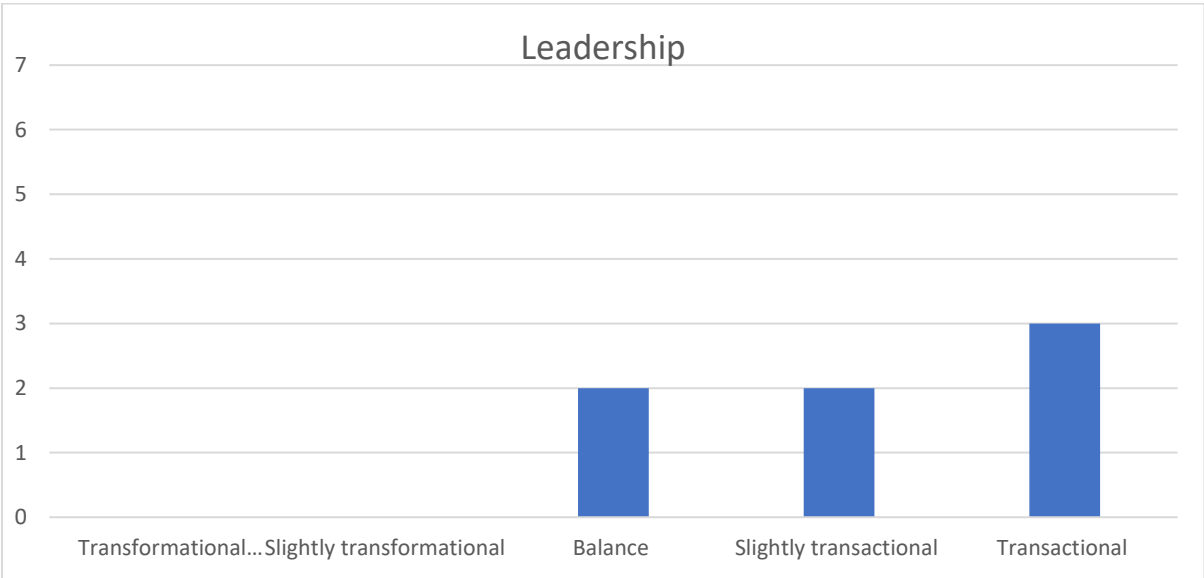


Figure 21: diagram of how the energy cooperatives investigated are distributed on the scale of leadership.

All energy cooperatives are inclined to have a more transactional type of leadership. Two energy cooperatives have a balance between transformational and transactional leadership. Five energy cooperatives have a slightly transactional or predominantly transactional type of leadership in their organization. They clarify that they start with a transformative way of leadership, because the initiative starts with ideals. An idealistic approach at the beginning is necessary to get through the initial phase (Jan Emmerzaal, personal communication, June 13, 2023). Because the activities you develop require a long breath, an approach that is too businesslike can also be an obstacle because things are more difficult to predict (Jan Emmerzaal, personal communication, June 13, 2023).

The five energy cooperatives that have a more transactional type of leadership indicate that the longer an energy cooperative is operating, this contributes to shift more towards a transactional way of leadership. Fun Hendriks explains that the initiators of the cooperative are at some point replaced by a new board, who do not consider the energy cooperative their 'baby'. That allows the board to look at the energy cooperative more from a distance (Fun Hendriks, personal communication, June 9,

2023). At that point it becomes more of a company where more attention is being paid to getting better organized and structured (Otto Hettinga, personal communication, June 21, 2023). Some energy cooperatives struggle to keep the balance between these two types of leadership. Zutphen Energie considers finding balance between transformational and transactional leadership as a barrier. They are unclear on what type of leadership they plan to take on in the future. Sanne Hoogmoed discusses how all sorts of daughter companies are now split off for economic reasons, which is very transactional (Sanne van Hoogmoed, personal communication, June 12, 2023). On the other hand, they are also looking back to when Zutphen Energie was founded with the ideals that the energy cooperative is going to accelerate the energy transition together with the citizens of Zutphen. She contemplates the struggle of where to draw the line as an energy cooperative with an example:

“A project with hydrogen generation is started, which is very nice for the local industry, but how does that benefit to the contribution of Zutphen Energie to the residents of Zutphen and the acceleration of the energy transition?” (Sanne van Hoogmoed, personal communication, June 12, 2023).

Some of the energy cooperatives indicate that too much focus on transactional leadership can create a barrier. In Brummen the power of entrepreneurship and the businesslike decision-making can be a strength of the energy cooperative, but at the same time the idealistic part of an energy cooperative should not be overlooked. It is very useful to stay focused on the embeddedness of the energy cooperative in the local community (Els Holsappel, personal communication, June 16, 2023). Energy cooperatives should be careful to consider the organization as a means and not the goal (Michael Boddeke, personal communication, June 21, 2023).

The second indicator focuses on the different forms of **expertise** that an energy cooperative has gained in practice during projects over the years. This is not measured by a ranking scale, but by different forms of expertise for which multiple of the categories can apply for one energy cooperative. The different forms of expertise that are measured are: solar energy on roofs, energy saving, energy poverty, solar parks and wind projects.

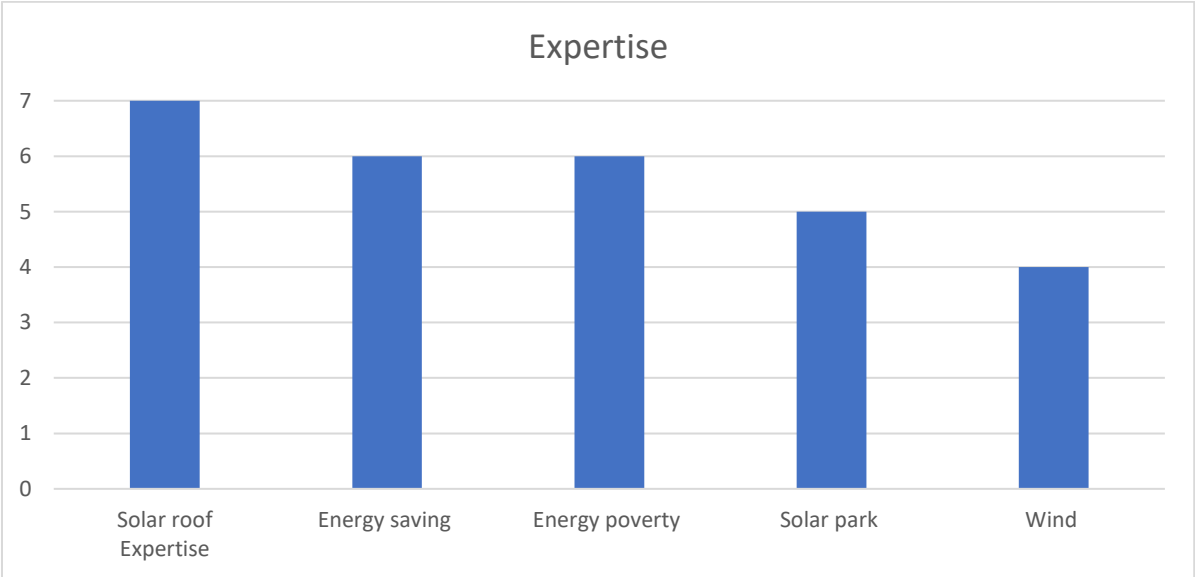


Figure 22: diagram of how the energy cooperatives investigated are distributed on the scale of expertise.

All energy cooperatives have experience with solar roof projects. Six energy cooperatives have expertise in energy saving. Six energy cooperatives have expertise in energy poverty. Five energy cooperatives have obtained expertise in realizing solar parks and four are currently in the development of a wind project.

Next to these main expertises, energy cooperatives are working on other types of activities. Some examples are the energy cooperative DeA in Apeldoorn focuses on starting and implementing a 'movement' for sustainability and accelerating the energy transition (Fun Hendriks, personal communication, June 9, 2023). Epe has been discovering possibilities of energy storage (Marcel Paques, personal communication, June 26, 2023). In Lochem one of the main focuses has been innovations (Tonnie Tekelenburg, personal communication, June 13, 2023). In Zutphen they distinguish themselves by having a physical store for people to connect and ask for advise (John Verheijden, personal communication, June 14, 2023). This results in them being focused on a more social approach. Brummen has taken a different approach than most energy cooperatives in the region by starting with renewable energy generation instead of energy saving and energy coaches for example (Els Holsappel, personal communication, June 16, 2023).

The last indicator is **knowledge**. The difference with the former indicator expertise is that there the focus was on expertise gained in practice and this indicator focuses on knowledge gained by individuals and their backgrounds. This indicator is measured similarly as expertise by different categories where multiple options can apply. The different kinds of knowledge measured are: financial knowledge, technical knowledge, social knowledge, juridical knowledge and the option 'other knowledge'. This applies to situations where certain kinds of knowledge are gained that are not included in one of the first four options.

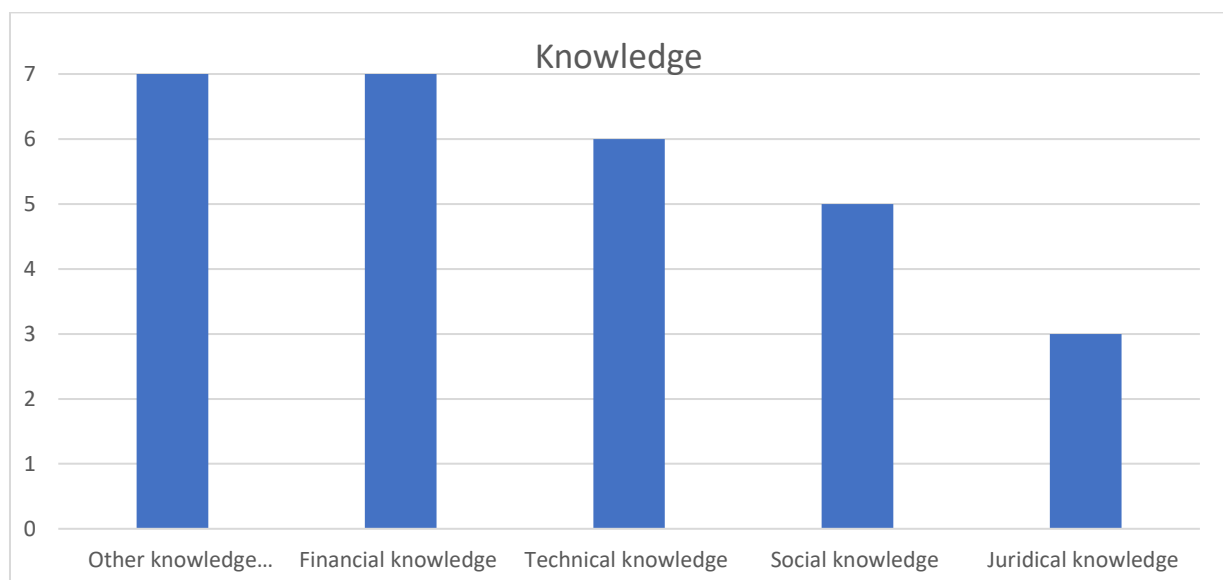


Figure 23: diagram of how the energy cooperatives investigated are distributed on the scale of knowledge.

All energy cooperatives have financial knowledge. And all energy cooperatives have knowledge in the category 'other knowledge'. In most cases this was knowledge regarding spatial planning, sustainability or organizational knowledge. Six energy cooperatives have technical knowledge. Five energy cooperatives state to have social knowledge. Three energy cooperatives have juridical knowledge.

One energy cooperative lacks technical knowledge (Marcel Paques, personal communication, June 26, 2023). Two energy cooperatives state that they miss social knowledge within their organization. Otto Hettinga explains how their energy cooperatives is rather technocratic and therefore misses the marketing and communication knowledge of how to reach people in the local community (Otto Hettinga, personal communication, June 21, 2023). While Energierijk Heerde recently gained a volunteer webmaster in their team, the communication and marketing side is still an underexposed subject in the energy cooperative (Gert de Vos, personal communication, 2023; Willie Fikken, personal communication, July 6, 2023). For these issues the younger generation is needed and it is

very hard to get the younger generation mobilized to join as volunteers (Gert de Vos, personal communication, 2023).

This is an issue that plays out in other energy cooperatives too. While five energy cooperatives state to have social knowledge, two of these five indicate that they would like more communication and marketing knowledge. Els Holsappel discusses that enhancing the communication part of the energy cooperative, especially in social media, would be beneficial (Els Holsappel, personal communication, June 16, 2023). Also Paul Stolte arguments that even though there is social knowledge in the energy cooperative, there is need for more power in this area, especially the digital part (Paul Stolte, personal communication, July 4, 2023). People that are able to build websites and social media and who can actively keep that running. The need for more digital communication is not only emphasized by the boards of energy cooperatives, but also by the members of energy cooperatives. In Zutphen a campaign was held on what members would like to receive from the energy cooperative. One of the issues that emerged was a different form of communication that is more concentrated on social media, like Instagram (Sanne van Hoogmoed, personal communication, June 12, 2023).

Paul Stolte states that knowledge in the field of communication is crucial for an energy cooperative. This is an important part in membership recruitment and social cohesion in the local community (Paul Stolte, personal communication, July 4, 2023). The reason is because communication is needed to share new projects and innovations. New projects result in making the news with proper communication and this leads to a continuous stream of new members (Paul Stolte, personal communication, July 4, 2023). National organizations like Energie Samen and Hier Opgeweekt can help with sharing knowledge. Communication specialists have compiled models specifically for energy cooperatives. Not only communication issues can be collected, but also other kinds of lacking knowledge needed for energy cooperatives can be retrieved. Tonnie Tekelenburg agrees with this: "If information cannot be retrieved in our own organization or from energy cooperatives in the region, it can be retrieved from the national organization Energie Samen" (Tonnie Tekelenburg, personal communication, June 13, 2023).

Four out of the seven energy cooperatives miss juridical knowledge. However, most of the energy cooperatives do not consider it as a barrier to lack juridical knowledge internally. The argument is that most of these legal issues are rather (project)specific, which results in the fact that help needs to be outsourced either way eventually, even if you have some juridical knowledge internally (Otto Hettinga, personal communication, June 21, 2023).

Some respondents emphasized that knowledge is not always the right term for what is needed. John Verheijden how experience or intuitions are important factors to possess (John Verheijden, personal communication, June 14, 2023). Energy cooperatives get into all kinds of circumstances and people that have learned to respond intuitively well during their years of working are valuable (John Verheijden, personal communication, June 14, 2023). And it is not only about the quality of knowledge, but also about the eagerness to learn and curiosity (Michael Boddeke, personal communication, June 21, 2023). Michael states that the knowledge a person starts with is less important than the knowledge to build upon: "I try to build the knowledge within the energy cooperative, so that you're much more independent. So if there's a new project, I think it's very important that we start building experience with my own people. Because if I hire someone for a year and then they leave, that accumulated knowledge is gone again. The approach is to try to gain as much as possible from within your own team" (Michael Boddeke, personal communication, June 21, 2023).

Another issue is that for knowledge quantity is now more of an issue as quality (Jan Emmerzaal, personal communication, June 13, 2023). Lots of energy cooperatives have the sufficient variety of

knowledge, but not the right quantity. It is more on the scope of work and not so much on the content. Where you used to need one project manager, you now need to have 3 project managers (Jan Emmerzaal, personal communication, June 13, 2023).

#### 4.5 Organizational barriers

The organizational dimension is measured by the social support from the local community, diversity of age in boards and diversity of professions in boards. **Social support** is measured by a percentage calculated by plotting the number of members against the number of households in the municipality.

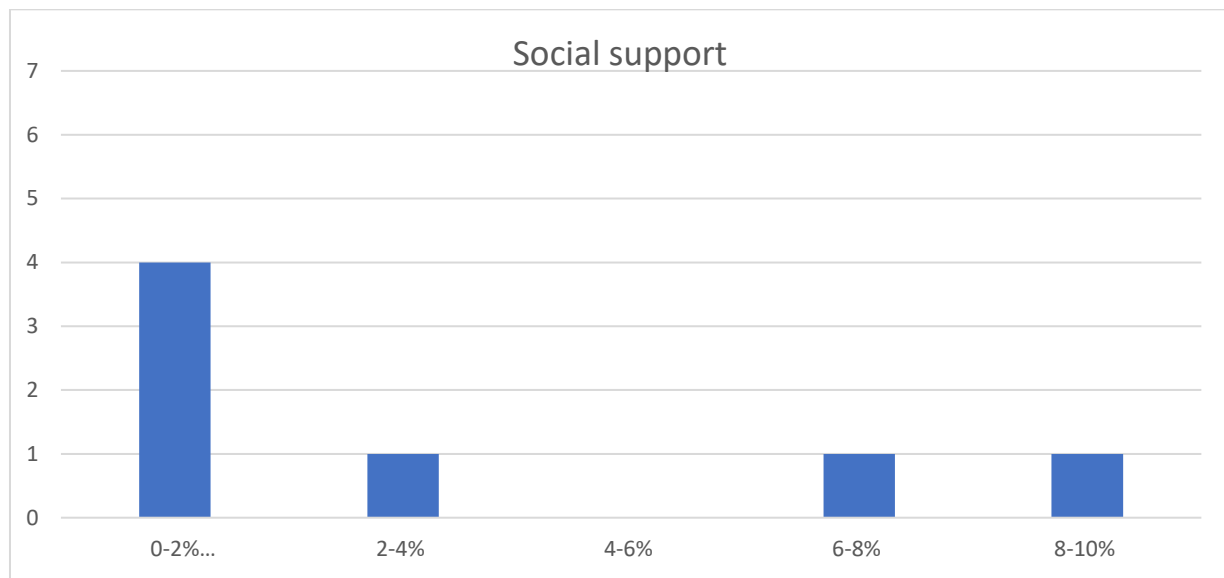


Figure 24: diagram of how the energy cooperatives investigated are distributed on the scale of social support.

Five out of seven energy cooperatives have a social support between 0 and 2,5% percent of all households in their municipality. One energy cooperative has a percentage of 7,1% and one of 8,7% of the households in the municipality that are affiliated with the energy cooperative. This means that a lot of energy cooperatives face a lack of embeddedness in the local community.

The lack of embeddedness is not only regarding the number of households involved, but also about the diversity of the households involved. Energy cooperatives only appeal to a certain group of people (Jan Emmerzaal, personal communication, June 13, 2023). Therefore energy cooperatives do not reach a right cross-section of the current society (Willie Fikken, personal communication, July 6, 2023). Energy cooperatives observe that members are frequently from higher backgrounds in society. This combined with the lack of diversity raises the question if energy cooperatives really represent the local community. Energy cooperatives experience this issue themselves: “Legitimacy and thinking that you speak for everyone, that’s something you slowly find out that that is not the case for all subjects” (Jan Emmerzaal, personal communication, June 13, 2023). If there is more focus on involving people with lower incomes and from different backgrounds in society this would create a more diverse pallet of members. This way energy cooperatives can land more widely in society (Erik Visser, personal communication, June 12, 2023).

Energy cooperatives consider it one of their biggest challenges to create more embeddedness in the local community (Erik Visser, personal communication, June 12, 2023; Els Holsappel, personal communication, June 16, 2023; John Verheijden, personal communication, June 14, 2023). Some energy cooperatives struggle with how to reach the wider local community. Paul Stolte suggests that it is important to have a concrete project when recruiting members. The impact of large information

sessions is not that great, it is better to organize small neighborhood or living room sessions with members inviting their neighbors. He explains his vision on how to recruit members: “I think that every cooperative has to grow through projects. If a project is not very innovative in itself, then make it exciting with other arguments. And for that, good communication is key. Whatever the project is about, energy cooperatives have more to offer than just generating and supplying renewable energy. It's also about social cohesion and learning from each other, for example in terms of savings” (Paul Stolte, personal communication, July 4, 2023).

John Verheijden agrees with the power of social cohesion. Energy cooperatives start with reaching the intrinsically motivated people in the local community (John Verheijden, personal communication, June 14, 2023). The challenge remains how to reach the other groups in society. He mentions the ABCD method: “This method originates from the social domain. This entails that if you want to reach people from the bottom of society, you should not start with your own agenda, but with their agenda. Ask yourself, what's on their minds?” (John Verheijden, personal communication, June 14, 2023).

The next indicators focus on the level of boards of energy cooperatives. **The diversity of age** in the board is identified by looking at the different ages of board members. This is done by categorizing the ages of board members in age cohorts of ten years, for example ages 20-29 representing one age cohort and ages 30-39 also representing one age cohort.

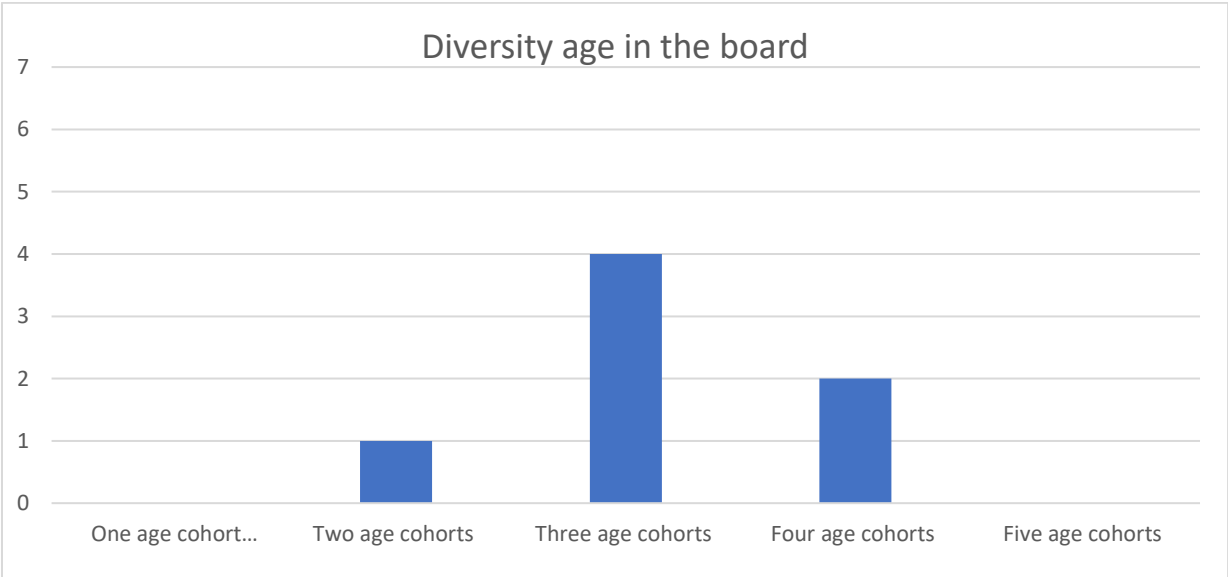


Figure 25: diagram of how the energy cooperatives investigated are distributed on the scale of diversity of age in the board.

Four energy cooperatives have age differences of three different ten-year age cohorts within their board. One energy cooperative has two different ten-year age cohorts and two energy cooperatives have four different age cohorts.

Next to data about the diversity of age cohorts, data about the ages themselves is important. While three different age cohorts sounds diverse, all energy cooperatives mostly exist of people above the age of 40 or 50. All energy cooperatives experience a serious shortage of young people involved in the organization. They have no idea how to attract younger people to participate, both as a volunteer and as a member.

Every single energy cooperative of the seven interviewed energy cooperatives declare that they lack young people in their energy cooperative. A selection of quotes from the interviews reflects the challenge: “older men and pensionados” (Els Holsappel, personal communication, June 16, 2023), “no youth” (Tonnie Tekelenburg, personal communication, June 13, 2023), “on average a lot of men and fairly old” (Otto Hettinga, personal communication, June 21, 2023), “too much pensionados and too many old people” (Gert de Vos, personal communication, 2023) and “people generally over sixty years old” (Erik Visser, personal communication, June 12, 2023).

Energy cooperatives are working on rejuvenation of the organization (Fun Hendriks, personal communication, June 9, 2023; Sanne van Hoogmoed, personal communication, June 12, 2023; Erik Visser, personal communication, June 12, 2023). That would also be a piece of professionalism, because normally in a team, there is some kind of balanced structure in terms of people and of their ideas (Erik Visser, personal communication, June 12, 2023). Energy cooperatives involve people who are generally 60 plus, who may be looking at the world a little differently than people of younger ages (Erik Visser, personal communication, June 12, 2023). This is not only acknowledged by representatives of energy cooperatives, but also by members of energy cooperatives. Zutphen Energie started a campaign about what members would want to see in their energy cooperative. One of the spearpoints was rejuvenation and more communication via social media such as Instagram (Sanne van Hoogmoed, personal communication, June 12, 2023).

Rejuvenation of energy cooperatives appears to be a challenge (Jan Emmerzaal, personal communication, June 13, 2023; Gert de Vos, personal communication, 2023). The challenge that the younger generation is very difficult to engage as volunteers is a common problem that spreads widely through society (Jan Emmerzaal, personal communication, June 13, 2023; Gert de Vos, personal communication, 2023). Some energy cooperatives that have recruited younger volunteers, face the fact that younger people do not want to commit structurally to for example board positions (Otto Hettinga, personal communication, June 21, 2023). The problem seems to be to that the generation from 25 to 40 years old is too busy to sustain themselves in current society (Gert de Vos, personal communication, 2023). It is a challenge to find people from this generation to volunteer for energy cooperatives.

The last indicator for the organizational dimension is also focused on the boards of energy cooperatives. This time the **diversity of professions** that are represented in the board is measured. There is looked at the backgrounds and occupations of the board members.



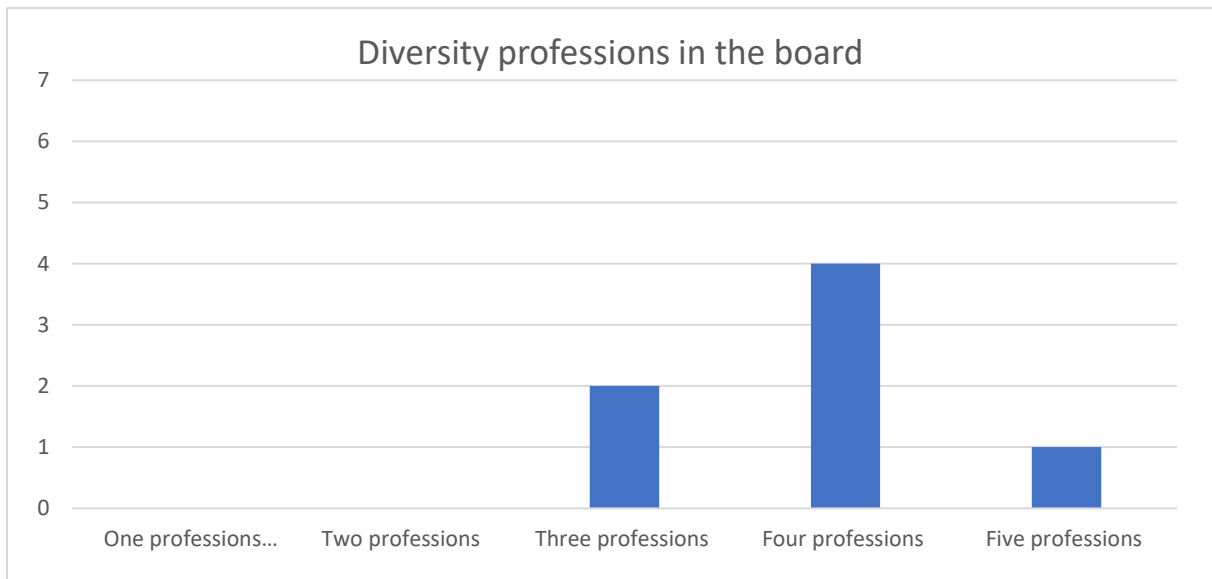


Figure 26: diagram of how the energy cooperatives investigated are distributed on the scale of diversity of professions in the board.

Two energy cooperatives have three different professions in their board. Most energy cooperatives have four different professions within their boards and one energy cooperative has five. The interviewed energy cooperatives state that they feel like the diversity in this area is sufficient. No energy cooperative has indicated that diversity in professions is experienced as a barrier.

However, some energy cooperatives discussed that a wider spectrum of diversity is more of a barrier. This entails age diversity as is discussed in the former paragraph, but also gender diversity (Marcel Paques, personal communication, June 26, 2023). Energy cooperatives are predominantly represented by (older) men and are therefore looking to create a more diverse pallet of representatives and volunteers. Creating diversity is less about their backgrounds or professions, but rather about age and gender diversity (Michael Boddeke, personal communication, June 21, 2023).

#### 4.6 Cultural barriers

The cultural dimension is firstly measured by the attitude of members on why they became a member and secondly on the way that members subsequently participate in the energy cooperative. The first indicator **pro-environmental attitude** is measured by three main categories; localism, investor attitude (financial incentive) and ecologism (environmental reasons). There is looked at what attitude is held by the majority of the members on why they joined the energy cooperative.

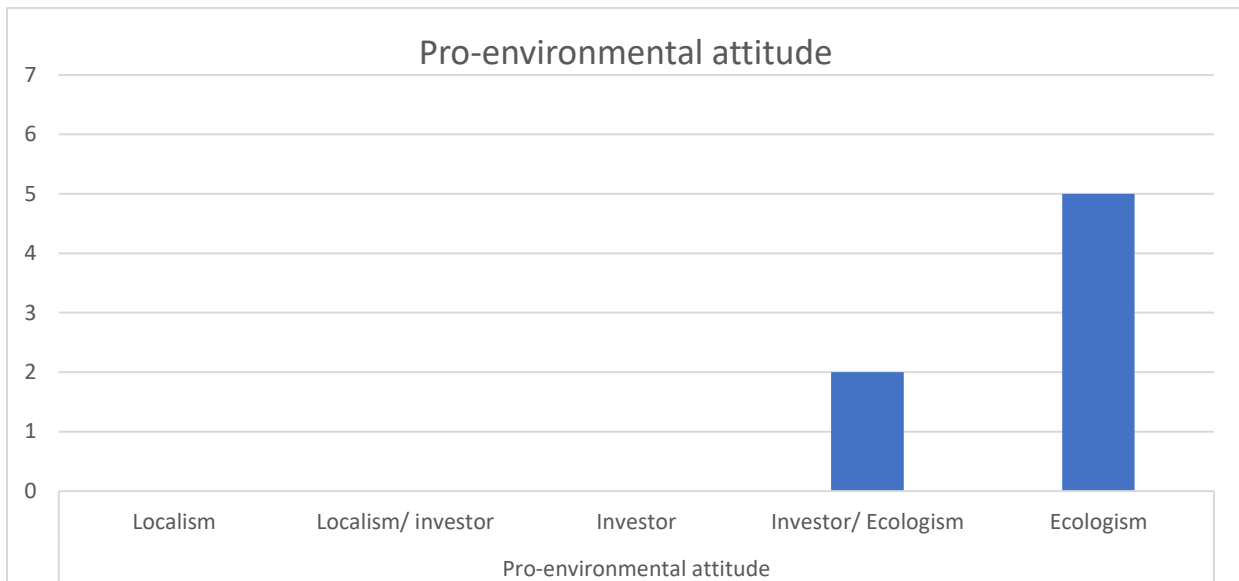


Figure 27: diagram of how the energy cooperatives investigated are distributed on the scale of pro-environmental attitude.

No energy cooperative has the majority of their members focused on localism. Two energy cooperatives see a mix of their members having an investor attitude and an ecological attitude. The ratio is estimated around 50/50, where members both join for financial reasons and for environmental reasons. Five energy cooperatives have a very clear majority of the members that is affiliated with the organization because of ecological reasons.

Energy cooperatives do see a trend that since the covid pandemic and energy crisis in the Netherlands, the amount of members that gets involved because of financial reasons (investor attitude) increases. Fun Hendriks declares how the first group of members joined for idealistic reasons and recently the majority of the new members joins the energy cooperative out of a financial incentive (Fun Hendriks, personal communication, June 9, 2023). Jan Emmerzaal acknowledges that the increase of energy prices has helped to gain more attention to this topic (Jan Emmerzaal, personal communication, June 13, 2023). In his opinion it not so much made people join the energy cooperative immediately but it made people engage with the topic in the first place.

The combination of a financial incentive and sustainability reaches larger groups of people. If energy cooperatives only apply for idealistic people it would stay a niche (Otto Hettinga, personal communication, June 21, 2023). Most people are not extremely idealistic, but have an interest to better the world, and in combination with financial return more people join the energy cooperative. However, too much focus on creating financial incentives can be a threat. Member benefits result in consumer behavior. And in the end, energy cooperatives are not companies, but cooperatives where it is about being part of a movement (Michael Boddeke, personal communication, June 21, 2023). There can be added that the energy cooperative is there to start a movement and improve social cohesion (John Verheijden, personal communication, June 14, 2023).

Next to the motivation on why members join the energy cooperative, there is looked at how members subsequently participate once they are members of the energy cooperative. This second indicator **willingness to act** is measured by three main categories. Social participation concern members that mostly attend events, financial participation where members hold financial shares and political participation where members exert influence by incorporating ideas.

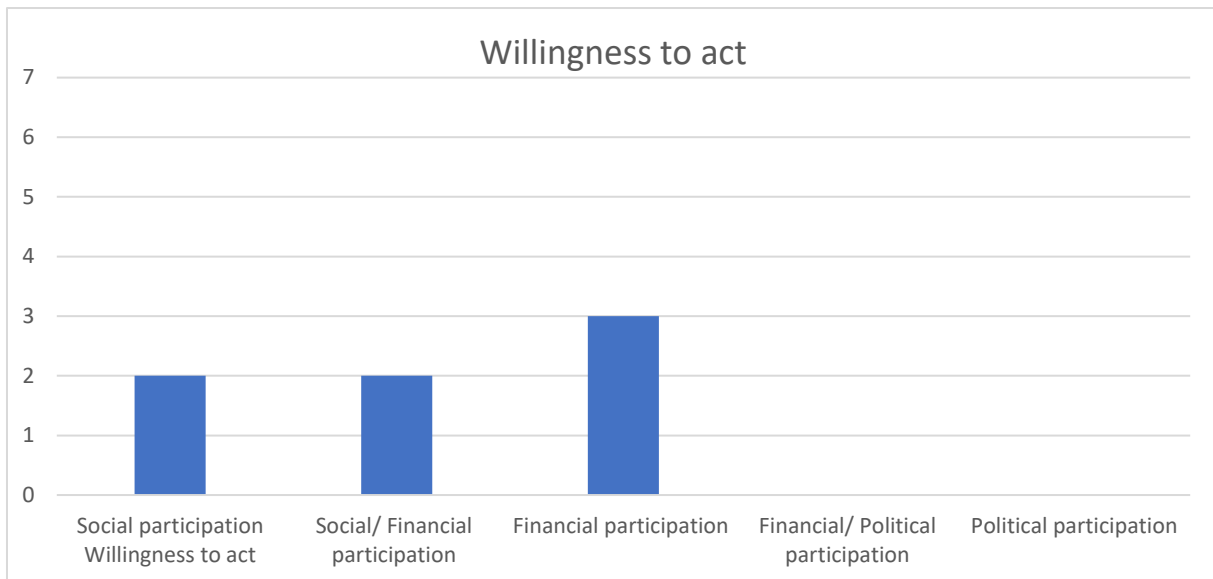


Figure 28: diagram of how the energy cooperatives investigated are distributed on the scale of willingness to act.

Two energy cooperatives see the majority of their members participating socially. This means most members attend meetings, but do not initiate voluntary projects. Two energy cooperatives see a mix of social and financial participation. Three energy cooperatives observe the majority of their members participating financially. No energy cooperative sees political participation as the biggest way their members participate. Political participation concerns members actively participating and coming with new ideas instead of being a spectator. The lack of political participation affirms the barrier experienced by the energy cooperatives that they want more active members (Fun Hendriks, personal communication, June 9, 2023; Els Holsappel, personal communication, June 16, 2023; Otto Hettinga, personal communication, June 21, 2023). Having a small number of active members is not so much a threat right now, but it definitely is a point of attention (Fun Hendriks, personal communication, June 9, 2023). Several energy cooperatives elaborate on having more active members: “It would be my dream for the energy cooperative to get a lot more volunteers that are working around the director in working groups of different topics like energy conservation or energy storage. To have working groups where people are actively working on projects and activities” (Els Holsappel, personal communication, June 16, 2023).

As highlighted in the former chapter, the last few years the focus has shifted from idealism to financial incentives. This results in more members participating financially and these members are less focused on being part of the movement. For these people being a member appears to be more of a condition in order to be able to participate financially (Otto Hettinga, personal communication, June 21, 2023).

Several possibilities to engage more active members are raised. The member campaign of Zutphen Energie to get insight in members’ expectations and contributions is an example of this. This creates the opportunity for members to indicate how they would want to participate and for the energy cooperative to see how the organization can give guidance to these ideas (Sanne van Hoogmoed, personal communication, June 12, 2023). Other energy cooperatives are considering a more active way of a meeting, in excursion-style to see what emerges out of that (Erik Visser, personal communication, June 12, 2023).

## 4.7 Economic barriers

The economic dimension is measured by the division of financial resources and the profitability of the energy cooperative. The indicator **division of financial resources** is measured by different forms of financial resources that can be used. For this indicator multiple categories can apply. The resources measured are: equity, member shares, commercial loans, subsidies and the category 'other financial resources' in case one of the resources used does not fit in the other categories.

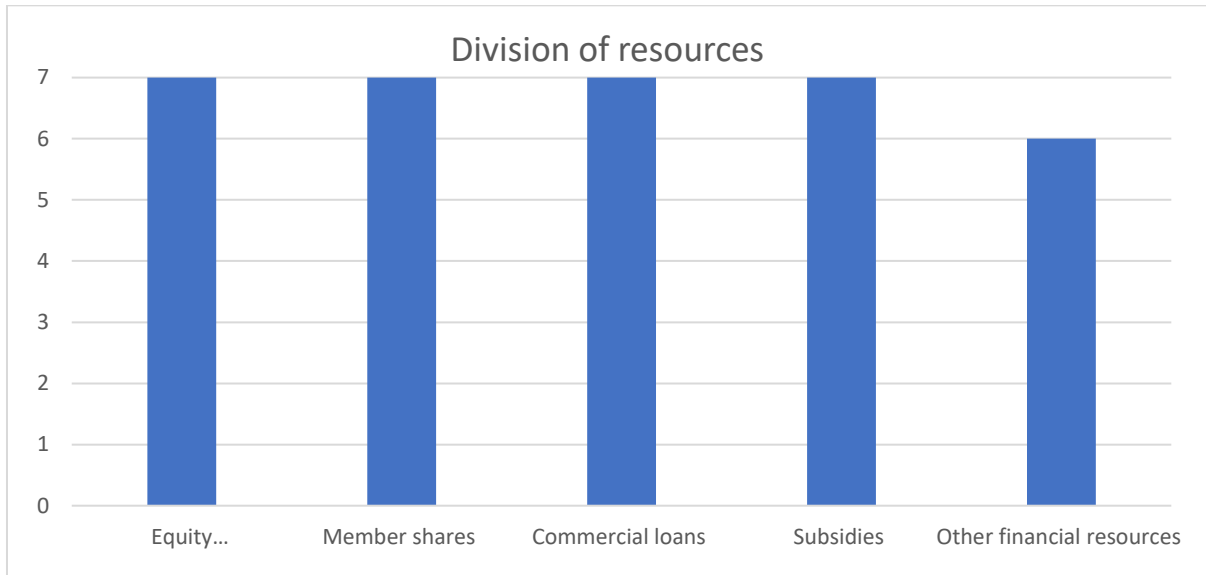


Figure 29: diagram of how the energy cooperatives investigated are distributed on the scale of division of resources.

All energy cooperatives use their own equity, member shares, commercial loans and subsidies as their financial resources. Only one energy cooperative uses next to these four resources another one. They are earning money by consulting other non-governmental organizations. Other energy cooperatives are doing consultancy jobs for their local government. This research considers operations for the municipality in the same category as subsidies. Therefore the business model of consulting non-governmental organizations is considered another form of financial resources.

The aim of this is to decrease the financial dependency of energy cooperatives (Fun Hendriks, personal communication, June 9, 2023). The branch of producing renewable energy is reliant on policy decisions and legal frameworks. Whereas the other branch of energy saving and such has more possibilities. For this branch energy cooperatives are very reliant and dependent on the paid operations they get, which makes them vulnerable. Therefore it can help to broaden the operations from not only municipal orders to operations from other organizations such as housing corporations, stakeholder organizations and other energy cooperatives. With multiple clients and creating a mix of products, energy cooperatives become more robust and less vulnerable fundamentally (Michael Boddeke, personal communication, June 21, 2023).

The other indicator for the economic dimension is the **profitability** of the energy cooperative. This is measured on a scale from negative profitability to positive profitability. This indicator is measured qualitatively, which means that an indication of the profitability is given by the answers that were given in the interviews.

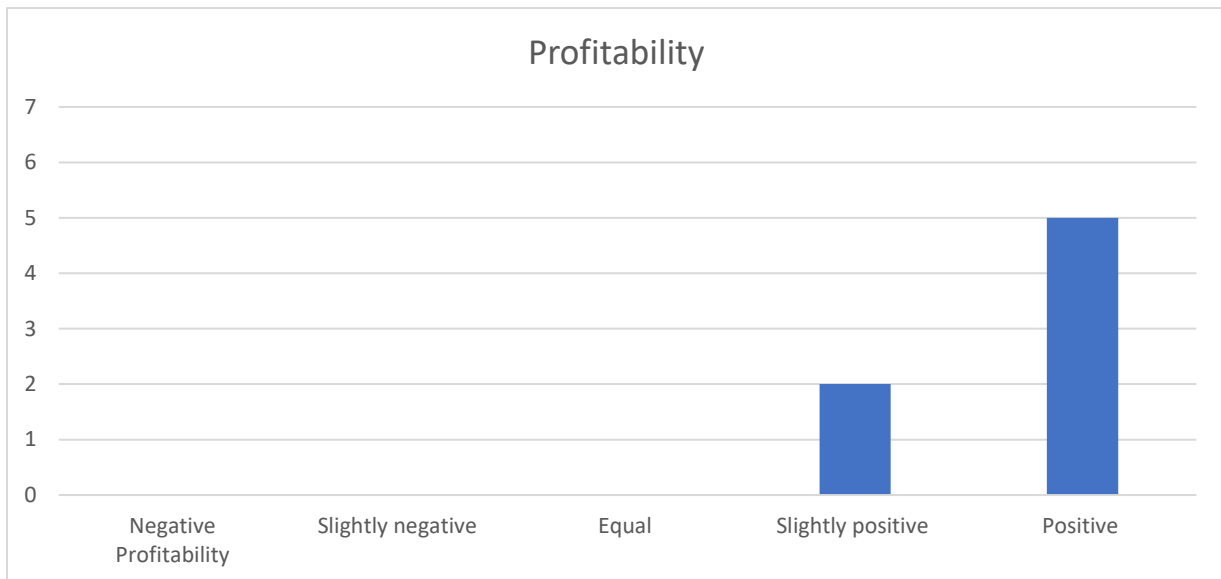


Figure 30: diagram of how the energy cooperatives investigated are distributed on the scale of profitability.

Two energy cooperatives state that they have a slightly positive profitability. Five energy cooperatives have obtained a positive profitability over the years. The energy crisis in the Netherlands has helped to provide more incomes than expected. Even the smaller energy cooperatives have ended their yearly profitability in positive numbers.

All energy cooperative strive for financial stability. This is played out differently for different kind of energy cooperatives. The (relatively) starting energy cooperatives investigated in this research continue to turn positive with help of subsidies, but if it were not for them, there would not have been a possibility for that (Willie Fikken, personal communication, July 6, 2023). In this phase the resources are limited, therefore help from municipalities is very important in this stage (Erik Visser, personal communication, June 12, 2023). A barrier experienced in Epe is the lack of guarantee from the municipality. Without this, especially for starting energy cooperatives, it is hard to make a proper business case (Erik Visser, personal communication, June 12, 2023). So the challenge for starting cooperatives is to become more financially stable by building up reserves, and to make that possible subsidies are needed at this point.

More mature energy cooperatives face other challenges in their journey to reach financial stability. They want to be financially independent from subsidies and make their own money in order to manage on their own. While the financial situation has become more stable over the years, some part of the incomes are dependent on governmental operations. Energy cooperatives mostly rely on two different branches; generating renewable energy and energy saving. For the energy saving branch applies that if the municipality would pull the plug on all these activities, that would cause financial problems for the energy cooperatives (Fun Hendriks, personal communication, June 9, 2023). While the branch of generating renewable energy is dependent on policy decisions and legislation, this branch results in big financial cash flows. And with that piece, energy cooperatives are able to stand on their own two feet. At first investing is big, but it pays off at some point. And with these incomes, more stability can be provided to that other branch (Michael Boddeke, personal communication, June 21, 2023). Also in Zutphen generating renewable energy is important: "That is the reason why we decided 7 years ago that we are going to focus very much on our customers. Because it should be possible to make a great deal of income by selling energy ourselves and generating ourselves. This is allowing us to continue to operate independently" (John Verheijden,

personal communication, June 14, 2023) For more mature energy cooperatives the trick is to be able to be financially stable by standing on their own two feet without subsidies.

To create stability several options are explored. In Zutphen financial stability is strengthened by a structural partnership with the municipality: “A second source that is enhancing our financial situation is that we finally managed to make a lasting commitment, a partnership with the municipality, where they are going to pay us a sum of money every year. And why do they want that? Because we mean a huge power and the municipality has trouble getting workforce so we are actually becoming some kind of operating company of the municipality” (John Verheijden, personal communication, June 14, 2023). In Brummen the power of entrepreneurship is embraced. Lots of energy cooperatives experience cold feet of getting into renewable energy projects (Els Holsappel, personal communication, June 16, 2023). Energy cooperatives might have the feeling that they have to ask for money from the members very quickly and that that is very risky. But the advice is to start with these kind of projects now and later see if you want to take risk earlier. At that point incomes are already earned, that way you can also invest in a project earlier yourself, which may reduce the need for external aids and loans (Els Holsappel, personal communication, June 16, 2023). The former paragraph elaborated on the manner by which financial stability is strengthened by DeA in Apeldoorn. Broadening operations from not only municipal to also a larger variety of organizations can make energy cooperatives less vulnerable. Because with a mix of products and clients, energy cooperatives become more robust (Michael Boddeke, personal communication, June 21, 2023). While there are different options to become more financially stable are explored, all energy cooperatives indicate that no matter what phase the energy cooperative finds itself in, it remains a challenge to strive for financial stability. If subsidies are withdrawn energy cooperatives could get into trouble financially. But also the more mature ones explain how they are still vulnerable: “Our biggest bottleneck is that the municipality would dissolve the contract. Because for our development, the space that the municipality gives us now is essential.” (John Verheijden, personal communication, June 14, 2023). Next to this branch, the branch of production of renewable energy has its own perks, with the dependency of policy decisions and legislation that is outside the hands of energy cooperatives.

#### 4.8 Market barriers

The last dimension is measured by only one indicator: the **decision-making process** between the energy cooperative and the market parties. This is measured by the ladder of citizen participation that starts with energy cooperatives having little power over the market parties in decision-making processes and building up to energy cooperatives operating independently. Starting with citizens only being informed of plans, to citizens being used for consultation by providing them with different options. The ladder moves to energy cooperatives and market parties deciding together and later acting together to the last step of an energy cooperative being independent.

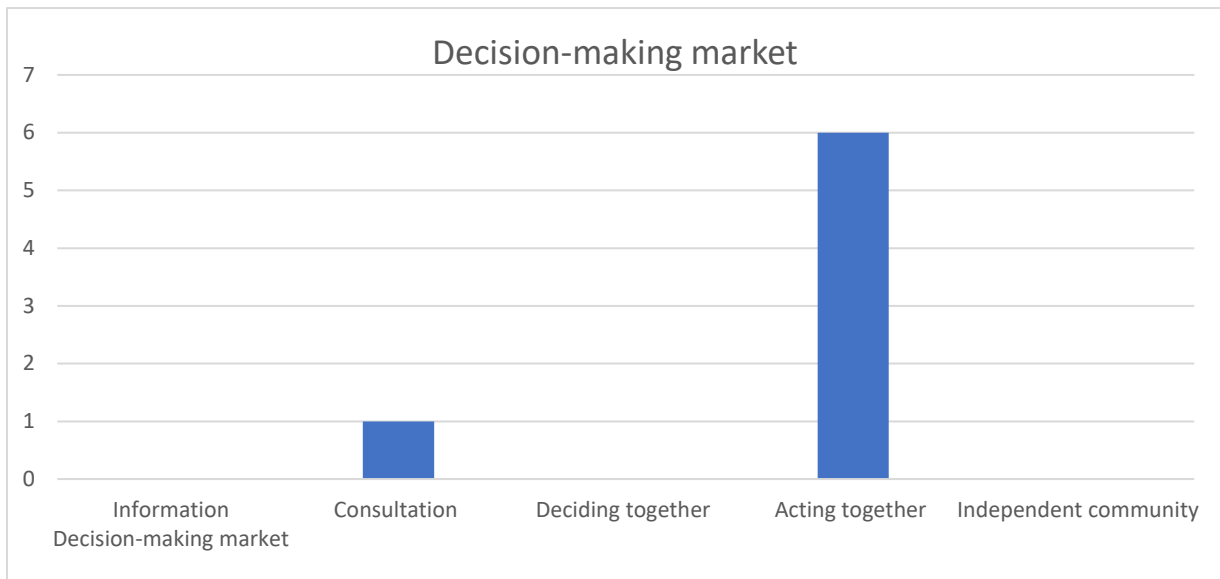


Figure 31: diagram of how the energy cooperatives investigated are distributed on the scale of decision-making process market actors.

One energy cooperative experiences that the market actors tend to take a stance that energy cooperatives are merely involved for consultation. The other six energy cooperatives experience the decision-making process with market actors as both actors are acting together. However, this is very reliant on the market actor.

The energy cooperative that experiences that market actors use energy cooperatives for consultation, but not for acting together describes their relationship the following: “Developers in large solar fields actually try to take advantage of the fact that cooperatives are often much smaller parties, consist of volunteers with mostly inexperienced people and still have to learn in the field” (Marcel Paques, personal communication, June 26, 2023). While this is the attitude experienced by the energy cooperative, they feel like they are able to deal with such parties because they have volunteers that have relatable backgrounds and knowledge. Also because energy cooperatives with more experience have helped with how to deal with such situations (Marcel Paques, personal communication, June 26, 2023).

Other energy cooperatives also recognize this attitude from certain market parties. While they recognize dominating market parties, they state that the majority of the time they are acting together with market actors. They indicate that the relationship between the energy cooperative and market party is experienced positively. Some describe that their partnership is based on equality because the ownership is 50% for the developer and 50% for the energy cooperative. Some collaborations start because the energy cooperative mediated between the municipality, developer and residents in order to ensure that all parties could come together (Otto Hettinga, personal communication, June 21, 2023). However, this is not a uniform observation, because energy cooperatives experience very different attitudes from different market actors. Some can be very much focused on acting together, while others have a rather regulating attitude because they hardly take into account what energy cooperatives want.

Four out of the six energy cooperatives that perceive their relation with market actors as ‘acting together’, indicate that the relationship differs very much between different developers. These differences appear to be dependent on the project but also on the developer (Fun Hendriks, personal communication, June 9, 2023; Sanne van Hoogmoed, personal communication, June 12, 2023).

Michael Boddeke notices that the attitude of developers towards energy cooperatives has changed over the years (Michael Boddeke, personal communication, June 21, 2023). Recently there is obviously a lot of resistance noticed from residents, hence the developer knows they need energy cooperatives to deal with this. In Heerde Willie Fikken illustrates these differences: “One developer is very open to input. That one lets us think along and takes us to discussions. This is a developer who likes to work together and lets us participate from the beginning. The other developer is much more setting the course on its own. They will prepare the project and the energy cooperative can get in once the permit is in place. That's a very different way of thinking and working” (Willie Fikken, personal communication, July 6, 2023). Collaboration with market parties also very much depends on the position of the municipality. If the municipality sets strict frameworks that developers have to cooperate with energy cooperatives, the collaboration runs more smoothly. If this is not the case things will be very different (Sanne van Hoogmoed, personal communication, June 12, 2023).

But in any case, it is also a matter of negotiating and getting used to each other. It does not only depend on the attitude of the market actor and the municipality, but also of the attitude of the energy cooperative itself (Gert de Vos, personal communication, 2023). Some energy cooperatives are very selective about who they get involved with. Otto Hettinga explains that during the orientation of which market party to join forces with, the ideas have to fit the DNA of your own energy cooperative (Otto Hettinga, personal communication, June 21, 2023). One energy cooperative uses the system of a list of predetermined criteria a market party has to comply to. If that is not the case, they will not get involved with the market party: “We have 5 or 7 conditions that we always tackle when we are approached or when we approach a developer that we take with us. This is a framework of criteria that we always start with that is not idealistic, it is a little bit tight and corporate, but it is a means of survival” (Jan Emmerzaal, personal communication, June 13, 2023). This approach also has a downside. You can run the risk of not getting enough projects this way. Relationships with market parties do not solely depend on practical criteria, but also on personal relationships (Joep Koene, personal communication, June 21, 2023).

Another option to not get dominated by market parties is to not get involved too quickly. Especially with solar energy there are quite a few cowboys in the market, who can put forward proposals that are never going to work (Els Holsappel, personal communication, June 16, 2023). One of the options to make sure an energy cooperative will not get swallowed up by such a large-scale developer is to make a construction to make separate companies that is not covered by the cooperative. In that case, if it collapses the developer cannot swallow the cooperative (John Verheijden, personal communication, June 14, 2023).



## 5. Discussion

In this chapter the data is interpreted. This chapter focuses on comparing cases and variables, interpreting data as a researcher and discussing outcomes.

The chapter is organized as follows. First I will discuss similarities and differences between the cases for each dimension. After that, I interpret the results for which I aim to identify recurring patterns and remarkable outcomes. Next to that, two findings have come up during the research which had not emerged from the literature, these two issues are also highlighted and substantiated.

### 5.1 Comparison of the cases

The former chapter offered empirical insights into the dimensions used to analyze how energy cooperatives work. In the table below, I will compare the cases through each dimension and transversally reflect on similarities and differences across the cases. After this, the most remarkable outcomes are interpreted.

*Table 10: overview of similarities and differences per dimension.*

<b>Dimension</b>	<b>Similarities</b>	<b>Differences</b>
Political	<p>The majority of energy cooperatives indicate their municipality is responsive to sustainability goals. This is considered a barrier because of the conservative attitude and lack of capacity.</p> <p>Whether project support is provided by the municipality or not is not considered as a barrier.</p>	<p>Subsidies are fragmented, some receive subsidies and some do not.</p> <p>Project support also differs between the energy cooperatives.</p>
Legal	No similarities under legal point of view.	<p>Rules and regulations of the municipality are fragmented four different categories between the interviewed energy cooperatives. Three of the four categories have their own barriers that are experienced. Network steering attitude of the municipality in rules and regulations do not come with any barriers for this aspect.</p>
Personal	All energy cooperatives tend to have a rather transactional type of leadership.	<p>Expertise can differ between energy cooperatives, the biggest differences appear for large-scale renewable energy projects like solar parks and wind projects.</p> <p>Knowledge differs between energy cooperatives, especially social knowledge and juridical knowledge.</p>
Organizational	<p>The interviewed energy cooperatives have around three different 10-year age cohorts within their boards.</p> <p>All energy cooperatives struggle to involve younger people.</p>	<p>Most energy cooperatives have a reach of somewhere between 0 and 2,5% of the households in their municipality. Two energy cooperatives have a considerably larger reach of 7,1% and 8,7%.</p>

	The majority of energy cooperatives have roughly four different professions within their boards.	
Cultural	The members of the interviewed energy cooperatives tend to have an ecological attitude. Some energy cooperatives have a mix of 50/50 attitude of ecologism and financial reasons.  Most energy cooperatives miss active members.	Some energy cooperatives have the majority of their members participating socially. Some energy cooperatives state the majority of their members participates financially.
Economic	All energy cooperatives use roughly the same financial resources; equity, member shares, commercial loans and subsidies.  All energy cooperatives have a positive profitability, some more convincing than others.	Only energy cooperative DeA uses an additional form of resource. They receive income from consultancy work they do for different organizations and companies.
Market	A similarity is that most of the energy cooperatives recognize a variation in the decision-making process between different market parties. Some developers take on a dominant role, while others are more collaborating equally.	One energy cooperative feels that most of the time the market parties take the stance of only involving energy cooperatives for consultation. The other energy cooperatives experience that the majority of the market parties want to act together with the energy cooperative.

## 5.2 Interpreting the results

Given the overview of similarities and differences across the cases, this paragraph discusses six points which I think are important to reflect upon. The first three points follow from the analysis of the different cases and dimensions. These were points that stood out the most during the analysis by being recognized as recurring patterns or interesting insights. For these points the majority of energy cooperatives showed the same patterns, some points even concerned all energy cooperatives interviewed. This made it interesting to dive deeper into these issues.

Next to these three aspects that are pointed out from the analysis, this research has led to two findings that did not come up in the literature study. These issues have therefore not been included in the dimensions and the analysis. Interestingly, they did emerge from the interviews. These two points are discussed after the four aspects that resulted from the analysis have been elaborated upon.

### 5.2.1 Vicious cycle of lack of embeddedness and rejuvenation

All seven energy cooperatives consider rejuvenation a major barrier. But also the barrier of lack of embeddedness is experienced by the majority of energy cooperatives interviewed. No rejuvenation and lack of embeddedness in the society can be a vicious circle. Mostly older people are involved in the energy cooperative and they do not appeal to the entire local community. And because not the entire local community is addressed, no young people get involved with the energy cooperative. And this brings us to the beginning of the cycle where no diverse community is addressed by the energy cooperative by the homogeneous group of members within the energy cooperatives.

One of the reasons might be the lack of knowledge in the field of (digital) communication and marketing. Without communication you are not able to reach further than your own bubble.

Therefore it is harder to attract younger people or people with lower income. Energy cooperatives indicate that there is especially a lack of knowledge in the digital part of communication. This is exactly the part that plays an important role in how to attract younger people. A solution could be more focus on this aspect. Most energy cooperatives have a focus on financial and technical knowledge, but enlarging knowledge in the digital communication side seems fruitful. This could also be achieved by collaboration. If the region would work together to make a campaign, it is more affordable and more people can be reached.

### 5.2.2 Division of tasks

Energy cooperatives indicate several political and legal barriers. Especially the municipal framework can cause barriers. A network steering attitude of the municipality to make policy frameworks does not come with any barriers experienced by the energy cooperatives. Also with market actors barriers are experienced by, in some cases, lack of collaboration. One of the points mentioned is discussing at the front how things are going to be executed (Evert Obdeijn, personal communication, May 25, 2023). For the interaction between municipality, market and energy cooperatives it could be beneficial to involve each other earlier in the process. This was also pointed out by the expert interviews.

It could be beneficial for the municipality, market and energy cooperatives to involve each other earlier and make a division of tasks to make clear what every different actor can add to the process (Sander Veltmaat, personal communication, July 4, 2023; Wouter Kamp, personal communication, June 26, 2023). The municipality can take on the role of the leading and facilitating party to stimulate collaboration. They are setting the frameworks and making the decisions. Doing this they should be inviting to give all parties the space needed, but at the same time be realistic. Market parties are beneficial because of their knowledge, expertise and their risk capital (Sander Veltmaat, personal communication, July 4, 2023). Energy cooperatives are involved in the participation process. They are the ones to understand the local community and to express their ambitions because they are the well-known face in the community, of which a market party is less capable. This part about creating social acceptance is the asset of an energy cooperative and it would be appropriate to quantify that value in money (Wouter Kamp, personal communication, June 26, 2023). This is something that can be discussed up front with market parties. Energy cooperatives do not have a lot financial capital to invest, however they can invest in working hours. Agreements can be made that if the energy cooperative creates social acceptance, they can later receive a share in the project (Sander Veltmaat, personal communication, July 4, 2023). This way energy cooperatives can get financial value for the effort they give in.

While the most logical choice would be that the municipality takes the lead in the division of the different tasks, it can be applied for any other stakeholder that initiates plans. Whoever initiates a new project, either the municipality, market actors or energy cooperatives, should involve all other of these actors in their plans. This does not necessarily mean that a collaboration has to take place immediately, but it creates more transparency which results in working more efficiently. Also being more transparent creates a more equal level playing field. There should be less focus on the rules and regulations in the energy transition, but attention should be paid to how we are organized socially (Wouter Kamp, personal communication, June 26, 2023).

### 5.2.3 Risk market parties

The perception of energy cooperatives towards developers can be that they feel that market parties want to take advantage of energy cooperatives. However, during the expert interviews, the perception of market parties towards energy cooperatives was discussed too. Market parties

experience that a lot of the time energy cooperatives are not professional enough yet. This is noticed by the fact that they sometimes cannot assess the trade-off of the risk being taken (Wouter Kamp, personal communication, June 26, 2023). They feel that energy cooperatives should realize that risks have to be taken in renewable energy projects. Energy cooperatives are not taking the risk, but should realize that market parties are (Sander Veltmaat, personal communication, July 4, 2023). After these three points of reflection, we now move on to two findings that have come up during the research, but were not discussed in the literature.

#### 5.2.4 Paid workers

The first finding that was not found in the literature is the barrier of the importance of paid workers that was raised by the respondents during the interviews. Most energy cooperatives address the challenge with hiring paid workers. Energy cooperatives start as a voluntary organization, but as they start growing there comes a point where the voluntary basis evolves into an organization with paid workers. A hundred percent volunteering is not enough to get the goals done (Evert Obdeijn, personal communication, May 25, 2023). The transition of hiring paid staff is seen as a step to professionalization. The larger the size of projects, the more the necessity to handle professionally which cannot be done with just volunteers. The larger the size of the project can also give opportunity to hire paid workers because of the incomes gained (Joep Koene, personal communication, June 21, 2023).

Some of the starting cooperatives are struggling if they should take the risk of hiring their first paid employees. For those first steps in this transition, it can be quite a complicated discussion because a cooperative now consists of volunteers. Questions arise like who will get paid and who will not, but also questions about reasonable rates. The energy cooperatives that already have paid workers are struggling that they actually need more paid workers to extent and maintain the professionalism and growth. It becomes more an issue on quantity instead of quality.

Paid workers are needed for several reasons. First, knowledge and professionalism have to be built up over time. Paid workers help to keep the gained knowledge within the organization which can be used to grow further. Second, it helps to sit alongside commercial parties as a fully-fledged partner which allows energy cooperative to have an equal position to market parties (Evert Obdeijn, personal communication, May 25, 2023). Third, working with serious parties on serious projects there is a need to stay away from non-commitment. If you appeal people to be operational during regular working days or deliver documents late at night, you can't do that with only volunteers but they need to get paid.

Paid workers help with risk aversion, which can help to create a level playing ground. Because this requires energy cooperatives to act more like a market party: "It means energy cooperatives will do their risk analysis on the front end of projects, because you want to deploy your people effectively. That means you don't assign them to projects that have less chance of success. This way you are more equal with the market party. You have to have more of a level playing field where you participate in a project together" (Wouter Kamp, personal communication, June 26, 2023).

Regional collaboration can help with the challenge of hiring paid staff. Cooperatives can learn from each other how they approached this issue. To enable more efficient use of paid staff, regional cooperation can help. Most of the bigger cooperatives have paid workers, but not always enough funding to actually keep those paid workers working. And the smaller energy cooperatives generally don't have those forces, but occasionally have the resources. So if those energy cooperatives put that together, a back office or a project organization can be set up that everyone can benefit from. This

type of construction brings us to the importance of regional collaboration between energy cooperatives.

#### 5.2.5 Regional collaboration

The second issue that was pointed out during the interviews, but did not emerge from the literature, is the importance of regional collaboration. The majority of the energy cooperatives discuss that regional collaboration is crucial for energy cooperatives to grow. During several interviews this issue was raised by the respondents to be of great importance, while it did not emerge evidently from the literature. In the literature the importance of energy cooperatives' relationship with the local government and with the market parties was emphasized, but not the relationship with other energy cooperatives.

The smaller energy cooperatives can learn from more experienced cooperatives. Joining forces with other energy cooperatives in the region is considered as a precondition to grow and professionalize. The bigger energy cooperatives can take the lead in accelerating the energy transition in the region, which is the purpose of energy cooperatives in the end. Next to this, bigger cooperatives can take a financial benefit by outsourcing their expertise and people to other energy cooperatives.

One of the ways how the collaboration can be used is to exchange knowledge. Energy cooperatives can learn from each other by sharing experiences of how to professionalize. The experiences of other energy cooperatives can help to gain knowledge on how to deal with market parties. Next to this, collaboration can also be used to exchange paid workers as mentioned in the former paragraph. The construction of establishing a regional umbrella, where energy cooperatives can exchange people could be an efficient concept (Wouter Kamp, personal communication, June 26, 2023). A pool of individual self-employed people could be established, who can charge for technology and finance. This construction is in operation to some extent. However, respondents indicate that it is desired to expand and enhance this collaboration more.

An important aspect to establish this collaboration in the region is to continue to maintain a local character towards the members of each energy cooperative. The back office systems can be handled and developed collectively not visible for local members. While they still make the appearance of a local organization to the outside world, the back offices are more efficiently organized.

## 6. Conclusions

The aim of this research is to answer the main research question: *“What are the barriers encountered by energy cooperatives and how can these be overcome?”*

Seven energy cooperatives in the Cleantech region in the Netherlands are interviewed. For every energy cooperative each dimension is measured in order to create a wheel diagram. After this the differences between all energy cooperatives are analyzed. This way the barriers experienced by the energy cooperatives are explored. In order to answer the main question, several sub-questions are formulated. The questions are the following:

*How can energy cooperatives be defined and what are their characteristics?*

This research defines energy cooperatives as: “decentralized, non-governmental initiatives of local communities and citizens to promote the production and consumption of renewable energy” (Oteman et al., 2014, p. 2). Next to this, reduction of energy consumption is also one of the main focus points of energy cooperatives. Characteristics of energy cooperatives are the fact that they are led by highly motivated people, but have relatively small resources. They are democratically owned by their members who are able to participate financially. Central to energy cooperatives is that they are based on a non-profit model and any profits go back to the community. This way energy cooperatives engage with citizens in their local community.

*What are the political barriers encountered by energy cooperatives?*

Local governments are predominantly perceived as responsive to prioritizing sustainability by energy cooperatives. This observation leads to two barriers experienced by energy cooperatives. The first barrier is that municipalities that do not prioritize sustainability goals are rather conservative. This does not give enough room for energy cooperatives to achieve what they intend to achieve. Because municipalities want to keep everyone satisfied and are fearful of the consequences, this leads to them not making clear decisions. The second barrier is the lack of capacity within municipalities, which has less to do with the ambition of municipalities but with their lack of forcefulness. The lack of capacity applies for both the number of staff as the internal knowledge. These two barriers can lead to the stagnation of the plans of energy cooperatives.

*What are the legal barriers encountered by energy cooperatives?*

The legal barriers experienced by energy cooperatives have to do with the policy frameworks of the municipality. This differs per municipality; legal frameworks can either be too open or too regulated. Too open frameworks leave everything open for market-forces, this way other actors are perceived equally as energy cooperatives. This makes it hard for energy cooperatives to be forceful. Too regulated frameworks do not leave enough room for the growth and development of energy cooperatives. Because energy cooperatives are not provided with a permanent role in the legal framework, this results in them being obstructed to operate in the small frameworks. A lacking framework can logically cause barriers to initiate and proceed new plans. In all the instances just mentioned, the biggest bottleneck experienced by the energy cooperative is them being one of the parties participating, but not being the only partner of the municipality.

*What are the personal barriers encountered by energy cooperatives?*

The majority of the energy cooperative tend to have a more transactional type of leadership. A barrier can be experienced on trying to find balance between transformational and transactional leadership. While the business-like type of leadership is needed in the development and

professionalization of energy cooperatives, the idealistic part should not be overlooked. Some energy cooperatives have more knowledge within the organization than others. Mostly the missing knowledge can be retrieved from other energy cooperatives in the region or national organizations like Energie Samen. However, missing communication and marketing knowledge is considered a barrier for the majority of the energy cooperatives interviewed.

*What are the organizational barriers encountered by energy cooperatives?*

Energy cooperatives experience an organizational barrier by the lack of embeddedness in the local community. This regards not only the number of members, but also the diversity of members. Most members are older men that are predominantly from higher parts of society. This lack of diversity brings us to the second organizational barrier experienced, which is the challenge to rejuvenate. All seven energy cooperatives struggle to reach younger people and involve them in the organization. There is a challenge to find people from 25 to 40 years old to volunteer. It seems to be a vicious cycle that these two barriers are intertwined. The older people involved with energy cooperatives do not appeal to the entire cross-section of society. Since there are no younger people reached, energy cooperatives do not rejuvenate. And back to the beginning, the homogenous group of people in the energy cooperatives do not reach a diverse group of people in the community.

*What are the cultural barriers encountered by energy cooperatives?*

A cultural barrier that is experienced is the lack of active members. Energy cooperatives would like to have more active members that participate politically. Right now, the majority of members participates financially, or socially by for example attending meetings from time to time. But energy cooperatives indicate to lack a large number of members that participate more actively.

*What are the economic barriers encountered by energy cooperatives?*

The economic barrier experienced mainly concerns creating financial stability. Energy cooperatives in earlier stages face this barrier by the fact that they want to be financially able to develop projects. For this they need financial support from the municipality and other subsidy schemes. More mature energy cooperatives also experience a challenge to become financially independent. For them the challenge lies in the fact that they want to be financially stable without having to rely on other aids such as subsidies. So, no matter the phase of the energy cooperative, striving for financial stability remains a challenge.

*What are the barriers encountered in the relationships with the market by energy cooperatives?*

The barrier that is experienced with market actors is that the attitude of market actors very much depends on the developer and the project. While the majority of energy cooperatives indicate that there is a collaboration between the energy cooperative and the market actors, in some cases energy cooperatives can feel like developers take advantage of them. Most of the times energy cooperatives know how to deal with this, but it remains a barrier to experience this attitude from market actors.

***What are the barriers encountered by energy cooperatives and how can these be overcome?***

The political barriers encountered by energy cooperatives are conservative municipalities and lack of capacity within municipalities. Legal barriers are experienced with too open, too regulated or lacking policy frameworks of municipalities. To overcome the legal barriers municipalities can take on a network steering attitude, because this legal framework has not resulted in any barriers experienced

by the energy cooperatives. To accomplish this, municipalities, market actors and energy cooperatives can try to involve each other earlier in the process and make task divisions in the beginning.

Personal barriers are struggling to find balance between transformational and transactional type of leadership and missing communication and marketing knowledge. An option to overcome this is to work together on marketing campaigns with region collaboration, because this makes it more affordable and more people can be reached. Organizational barriers encountered are the lack of embeddedness in the local community and the challenge for energy cooperatives to rejuvenate. For overcoming these barriers it can be important to strengthen the (especially digital) communication part of the energy cooperative, this can be done by the regional campaigns as mentioned above. To reach larger parts of society energy cooperatives can try to do marketing with a concrete project to enthuse people, but also use the ABCD-method by starting with the agenda of the people you want to reach instead of only pushing through your own agenda. As for the cultural barrier is that energy cooperatives want more active members.

The economic barrier experienced by energy cooperatives is the challenge to strive for financial stability. Energy cooperatives mostly rely on two branches; producing renewable energy and energy saving. For the branch of renewable energy it is important to enter these projects and take risks, because this results in big financial cash flows. In the other branch of energy saving it can be an option to consult non-governmental organizations to decrease financial dependency. By creating a mix of products energy cooperatives become more robust. Next to this, structural partnerships with the municipality can be made to provide more stability. As for the market barriers, in some cases energy cooperatives feel like market parties want to take advantage of them. One of the options addressed to overcome this barrier is to make a list of criteria that a market party has to comply to according to the energy cooperative.

Next to these barriers experienced from the dimensions based on the literature, energy cooperatives state to have a challenge of hiring paid workers. In order to professionalize, paid workers are needed. The struggle appears to be when it is the right time to hire people and how to handle such changes. To enable more efficient use of paid staff, regional collaboration can help. Larger cooperatives have paid workers, but not always enough work to keep those paid workers working. And starting cooperatives do not have those workforces, but occasionally have the resources. This brings us to importance of regional collaboration between energy cooperatives. Regional collaboration can also be used to exchange knowledge, such as for overcoming the aforementioned barrier of lack of (digital) communication and marketing knowledge. But it could also apply for exchanging knowledge in other areas. As mentioned before, the regional collaboration can also be used to efficiently use paid workers. This can lead to more professionalization to be able to engage in more projects which results in more financial stability.



## 7. Recommendation

### 7.1 Reflection

One of the limitations of this research is that it is a broad-research, which makes it harder to dive deeper into certain topics. The aim of this research is to give a broad picture of how energy cooperatives operate. To achieve this, several similarities and differences between energy cooperatives in the Cleantech region in the Netherlands are discussed and barriers are indicated. This is done for seven different dimensions, which makes it an exhaustive set of results. Because of this extensive set of data, the research is not sufficient enough to dive deeper into specific points that are addressed in the conclusion. This can be seen as a limitation of the research, because some of the conclusions would be interesting points to investigate further.

The second point of reflection has to do with the methodology concerning the wheel diagram. This research has used a wheel diagram to indicate the differences between energy cooperatives for different dimensions. For each dimension, indicators have been determined that are derived from the literature. This way the wheel diagram is tailored to fit exactly what is aimed to be measured for this research. While this can be seen as a strength, it can also confuse because this way of compiling the wheel diagram means that each dimension is based on different literal sources. One of the drawbacks of this research is that this has resulted in the use of different scales for the indicators that are measured. Almost all of the scales are based on categories for which no hierarchy is applied. However, three of the 17 scales are numerical and do have ranking in the scale. This different kind of measuring indicators can bring about confusion. Next to this, most scale have only one category on the scale that applies, but some of the scales can have multiple categories that apply. This is something that can get disordered when reading the wheel diagram. In future research it would be more comprehensible to stick to one kind of scale.

### 7.2 Recommendation for future research

As mentioned above, the broad scope of the research resulted in this research not being able to dive deeper into specific results. Future research can be done on diving deeper in the results found in this research. Actually for each dimension interesting results have come up. One thing that could be interesting to follow up on is the interaction between municipalities, energy cooperatives and market actors. In some cases more barriers are experienced than in other. It could be interesting to further investigate these interactions and solutions how to overcome the obstacles experienced.

Also, future research could focus on how the barriers that are exposed in this research can be overcome. Future research could focus on one of the issues discovered and dive deeper into the subject to try and find solution to overcome the barriers. One issue that issue that could be further investigated is the lack of embeddedness and challenge to rejuvenate. This research has identified the obstacle and future research could investigate how energy cooperatives can overcome this barrier. The research could focus on what is needed from the energy cooperatives or if are there external factors that influence might this issue.

Another point for future research could be to further develop the wheel diagram that is compiled for this research. The method could be a useful tool to indicate the differences between energy cooperatives. As indicated in the former paragraph, this model has its drawback. But since this was the first time such a model is created, further research can develop the first model of the wheel diagram further.

### 7.3 Recommendation for future policy makers

In Gelderland in the Netherlands energy cooperatives are working on an easy way to compare energy cooperatives in the region in order to identify differences and complement each other where needed. This can help with partnerships in the region. This thesis can be used as theory building for the province of Gelderland when they are creating a model to compare different energy cooperatives in the region.

Friday September 8<sup>th</sup> I have given a presentation to all seven interviewed energy cooperatives. The nine energy cooperatives in the Cleantech region sit together four times a year to discuss issues and exchange knowledge. During one of these meetings I have presented my results to them and discussed the most remarkable outcomes. This research has focused on the partnership in the Cleantech region in Gelderland. It could be useful to execute this research in other regions in Gelderland to stimulate collaboration and learn from each other. Next to other regions in Gelderland, it could also be executed in other places in the Netherlands.

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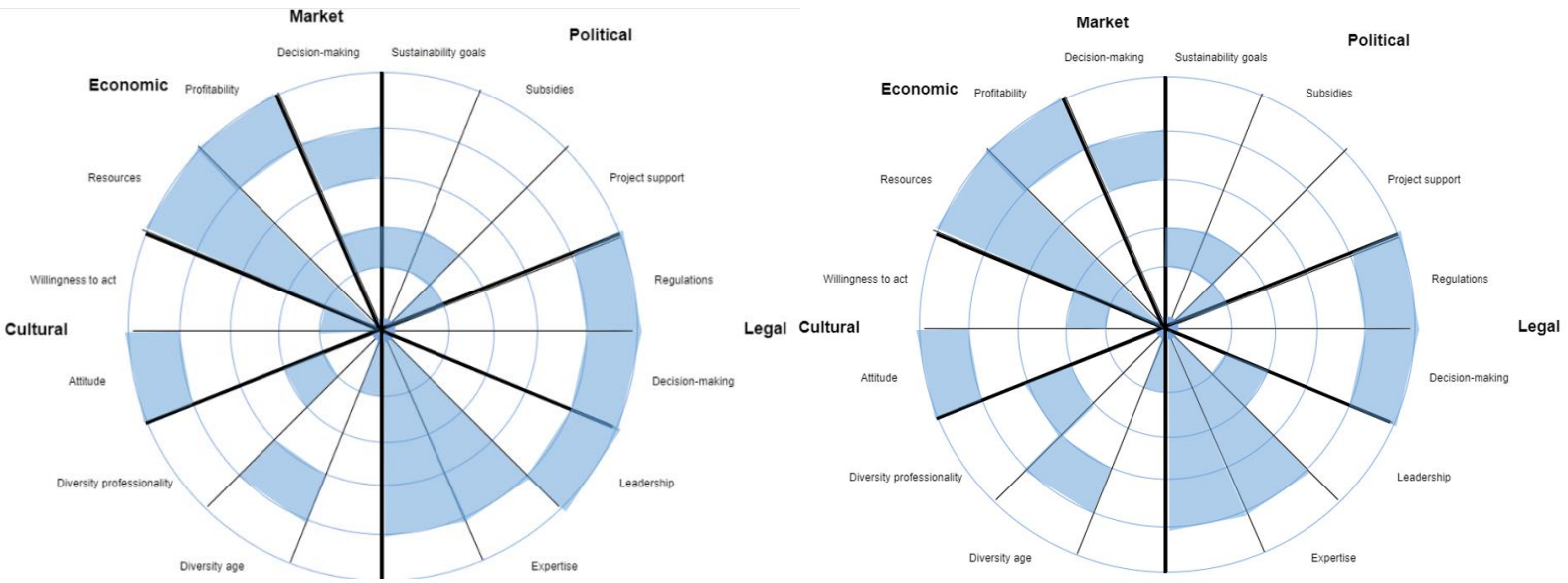
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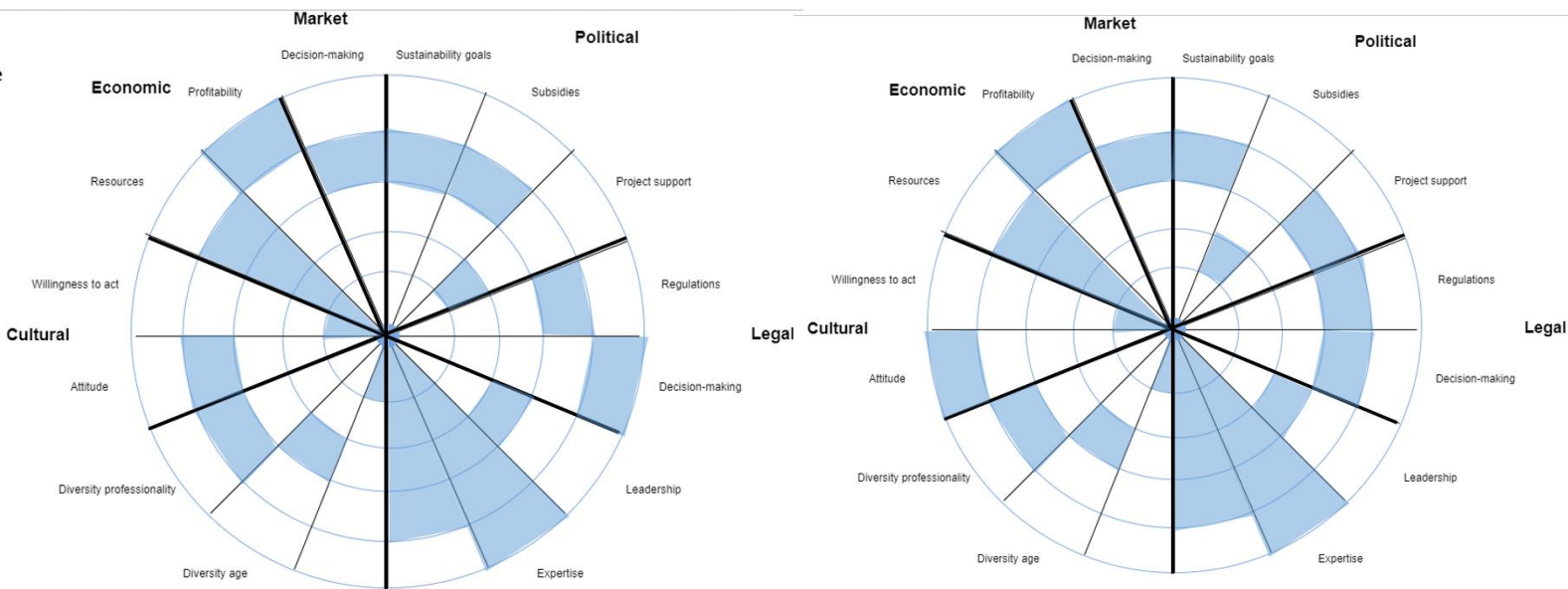


# Appendix I: wheel diagrams per interview

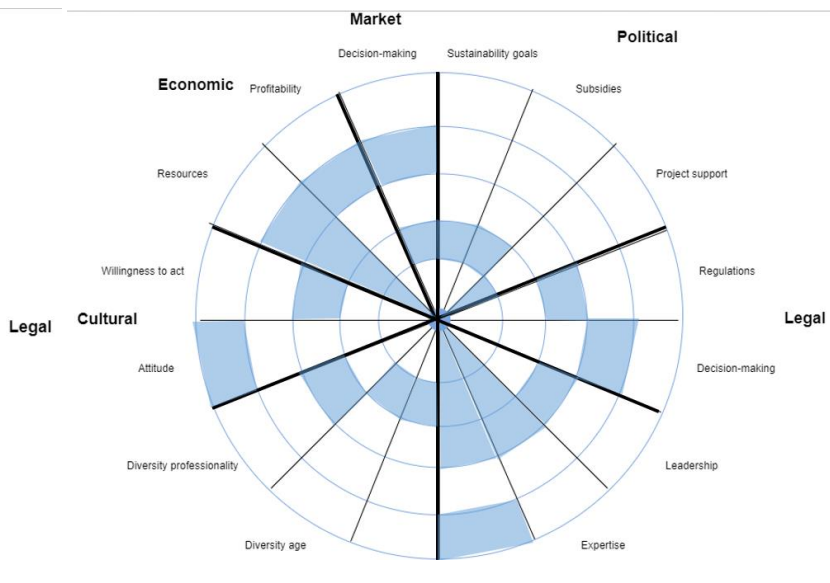
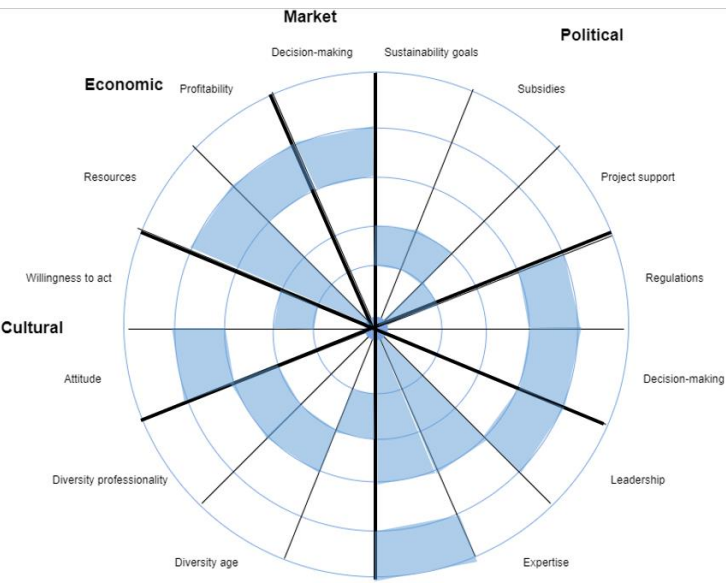
## Two interviews with energy cooperative DeA in Apeldoorn



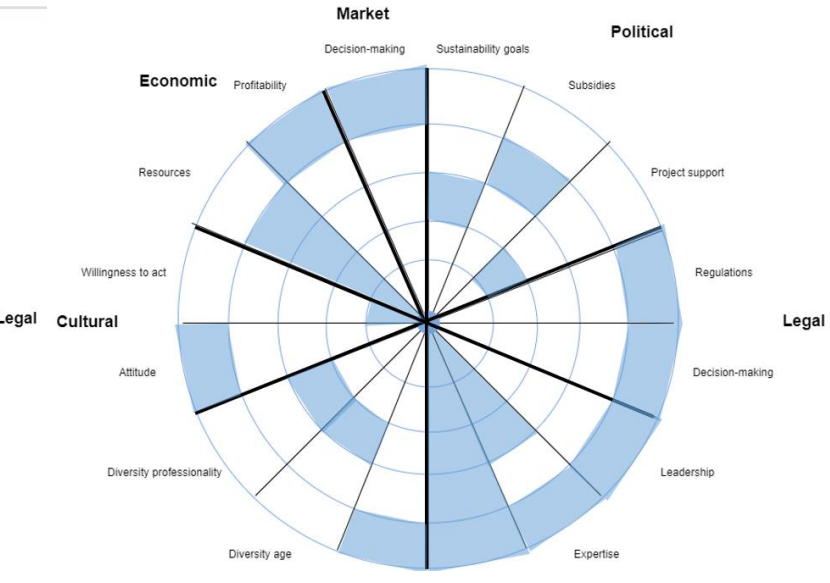
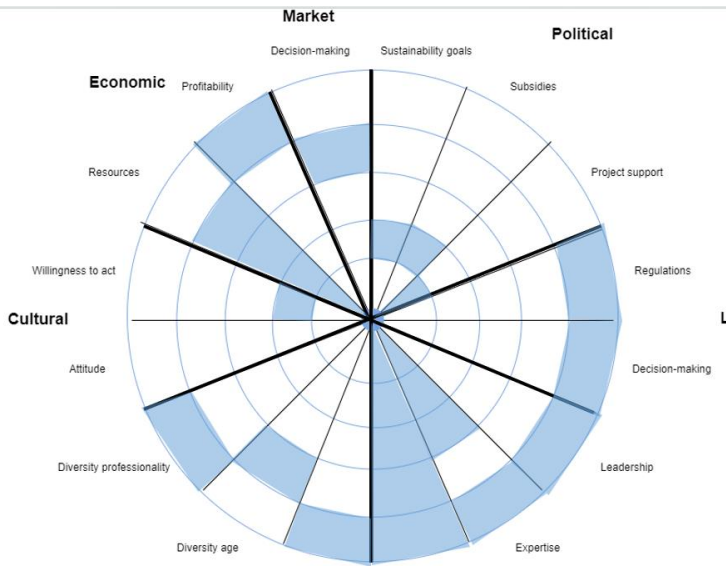
## Two interviews with energy cooperative Zutphen Energy in Zutphen



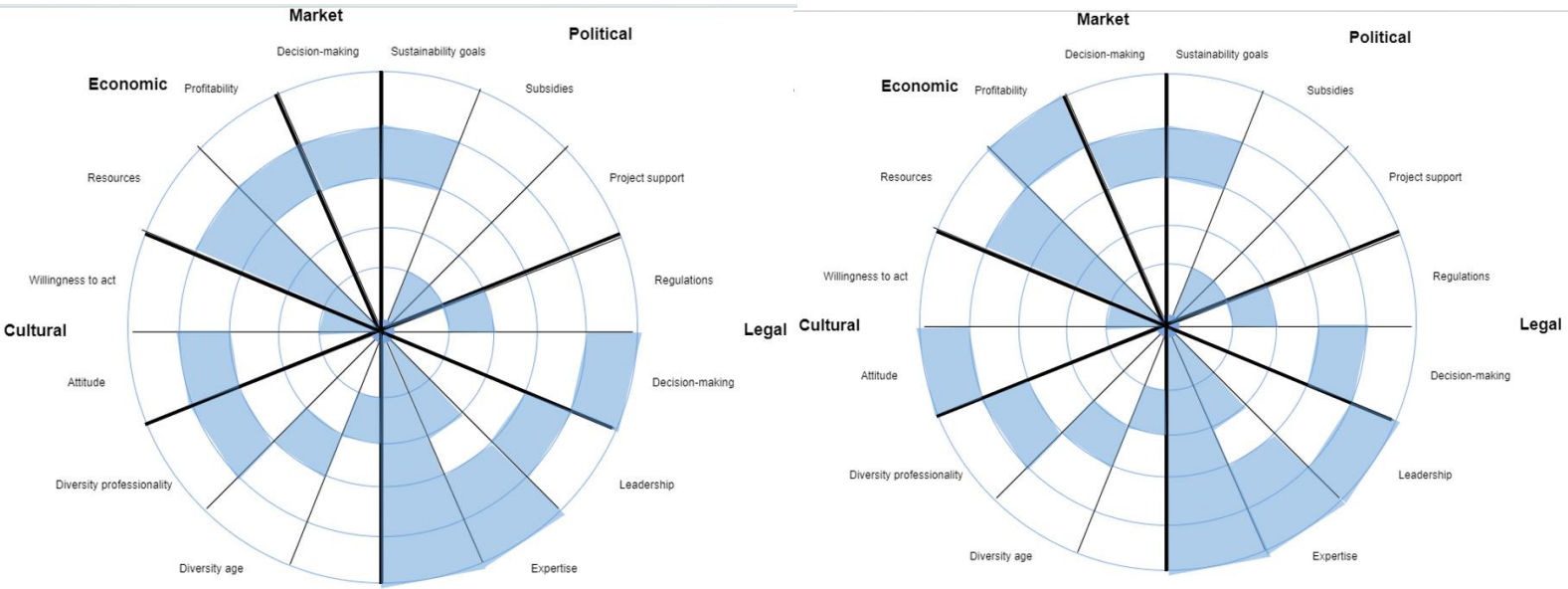
Two interviews with energy cooperative Heerde Energiek in Heerde



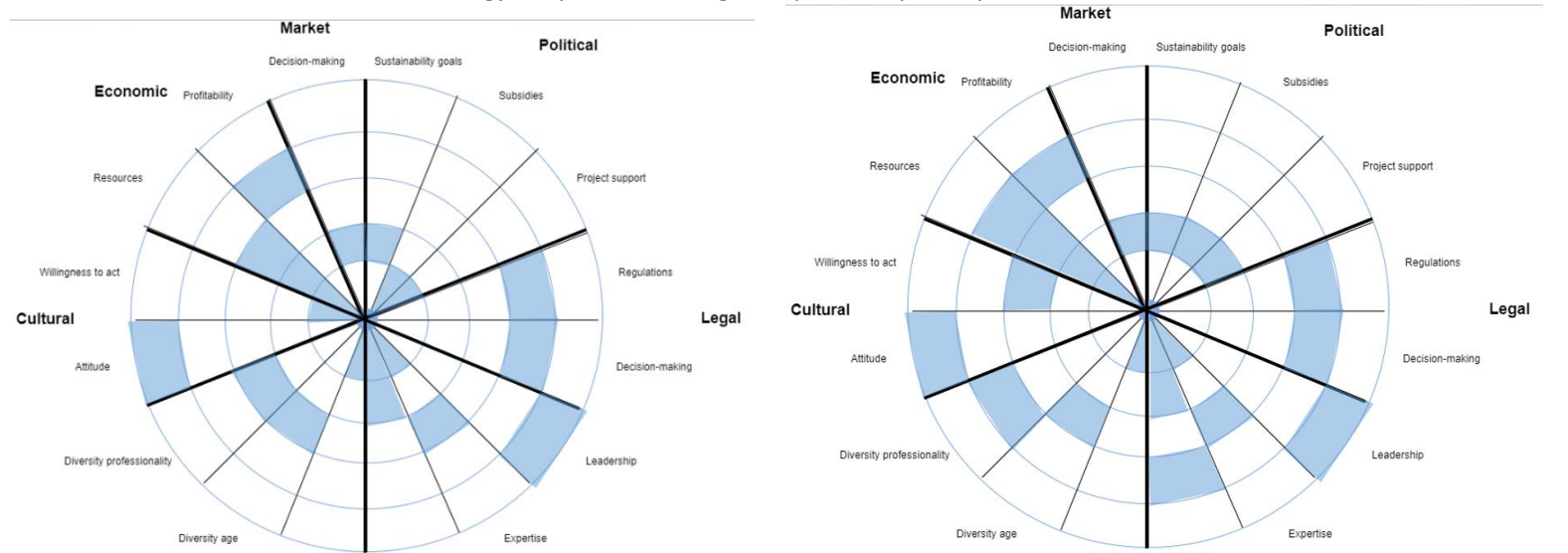
Two interviews with energy cooperative Lochem Energie in Lochem



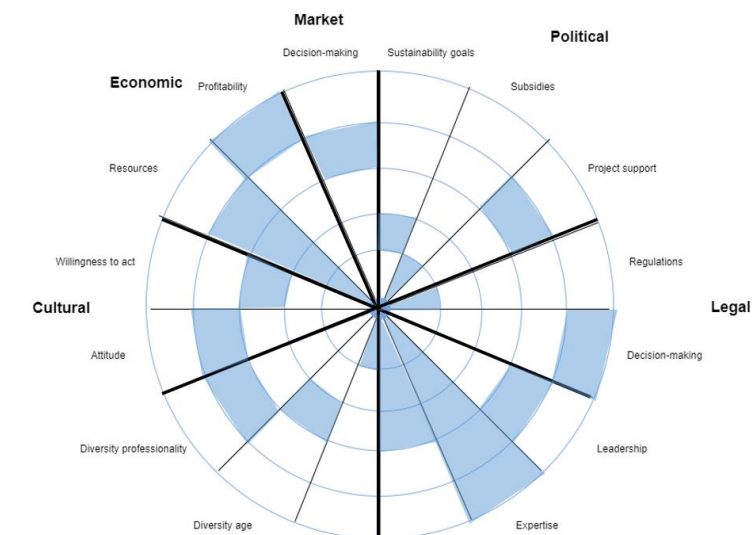
*Two interviews with energy cooperative Brummen Energie in Brummen*



*Two interviews with energy cooperative Energiecoöperatie Epe in Epe*



*One interview with Energierijk Voorst in Voorst*



## Appendix II: Interview guide

Kunt u zich kort introduceren?

We zullen dit interview doorlopen door zeven dimensies die uit de theorie naar voren zijn gekomen te handelen die belangrijk zijn voor het handelen van een energiecoöperatie. Deze dimensies worden gemeten aan de hand van verschillende indicatoren, die komen vanzelf aan bod. Deze zullen een voor een worden doorlopen met een aantal vragen. Omdat we veel indicatoren te doorlopen hebben, zullen we ongeveer 2 minuten per vraag aanhouden. Dit is natuurlijk een beetje flexibel. Op deze manier zal het visuele model kunnen worden ingevuld per energiecoöperatie. Dit zal worden gedaan aan de hand van de volgende dimensies:

Politieke dimensie (bedraagt de relaties met de lokale overheid), juridische dimensie, persoonlijke dimensie, organisatorische dimensie, culturele dimensie, economische dimensie en relatie met de marktpartijen.

### *Persoonlijke dimensie*

Dit omvat de capaciteiten van de individuele leden van de coöperatie, dit wordt gemeten op bestuursniveau en geen individueel niveau.

1. Hoe zou u de leiderschapskwaliteiten van het huidige bestuur beschrijven? Denk hierbij aan een nadruk op idealisme of op zakelijkheid.
  - Is er een idealistische manier van leiderschap waarbij soms risico's worden genomen of is het leiderschap meer economisch gedreven waarbij de nadruk ligt op zekerheid op zakelijk gebied?
  - Voorbeeld?
2. Waar ligt jullie voornaamste expertise als je kijkt naar de praktijkervaring die is opgedaan bij projecten tot nu toe?
  - Energiebesparing - energieproductie wind - energieproductie zon op dak - energieproductie zonneparken - energiearmoede.
3. Welke kennis is aanwezig in de organisatie? Hiermee wordt bedoeld, leden die een achtergrond of nevenfunctie hebben op bepaalde kennisgebieden,
  - Financiële kennis, technische kennis, juridische kennis, sociaal/communicatieve kennis, of iets anders?
  - Is al deze kennis even nuttig?

### *Organisatorische dimensie*

De positie van energiecoöperaties binnen de bredere lokale gemeenschap.

4. Wat is het aantal leden van de energiecoöperatie?
5. Uit hoeveel mensen bestaat het bestuur? Hoeveel verschillende leeftijdscohorten van tien jaar zijn er aanwezig binnen het bestuur?
6. Hoeveel verschillende beroepsgroepen zijn er aanwezig binnen het bestuur?

### *Culturele dimensie*

Dit betreft de motivatie waarom mensen betrokken zijn bij een energiecoöperatie.

7. Hoe zou u de voornaamste motivatie beschrijven van jullie leden om deel te nemen aan deze energiecoöperatie? Uiteindelijk zal het een combinatie zijn, maar wat denkt u dat de overwegende motivatie is?
  - Ligt de nadruk op milieubewegredenen, voorkeur voor lokale energieproductie of - een financiële prikkel?
  - Ziet u een verandering?
8. Hoe zou u de voornaamste manier waarin leden participeren omschrijven?
  - Leden participeren door af en toe naar bijeenkomsten te komen, leden participeren actief met ideeën, of leden participeren door financiële participatie?

#### *Economische dimensie*

Omvat de verdeling financiële middelen onder de actoren in de energiesector, die gedeeltelijk afhangt van de verwachte winstgevendheid.

9. Welke financiële middelen worden door deze energiecoöperatie allemaal gebruikt bij hernieuwbare energieprojecten? Denk aan eigen vermogen, leningen bij de bank, fondsen, PPA, of ook andere middelen?
  - Wat is het bedrag dat leden moeten betalen om lid te zijn?
  - Wordt er op dit moment al geld uitgekeerd naar leden vanuit projecten?
10. Wat is de verwachte winstgevendheid voor dit jaar? Wordt deze negatief verwacht, ongeveer nul of positieve winstgevendheid?
  - Hoe staan jullie er financieel voor? Zijn jullie erg afhankelijk van anderen of lukt het jullie om op eigen benen te staan?
  - Ziet u een verandering?

#### *Relatie met de markt*

Dit onderzoek analyseert de mate waarin marktpartijen invloed hebben op het functioneren van energiecoöperaties.

11. Hoe ziet u de invloed van marktpartijen bij besluitvormingsprocessen over hernieuwbare energieprojecten t.o.v. uw energiecoöperatie?
  - Hebben de marktpartijen een dominerende rol in het zeggenschap of het andere uiterste, kunnen jullie als energiecoöperatie alles beslissen? Of iets er tussenin zoals een samenwerking?
  - Merken jullie dat jullie meer zeggenschap hebben wanneer jullie in een vroeg stadium financieel instappen bij een project dan wanneer jullie later instappen?
  - Wat zouden jullie nodig hebben hiervoor?

#### *Politieke dimensie*

Dit betreft de relatie die een energiecoöperatie heeft met de lokale overheid.

12. De eerste vraag betreft de rol die de gemeente op zich neemt met het prioriteren van duurzaamheid. Zou je zeggen dat jullie gemeente zich actief bezig houdt met duurzaamheid als prioriteit stellen of laten zij anderen de kar trekken?
  - Legitieme overheid (regulering) / presterende overheid (efficiëntie in beleid) / samenwerkende overheid / responsieve overheid (laat anderen leiden)
13. Op welke manier voorziet de gemeente jullie van subsidies?

14. Op welke manier voorziet de lokale overheid jullie van adviserende projectondersteuning?

*Juridische dimensie*

Juridische kenmerken omvatten zowel formele regels en voorschriften als informele structuren zoals besluitvormingsprocedures.

15. Op welke manier is het gemeentelijk beleid van de gemeente van invloed op hoe jullie handelen als energiecoöperatie?

- Waarom?

- Voorbeeld?

16. Wat is de invloed van de overheid bij besluitvormingsprocessen op het gebied van hernieuwbare energieprojecten?

- Voorbeeld?

Wat ziet u als de knelpunten waar uw energiecoöperatie tegen aan loopt? Kunt u dit terug leiden naar een van de dimensies die zijn behandeld?

Als laatste zou ik willen vragen of u nog bepaalde onderwerpen of vragen mist, waarvan u denk dat deze belangrijk zijn?

Of zijn er dimensies gevraagd in dit interview waarbij u denkt dat deze niet van belang zijn in dit onderzoek?

Dank u!