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**Master's Thesis – master Sustainable Development  
(45 EC)**

**Ownership: what role does it play in ensuring  
a just transition?**



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## Executive Summary

Transitioning away from fossil fuels towards more renewable forms of energy is essential for the world to become carbon-neutral. The intermittent nature and weather-dependent power output of these renewables is leading to more decentralized energy systems consisting of smaller generation, often placed near consumers. Historically, energy production and distribution has been centrally-owned by large fossil-fuel dominant energy companies. But, the shift to a more decentralized energy system is providing more opportunities for local actors such as citizens and local governments to own these energy services. This is sparking debates on who should own energy production and distribution. Simultaneously, in this transition it is important to consider what injustices may occur as some people may not benefit equally or may even be disadvantaged, highlighting the importance of a just transition. Although several authors have examined the connection between e.g. community owned energy and energy justice, it remains unclear what exactly ownership means for energy justice and for a just transition. Hence, this thesis researches what role ownership of energy production and distribution plays in ensuring a just transition, using the Netherlands as case study. First, different forms of ownership are determined, in the Netherlands consisting mainly of private, public, shared and community ownership. Second, the effect of these ownership forms on energy justice is examined, focusing on distributional, procedural and recognition justice. Third, future expectations of ownership and what this means for energy justice is described. Data was gathered via literature reviews and via interviews held with relevant stakeholders in the Dutch energy field. Results indicate that ownership plays a significant role in determining how just the energy transition is, as different ownership forms have different implications for energy justice and hence for the justice of the energy transition. However, in practice more 'just' ownership forms such as cooperatives and municipalities face several barriers hindering their development. Hence, we cannot rely solely on these ownership forms to reach climate targets. Yet, we should be aware of which ownership forms to support towards the future as this will have consequences for how just the energy transition will be. This thesis provides insights on social impacts of ownership structures in energy production and distribution, and it can help policy-makers make more informed and more just choices around ownership. Future research could focus on making ownership structures more inclusive and could broaden the research scope to other energy justice dimensions.

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# 1. Introduction

## **1.1 Introduction**

In the combat against climate change, governments around the world are aiming to reduce greenhouse gas emissions drastically (Goedkoop & Devine-Wright, 2016). This has become prevalent via international agreements such as the 2015 Paris Agreement, the European Green Deal 2019, and the Glasgow Climate Pact which all advocate for concrete climate action (Apostu et al., 2022). Transitioning away from fossil fuels towards more renewable sources of energy is an essential part of reaching these goals. With the energy transition also come many challenges. One of the biggest challenges of renewable energy technologies, such as wind and solar, is their intermittent nature and weather-dependent power output (Grosspietsch et al., 2019). Matching supply and demand therefore, requires additional measures for flexibility and balance (Grosspietsch et al., 2019). Such measures can be taken in decentralized systems in which multiple energy generation technologies are utilized in combination with conversion and storage technologies (Grosspietsch et al., 2019). Currently, there is a shift towards such decentralized systems in which renewable energy production consists of smaller generation units that are often placed close to consumers (Grosspietsch et al., 2019).

As the shift to more decentralized renewable energy production occurs, debates tend to focus on what the appropriate technological choices are moving forward (Gorroño-Albizu et al., 2019). Although potentially camouflaged, ownership appears to be a “strong underlying component” in these debates around the energy transition (Gorroño-Albizu et al., 2019). This becomes evident in debates on what the appropriate technological pathway forward is, where different forms of ownership prevail in centralized vs. decentralized energy production. In terms of energy production, currently, predominantly large fossil fuel-dominant energy companies hold a large market share (Gorroño-Albizu et al., 2019). This means these companies own a large part of energy production units, i.e. centralized energy production. Renewable energy provides an opportunity to challenge these large companies, challenging existing forms of energy ownership, development and control (Shelton & Eakin, 2022). Sources such as wind and solar require relatively less capital to produce energy from which allows the possibility for energy production to be small, decentralized and locally owned (Shelton & Eakin, 2022). This results in more opportunities for residents and local governments to own and control energy production (Shelton & Eakin, 2022). Different forms of ownership exist for energy production and distribution. Electricity production in Europe exists of both private and state-owned utilities (Steffen et al., 2022a). Additionally, energy production can be owned by more local, consumer-based actors such as municipalities, companies with a community interest/social enterprises, cooperatives, public-private partnerships, foundations, non-profit organizations and associations (Roberts, 2020; Gorroño-Albizu et al., 2019). In most European countries transmission and distribution networks are owned and managed by separate entities, namely the transmission and distribution system operators. Who owns these entities varies across European countries (Neuhoff et al., 2014). Hence, ownership of energy production and distribution ranges from public, to private, to consumer ownership with many forms in between.

## **1.2 Problem definition**

Historically, energy production and distribution, have been centrally-owned (Miller, 2023). Centralized generation comprises of large-scale energy production at centralized facilities, which are often placed relatively far away from end-users, and then is distributed to these end-

users (US EPA, 2024). Such centrally-owned energy production and distribution have been based on large fossil fuel-dominant energy companies. While these companies formed the basis of industrial growth and today still fuel the global economy, they simultaneously are responsible for emitting vast amounts of CO<sub>2</sub> into the atmosphere. As their fuelling of the carbon-based economy is also known to drive climate change, such centrally-owned energy systems are now under pressure. The crisis such systems face is exacerbated by large concentrations of wealth and inequalities in society, which in combination with other drivers has been the result of centralized energy systems, and the corruption these systems have brought in preserving carbon-based energy sources and the wealth they produce (Miller, 2023). This raises questions on what ownership in energy systems means for individuals and groups in society, playing into energy justice issues.

Currently, in the world there is a trend of increasing inequality with regards to income, wealth, and resource ownership (Healy & Barry, 2017). Additionally, inequality is increasing for access to safe and affordable energy and for energy poverty, which is even the case for first world countries. Without certain efforts made to safeguard an equitable transition, people will not benefit equally and may even be disadvantaged (Carley & Konisky, 2020). Hence, it is very important to consider whether, where and how transitioning to a zero-carbon society is causing injustices. Thinking of just transitions raise questions of ‘who wins, who loses, how and why’ (Healy & Barry, 2017).

Several studies argue that distributed community ownership could improve the distribution of equity and justice, while a more centralized (which often goes hand in hand with privatized ownership) could worsen the distribution of equity and justice (Miller, 2023; Shelton & Eakin, 2022). Here, community energy groups are seen as ‘ideal organisational entities’ where citizens are in control of resources and actively participate in decision-making, forming an alternative to both public and private ownership (Van Veelen, 2018). However, generally researchers have a tendency to assume, rather than demonstrate that such community energy projects are more democratic or just (McHarg, 2016). As Jenkins (2019) explains, forms of consumer ownership still face issues of justice regarding the distribution of risks, who should be responsible for owning renewable energy facilities and who might be excluded, they may cause differences in power and not everyone may be included in decision-making processes. This highlights the importance of researching what ownership means for energy justice what it means in ensuring a just transition. Ultimately, it is essential to examine how different forms of ownership “inflect, intersect, and integrate into larger social, economic, and political dynamics, geographies, and structures” (Miller, 2023). Reorganizing energy ownership may therefore be of major importance in the energy transition (Miller, 2023).

### **1.3 Research gap and aim**

Previous research has primarily examined what justice issues occur for energy projects owned by private developers (Rand & Hoen, 2017; le Maitre et al., 2023) or energy projects owned by local communities (Forman, 2017; Jenkins, 2019), with fewer studies focusing on shared ownership forms (e.g. between private developers and local communities) (Goedkoop & Devine-Wright, 2016; Huijts et al., 2012). Papers tend to focus on research within a single ownership form. However, to date, no research has taken a broad perspective, examining what these different forms of ownership mean for energy justice and therefore it remains unclear what exactly ownership means for energy justice and for a just transition. Additionally, no research was found on public or municipal ownership in relation to energy justice and within

the research that has been done on ownership, the primary focus is on energy production, while the role of ownership in distribution networks, regarding energy justice, remains unexplored. Hence, this thesis aims to fill the aforementioned knowledge gaps.

This thesis aims to explore what role ownership plays in ensuring a just transition. The research aims to give insights into different ownership forms in energy production and distribution with regards to energy justice. The Netherlands will be taken as a case study. The main research question, with three sub-questions, are as follows:

What role does ownership play in ensuring a just energy transition in the Netherlands?

1. What forms of ownership exist for different energy production and distribution and why?
2. How do different forms of ownership affect energy justice?
3. How is ownership in the energy transition expected to develop into the future and what does it mean for energy justice?

#### **1.4 Relevance**

This thesis will give important insights on energy justice for different forms of ownership in energy production and distribution. This will allow policy makers to make more informed decisions in the future in steering the energy transition to just outcomes for society. Additionally, this research will contribute to the existing body of literature on ownership and energy justice and will possibly help accelerate the transition towards a more just and sustainable world.

#### **1.5 Case study**

Currently, in the Dutch energy sector, there is an ongoing discussion regarding ownership in energy production and distribution. Following the Dutch Climate Agreement, two new acts have been proposed: the ‘Energiewet’ and the ‘Wet Collectieve Warmtevoorziening’ (Klimaatakkoord, 2019). The former aims for 50% of onshore electricity production to be locally owned (Poelen, 2024). The latter obliges at least 50% + 1 share of heat production and – distribution to be publicly owned (Rijksoverheid, 2023a). This has raised political debates in which there are mixed opinions and concerns amongst different stakeholders. Therefore, the Netherlands is a very interesting country to use as case study, as the discussion on ownership is arising.

#### **1.6 Thesis Roadmap**

This thesis, first, presents the conceptual theory, connecting ownership to the energy transition and providing information on what it means for a transition to be just, based on just transition literature. Then it explains energy justice theory, in which the three main pillars of energy justice: distributional, procedural and recognition justice are explored, followed by an analytical framework describing how data is gathered and interpreted in order to answer the research question. Second, the methodology section provides a step-by-step guide on how the research for this thesis was conducted. Third, the results are depicted per sub question, each consisting of a literature review and an analysis of interviews held with representatives of different ownership forms in the Netherlands. Finally, the thesis provides a discussion in which a conclusion is given, answering the main research question, in addition to the limitations of this research, the implications is has and recommendations for future research.

## 2. Conceptual Theory

In the following section several relevant concepts are explained to gain a better understanding of the research carried out in this thesis. First, ownership of energy systems in relation to the energy transition is explained, forming the theoretical background of the thesis and highlighting the importance of discussing ownership in the current energy transition. Then ‘just transition’ literature is discussed illustrating the broadness and complexity of what a just transition means. Third, the concept of energy justice is explained, which finally leads to the presentation of the analytical framework this thesis uses. In figure 1 the conceptual framework of this thesis is depicted illustrating how these concepts will contribute to answering the research question.

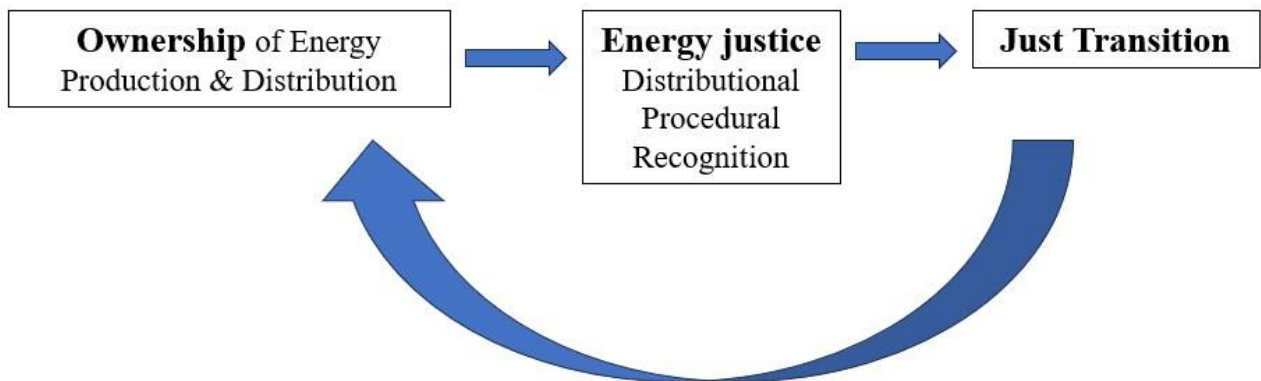


Figure 1. Conceptual framework of this thesis illustrating how concepts are used in the research of this thesis.

### **2.1 Ownership in the energy transition**

This section gives the reader an understanding of what factors influence ownership of energy systems (i.e. who owns what share of what technology) and how this relates to the energy system transition (i.e. types of technologies implemented and the associated amounts). This section serves as important background information and forms the theoretical basis for the rest of this thesis regarding ownership. A theoretical approach by Gorroño-Albizu et al. (2019) is used and is illustrated in figure 2. According to this approach different kinds of actors (companies, citizens, the public arena etc.) who are constrained to a certain political system, determine the legislative and economic incentives that drive 1) the energy system transition (types of technologies implemented and the associated amounts) and 2) the ownership of energy systems (who owns what share of what technology). Additionally, available resources (e.g. land, economic resources) determine what share of what technology is implemented (the energy system transition) (Kooij et al., 2018). Furthermore, ownership of energy systems and the energy system transition can influence each other and are based on goals of society (e.g. mitigation of climate change) (Hvelplund, 2014). This theoretical approach, is representative for member states of the EU and possibly other industrialized countries (Gorroño-Albizu et al., 2019) and gives insights into how ownership relates to the energy system transition.



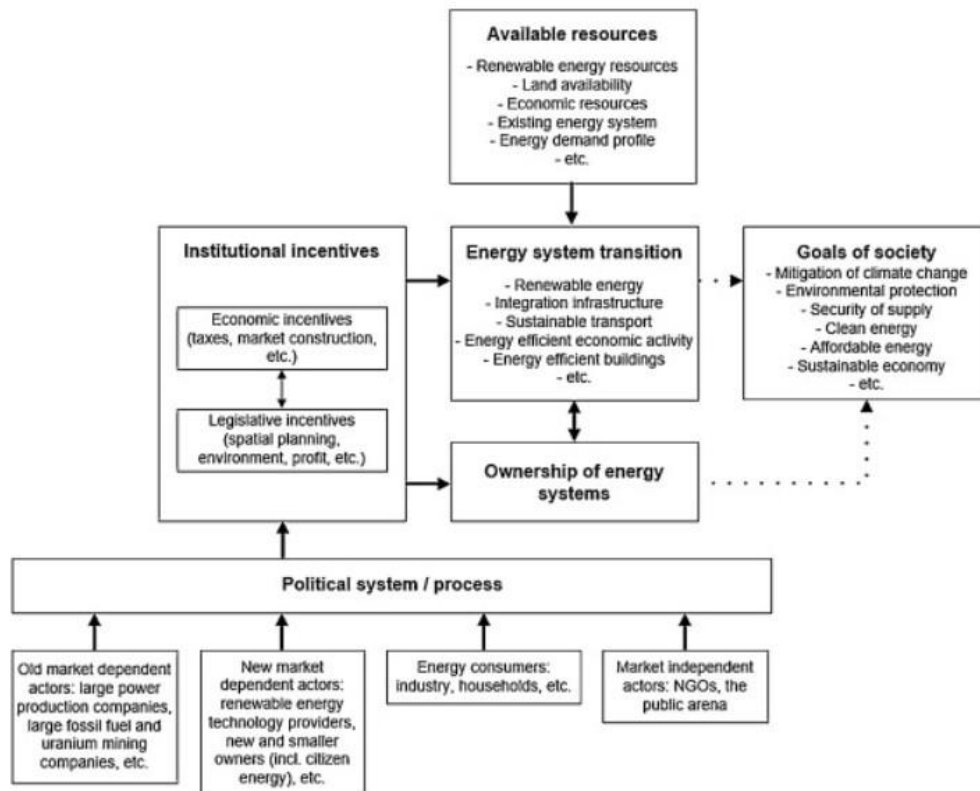


Figure 2. Theoretical approach linking ownership to energy system transition for EU countries (Gorroño-Albizu et al., 2019).

This paragraph describes how ownership is an essential part of debates around the energy transition, based on figure 2, and helps justify the relevance of researching this topic. In the transition from a centralized fossil fuel-based energy system to a more decentralized system with renewable forms of energy, the value added to parts of the supply chain may change, undermining the current ownership regime, in which energy companies hold a large share of market power (Hvelplund, 2014). In more conventional centralized systems, business models of large energy companies rely on economies of scale with regards to fuel purchases and capital investments. However, in decentralized renewable energy systems, which have low fuel costs, such business models are no longer required. Hence, decentralized RE systems can be a threat to large fossil fuel-based energy companies. These large companies would rather encourage technological pathways to centralized low-carbon energy systems and incentives discouraging citizen ownership (Hvelplund, 2014). It can be concluded that ownership is an important and inherent part in debates concerning the energy transition, although it may be disguised in discussions around technological choices (Gorroño-Albizu et al., 2019). Hence, research is needed on ownership of different technologies to help make decisions in the energy transition (Hvelplund, 2014) and to examine the appropriateness of different legislative and economic incentives that may affect ownership and energy transitions (Gorroño-Albizu et al., 2019).

## 2.2 A just transition

This section will explain what the literature says about just transitions and what it means for a transition to be just. Phasing out fossil fuels while increasing renewable technologies requires technological and social changes, which will have a significant social impact (Wang & Lo, 2021). Hence, such a shift must occur without repeating patterns of environmental and socio-

economic injustices caused by the existing energy regime (Carley & Konisky, 2020). Research on the existing energy regime has focused primarily on the economic side of the transition (Rist, 2016). However, such conventional economics have not allowed for 'just' outcomes for society and it can even be said that inequality has been increased by it. Yet, the neo-classical way of thinking still directs economic decision-making, which is also the case in fossil fuel-based research (Rist, 2016). Additionally, powerful elites have prevented society to reform and move away from such a traditional-economic way of thinking (Heffron & McCauley, 2018).

Recently, the 'just transition' has become a hot topic amongst scholars (Heffron & McCauley, 2018). Here, the notion is created that a sustainable transition must be a 'just transition' (Wang & Lo, 2021). However, there is no globally agreed upon definition of what exactly a 'just transition' means and also no agreed upon framework researchers can use for determining this (Wang & Lo, 2021). In a literature review by (Wang & Lo, 2021) five main themes are identified around which the 'just transition' concept has been discussed. The first theme is the just transition from a labour point of view in which labour unions have fought for a more just transition. The second theme is the just transition as an integrated framework for justice including environmental, climate and energy justice (Wang & Lo, 2021). These three approaches all have different definitions of what exactly a just transition means. At its core 1) climate justice examines the benefits and burdens resulting from climate change in terms of human rights; 2) energy justice applies human rights across all stages of the energy life-cycle; and 3) environmental justice aims for equal treatment and involvement of citizens around environmental laws, regulations and policies (Heffron & McCauley, 2018). These mixed meanings of justice makes it hard for society to support a 'just transition' when it is unclear what exactly is meant (Heffron & McCauley, 2018). The third theme entails the just transition as a theory of a socio-technical transition which examines how such a transition may lead to fundamental changes for society (Wang & Lo, 2021). The fourth theme engages with how governance strategies may influence how just a transition is and the fifth theme focuses on how public perceptions and attitudes towards e.g. renewable energy technologies shapes how just a transition is (Wang & Lo, 2021).

Due to the polysemous nature of 'just transition' literature, it is important to distinguish between the different conceptual meanings it has and also to acknowledge the tension between these different strands (Wang & Lo, 2021). Still, there is a need for adding the justice component to the energy transition to make sure the 'status quo' (powerful elite) is not favoured and to make sure the transition is fair for everyone (Heffron & McCauley, 2018).

In the literature the 'just transition' is the meeting point between the energy transition and energy justice. It emphasizes the importance of equity and justice in the development, implementation and evaluation of "every socio-energy system change that shapes the energy transition" (Carley & Konisky, 2020). Ensuring a just transition entails all stakeholders (governments, private parties, NGOs etc.) to reallocate welfare to prevent undue burden on any groups, to provide adequate energy services to all, and to ensure a safety net for marginalized groups (Carley & Konisky, 2020).

This thesis hopes to contribute to a more just transition. However, since just transition literature is so broad and there is no clear framework to use, the researcher has chosen to focus on energy justice as a conceptual and analytical tool for the research of this thesis. Energy justice will be explained further in the following section.

## 2.3 Energy justice

Energy justice is a recently developed research area in the social science realm which applies justice to decision-making around energy systems (Jenkins, McCauley, et al., 2016). At its core justice means “ensuring and recognizing the basic equal worth of all human beings together with a commitment to the distribution of good and bad things” (McCauly et al., 2013). Energy justice is founded upon environmental justice, which developed in the 1970s in response to an unequal distribution of negative environmental effects such as pollution and waste, often located near poor communities and people of colour (Davies, 2006). This movement was driven by empowerment, social justice and public health principles (McCauly et al., 2013). Energy justice relies on these same ideas, however the difference lies in its aim “to provide all individuals, across all areas, with safe, affordable and sustainable energy” (McCauly et al., 2013). In energy justice literature, justice is applied to energy policy (McCauly et al., 2013), energy consumption (Hall, 2013), energy production (Heffron & McCauley, 2014), energy security (Sovacool et al., 2013), the political economy (Jenkins, Heffron, et al., 2016) and climate change (Jenkins, McCauley, et al., 2016).

The three core tenets in energy justice literature are 1) distributional justice, 2) procedural justice, and 3) recognition justice (McCauly et al., 2013). This is a common approach allowing researchers to explore multiple agendas regarding energy justice and is illustrated in table 1 (Jenkins, McCauley, et al., 2016). The definitions of the three forms of energy justice are explained further below, summarized in table 1.

Table 1. The three core tenets of energy justice (Jenkins, McCauley, et al., 2016).

Table 1. The evaluative and normative contributions of energy justice.

Tenets	Evaluative	Normative
<b>Distributional</b>	Where are the injustices?	How should we solve them?
<b>Recognition</b>	Who is ignored?	How should we recognise?
<b>Procedural</b>	Is there fair process?	Which new processes?

### *Distributional justice*

The first tenet of energy justice is distributional justice. This is a spatial concept examining the unequal distribution of positive and negative effects (Walker, 2009). This can be the case in terms of the physical siting of an energy project, which may cause e.g. environmental risks (Mitchell & Norman, 2012). Distributional justice also refers to the access to affordable energy, which in the literature can for example be discussed as fuel poverty (McCauley et al., 2013). Distributional justice issues may also arise in the distribution of benefits between parties such as developers and communities, or within communities. An example is when a certain group of citizens produce their own energy leading to de-solidarization of the people who cannot afford owning and producing their own energy. Since the former group stops paying charges to the grid, the burden shifts to the latter group (Goedkoop & Devine-Wright, 2016). Distributional justice does acknowledge the fact that some resources are inherently distributed in an uneven manner (e.g. the access to ground source heat pumps). This is not necessarily unjust. However,

this does demand fair processes and fair treatment around energy projects (G. Walker & Bulkeley, 2006). This has resulted in including justice as recognition and procedural justice as well (Jenkins, 2019).

### ***Recognition justice***

In the literature it has been widely debated whether justice as recognition should be included as a core tenet as some scholars advocate distributional issues are most important (Jenkins, 2019), and most focus historically has been on questions of distribution (Walker & Bulkeley, 2006). Yet, it is included in the core tenets as it sheds light on “who” energy justice is for and who is responsible for delivering it. In terms of ownership of energy projects this may emerge in the question of who should own these projects and who may be excluded from such activities (Schlosberg, 2007). It sheds light on the individuals and groups affected by these injustices (Jenkins, McCauley, et al., 2016). Recognition justice also comprises of acknowledging different perspectives held by different groups in terms of ethnicity, race, and gender (Sovacool et al., 2017). It concerns the acknowledgement of rights of different groups including local and indigenous peoples (Heffron, 2022). Finally, issues in recognition justice may lie in misrecognition of people’s views which may disrespect certain communities and may impact decision-making (Jenkins, 2019). This may then impact who we believe should be stakeholders and how we believe these stakeholders should be involved, which plays into procedural justice, explained in the following section (Jenkins, 2019).

### ***Procedural justice***

In the final core tenet, the “how” of energy justice is examined. It concerns the access to decision-making processes which help determine the distributions of justice and aims for equitable procedures including all stakeholders in a non-discriminatory way (Walker, 2009). It includes participation, full provision of information and utilization of appropriate and sympathetic engagement mechanisms (Jenkins, 2019). In Sovacool & Dworkin (2014) this is formulated into four essential rights: 1) access to information, 2) access to and meaningful participation in decision-making, 3) lack of bias on the part of decision-making and 4) access to legal processes for achieving compensation. Unequal representation may also affect the decisions made around energy projects causing injustices (K. Jenkins, McCauley, et al., 2016). Different ownership models result in different contractual arrangements, determining the degree of participation in decision-making (Jenkins, 2019). Also, different power relations exist which can cause procedural justice issues, e.g. between developers and communities (Cowell et al., 2011).

A second approach for looking at energy justice is a principle-based approach which focuses on eight core principles: 1) availability, 2) affordability, 3) due process, 4) transparency and accountability, 5) sustainability, 6) intra-generational equity, 7) inter-generational equity and 8) responsibility (Sovacool et al., 2016).

A third approach in energy justice literature is the application of energy justice to all stages of the energy life-cycle (planning, construction, operation, and decommissioning) (Heffron & McCauley, 2014); Jenkins et al., 2014), also referred to as cosmopolitan justice (Heffron & McCauley, 2017). When energy justice is applied to all of these stages, operation of energy projects can be sustained (Heffron, 2022). Cosmopolitanism justice also encompasses taking

into account cross-border effects from the energy sector since citizens all over the world can be affected by these activities (Heffron, 2022).

A major limitation of all three approaches is that it is unclear how to put these into practice and how they can be enforced (Heffron & McCauley, 2017). Hence, in Heffron & McCauley (2017) a conceptual framework is developed, adding ‘restorative justice’ to the earlier mentioned approaches. This conceptual framework aims to apply energy justice into the real world in three distinct phases of decision-making. Restorative justice entails that any injustices caused by the energy sector should be resolved, e.g. in the decommissioning of energy infrastructure (Heffron, 2022). In Figure 2 this conceptual framework is illustrated (Heffron & McCauley, 2017).

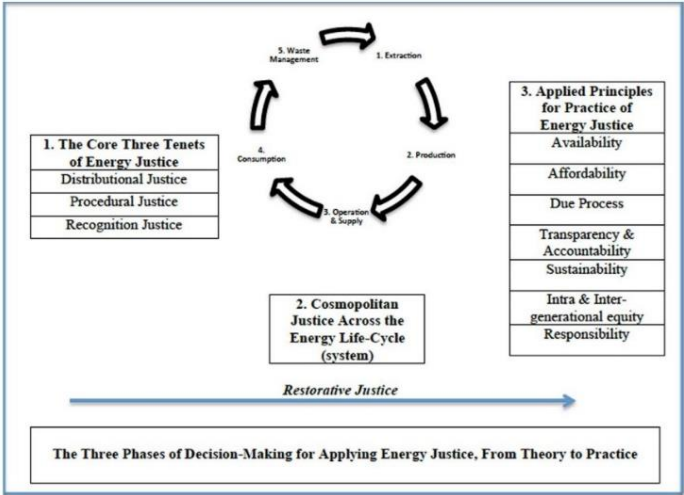


Figure 3. Conceptual framework of applying energy justice from theory to practice in three phases of decision making (Heffron, 2022).

The main idea in figure 3 is that adding restorative justice would ensure that all three energy justice approaches (the core tenets of energy justice, cosmopolitan justice and the eight principles of energy justice) are applied since the framework shows where exactly restorative action is required. This would allow decisions to be made based on potential harm and attributed costs (Heffron & McCauley, 2017). It is important for energy justice to be applied to practice in order to meet global environmental climate change goals and for ethical issues to be resolved. Incorporating justice into the energy sector will help solve issues from an environmental, social and governance point of view. (Heffron, 2022).

Although multiple approaches have been explained, the research in this thesis will focus on the three core tenets of energy justice. This approach has become dominant in the literature on energy justice (van Bommel & Höffken, 2021). Additionally, literature on the connection between energy justice and ownership tend to focus on one or more of these pillars (van Bommel & Höffken, 2021), making this an appropriate approach. Focusing on this approach allows for a sufficiently narrow research focus, allowing for a deep understanding of the core tenets in relation to ownership of energy production and distribution.

### 2.4 Analytical Framework

The complexity of examining when a transition is just, has led the researcher to use the concept of energy justice as analytical tool. This concept can be used as an analytical tool to analyse energy policies and systems (Reitz et al., 2022). For example, Mundaca et al. (2018) use energy justice to examine local energy transitions, by examining distributional and procedural justice. The analytical framework of this thesis is inspired by Mundaca et al., 2018, but simply adds recognition justice to it.

The analytical framework of this thesis is shown in figure 4, depicting how data is gathered and analysed in this thesis. This framework highlights which indicators are used to determine how just different ownership forms are per core tenet of energy justice: distributional, procedural and recognition justice. Distributional justice exists when outcomes are fair, procedural justice exists when decision-making is fair and recognition justice exists when all groups are included and views of all groups are recognized.

Now it will be explained how the analytical framework (figure 4) is used in relation to the conceptual framework (figure 1), in order to answer the main research question. First, different forms of ownership in energy production and distribution have an effect on energy justice. This effect on energy justice is determined by the analytical framework, providing information on what effect ownership has on the three core tenets of energy justice, utilizing the indicators from the framework.

Theory	Aspect	Concept	Indicator
Energy justice	Distributional justice	Outcomes	Distribution of benefits Distribution of costs Access to affordable energy
	Recognition justice	Inclusion of all groups	Who owns projects and who may be excluded from owning projects Acknowledgement of views held by different groups
	Procedural justice	Decision-making Consultation process Information sharing	Access to meaningful participation in decision-making Ability to be heard Access to information Quality, transparency and timing of information

Figure 4. Analytical framework used in this thesis, using the three core tenets of energy justice as analytical tool, depicting how data is gathered and interpreted (inspired by Mundaca et al., 2018).

Then, this information per ownership form on energy justice determines how just a transition is. As explained in section 2.2 a just transition forms the meeting point between energy justice and the energy transition, making it possible to apply energy justice findings to the justice of the transition. Additionally, the focus of this thesis is on ownership of renewable energy production and distribution which directly contributes to the energy transition, as the increase

of these renewable projects are driving the energy transition. Hence, connecting ownership of such energy production and distribution to energy justice can impact how just the transition is.

In this thesis, a transition is considered just when outcomes are fair (indicating distributional justice), decision-making is fair (indicating procedural justice) and when all groups are included equally with their views recognized (indicating recognition justice). Ownership of energy production and distribution may influence how just such a transition is, highlighting the research of this thesis.

In summary, the core tenets of energy justice can determine, per ownership form in energy production and distribution, whether they contribute to a just transition or not. Ultimately, the comparison between different ownership forms and how just these forms are, provides new insights on what role ownership plays in ensuring a just transition.

### 3. Methods

This thesis answered three sub-questions in order to answer the main research question. The following section describes the methodology for answering these questions, which include two main research phases, consisting of 1) literature reviews and 2) interviews. An overview of the methods is illustrated in figure 5.

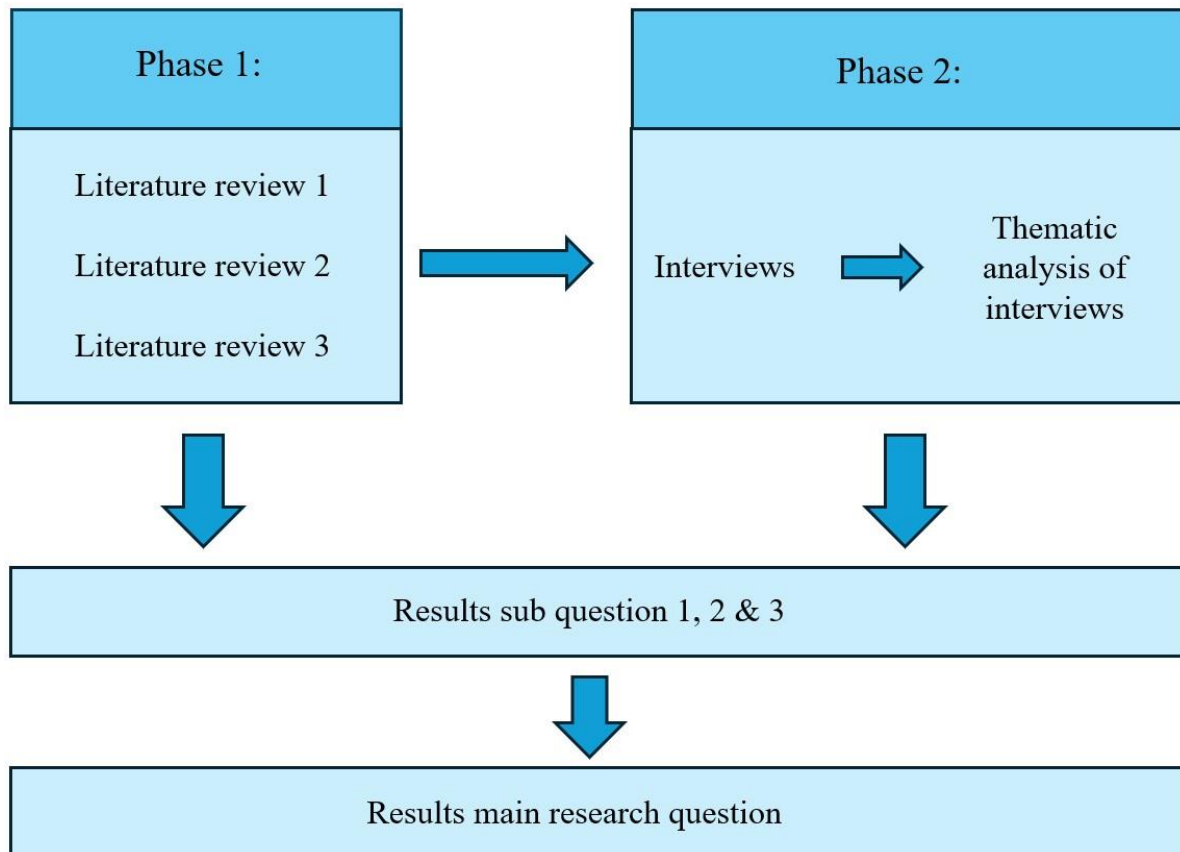


Figure 5. Overview of methods, consisting of two main research phases, answering three sub questions, leading to answering the main research question of this thesis.

#### 3.1 Data collection

##### Phase 1: literature reviews

The first step to answering all sub questions was by carrying out three separate literature reviews. These were all descriptive reviews determining what has been written on the topic so far and identifying possible patterns and gaps (Paré & Kitsiou, 2017). For all literature reviews Google Scholar and Web of Science were used as search engines as these engines could provide a large array of possible academic literature relevant to this research, and also Google was used to find relevant websites and reports.

##### *Sub question 1*

The first literature review, answering sub question 1, gathered information on what types of ownership in energy production and distribution exist and why. Here it was important to gather information on debates occurring on ownership in energy production and distribution both



historically and currently. For this a total of 22 academic papers were utilized, of which 7 concerned the debate on public vs. private ownership, 5 concerned public vs. private ownership with regards to renewable technology investment, and 11 papers concerned community energy in addition to 1 European commission report. Papers were selected if they could provide information on what considerations are important to take into account for different ownership forms in energy production or distribution. After this general information was gathered on why certain ownership forms exist and what characterized them, the Dutch ownership structure in energy production and distribution could be placed alongside this general information. First, information was gathered on the Dutch energy mix to gain insights on what energy generation technologies are used in the Netherlands. Then information was gathered on general ownership structures in energy production and distribution in the Netherlands, followed by a more detailed ownership structure per technology type. The literature section on the Netherlands utilized 6 academic papers, 7 website pages consisting of the organisations CBS, HIER, Vattenfall and Solar Magazine, in addition to 4 reports either carried out or commissioned by 'Rijkdienst voor Ondernemend Nederland' which is an agency that falls under the Dutch Ministry of Economic Affairs and Climate and the Ministry of Agriculture, Nature and Food Quality.

### ***Sub question 2***

The second literature review, answering sub question 2, gathered information on energy justice in relation to energy production and distribution. Here, research explored how different forms of ownership affect energy justice and what energy justice issues occur per ownership forms. A total of 37 academic papers were utilized of which 15 concerned private ownership, 8 referred to shared ownership and 16 concerned community energy. Papers were only included if the main focus was on one or more of the core tenets of energy justice. No papers were found focusing on the effect of public or municipal ownership on energy justice. Also, no papers were found examining the effect of ownership of energy distribution on energy justice.

### ***Sub question 3***

The third literature review, answering sub question 3, gathered information on the future of energy ownership and what this means for energy justice. Since no one can predict the future it was hard to find academic literature on this. It was possible though to look at the Dutch case study and examine what policies are being proposed and are likely to be implemented in the near-future regarding ownership on energy production and distribution. Sources utilized for this were 1 academic paper, 1 report (the Dutch Climate Agreement), 1 letter written by Minister Rob Jetten and 3 website pages of which 2 concerned the governmental website and 1 concerned the website of the Dutch Climate Agreement.

These literature reviews provide a theoretical foundation for the remaining research carried out in this thesis, further explained in the following section.

### **Phase 2: interviews**

The second part of the research relied on qualitative data gathered from semi-structured open-ended interviews with participants representing different forms of ownership in Dutch energy production and distribution. Participants considered relevant to the study were determined based on the ownership types found in the literature search, as each participant represented a certain form of ownership. In the literature search four main types of ownership structures were identified: private, public (including municipal), shared (typically between private parties and

cooperatives) and cooperative ownership (as a form of community energy). The study aimed to include at least one stakeholder per ownership form in both the heat sector and the electricity sector. A total of n=9 interviews were conducted. A list of participants: can be found in table 2.

Table 2. Overview of interviewees that participated in the research, each representing an ownership form in a certain sector.

Sector	Ownership form	Participant	Abbreviation
Electricity production	Private & shared	Pure Energie	P1
	Public/municipal	Anonymous	P2
	Cooperative	Amsterdam Energie	P3
	Cooperative & shared	Brummen Energie	P4
Electricity distribution	Public	Anonymous DSO	P5
Heat production & distribution	Private	Anonymous	P6
	Cooperative	VlieWaCo	P7
	Branche organisation (representing private & public)	Energie Nederland	P8
Electricity & heat sector	Umbrella organisation representing cooperatives	Energie Samen	P9

The reason these stakeholders were chosen is because they represent actors of the main ownership structures in the Netherlands. In the electricity production sector, stakeholders from all four types of ownership were willing to participate, in addition to one distribution system operator (DSO). All DSOs are publicly owned in the Netherlands so one DSO sufficed. In the heat production and distribution sector, three stakeholders were willing to cooperate. These represent private ownership, cooperative ownership and the branch organization ‘Energie Nederland’ which was able to give insights into different forms of ownership, although it should be noted that mostly private companies are members of the organization, possibly influencing answers to be more representative of private ownership. Finally, an umbrella organization for energy cooperatives ‘Energie Samen’ was interviewed as they could give insights into cooperative ownership for both the electricity sector and the heat sector.

The goal of the interviews was to verify and add to the information gathered in phase 1, providing new insights on different ownership forms, ultimately answering the main research question. Interviews were partly conducted face-to-face (n=3) and partly conducted online via MS teams (n=6). Information sheets and consent forms were given to each participant fulfilling privacy and consent requirements. Each interview was adjusted and fit to the participant involved and all interview guides are depicted in Appendix A. Interview questions were based on the information found in the literature reviews of phase 1.

The following data was gathered per sub-question:

### ***Sub question 1***

Participants were asked to provide information on what considerations should be taken into account for different ownership forms. This could be economically, legally, socially and technically. In this way different forms of ownership could be compared to one another in these realms.

### ***Sub-question 2***

Interview questions addressed the three core tenets of energy justice: distributional, procedural and recognition justice. To examine distributional justice, stakeholders were asked what they perceive to be positive and negative effects of their ownership form, possibly in comparison to other ownership structures, and specifically how these pros and cons are distributed. This included topics such as distribution of revenue, accessibility, affordability, investment risks and environmental concerns. To examine procedural justice, questions were asked on decision-making processes which included information on the quality, transparency and timing of information, who is participating, who is in control and who is represented. Finally, questions on recognition justice consisted of who or which groups are possibly excluded from access to participating in energy projects, who is not able to participate or is not represented in decision-making processes, and whether these views are recognized.

### ***Sub-question 3***

This part of the data collection requested participants to give insights into their expectations for the future of ownership in energy production and distribution in the Netherlands. Although participants of course cannot predict the future, they are experts in their fields meaning they were able to give relevant insights. The participants were asked how they expected their ownership form to develop in the future, given current trends. Additionally, participants were asked what they thought this would mean for energy justice and bringing about a just energy transition.

Overall, data from the literature reviews in combination with data from the interviews answers the main research question, providing an answer to what role ownership plays in ensuring a just transition in the Netherlands. The following section describes how the interviews were analysed.

## **3.2 Data analysis**

The data collected from the interviews were analysed via thematic analysis which is a flexible approach used for analysing qualitative data. This method identifies patterns (i.e. themes) in the collected data in a systematic way. This method of analysis is useful in participatory research, as is the case in this thesis. Additionally, it allows the researcher to summarize key points from a large amount of data, highlighting similarities and differences, very relevant to this thesis as it aims to examine such information of different ownership forms (Braun & Clarke, 2006).

In thematic analysis either an inductive thematic approach can be taken, in which themes are based on the found data, or a theoretic thematic approach can be taken, in which themes are driven by the researchers theoretic or analytic area of interest (Braun & Clarke, 2006). This thesis used both the theoretic – and inductive approach as themes were based on the sub

questions and areas of interest for the study (i.e. indicators concerning the three tenets of justice). But simultaneously this method allowed for new themes to be identified within the sub questions, based on interview answers, if these were deemed relevant for the research.

Table 3. Phases of thematic analysis (Braun & Clarke, 2006).

Phase	Description of the process
1. Familiarizing yourself with your data:	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.
2. Generating initial codes:	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes:	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes:	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5. Defining and naming themes:	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6. Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Thematic analysis consists of several key phases, which are summarized in table 3. Transcription of the data was done via the software TurboScribe, in which only several errors required edits by hand. These transcripts were then entered into the data analysis software NVivo to facilitate analysis. Initial codes were based on the three sub-questions of the thesis, splitting the data into three (level 1 codes). Within these codes, themes (level 2 codes) and sub-themes per sub question (level 3 codes) were determined. These themes were based on the topics touched upon in the interviews which were based on the literature review that was done, in line with the indicators of the analytical framework determining distributional, procedural and recognition justice (see figure 4). These themes and sub-themes were then reviewed, defined and named. Within these themes, ownership forms were compared amongst each other, highlighting similarities and differences. This led to answering the each sub question, providing insights particularly on the Dutch case study. Together with the literature reviews this resulted in answering the main research question, giving insights into what role ownership plays in ensuring a just energy transition in the Netherlands.

The results are organized per sub question in section 4, 5 and 6, each containing a literature review and thematic analysis of the interviews.

## 4. Results Sub Question 1 - What forms of ownership exist for different energy production and distribution infrastructure and why?

In this chapter, sub question 1 will be answered via a literature review in 4.1, and an interview analysis in section 4.2.

### 4.1 Literature Review

In this section the reader will become with different forms of ownership that occur in energy production and distribution. Section 4.1.1 starts with explaining the historic debate on public vs private ownership of energy utilities, also touching upon public-private partnerships. This debate is then put into perspective in the transition towards more renewable energy technologies and how public vs private actors tend to invest in such a transition. This then leads to discussing new forms of ownership that have emerged in the midst of the transition, namely, community owned energy. Finally, in section 4.1.2 the ownership structure of energy production and distribution specific to the Netherlands is explained.

#### **4.1.1 Ownership forms and their considerations**

##### *Public vs. private*

Historically, there have been debates in the energy sector whether energy production and distribution should be owned publicly (i.e. by the state) or privately (i.e. by companies) (Haney & Pollitt, 2013). Traditionally, energy utilities have been in hands of the public sector, but during the 1990s this started to change as the idea of liberalization started to gain momentum (Pepermans, 2019). Policy-makers' main goal of this was to provide electricity and gas in a more efficient way by establishing competition and regulating the market where needed, ultimately lowering prices (Pepermans, 2019). In the debate on public vs. private ownership, supporters of privatization claim privatization is a solution to budget constraints and a solution to state-owned firms with low performance (Andrews & Dowling, 1998). While critics perceive public ownership to be superior in managing public utilities since it poses a solution to market failure of private companies and also claims it is the governments duty to ensure that vital services are provided to people at an affordable cost (Grout, 2003).

In early economics literature there are four main theories on public ownership. The first theory is by Laffont & Tirole, (1993). The authors suggest that public ownership may have higher costs compared to private ownership. Additionally, they mention the lack of capital market monitoring, the fact that there are no strict budget constraints, no precise objectives, there is expropriation (i.e. the state taking property from its owner for public use) of investments, and finally that public ownership may be vulnerable to lobbying by parties with certain interests. However, a benefit of public ownership is the possibility of targeting social welfare instead of focusing on profit maximization. Also, in private firms there may be conflicting interests between stakeholders and regulators making public ownership better for solving the principal-agent problem. This can lead to appropriation of investments by managers in private companies (Laffont & Tirole, 1993).

In the second theory, Gilbert & Newbery, 1994) examine when public or private investment is more or less likely based on the regulator's actions. They conclude that private investment is more likely when demand is likely to be high, the cost advantage of the private monopolist is

expected to be higher and capital costs are expected to be lower. Public ownership is more likely when there are high discount rates, there is low social weight on profits and there is a higher possibility of low demand. That is because in this situation the regulator will set low regulated prices, potentially resulting in bankruptcy for the private monopolist or at least reducing its long-term incentives to invest.

The third strand of literature focuses on public-private partnerships (PPP) in which the main focus is finding a balance between public and private. Hart et al. (1997) conclude that only under few circumstances public ownership would be better than private ownership. These circumstances include when competition is low, and when consumer choice and reputation loss does not result in penalizing underperformance of a contract.

Finally, there is a strand of literature focusing on risk allocation issues. Appropriate risk sharing is required between the public and private sector. According to the World Bank's Risk Allocation and Sharing Tool Kit the economic -, financing -, construction -, operational - and commercial risks are better dealt with by the private sector, while political and legal risks are handled better by the public sector. Hence, PPPs can be as a solution to these issues (Haney & Pollitt, 2013).

It can be concluded that early economics literature implies three dimensions are important in public vs. private ownership: "capital market requirements, social welfare concerns and the relative importance of various risks" (Haney & Pollitt, 2013). Haney & Pollitt (2013) suggest that high capital costs can encourage public ownership. Additionally, public ownership is more beneficial when social welfare priorities are considered important. Finally, appropriate risk allocation can result in PPP, as private companies are better at handling e.g. construction risks while the long-term nature of certain projects makes it desirable for the public sector to also become involved. For energy networks specifically, Haney & Pollitt (2013) suggest that a high priority for consumer protection encourages public ownership. Also, a higher focus on energy efficiency and decreasing household consumption (i.e. social welfare) can shift towards public ownership, while lower capital investments can push towards private investments.

### ***Public vs private in renewable technology investment***

Steffen et al., (2022) describe how generally, amongst economists, private firms are considered more productive compared to state-owned firms. According to theoretical explanations managers of state-owned firms have to take into account complex goals which prevents them from making investments that increase productivity. Additionally, theoretical literature suggests that public managers have less incentive to invest in innovation since they would benefit less from success compared to private owners. Hence, by applying this theory of ownership to the electricity industry, it would be logical to hypothesize that private utilities would invest more in renewables compared to state-owned utilities. However, if the state has climate change as a high priority, this can direct state-owned utilities to advance climate policy and reduce greenhouse gas emissions (i.e. investing in renewables). Additionally, public ownership can direct investment decisions since it is often expected by citizens that state-owned utilities conform to social preferences at a higher level compared to private companies (Steffen et al., 2022b). Also, governments rely on regulation to influence behaviour of private companies. When this regulation is weak, state ownership is an effective tool for advancing environmental and climate goals. However, if the influence of the established industry is strong, enforcement

of these goals in state-owned utilities can be blocked (Hallward-Driemeier & Pritchett, 2015). This would result in lower renewable energy technology adoption.

Liberalisation in the EU at the end of the 1990s has led to a change in the ownership landscape in the natural gas and electricity sectors. Private and mixed ownership companies are now acting in the market together with state-owned firms (Di Pillo et al., 2020). Steffen et al., (2022) examine how ownership can influence adoption of renewable energy technologies. Results indicate that in the EU, state-owned utilities are more likely to invest in renewable energy. That is because ownership relates to the existence of pro-adoption policies and also to the ability of state enforcement. The study also shows that the stringency of climate policy strongly affects the share of utility investments in renewables, which is the case for both state-owned and private-owned enterprises, yet investments by state-owned utilities remain higher (Steffen et al., 2022). Investments in infrastructure, which historically have been done by primarily the public sector, are now being increasingly managed via public-private partnerships (PPPs) (Somma & Rubino, 2016). These mixed ownership companies benefit from the skills and resources private actors have, while ensuring the quality and price public authorities tend to aim for (Di Pillo et al., 2020). Di Pillo et al. (2020) research whether the type of ownership influences the companies tendency to invest, particularly looking at distribution companies. Decisions regarding investments of the energy distribution sector are vital for the energy transition since they can make energy networks smarter and more flexible. Ultimately, this can improve these networks' efficiency, safety and reliability. Di Pillo et al., (2020) conclude that mixed public-private ownership positively influence such infrastructural investment, meaning ownership matters.

Although public vs private considerations are important to consider, ownership in the energy sector is changing drastically. Haney & Pollitt (2013) highlight that the traditional debate of full state ownership vs. full private ownership is no longer relevant, emphasizing the need for a combination of the two along with other organizational models that are emerging. These forms of ownership are not easily characterized as public not private, but instead owned by citizens. This is referred to as community ownership and is discussed in greater detail in the following section.

### ***Community ownership***

Historically, energy systems in western countries have been dominated by large scale, centralized actors (Brisbois, 2019). Centralized, typically fossil-fuel based supply models, are vulnerable to price increases due to scarcity and geo-political tensions (Rae & Bradley, 2012). Currently, more and more decentralized actors are being integrated into these systems (Brisbois, 2019). These include primarily commercial renewable energy producers from the private sector, but also a growing number of community energy actors are entering the market, e.g. city, municipal, community and cooperative groups (Brisbois, 2019). Hence, a shift is occurring towards a more distributed energy landscape in which there is more locally produced-, stored- and consumed energy (Rae & Bradley, 2012). Such energy models have the potential to provide higher levels of energy security, and financial incentives provided by governments are promoting the uptake of renewable energy technologies by such organizations. This illustrates the desirability of such locally owned and managed energy in society (Rae & Bradley, 2012).

The need to tackle climate change and therefore the transition to a more sustainable society, has motivated citizens, individually and collectively, to invest and take ownership of renewables,

energy efficiency and other sustainable energy technologies (Roberts, 2020). This is termed 'community energy' which is not necessarily a new phenomenon. In the beginning of the 20<sup>th</sup> century many energy networks were owned and operated by local authorities and cooperatives (Holstenkamp, 2015). In the 1970s Danish local communities started to create wind projects, which was reproduced by Germany and the Netherlands in the 1980s (Roberts et al., 2014). Recently, community energy has gained increasing attention from EU policy as renewable energy integration into markets has negatively affected community energy projects, for instance via changes in support schemes resulting in community projects being forced out of the market (Commission EU, 2016). Simultaneously, the European Commission has acknowledged the importance of community energy in order to meet both national and EU climate change goals and wants to put citizens at the centre of the energy transition (Commission EU, 2016). In 2019 the Clean Energy for All Europeans Legislative package (CEP) was created aiming to support the EU's 2030 climate objectives. This legal framework requires member states to guarantee several rights of energy communities and also encourages the development of community energy (Roberts, 2020).

Community ownership requires the establishment of a legal entity for the purpose of determining agreements, responsibilities and activities carried out for the members of the entity. Such legal entities can be in the form of cooperatives, partnerships, companies with a community interest, community trusts or foundations, non-profit organizations, social enterprises and associations (Roberts, 2020).

Aims of community energy initiatives can range from generating revenue for local use, reducing greenhouse gas emissions, tackling socio-economic issues such as energy poverty, saving money on energy bills and advancing education (Roberts, 2020). Incentives for community ownership include local income and generation, local approval and planning permission, local control, lower energy costs and reliable supply, ethical and environmental commitments, and local management of networks (Walker, 2008b). Kunze & Becker (2015) show that new forms of social organization can help accelerate the transition towards more renewable forms of energy. The authors suggest that ownership and political motivation in renewable energy projects are key for transitioning to a more sustainable world. They state that the combination of collective ownership and decision-making with certain political motivations can stimulate 'degrowth' as they aim to save energy and integrate environmental practices into their projects. Often they practice self-sufficiency and democratic organisation (Kunze & Becker, 2015). Furthermore, local ownership can increase acceptance of for example wind energy projects (Enevoldsen & Sovacool, 2016), while ownership by multinational companies is believed to negatively influence acceptance (Szarka, 2007).

However, there are many complexities in community energy projects, forming several barriers to their development. Firstly, expert knowledge regarding legal conditions is required since this determines economic and technical feasibility. Additionally, this knowledge is important in the long-term in order to maintain these systems and have them operate in an efficient manner (Walker, 2008b). The lack of professionals in such projects makes it hard to navigate certain administrative procedures such as obtaining the required permits, licences and grid connections. This also makes it difficult to engage with financial institutions, DSOs and regulators (Roberts, 2020). Issues may arise around market entry and network connection as for example network operators may not connect smaller projects, and also refusal of planning permission by local authorities can be an issue (Walker, 2008b). Furthermore, the fact that community projects often



use democratic governance models makes this a slower process than if e.g. a private company would set up a project. Also, acquiring enough financial resources for taking full ownership is challenging. This in combination with the fact that communities may only want to develop a relatively small project compared to other larger market actors (i.e. meaning they do not benefit from economies of scale) makes it financially challenging. Due to this and the fact that alternative legal forms are used can make it hard to acquire favourable loans at lending institutions (Roberts, 2020). Finally, social acceptance is an important barrier to energy projects placed in communities (Mundaca et al., 2018). This lack of acceptance can often be linked to issues of fairness and equity (Wolsink, 2007).

According to the literature, municipal ownership of energy projects can fall under community-owned energy due to its local scale. It is argued that local governments have the potential to play an important role in community energy projects. Before privatisation in the energy sector, municipalities were responsible for providing public services such as heat and electricity. The need to decarbonize the energy sector has resulted in more municipalities in generating and providing these services again. This can be in the form of public utility companies, public-private partnerships or even public-public partnerships where different municipalities work together (e.g. in the form of a cooperative). Hence, municipalities can play an important leadership role in community energy, but it must remain community centred and be careful to not place profits above public interest. Finally, there must remain space available for other forms of local community ownership models to compete (Roberts et al., 2014). Important to note for the rest of this thesis is that municipal-owned energy production and/or distribution is considered to be public. This to prevent confusion with community energy projects developed by citizens and also because municipalities do remain a public institution.

### *Interim conclusion*

To conclude, for each type of ownership pros and cons exist. What is interesting to note is that the discussion on full private vs. full public ownership is not so relevant anymore as partnerships between these two parties offer various benefits, and also because new organizational ownership models have emerged and are gaining prominence. In recent years, the desire for more locally owned and managed energy has increased, meaning community owned energy via e.g. cooperatives is increasing, although community owned energy do face significant challenges for their integration and development. What the reader should take away from this section is that all forms of ownership can contribute to the energy transition in their own way, with new initiatives definitely helping. It is also evident that partnerships between public and private parties or between public parties can provide benefits. Finally, municipalities can play an important role in leading local energy transitions, with the possibility of owning energy projects themselves.

#### **4.1.2 Ownership in Dutch energy production & distribution**

In this section first the energy mix of the Netherlands will be discussed giving the reader a general indication of what energy sources are used in the electricity and the heating sector. Then the Dutch ownership structure of energy production and distribution will be explained in general and then per renewable electricity technology specifically.

### ***Energy mix of the Netherlands***

Since the 1960s the Netherlands has been using primarily natural gas for heating purposes, which is still the case in most households today (Huygen et al., 2019). In 2022 87% of households were heated with natural gas and 8.1% of households were free of natural gas, of which 5.8% were connected to a heat network and 2.3% were heated with electricity (Rijksdienst voor Ondernemend Nederland a, 2023). In 2022 around 400.000 households were connected to a heat network. The share of renewable sources used for producing heat was 37.9%, primarily existing of biomass, waste incineration and increasingly the use of heat pumps (Rijksdienst voor Ondernemend Nederland a, 2023). For electricity production in 2023 48% was produced from renewable sources, which is a 21% increase compared to the year before. The Netherlands' primary renewable energy sources are solar (37.1%), wind on land (30.5%), wind on sea (20.1%) , biomass (12.2%) and water power (0.12%) (CBS, 2024).

### ***Ownership structure energy production & distribution Netherlands***

Before the 1990s energy production and distribution were vertically integrated together and the energy utilities in charge of this were owned by municipalities. The 1989 Electricity Law changed this, making electricity production and distribution separate. This resulted in on the one hand distribution system operators (DSOs) which remained in public hands and on the other hand energy suppliers, which since left to the market, fell into the hands of commercial companies, eventually all being sold to large international companies (Verbong & Geels, 2007). Although full unbundling was only complete in 2007, in 2004 the demand-side of the Dutch energy market was also liberalized, meaning consumers were allowed to choose their energy provider. This meant a large number of new energy companies emerged, but also new players from civil society started to enter the market (e.g. cooperatives) (de Bakker et al., 2020).

Currently in the Netherlands there is still a clear distinction of ownership between the grid and commercial activities such as production, supply and trade (Akerboom & van Tulder, 2019). This is a strict legal separation. The grid network is owned and operated by several publicly-owned corporations (Akerboom & van Tulder, 2019). Gasunie Transport Services (GTS) is in charge of the gas network (*Hoe Zit Het Nederlandse Gasnetwerk in Elkaar? | Vattenfall Grootzakelijk*, n.d.). Tennet is the transmission system operator (TSO) for the high voltage transmission electricity grid, and seven distribution system operators (DSOs) distribute both gas and electricity to consumers on the low- and medium voltage transmission grid (Akerboom & van Tulder, 2019). Each DSO operates in an appointed area. Only in specific cases under strict terms a small, decentralized grid could be owned and operated by a private actor. This is referred to as a closed distribution system, and such an exemption can only be granted when the grid is small, provides less than 500 non-household consumers with energy, and is requested as a result of technical or safety issues related to a particular business or product (Akerboom & van Tulder, 2019). In terms of energy supply, this is for the largest part in hands of traditional commercial companies such as Green Choice, Budget Energie, Eneco, Oxxio, Vattenfall etc. who have private shareholders. However, the opening of the market in 2004 in combination with modernisation of the 1998 Electricity Act in 2010 allowing more experimentation with e.g. cooperatives, and the Dutch Climate Agreement supporting local co-ownership has started to change the playing field in ownership structures, allowing a more diverse set of actors to own energy supply and production (de Bakker et al., 2020).

For the heating industry, different ownership rules apply, as production, distribution and network operation are generally vertically integrated into one another (Vitéz & Lavrijssen, 2020). This means one entity takes on both roles as supplier, and network operator/distributor. Due to several characteristics, such as heat networks being prone to heat losses, the dependence on the location of the heat source and the fact these are often closed systems (i.e. connected to only one source of heat) the heat market consists of local, natural monopolies (Vitéz & Lavrijssen, 2020). The district heating market of the Netherlands was unregulated until 2014, after which a regulatory framework was established to limit maximum prices for consumers and to improve supply security (Herreras Martinez et al., 2023).

In the following paragraphs the ownership structure per source of renewable electricity production in the Netherlands is discussed, in addition to the ownership structure of heat networks. Water power is not discussed since this is such a small percentage of energy production.

### ***Solar***

The ownership structure of solar power takes on several forms. Of all electricity production from solar power 60% is owned by companies, in the form of for example solar parks, with the remaining 40% owned by small scale consumers (CBS, 2023).

According to the ‘Monitor Financiële Participatie’ in 2022 there were a total of 541 solar parks (in the non-built environment) of which 12% were owned by citizen collectives (e.g. cooperatives), 29% were owned publicly (municipalities, waterboards etc.), 40% were owned by local companies and 40% was not owned locally (private companies), with 4% of ownership unknown. Translated to the total solar energy production this consists of 4,1% owned by citizen collectives, 4,9% owned publicly, 11,2% owned by local companies and 79,4% owned non-locally, with 0,3% unknown (ASI - Search & Bosch & Van Rijn, 2023).

In 2022 the cooperative sector represents 2.4% of the capacity of large scale solar power (>15 kWp). These cooperative projects increasingly make use of solar that is not attached to buildings, but instead to land, water or other types of infrastructure (such as wind shields next to highways) (Rijksdienst voor Ondernemend Nederland b, 2023). Of all cooperatives in the Netherlands, 68% consist of collective solar projects, resulting in 272 MWp of collective solar capacity. This is equal to electricity of around 81.600 households and around 1-2% of the total solar capacity of the Netherlands. This solar energy is realized largely on roofs and on the ground, with a smaller percentage on water (*Collectieve Zonprojecten | HIER*, 2022).

Additionally, more and more households have solar panels, with 24% of houses in the Netherlands having solar panels (Rijksdienst voor Ondernemend Nederland b, 2023). In 2023 around 600.000 small consumers (< 15 kWp, mainly households) had solar power installed (Solar Magazine, 2024).

### ***Offshore wind***

There are a total of 10 active offshore wind farms in the Dutch part of the North Sea, which together have a total electricity capacity of 4,7 GW. These are all owned by large conventional energy companies such as Shell, Vattenfall and Eneco. Only one of these wind farms (wind farm Gemini) is partly owned by a public utility company, which is only 10% of the project (Rijksdienst voor Ondernemend Nederland, 2024). Dutch wind energy policy plays a role in

this as it aims for large-scale farms of at least 150 MW of installed capacity (Akerboom & van Tulder, 2019). This means owning offshore wind farms is more accessible and feasible for these kinds of large private companies.

### ***Onshore wind***

Onshore wind, on the other hand, sees a trend of cooperative ownership. This form of ownership entails citizens and businesses working together to realize and operate collectively owned wind turbines, which is in line with the Dutch Climate Agreement aiming for 50% local ownership of renewable energy on land. At the end of 2022 36.1% of wind production was owned by local parties, while in 2021 this was 32%. This is partly due to Windpark Zeewolde which is 100% owned by citizens and local farmers (ASI - Search & Bosch & Van Rijn, 2023).

According to the ‘Mintor Financiële Participatie’ there were a total of 142 onshore wind parks in 2022 of which 31% was owned by citizen collectives, 1% was owned publicly, 24% was owned by local companies and 36% was owned by non-local parties, with 8% unknown. This translates to 19,2% of onshore wind production owned by citizen collectives, 2,6% owned publicly, 14,2% owned by local companies and 63,4% owned by non-local parties, with 0,5% unknown (ASI - Search & Bosch & Van Rijn, 2023).

Of all energy cooperatives in the Netherlands, wind projects make up 12% of the cooperatives. This results in a total collective wind capacity of 315,6 MW on shore. This is equivalent to 1.010 million kWh of electricity per year, which would be able to provide electricity to 337.000 households. The total collective wind energy is 5% of the total wind capacity in the Netherlands. It is expected that the total cooperative wind capacity will increase to 380 MW between 2023 and 2025, with potentially another 104 MW by local initiatives (*Collectieve Windprojecten | HIER*, 2022).

### ***Biomass***

Energy from biomass is primarily produced via waste incineration (Rijksdienst voor Ondernemend Nederland a, 2023). Government-run facilities produce 35% of this energy, 30% is produced by private consumers used in households and the final share consists of biogas and biofuel production facilities owned by energy firms (Akerboom & van Tulder, 2019).

### ***Heat***

There are currently 18 large heat networks that provide 20 PJ of heat to end-users. Additionally, there are around 100 smaller heat networks providing roughly 2 PJ. This adds up to a total of 22 PJ of heat being delivered to households, buildings and greenhouses (Huygen et al., 2019). Of all district heating in the Netherlands only 10% is publicly owned and the remaining 90% is privately owned (Herreras Martinez et al., 2023). The three largest private companies are Vattenfall (a Swedish state-owned company but by Dutch law considered private), Eneco and Ennatuurlijk (Herreras Martinez et al., 2023). The largest publicly-owned companies consist of HVC and SVP, in hands of municipalities and/or provinces. Additionally, a few smaller municipality-owned heat companies exist, with even fewer owned by citizen cooperatives (Huygen et al., 2019).

A total of 78 cooperatives, which is around 11% of the total amount of cooperatives, are in the development phase of a heat project, with only three being operational in 2022. Of these

cooperatives heat networks are the most common type of project with aqua thermal energy being the most common source of energy (*Collectieve Warmte* | *HIER*, 2022).

### ***Interim conclusion***

To conclude, the Netherlands went from a municipal based energy system (publicly organized) to one characterized by mainly large-scale private companies owned by foreign investors. Over the last few decades a more diverse set of actors has entered the market particularly for solar and onshore wind, seeing more locally (co-) owned projects. Yet, for offshore wind ownership remains (almost) fully in private hands, similar to heat. It is interesting so see how ownership is changing at different rates in different technologies.

## 4.2 Results Interviews

To answer research question 1 participants were asked what the goal of the ownership form they represent is and which considerations are important to take into account for different ownership forms (private, public, shared and cooperative) in Dutch energy production and distribution. The results are discussed according to the themes found from the thematic analysis. These include sustainability -, spatial -, legal -, financial -, technical -, scale - and social aspects. The results are presented in this manner so the different ownership forms can be compared amongst one another. Hence, it will become clear what is important to consider for different ownership forms in energy production and distribution. In table 4 a summary of the findings is presented.

Table .4. Summary of findings RQ1 highlighting the differences between ownership forms in energy production and distribution.

	<b>Private</b>	<b>Public</b>	<b>Shared</b>	<b>Cooperative</b>
<b>Sustainability</b>	Use GoO.			Do not use GoO.
<b>Spatial</b>	Easier to enter the market.		Cooperation with land owners very important.	Geographically limited.
<b>Legal</b>	Easier to enter the market.	Face difficulties with rules & regulations		Face difficulties with rules & regulations.
<b>Financial</b>	Have more capital.	Are limited to capital from other public parties.	Solution for increasing capital .	Face difficulties in acquiring funds.
<b>Technical</b>	Have more knowledge & experience.	In some cases new to market so less knowledge & experience.	Solution for increasing knowledge.	In most cases new to market so less knowledge & experience.
<b>Scale</b>	Larger scale has an advantage. But smaller scale companies can more easily foster local needs of society.			Small scale means cooperatives are slower. Based on volunteers but becoming more professional.
<b>Social</b>	Participation processes help increase acceptance. Social responsibility is questionable.	Public values aim for security of supply, affordability an sustainability. But could merely be an ideological idea.	Working together with local parties help increase acceptance.	Community feeling.

All forms of ownership aim for improving sustainability by producing renewable energy. However, according to P3 what sets cooperatives apart, from particularly private companies, is the fact that cooperatives do not “tamper” with Guarantees of Origin (GoO). GoO are tradable energy certificates informing consumers that a given share of energy is produced from renewable sources (Hamburger, 2019). This is not “actual green” energy since with these GoO’s you can still emit CO<sub>2</sub> while purchasing renewable rights from elsewhere, whereas cooperatives do actually produce sustainably (P3). Another difference several participants mentioned is that when citizens are more involved in their energy production, such as in a cooperative, this may lead to behaviour changes, which may reduce their energy use (P3, P9).

Spatially, all forms of ownership have to deal with the same rules and regulations. This starts with spatial planning in which it is determined by the government and provinces where projects are allowed to be located. Depending on this planning developers ask for permission to develop a project. In this process it does not matter (for the province) who is taking initiative to develop the project (i.e. whether this is a private company, public company or a cooperative) (P1, P8, P2). Since this is left to the market it can be difficult for municipalities or energy cooperatives to enter this market (P2). Moreover, energy cooperatives are typically “geographically quite limited” as neighbourhoods taking part in these initiatives are dependent on their location (P1, P9). Hence, cooperation with land owners is very important, often leading to shared ownership of energy projects (P2, P4).

All forms of ownership operate in the same legal framework and have to take the same steps to develop e.g. a heat network (P6). However, cooperatives, often run fully by volunteers, encounter difficulties with certain rules and regulations (P9). Hence, Energie Samen (P9) as interest group for energy cooperatives, is trying to ease these rules and regulations to make it easier for cooperatives to enter the market. The public sector may also encounter challenges in this domain. P2 mentioned facing many challenges relating to law, market and government when developing their municipal solar park, as they are carrying out activities normally left to private companies. Examples include having to consider the European Public Procurement Law meaning all works, goods and services have to be purchased from Europe. Additionally, the sustainability reserve set up for citizens (such a reserve is often set up by cooperatives) with revenue from the solar park was not allowed to just lend money to citizens because municipalities are not allowed to directly lend to citizens. Hence, they had to find an alternative way for this, while also figuring out a way to subsidize lower-income households without indirectly subsidizing housing associations (P2).

Financially, energy projects within each form of ownership must acquire the necessary funds and have “a cost-effective business case” (P1). For volunteers in cooperatives it can be very complicated to grasp the financial component of the project. For example in the case of P7 the SDE subsidy from the government was supposed to repay the loan granted by the municipality. However, since the gas prices were so high, and this is coupled with the heat prices, the cooperative did not receive the SDE subsidy anymore. This means that the cooperative cannot repay their debt. P7 explains that “the amounts of money are so high, and in the end we are just volunteers. We have no idea where to get the money from”. Additionally, P7 emphasizes the fact that a lot of money is available for setting up projects but not for the exploitation phase. Since it can be so hard to acquire funds, Energie Samen has a funding department to help out starting cooperatives (P9). Shared ownership is also a solution for acquiring sufficient funds. As P2 exemplifies “[for wind] you need a party to take on the role of providing capital”. Other

forms of cooperation are also possible if e.g. large local companies would like to use the produced energy themselves (P2). For public parties, what is important to note, is that they are only allowed to acquire capital from parties that are also public, which is also the case for Dutch DSO's. P5 states "that makes it hard, it's not like municipalities, provinces and the government have money to spare. This limits the possibility to acquire capital", indicating issues for electricity distribution.

Technically, it is agreed upon by multiple participants that private parties in energy production have built a lot of knowledge and experience compared to other parties that are more newly entering the market (P6, P1, P7). This is particularly made use of in shared ownership of energy projects (P4). An illustration of the fact that certain parties struggle to develop and exploit energy projects is the fact that some public heat companies (e.g. Warmtenet Hengelo & Warmtebedrijf Rotterdam) have been sold to private companies since "they could not handle it themselves" (P6). For the heat cooperative VlieWaCo there were also a lot of technical difficulties with getting the project to run, as P7 explains "it is so difficult to be pioneering as volunteers. I'm glad I have some men with technical knowledge in our board. And with some general knowledge you can get somewhere".

Another theme that emerged from the interviews was scale. For private companies of course their large scale works in their advantage (P7). Within private companies, P1 states that it is easier for them to work together with local parties because they are "small, flexible and have a flat organisation structure". This means they can play into society's needs in a more flexible and faster way compared to larger energy companies (P1), indicating scale matters within private ownership as well, instead of just compared to other ownership forms. In general cooperatives are still quite small-scale, with some exceptions in the wind sector, but that's still not comparable to large energy companies (P3). This makes cooperatives a bit slower and makes it harder financially, so "the scale is problematic but that's because we're quite new" (P3). P7 emphasizes that she "would have preferred to see more responsibility with the municipality with professional parties". She goes on to explain that "I would for example like to stop. I don't really like it and I'm super busy, but it's not like the rest of the neighbourhood wants to take over. So fine, I'll do it.[...]. It's not a priority, it's not my real job". However, the cooperative sector are slowly becoming more and more professional by working together with each other and with municipalities (P3, P4, P9). For example Brummen Energie has their first professional director (P4) and there are also two cooperative energy suppliers helping take stress of cooperatives that produce energy (P9). It is important that "when the cooperative sector becomes larger, they become professional organizations with paid employees, but not organizations that make profits or have shareholders" because then they will start looking like private companies (P9).

Participants representing all forms of ownership agree that a social approach, i.e. taking into account inhabitants and the surroundings, is essential for the acceptance of these projects (P1, P4, P8, P9). In projects with shared ownership, participation processes and working together with local parties (e.g. cooperatives) allow for projects to be supported (P1, P4). When citizens (partly) own their energy production and distribution, it also helps the "community spirit" (P4). Similarly, P3 state that cooperatives are a "human-oriented entrepreneurial form" where "it's about the feeling". Contrastingly, a private company aims for profit and "one may question whether the shareholders act in social responsibility" (P4). P7 explains how doing things together fits well in their hometown and "an energy giant" does not fit there. Previously,



Vattenfall had provided the neighbourhood with heat (via gas) for around 15 years but it was not profitable so they wanted to stop supplying there (P7). Hence, the neighbourhood found a way to do it themselves. For public ownership, three points of interest are important: security of supply, affordability and sustainability (P5). From the public perspective it is important for crucial infrastructure such as the electricity network to be in public hands so that the three public interests are met and that “an additional dimension” can be given to these three points (P5). However, according to P8 the difference between public and private in these three matters is not relevant and states “there is no evidence these points get better in public ownership”. According to P8 it is an “ideological idea” that it would be better for the acceptance of energy production and distribution. Instead, “acceptance is mostly whether people believe if this is the right solution for them, with acceptable pricing” (P8).

### *Interim conclusion*

To conclude, different forms of ownership face different challenges in the Netherlands. Most of the findings of the interviews are in line with the literature found in section 4.1. What is important to realize is that all ownership forms operate within the same landscape meaning they have to take the same legal steps, they have to conform to the same regulations, they face the same costs, and they all have to take into account surrounding areas and neighbourhoods. Yet within all these similarities, there are still some major differences. Private parties seem to benefit most spatially, legally, financially, technically and with their scale, while predominantly they struggle in the social realm, in which their social responsibility may be questionable. Public (or municipal) companies face difficulties legally, financially and technically, which is it interesting to see as just decades ago all energy production and distribution was completely in hands of municipalities. Where public entities stand out is in the social dimension since the three core public values (security, affordability and sustainability) are important aims. Cooperative ownership face many difficulties legally, financially and technically and also their scale is problematic, in addition to their dependence on volunteers. Where public and cooperative ownership can struggle in the financial and technical departments, shared ownership can pose as a solution due to the cooperation with private parties. While where private parties struggle in the social realm, shared ownership can also solve this issue. The main strength of cooperatives is enhancing communities’ sense of feeling. Two findings in cooperative ownership was not found in the literature. The first is the fact that cooperatives are geographically limited to their neighbourhood, where e.g. a private company may have more options. This can potentially also be applied to public ownership where municipalities may be confined to their municipal area or province. The second is the fact that cooperatives do not use GoO’s and therefore are actually more sustainable compared to private companies that do use such certificates. This is an interesting point to take into consideration in ownership literature.

These results illustrate that private parties, known to the current market, have it easier compared to the other ownership forms who face more difficulties. Shared ownership between public or cooperative and private parties can solve some issues that public or cooperative ownership forms face. Still it is clear that it must be made easier for public and cooperative parties to exist and develop.

## 5. Results Sub Question 2 - How do different forms of ownership affect energy justice?

In this chapter sub question 2 will be answered via a literature review in 5.1 and an interview analysis in 5.2.

### 5.1 Results Literature Review

This literature review will examine how different ownership forms in energy production and distribution affect energy justice. This section is split into private ownership, shared ownership (between private developers and cooperatives), and community energy, which is in accordance with the available literature. Per ownership form, depending on what is highlighted in the literature, distributional, procedural and recognition justice are discussed, in line with the three core tenets of energy justice.

#### *Private ownership*

First, the effect of private ownership on energy justice is discussed. Currently, renewable energy projects are still primarily owned by large-scale commercial companies (Rand & Hoen, 2017). In the literature, research regarding private development of renewable energy, issues of justice are focused largely on wind projects (Baxter et al., 2020; Rand & Hoen, 2017; Kerr et al., 2017). This is particularly the case for onshore wind projects, which impacts the ‘backyard’ of communities (Rand & Hoen, 2017). This leads to questions of perceived justice in local communities, which also influences acceptance of such energy projects in or near communities (Rand & Hoen, 2017).

There are several distributional justice considerations to take into account regarding wind farm developments, affecting how positive and negative effects are distributed amongst people or places. Firstly, the siting near communities affects those communities disproportionately compared to those further away. These communities face issues such as noise annoyance (Hübner et al., 2019), shadow flicker (Peri et al., 2020), local economic impacts (Ek & Matti, 2015) and ecological impacts (Vuichard et al., 2022). Consequently, policy makers and private developers have offered different kinds of financial benefits to community members in order to increase local acceptance (Kerr et al., 2017; Bidwell, 2016). Such distributive compensation mechanisms consist of community benefit funds, near-neighbour payments and the possibility of citizen investment (le Maitre et al., 2023). However, tackling non-financial issues is also important to improve the perceived fairness of outcomes (le Maitre et al., 2023).

Procedural justice considerations to consider in private development of wind projects include the quality of information given to community members, the degree of transparency in processes, the confidence level community members have in developers, representation of stakeholders and citizen control (Bidwell, 2016). Processes supporting citizen participation are also vital for perceived fairness and acceptance (le Maitre et al., 2023). This is particularly important in early stages of project development, giving people the opportunity to voice their concerns before a project is already set in stone. If consultation happens after a project is announced this can increase perceived unfairness and can trigger opposition (Wolsink, 2007). In theory citizen participation is more democratic and can result in desired outcomes (Bidwell, 2016). However, citizen participation in private energy projects is often limited (Kerr et al., 2017). Additionally, power differences may prevent community members from influencing

decisions made around such privately owned projects and prevent them from helping e.g. shape financial benefits (Kerr et al., 2017).

A factor that can impact perceived procedural and distributional justice is the scale of a wind farm project (Baxter et al., 2020). Some studies state that projects owned by large corporations were accepted at lower levels compared to semi-state or locally-owned projects (Brennan & van Rensburg, 2020); (Walker & Baxter, 2017). That is because locally-owned projects typically are smaller-scale and have a wider set of communitarian motivations compared to private projects that aim for profit (Walker & Devine-Wright, 2008). Although private companies aim to provide large-scale, affordable renewable energy, providing financial benefits, it does result in less citizen participation in energy (co-)ownership. Private companies are forced to maintain a competitive advantage in energy auctions and do not want to risk losing this by involving citizens, reducing citizen influence in commercial wind projects (Grashof, 2019; Bidwell, 2016). At minimum, le Maitre et al. (2023) suggest private developers to incorporate one-on-one consultation and town hall meetings to engage the community.

For private developers it will likely be necessary to go to greater lengths compared to local or semi-state owners to get the community on board. Joint ventures and co-investment can be considered as options (le Maitre et al., 2023). Co-production prioritizing citizen involvement is crucial for increasing justice and acceptance (Wolsink, 2018). Hence, in the next section shared ownership between private developers and local communities is discussed.

### ***Shared ownership***

In several European countries companies are being encouraged to share ownership of renewable energy projects with local communities. Shared ownership assumes that these actors share the same goals and can effectively collaborate Goedkoop & Devine-Wright (2016) Goedkoop & Devine-Wright (2016) indicate strong support for this form of ownership by both developers and community members, but also identify important challenges relating to trust and justice. These challenges include a lack of trust, in which developers voiced being sceptical in capabilities and representativeness of community actors; and community actors seeing developers as profit-seeking and merely using communities for planning consent Goedkoop & Devine-Wright (2016). These negative expectations of each other can lead to a decrease in willingness for actors to take part in collaborations such as shared ownership, creating a negative feedback loop as described by (Walker et al., 2010).

Hence, for shared ownership to be successful, trust and justice are essential (Goedkoop & Devine-Wright, 2016). These two concepts are interlinked as judgements of fairness can lead to trust, and trust can in turn improve perceived fairness (Huijts et al., 2012). The two pillars of energy justice that are specifically important with regards to shared ownership are procedural justice and distributional justice (Huijts et al., 2012). Procedural justice concerns how fair a decision-making process is perceived to be and relates to the participation of different actors. In shared ownership structures, the ability to participate allows citizens currently excluded from political and economic processes (e.g. in private energy projects) to be included in the future. In shared ownership procedural justice issues consist of timing (i.e. what stage of development the project is in when developers and community actors start their collaboration), transparency (degree of information shared with community actors in a developer-led project), and equity (whether community actors are able to have an effective partnership role in terms of resources,

taking part in the decision-making process and having a stake in the project between 5 and 25%).

Distributional justice concerns how costs, risks and benefits are perceived to be distributed between different actors. In shared ownership, this can be between developers and communities but also within communities which can result in tensions in the community (Aitken, 2010). Other distributional justice issues include the ratio of community-developer ownership and what rules exist on the shared purchase. The latter can for example include what the share price is, whether local residents receive more favourable conditions compared to people outside of the local community and whether local residents that do not purchase energy from the project receive some form of compensation (Goedkoop & Devine-Wright, 2016). The spatial boundaries as to whom financial benefits should concern and how this should be spent will likely spark debate regarding the fairest distribution of benefits (Devine-Wright & Sherry-Brennan, 2019).

Several issues of recognition justice have also been highlighted in the literature. First of all, representatives involved in such an ownership structure may lead to only certain interests being pursued, instead of wider community interests (Boyle et al., 2021). Additionally, shared ownership requires effort, skills and time from volunteers, especially if volunteers do aim to take into account wider community interests (Devine-Wright & Sherry-Brennan, 2019). This could be perceived as unfair in itself and also risks not giving everyone the opportunity to be included (Devine-Wright & Sherry-Brennan, 2019).

In comparison to private energy projects, local (co-)ownership is perceived as a good option to improve procedural and distributional justice (Munday et al., 2011; le Maitre et al., 2023). However, issues of procedural, distributional and recognition justice need to be taken into account when judging its fairness and equity.

### ***Community ownership***

Many studies advocate that community energy projects have a high likelihoods of procedural and distributional justice (Baxter et al., 2020). That is because in these community based models local populations either lead or own projects, while also receiving most of the financial benefits (Baxter et al., 2020). This higher level of perceived procedural and distributional justice is linked to higher levels of acceptance of energy projects in local communities (Baxter et al., 2020). This is particularly the case when projects are developed from within trusted networks advocating for local public benefits, which reduces the possibility people opposing due to 'fairness' issues. Several studies indicate that local ownership and/or participation in planning processes increase support for renewable energy and may even lead to higher deployment rates (Berka & Creamer, 2018). However, generally researchers tend to assume, rather than demonstrate that community energy projects are more democratic or just (Van Veelen, 2018). Van Bommel & Höffken (2021) state that "despite, or maybe because of this tendency" there is growing academic literature exploring the relation between community energy projects and energy justice.

Community owned energy projects are suggested to be more procedurally just, as this form of ownership scores highest on the ladder of citizen participation, which is citizen control. This means that communities are able to decide the location and size of the project, in addition to what costs and benefits they deem acceptable.(Walker & Devine-Wright, 2008). Community

energy projects are often associated with the concept of 'energy democracy'. Energy justice and energy democracy are relatively similar terms, in which they both seek a just and ethically informed energy policy. Hence, they mostly overlap in the aspect of procedural justice, where in energy justice the procedural pillar focusses on the moral implications of collective energy decisions and energy democracy concentrates on political implications (Szulecki, 2018). In addition to focusing on procedural aspects of participation, energy democracy also deals with issues of inclusion and outcomes (Wahlund & Palm, 2022). In Szulecki (2018) energy democracy is conceptualized as "an analytical and decision-making tool, defined along three dimensions: popular sovereignty, participatory governance and civic ownership." The first dimension consists of citizens as recipients of energy policy, citizens as stakeholders (i.e. producers and consumers) and citizens as accountholders. The second dimension involves inclusiveness, transparency, access to information and energy education/awareness. The third dimension comprises of civic ownership of power generation and civic ownership of transmission/distribution infrastructure (Szulecki, 2018). Hence, community ownership is considered as an appropriate way to enhance energy democracy and therefore to improve procedural justice. This is done via active participation in decision-making. However, there is often an assumption that community energy projects are more democratic or just, merely because of their local scale (Catney et al., 2014), while this is not always the case. Additionally, it may be assumed that community organizations are willing and able to act in a democratic way, while in practice this is also not necessarily true (Van Veelen, 2018).

Distributional justice concerns how positive and negative effects are distributed. As in any energy project placed in or near a local community, community-owned energy projects can on the one hand have negative effects such as noise annoyance, shadow flicker, ecological impacts, risk of local economic impacts (le Maitre et al., 2023). However, on the other hand community owned projects may also offer benefits such as financial benefits (e.g. employment opportunities, improved tourism facilities), environmental benefits (e.g. energy saving) and social and cultural benefits (e.g. community feeling/closeness) (van Bommel & Höffken, 2021). Community owned projects may particularly offer high financial benefits as all profits go directly or indirectly to communities (McHarg, 2016) and efforts can be made to distribute this in an equitable way (Cointe, 2019). Additionally, several studies claim that these kinds of projects can increase access to affordable energy, particularly in remote locations and when alternative fuels are expensive (van der Horst, 2008).

However, the way that these positive and negative effects of community energy projects are distributed amongst communities and between communities is not always equitable or just. Catney et al. (2014) argue that "localism" does not automatically mean there is greater social justice. Although community energy initiatives vouch for "empowerment" and "freedom" they seem to neglect social justice aspects. Catney et al. (2014) state that distributional justice is not taken into account and that there is lack of recognition of marginalized groups who are not easily able to take advantage of such local initiatives due to funding structures. Instead funding may only benefit well-organized and professional groups, leaving groups with limited capacities with nothing. Hence, communities with greater wealth tend to dominate funding while poorer communities may suffer increasingly from residualisation (North, 2011). In line with this, Johnson & Hall, (2014) state that distributional equity challenges in distributed civic energy systems are for a large part centred around finance and accessibility. It is important to take into account who is able to participate in such community energy projects, as individuals must have the financial capacity to invest, possibly excluding certain socio-economic groups.

In marginalized communities, if people even wanted to participate in community energy initiatives, time, lack of money and the fact people do not own their own dwellings can be barriers to becoming involved in such initiatives. Walker (2008a) explains that low-income households depend on their landlord for their access to energy, limiting their choice. Additionally, people living in poverty may not be concerned with reducing carbon emissions or partaking in such schemes as they have other worries on their minds (Catney et al., 2014). Hence, it must be considered who is benefiting from community energy, how can business models and financial structures become more inclusive, providing opportunities to all income groups (Johnson & Hall, 2014).

There are solutions emerging though, trying to include lower-income groups and allow them to benefit from community projects as well. For example, community organizations may help pay for upfront capital costs of projects on behalf of energy poor citizens (Walker, 2008a). They may also use more innovative financing mechanisms to prevent high upfront costs for citizens. Additionally, projects developed to a certain level may start to acquire and reinvest revenue into efficiency measures or other microgeneration projects, improving access to affordable energy (Berka & Creamer, 2018). Finally, central and local governments are key in ensuring social justice in these developments Catney et al. (2014).

In community owned energy projects recognition justice concerns who may be excluded from access to or participation in such projects. In Berka & Creamer (2018) community empowerment is mentioned as an outcome of community owned energy. Full or co-ownership of renewable energy production is seen as intrinsically empowering for communities (Slee, 2015). However, it has been found that community energy initiatives typically involve well-educated males with high socio-economic status who already may participate in certain groups and organizations (Radtke, 2014). Hence, this suggests that previously powerless individuals that may be empowered via community energy is only the case for a small portion of society (Berka & Creamer, 2018). If community energy projects are more accessible to individuals with higher education levels, such projects may even increase inequality gaps (Johnson & Hall, 2014). Moreover, individual empowerment does not necessarily lead to community empowerment (Skerratt & Steiner, 2013). Hence, not always all groups of a community may be represented and included in a community energy project, implying a lack of recognition of certain community members.

Wahlund & Palm (2022) identify a lack of research focusing on representational democracy in community ownership. Also, in the literature on community-owned energy, there is a lack of focus on community-owned district heat networks and community-owned microgrids (Berka & Creamer, 2018). Finally, research on citizen participation is biased towards decentralized energy systems, meaning a lack of research on participation in centralized systems. This is a missed opportunity to enhance democratic mechanisms in such systems, which currently still have the upper hand and for the near-future will continue to exist (e.g. transmission grids) (Wahlund & Palm, 2022)

### ***Interim conclusion***

In summary, privately owned energy companies use compensation mechanisms to overcome negative effects felt by communities to improve distributional justice and aim for higher levels of procedural justice by increasing citizen participation. This in theory could lead to more democratic processes and result in desired outcomes. However, power differences influence

whether this is actually the case. Private developers must go to greater lengths for their projects to be accepted and for increasing justice. Shared ownership is a way citizens currently excluded from participation in decisions can partake. Whether community members have a meaningful and effective take partnership role, is particularly important for justice in this ownership form. The ratio of ownership between the two parties is important for the a fair distribution of benefits. Recognition justice issues arise as only certain community members may be represented and since community inclusion is on voluntary basis not everyone will have the opportunity to be included (e.g. time constraints). Community owned energy production and distribution can improve energy democracy via active participation in decision making. It can also provide financial, environmental, social and cultural benefits, improving distributional justice. However, lack of recognition of marginalized groups may only benefit certain groups and not all community members may be represented.

From this it can be concluded that by including community members in shared ownership structures, distributional and procedural justice are already increased, but only under conditions considered as fair for each party. In theory community owned energy would be best for distributional and procedural justice, however in practice several issues come up that are considered unfair in these 'more ideal' forms of ownership. These are primarily issues of recognition justice, but also play into distributional and procedural dimensions. Hence, it is vital that all groups in communities have sufficient access to participating (financially) and are represented in decision-making. Justice in community-owned projects can only be achieved when all groups of society are empowered and views of all groups are recognized. Ideal ambitions in community energy do not automatically result in energy justice. Therefore, solutions for incorporating recognition justice are of significant importance.

## 5.2 Results Interviews

To answer research question 2 participants were asked questions on distributional, procedural and recognition justice in relation to the ownership form they represented in Dutch energy production and distribution. The results are discussed according to these three tenets of energy justice, which in the analysis are the main themes, with several sub-themes within these forms of justice. The results are presented in this manner so the different ownership forms can be compared amongst one another per (sub-)theme. Hence, it will become clear how different forms of ownership effect energy justice issues.

### *Distributional justice*

The sub-themes found in the analysis of the interviews relating to distributional justice consist of: distribution of revenues, accessibility, affordability, distribution of investment & risks, and distribution of visual-, noise & environmental impacts. In table 5 a summary of the findings is presented.

Table 5. Summary of findings highlighting the differences in distributional justice between different forms of ownership.

	<b>Private</b>	<b>Public</b>	<b>Shared</b>	<b>Cooperative</b>
<b>Distribution of revenue</b>	(Foreign) shareholders, unclear how profits are used. Smaller more local companies may set up a local fund.	Public shareholders, reinvest in society. A sustainability reserve may be set up.	Revenue is split equally. A local fund may be set up. People that invest have financial benefit.	Members decide where revenues go, which is often new projects. People that invest have financial benefit.
<b>Accessibility</b>	Aim to provide as many people as possible with their service.	Aim to include lower-income groups, via reserve or fund.	Financial participation not always accessible.	Everyone can become a member. Financial participation not always accessible. Aim to include lower-income groups. Sector working towards local energy use.
<b>Affordability</b>	Scale may be beneficial to affordability.	Pricing may be kept artificially low via subsidies, but this money must come from somewhere.		Hope to increase awareness around energy use leading to lower energy bills.
<b>Distribution of risks</b>	Heat legislation regarding ownership is	Public parties in monopolistic positions e.g.	Risks are (partly) shifted to citizens. Risk	Risks are (partly) shifted to citizens. Risk



	uncertain making private parties hesitant to invest. Private parties may give out shares as alternative investment model.	heat companies or DSOs may be hesitant to invest	is reduced by allowing people to invest when risk is lowest. Risks are divided evenly between two parties. Cooperatives must decide when wise to enter partnerships.	is reduced by allowing people to invest when risk is lowest. For heat risk is highest often resulting in collaborations with municipalities.
<b>Distribution of visual -, noise, and environmental impacts</b>			When people (co-)own a project their resistance may decline.	When people (co-)own a project their resistance may decline. Cooperatives probably take into account the local environment more.

The distribution of revenue differs per ownership form. In private ownership structures, profits go to the shareholders (P3, P6). For large energy companies these are often foreign shareholders (P3) (e.g. Eneco has Mitsubishi and Chubu as shareholders) and it is often unclear how these profits are used (P9). In general, these profits are not returned locally, as P4 exemplifies “Vattenfall, nice people, but they are not philanthropists”. P8 questions why it should matter if profits go abroad, as this is also the case for so many other products we use, “why would that then not be okay for energy?”. It should matter who is helping the energy transition, not whether some types of companies are making more money and where it goes (P8). In public ownership the structure can be similar to private as there may be shareholders receiving profits (P5). However, since shareholders are public as well, the profits are reinvested in society or used for other public services, as is the case with e.g. Dutch DSO’s (P5). Public parties may also put their profits in e.g. a sustainability reserve, which a municipal solar park does with special attention to lower-income households, keeping the benefits as local as possible (P2). Furthermore, a local fund (omgevingsfonds) can be created, this is used in all ownership forms (P2, P1). E.g. P1, representing, a relatively small private company that also has many shared ownership projects, often creates such funds, in which locals determine where the money goes (P1). In shared projects such a local fund is financed equally by both parties (P1), similar to how all project revenues are shared equally or relative to the share each party owns (which is mostly 50%-50%) (P1, P4). An example given by P4 of how shared projects can benefit the local community is when a horse riding association with an asbestos roof, received a new roof with solar panels, and once the solar panels are paid off they will also own the panels, “that’s a win-win situation” (P4). People may also benefit financially if they choose to invest in e.g. a solar panel and then receive returns on that, which is a direct benefit of a cooperative being

involved (P3, P4, P9). For cooperatives, members decide themselves where project revenues go (P3, P7). This is often invested in new projects (P3). What sets cooperatives apart from the other ownership forms is that they do not aim for profits and if they do make profit this is reinvested locally to benefit the community (P3, P7, P9).

The second sub-theme is accessibility, specifically the degree of accessibility for people to participate in the energy transition and the benefits they may receive from this accessibility. Representatives from each ownership form agree that the energy transition should be accessible to everyone (P6, P3, P4, P3). A private company may do this by trying to connect as many people as possible to their (sustainable) heat networks (P6). While more community-oriented ownership forms go much further by giving people the opportunity to become members for either a small amount of money (e.g. 25 euros) or only 1 euro to make it as accessible and inclusive as possible (P4, P9). Public parties and cooperatives pay special attention to inclusion of lower-income groups (P3, P4, P3). However, in cooperatives and shared ownership when it comes to financial participation this is not accessible to everyone as “the disadvantage of participating financially is that you need money. In the co-owner role that is a market condition” (P1). In order to increase accessibility some cooperatives set a maximum to the amount of money someone can invest, so more people can participate (P4). P3 explains how they use money from a fund to partly finance e.g. solar panels making it much cheaper for people to participate, who normally would not be able to afford the panels (e.g. 50 euros instead of 400 euros for 1 panel). The only thing that people then still need to pay is the rent, which is lower than the returns, giving more people the opportunity to participate and also giving people a financial benefit (P3). The cooperative sector is working towards actually using the energy locally in which citizens with less money still get to use a part of the produced energy, which is an initiative called local4local (P9). It is vital here that agreements are made in distributing the energy in a fair way, “you don’t want people with most money receiving all the energy, then it will be very unfair” and it will become “a rich people thing” (P9). A challenge that cooperatives face is the fact that housing associations do not want to work together with them, denying tenants (who are often lower-income groups) the opportunity to have solar panels on their rooftops. “[The housing associations] are often approached by energy-cowboys making the [tenants] worse off” (P3). The only other option for them is to develop a large collective roof elsewhere, but this is “of course a shame” (P3).

The third theme is affordability of energy production and distribution for consumers. For renewable energy in general the cost price is stable and low, however, due to the market system different prices are coupled together making the price consumers pay dependent on this market, this is the same throughout different ownership forms (P1). Also, the Dutch market is regulated by the ACM, which is particularly relevant for heat companies and DSOs since these entities both have a monopolistic position (P6, P5, P8). This results in maximum prices and monitoring of revenues, but for this it doesn’t matter who is owner (P6, P5). Naturally, every form of ownership aims for cheap and affordable pricing (P1, P6, P3). However, one may argue that the reasons for keeping the prices low differ (P6). What P6 mentions is the fact that if prices are kept “artificially low [by public institutions] [...] someone has to pay the bill] because costs etc are the same for each type of party. “For us as private party it is also essential energy is affordable” (P6). For DSOs specifically, the diversity of users connected to the grid, as a result of the energy transition, means some people are using the grid much more than others (with e.g. an electric car) (P5). So it would be fair to have people pay more with higher use. Additionally, the investments required for the grid due to increased electrification, means prices may increase

“meaning some groups may be put under pressure” (P5). Cooperatives hope to give people an extra incentive by making people more aware of their energy use, which may help people “save money on their energy bill”. Although cooperatives also aim to provide energy as affordable as possible, P7 explains how the financial challenges their cooperative faces means that they use the maximum prices the market allows and wonders “if maybe a professional company could have done this more efficient due to their scale”.

Here it is discussed how risks are distributed per ownership form. For any type of ownership form, investment comes with risks and this is not “suddenly different [for an investor] if you are public” (P6). However, in the heat sector legislation towards ownership in the future is very uncertain making private parties hesitant to invest (P6). According to P8, also public parties such as DSOs may be hesitant to invest because of their monopoly position, so it is important for the ACM to monitor any market strictly (P8). If people choose to invest via cooperatives, risks are partly shifted to citizens (P1, P9). P9 explains “it remains risk-bearing money, it’s a business, a wind - or solar park, that can also lose money. So if you put money into it you can also have negative returns if it doesn’t go well with the project.”. Generally, investing in solar is not that risky as “the sun will continue to shine the coming 25 years” (P3). Risks of price changes (making them very low) are insured with the SCE subsidy and only if they become extremely low you may lose money, but that “is very unlikely” (P3). Wind is more risky as this concerns much more money, and you may still need to acquire certain permits and funds. Hence, cooperatives tend to split investments in phases in which the first phase is mostly financed with own money or with money from people who can miss it, followed by phases becoming less riskier making it open for anyone to invest (P3). “We want people to invest at the time when the risk is lowest” (P4). For heat risks are even higher, often resulting in collaborations with municipalities (P9, P7). Energie Samen is aiming to reduce this risk by setting up a specific fund in which cooperatives lend money with a small interest rate and if the project fails you don’t have to pay the money back, and if it succeeds it helps the fund and thus other cooperatives (P9). In shared ownership projects risks are divided evenly between two parties as it represents “equal entrepreneurship” (P1). It is important for cooperatives to sometimes consider whether it is beneficial entering such an agreement as some projects may simply be too large and risky (P4). If private companies do not choose to enter a partnership, they may also choose a different investment model in which they give out shares, which may be given to people via either a cooperative or not (P1).

Of course for every energy project there are going to be disturbances such as visual -, noise - and environmental impacts. Hence, for this purpose a scheme exists to compensate residents near these projects, but this is irrelevant to the type of ownership the project has (P2). What is important is to take into account local residents and make sure there is integration into the landscape. This is also one of the demands [by law]” (P4). An interesting point made by several participants is that when people (co-)own an energy project, their resistance to such projects will likely decline (P1, P4, P9). Additionally, P4 states that cooperatives “probably take into account local residents more because we are local. It’s our own people that have to look at it. So you want to take them into the process. It is a part of our own environment where we live”. In the case of VlieWaCo it does not matter if you are a member of the cooperative or not, if something is bothering you “we take everyone seriously. [...]. It doesn’t even go via an official number, it’s just put in the neighbourhood WhatsApp”.

### *Interim conclusion*

The results indicate that public ownership, particularly municipalities, may allow for high distributional justice since revenues are reinvested in society and they actively aim to improve accessibility of all groups. However, it must be considered whether low prices are artificially low due to subsidies and sufficient investments must be made in crucial infrastructure. In shared ownership revenue is split equally between parties and revenue therefore partly goes to the local community. Also, negative effects may be perceived as more just for the people that now co-own a project. This has a positive effect on distributional justice, however, financial participation is not accessible to everyone and financial risks are partly shifted to citizens. Hence, shared ownership projects must become more inclusive and cooperatives must decide when it is wise to enter partnerships to reduce risks. Cooperatives take distributional justice a step further compared to shared ownership as members decide where all revenues go and it is accessible for everyone to become a member. Also cooperatives aim to improve awareness around energy consumption, which can lead to lower energy bills and they claim to take into account the local environment more than other parties do. However, also here risks are partly shifted to citizens. Cooperatives must work with municipalities to reduce risks and they must also keep working towards becoming more inclusive for lower-income groups. Private parties can be distributionally just if their scale results in affordable pricing and in that way improves accessibility. However, a major concern is the fact that it is unclear how profits are used and revenues may end up in the hands of foreign stakeholders, which can be perceived as unjust.

### *Procedural justice*

The sub-themes found in the analysis of the interviews relating to procedural justice consist of: participation in decision-making processes, quality, transparency & timing of information, and representation in decision-making. In table 6 a summary of the findings is presented.

Table 6. Summary of findings highlighting the differences in procedural justice between different forms of ownership.

	<b>Private</b>	<b>Public</b>	<b>Shared</b>	<b>Cooperative</b>
<b>Participation</b>	Board of directors in charge with supervisory board. Involvement of citizens via e.g. town hall meetings. People must feel heard, but also understand developers point of view.	Board of directors in charge with supervisory board. Shareholders do influence decision-making. Involvement of citizens via e.g. town hall meetings. People must feel heard but also understand developers point of view.	Power balance is typically 50%-50%. Important for cooperatives not to be overruled. Citizens are more involved via cooperative.	Members are fully in charge. The general assembly is the highest body. The board of directors simply execute an initiate on behalf of the members. One-man-one vote makes it a democratic process.
<b>Quality, transparency &amp; timing of information</b>	Aim for good quality & timing of information, but not as transparent.	As open as possible, all annual reports etc are open to the public.	Open communication once there is an agreement	Very transparent since members need to discuss and vote.

			with land owners.	Timing can be an issue since dependent on volunteers.
<b>Representation</b>	Government is responsible for considering stakeholders' interest in terms of giving project permission. Interests may be represented via formal procedures and companies aim to approach relevant stakeholders informally before start project.	Assumption that municipal council is a reflection of society.		Diversity is low in general in energy sector, including in cooperatives. Members are mostly older white men with high education background. Representation of some neighbourhoods is higher than others. Boards are mostly white but differ in ages with around equal male-female ratios.

Regarding decision-making processes, in private ownership structures there is a board of directors and a supervisory board (P6). Residents are not a part of the decision making but are involved before projects are started to inform them on the impacts etc. (P6). In the case of a heat network this is particularly important because you must know if people want to connect to your network, because only with a significant amount of connections the network will be profitable (P6). There will always be people that disagree but at some point “decisions will have to be made” irrespective of who owns the initiative (P8). It is definitely important to “be in town halls, have conversations with people, and give people the feeling you stand side by side. That people also understand why you are making a certain decision. [...]. Then it will feel more fair” (P8). Decision making structures in public energy companies are similar to those of private companies, with a board of directors and supervisory board (P5). The directory board makes all decisions independent of shareholders, but shareholders do have “a large influence on what we do” (P5). First of all, they decide what they do with the profits they receive, they appoint commissioners for the supervisory board, they give advice on strategies and annual plans and they must approve or reject alliances with certain parties (P5). Involvement of citizens is similar to that of private parties, via e.g. informative meetings (P2). Projects with shared ownership have joint decision-making which is recognized in a collaboration agreement (P1). There is usually a project team for daily activities and a steering committee, from both the private party and the cooperative (P1, P4). The power balance in these structures is typically 50%-50% depending on the share each party owns (P1, P4). Hence, it is important the parties “reach a certain unanimity on matters” (P1). P4, representing a cooperative in such partnerships, explains the 50% is important “to not be overruled. [...]. You can have 10% of [a project] but we don’t do that. Then you’re just a symbol of showing local ownership” (P4). What

distinguishes cooperatives from the other ownership forms, is that in cooperatives, the members are fully in charge (P3). There is a directory board which has an executive and policy-making role and a supervisory board which remains in the background, but the general assembly of members (algemene leden vergadering) is the “highest body” (P3). This assembly is held at least once a year in which every member has one vote, making it a democratic process (P3, P9). Based on the experience of P7 “the members usually agree. They may have some critical questions but [the board] has never not gotten something through”. Nevertheless, “the board can always be called back by the general assembly” (P4).

In terms of quality, transparency and timing of information all ownership forms aim for this to be as good and complete as possible (P6, P8, P2, P1, P3, P4). For DSOs how and when to provide information to stakeholders, a lot is organized by law (P5) and according to P2 the municipality is “as open as possible. All annual reports etc are public, also for residents”. P1, representing a local private company that often engages in shared ownership projects, aims for open communication, providing documentation online including reports of conversations held with local councils, physically visiting the closest residents surrounding the project, sending out letters, organization information meetings and sending out press releases (P1). This all happens when there is a solid initiative in agreement with land owners, but before formal permit requests (P1). For cooperatives it remains hard that volunteers are responsible for e.g. communication, “if someone is sick or suddenly goes on vacation, no hard feelings” (P3). It’s different if a fully paid staff is responsible “who have review meetings every year” (P3). In this respect timing may be challenging, exemplified by P7 “a volunteer thinks I’ve already worked today, it’s my free evening, I’ll do it tomorrow”. Cooperatives do exceed in transparency since everything needs to be discussed in the general assembly (P3, P4, P9). “Large companies that are active across the globe are not transparent, we are” (P3). Nevertheless, P7 describes that “you don’t want to overwhelm people with information. The system works, the houses are warm, they aren’t paying a lot, people are quite easily satisfied”.

Here, the representation in decision-making bodies in different ownership forms is discussed. According to P1, the government is the one responsible for considering the interests of different stakeholders, since projects are located based on their spatial planning. Still, a private company itself does of course approach all relevant stakeholders before the start of a project so research can be done on e.g. ecological impacts (P1). And people of course also have the possibility to represent their interests via formal procedures, but eventually the government (or province) will give permission for the project or not, taking in the considerations of different stakeholders (P1). No information was given by participants on the representation in decision-making bodies in private entities. In public decision-making bodies P2 assumes that “in a democratic society, a municipal council is a reflection of society” which would represent all residents of that area. According to P3 there is not a lot of diversity in general in the energy sector, including in cooperatives. Members of cooperatives are primarily older men who are retired, and thus have enough time on their hands (P3, P4, P9) and maybe have done a technical study who find energy production interesting, although “for running a cooperative you also need other skills than understanding how a windmill works” (P3). P3 states that the cooperative she is active in is quite white, with a completely white board. The members of the cooperative do have diverse ages and male-female ratios are fairly even (P3). “In some neighbourhoods we are more active than in others, but that has to do with the fact that you grow in an organic way, if there is an active club then it works as a magnet” (P3). P7 describes their board exists of people with

bought houses (indicating a higher-income group), although they do differ in types of houses, and they have different ages with an equal male-female ratio (P7).

### ***Interim conclusion***

Procedural justice, is lowest in private ownership as citizens and relevant stakeholders are involved but do not actually have a say in decision-making. Private companies of course aim for good quality, timing and transparency of information, but it appears that transparency can lack. Participants were unable to provide information on representation within decision-making bodies, which could be because this is unknown, indicating a lack of awareness, or the desired answer was unable to be provided. Participants did indicate that the government is mainly responsible for considering stakeholders' views by approving permits or not. Hence, responsibility was shifted to the government. Public ownership results in more procedural justice as e.g. municipalities aim to be as open as possible. Additionally, since municipal councils are democratically chosen, they are assumed to be a reflection of society allowing for representation of the whole municipality. In reality though, this may not be the case with some groups being under represented, as individuals from certain groups may be more prone to becoming a council member. Similar to private ownership, citizens are involved, but not actually participating in decision-making. Nevertheless, since municipal councils function as a democratic organization, they will likely act in accordance with citizens' goals and desires, making this more just. Shared ownership improves procedural justice compared to private ownership as citizens participate via a cooperative and therefore have a say in the project. Typically, the power balance between parties is 50-50% as it is important for cooperatives not to be overruled. This is the most fair and just way for such a partnership to exist. Once agreements are made with landowners, there is open communication, which is required so the board of a cooperative can discuss everything with its members. Procedural justice is highest in cooperative ownership since members are 100% in charge with a one-man-one-vote approach. Since everyone can become a member this means everyone is able to actively participate if one desires to do so. Quality and transparency of information is of vital importance since members need to make decisions based on this information. Timing is an issue as cooperatives are still largely dependent on volunteers. This indicates the need for cooperatives to professionalise. The cooperative sector does face issues regarding representation. Cooperatives exist of primarily older white men, who are retired and have an interest in the energy sector and boards, although they are more diverse in terms of ages, male-female ratios, they are still predominantly white. The cooperative sector is aware of this though and is trying to change this.

### ***Recognition justice***

In recognition justice only one sub-theme is used: recognition of excluded groups. Table 7 gives a summary of this information.

In previous years, generally development was more "technocratic" and the local community and its environment was taken into account less (P1). The municipality or province would then cancel initiatives, if interests were not taken into account in the initial planning (P1). This has changed to become more inclusive, incorporating views of locals, because otherwise a project will simply not happen (P1). P2, representing a municipal project, originally wanted to develop the project via a cooperative so citizens could be included as much as possible, but there was no cooperative at the time so they developed the project themselves. But people did get the

opportunity to voice their concerns and people made use of this (P2). In hindsight the municipality did hear about a local entrepreneur next to the solar park who would have liked to take part in the project or develop a solar park there themselves, but this was in hindsight so not much the municipality could do (P2). Of all ownership forms, cooperatives of course represent locals best. However, they are fairly dominated with white, older men. There are too little women (P3, P9), too little people with different backgrounds, a small amount of people from lower-income groups (P9) and not enough young people (P4, P9). Since cooperatives are relevant for everyone the sector wants to become more inclusive, since “now it really is not” (P9). “As a sector we are very aware of this” and are trying to improve this in different ways, such as experimenting with general assemblies in different cultural styles (P9). If cooperatives do not become more inclusive “it will stay a group of highly educated, generally white people”. (P9).

Table 7. Summary of findings highlighting the differences in recognition justice between different forms of ownership.

	<b>Private</b>	<b>Public</b>	<b>Shared</b>	<b>Cooperative</b>
<b>Exclusion of groups</b>	Previously local communities were taken into account less. Views of locals are now more incorporated making it more inclusive.	Opportunities to voice concerns and aims for inclusivity.	Views of locals more recognized via cooperative party.	Recognition of different groups is best. However, not enough women, people with different backgrounds, lower-income groups and young people. Cooperative sector aiming to make this more inclusive since now it is not.

***Interim conclusion***

Amongst all ownership forms, certain groups are excluded from participation or representation around energy projects. In private ownership, previously local communities were taken into account less. This can possibly be attributed to the fact that until the last decade or so there were way less renewable energy projects in general and therefore also less RE projects situated near people. Nevertheless, now communities are more involved and are able to voice their concerns. In the public sector there are also opportunities to voice opinions and hence both private and public parties aim to recognize all groups. Based on information in the sections on distributional and procedural justice, municipalities are actively trying to include all groups of society, improving recognition justice. In shared ownership recognition justice is more prevalent as views of locals are more representative via the cooperative party in the partnership. In cooperative ownership recognition justice is best as everyone is able to become a member, ideally representing and recognizing all views of all groups. However, there are not enough women, people with different backgrounds, lower income groups, and young people active or represented in this sector. This could mean that not all views are recognized the way we would like them to be. Also, if this lack of recognition of marginalized groups is the case in



cooperatives, it can be expected that this is also the case for shared ownership and especially private parties, where representation and inclusion is typically not high on the agenda. It can be concluded that for energy justice to be highest, recognition justice is of vital importance to make sure that marginalized groups are included in all ownership forms.

## 6. Results Sub Question 3 - How is ownership in the energy transition expected to develop into the future and what does it mean for energy justice?

This section answers sub question 3 via a literature review in 6.1 and an interview analysis in 6.2.

### 6.1 Results Literature Review

It is of course impossible to predict what exactly the future of ownership in energy production and distribution will look like. However, proposed policies and legislation in both Europe and the Netherlands gives an indication of how ownership may develop into the future. Hence, section 6.1 aims to provide information on how ownership in energy production and distribution may develop into the future in the Netherlands.

According to the Dutch Climate Law the Netherlands is required to reduce CO<sub>2</sub> emissions with 55% by 2030, and aims to be climate neutral by 2050 (Rijksoverheid, n.d.), in line with goals stated in the Dutch Climate Agreement. Additionally, the Dutch Climate Agreement states that in future renewable energy generation on shore, citizens must benefit from these projects for at least 50%. This is the case when citizens or local companies own 50% of an energy project, when (a part of) the profits are reinvested in community projects, or when community members develop their own project (Klimaatakkoord, n.d.). What is specifically mentioned, is that in energy production on land citizens and companies must receive the opportunity to participate and have a say in where projects should be located and where profits should go. The Agreement states the importance of transparent decision-making processes and an equal distribution of financial, spatial, and social costs and benefits. This highlights the aim of improving distributional and procedural justice. Ultimately, the goal is to gain a higher level of acceptance and support by citizens. Hence, the Climate Agreement aims for a more local ownership structure, taking into account justice concerns and therefore enhancing support for a just energy transition (Klimaatakkoord, 2019).

In line with the Climate Agreement, local governments and municipalities are expected to take the lead in the energy transition, in collaboration with other local partners. The 'Regionale Energiestrategieën' (RES) should help guide these actors to realizing local ownership of energy production. In this process, participation is key and best practices should be followed so citizens with a lower income can also participate, indicating aims for recognition justice. Also, in shared local ownership structures actors should work together in an equitable way, meaning 50% local ownership (Klimaatakkoord, 2019).

To reach the goals of the Climate Agreement, two new Dutch laws have been proposed. The first is the 'Energy Act (Energiewet)', which is intended to replace and modernize the current Electricity Law 1998 and the Gas Law. This new law aims to account for all the changes our current electricity- and gas market and the whole energy system is going through. Existing rules are clarified and simplified and unnecessary differences in regulation between gas and electricity are removed. Additionally, the new Energy Act offers better consumer rights and – protection, gives distribution system operators more opportunities for dealing with net congestion and it addresses new regulations concerning data exchange. Finally, the Energy Act creates more opportunities for people and companies to actively participate in the energy market

(e.g. in the form of community energy in which members sell and deliver electricity) (Rijksoverheid, 2023b). The Energy Act should allow citizens to control and operate ‘energy communities’ and provide opportunities for future projects (Jetten, 2023). This all should help accelerate the Dutch energy transition according to Minister of Climate and Energy Rob Jetten, who submitted the law proposition (Rijksoverheid, 2023b). European legislation is also incorporated into this law by including large parts of the Clean Energy Package (CEP) (i.e. legislative framework aiming to help the EU achieve its 2030 climate targets). This involves embedding new market players, positioning energy communities and creating clear and fitting rules for active consumers within these communities (Jetten, 2023). In the CEP Renewable Energy Communities and Citizen Energy Communities are recognized as “non-commercial market actors, in which citizens, small businesses and local authorities are empowered to take ownership and control of energy resources to meet their needs and promote social innovation”. The CEP obligates member states to support this community-owned energy, or at minimum not stand in its way. It is not yet clear how the implementation of the CEP will play out in the future as this can only be assessed after national implementation has started. In this community based energy, citizens and policy makers must encourage inclusiveness in order for the whole of society to benefit (Roberts, 2020).

A second Dutch act that has been proposed is the Wet Collectieve Warmtevoorziening (WCW), which will be replacing the current ‘warmtewet’ (heat act). The Dutch government aims to make all households and buildings gas free by 2050 and this will be done by increasing the use of heat networks. With the WCW the growth and sustainability of collective heat systems plays a key role. The most important goals are to provide citizens with energy security, to make collective heat more sustainable and to modernise the design and operation of heat systems. In this way citizens are protected from high prices and there is more transparency. Additionally, the WCW requires future heat companies to be owned by local governments (i.e. municipal or provincial) for at least 50% + 1 share, making heat companies and heat networks for the majority share publicly owned. In this way there would be more guidance from governmental bodies and public actors would always have the final say (Rijksoverheid, 2023a).

### ***Interim conclusion***

Here, it can be concluded that according to the currently proposed Dutch legislation ownership structures in energy production and distribution are going to significantly change in the near future. This is particularly the case in the heat sector, where a majority share is obliged to be owned by public parties giving them the power in this sector. Based on the information obtained in sub question 2 it can be concluded that distributional and procedural justice may be improved by this public majority interest, in comparison to when private parties would own the largest share of the market. In the electricity sector, where there is an ambition towards 50% local ownership, distributional and procedural justice may also be improved, making the energy transition more just. The Dutch government expects collaboration between local governments and municipalities with other local parties to be of vital importance, as is in line with earlier literature found in this thesis, depicting an important leadership role for municipalities. The results also mention that everyone should be included and be able to participate in the energy transition, playing into recognition justice issues, although at the moment it remains unclear how exactly this will be done.

## 6.2 Results Interviews

To answer research question 3 participants were asked their perspective on the future of ownership in the Netherlands in general and for their representative ownership form, whether they expect this to continue into the future and what this would mean for energy justice, if they were able to form an answer for this. Although it should be noted that none of the participants are able to predict the future, it does give relevant insights to possible expectations given current trends and given their involvement in the energy sector. The results are discussed according to three themes: future of ownership, role per ownership form, and meaning for energy justice/justice of energy transition. Table 8 presents a summary of the findings.

Table 8. Summary of findings highlighting how different ownership forms may develop into the future and what this may mean for a just transition according to the interview participants.

	<b>Private</b>	<b>Public</b>	<b>Shared</b>	<b>Cooperative</b>
<b>Future of ownership</b>	Debate around public vs private very relevant. Heat companies may need to be expropriated and hence decreasing investments. This is potentially slowing down the transition. More citizen participation is expected for wind & solar.	Will take time for municipalities to develop heat companies. Aim of maximal local ownership in the form of energy communities. DSOs are expected to stay public.	With pursuit of 50% ownership in Energy Act, (large) companies will have to work with cooperatives. Gives cooperatives more power.	Dependent on governmental/municipal support. Professionalization and collaboration needed. Working towards local energy production (Local4Local). Some changes proposed by Energie Samen in new Energy Act to help the position of cooperatives.
<b>Role per ownership form</b>	If Wcw goes through no role for private parties in heat sector. Options are to work on behalf of e.g. municipalities or having a minority interest, which is not attractive. In electricity sector private role is still significant	Role of municipality to support cooperatives. Also can play role in including everyone from municipality. Can form a stable partner.	Mix of different ownership forms. Shared ownership may increase since private companies have the knowledge and cooperatives cannot handle everything.	Role for cooperatives expected to become bigger. People are in support of this development. Must consider with professionalization that they may start to look like private parties.
<b>Meaning for just transition</b>	Public vs private debate is irrelevant for how just transition is. Important that everyone is included	Municipalities can help inclusion in transition which can contribute to a more just transition, this can	May feel unjust for people to live near energy projects. When people become (co-) owner it is implied this is	May feel unjust for people to live near energy projects. When people become (co-) owner it is implied this is more just, while

	<p>in transition via e.g. subsidies. Affordability is just as important for private parties as for others. Decisions still need to be made, can't cater everyone's needs. If people can understand this decision (by talking to them) it will already feel more fair for them.</p>	<p>also be in a partnership role.</p>	<p>more just, while this also implies a risk.</p>	<p>this also implies a risk. A just transition needs to be done with local democratic organizations such as cooperatives. Cooperative principles (participation, inclusion, representation) must be included. Local democratic organizations set up locally are automatically more democratic and just than when a few large companies do this.</p>
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For private parties, particularly in the heat sector, the debate around public-private ownership is very relevant in the future of energy ownership (P6, P8). With the proposed new heat act (WCW) the majority share (at least 50%+1 share) of ownership would become public. Currently, 90% of the heat market consists of private parties meaning these companies would all need to be expropriated, resulting in “a lot of hassle” (P8). According to P8 the market should be challenged, resulting in better innovation, and not allowing private parties to participate anymore “will slow down the energy transition”. P6 is already experiencing the consequences of this proposed new law as “there have hardly been any investments over the past two years”. Currently, “public parties simply don't have the knowledge and experience yet, which will have to be built” (P6) and “it will take a lot of time if you ask municipalities to develop these types of [heat] companies” (P8). On the other hand, in the electricity sector, P1 expects more citizen participation, particularly for “smaller-scale wind and solar that is located near people, this will become the norm”. This movement was already put into motion and is expected to continue into the future due to the new Energy Act (P1). For shared ownership this is particularly interesting since “if 50% ownership is asked, then those large companies also have to come to us” (P4). This opens up “a playing field” giving cooperatives more power (P4). In public ownership P2 states they are aiming for “maximal local ownership”. This is particularly the case for wind where they are trying to establish a type of public-private partnership where the municipality collaborates with local companies, local land owners and the local energy cooperative, which then also involves citizens (P2). Additionally, they want to work with neighbouring municipalities since wind energy concerns a larger area (P2). Such a construction is similar to what in European law is referred to as “energy communities” and will also be present in the Dutch Energy Act (P2). However, “this does not mean that such energy communities will have priority over private parties” (P2). Regarding the electricity network, P5 expects DSOs to stay in public hands, “at least in a majority interest”. Also, in the proposed

Energy Act nothing is mentioned concerning operation of the network and who should be entitled to own this (P5). For cooperatives the future is “dependent on support” and “if [the municipality] does not want to help us it may become more of a struggle” (P3). All participants representing cooperatives agree that they must professionalize and collaborate more (P3, P4, P7). P4 exemplifies this by stating their cooperative works in a “triangle of cities to, with their shared knowledge, be able to handle larger projects”. Amsterdam Energie is having conversations with large builders, to contemplate whether in all new housing projects rooftop solar PV can be in cooperative hands (P3). Additionally, there is an initiative amongst all Dutch cooperatives to develop a windfarm on sea (P4). Where previously, cooperatives focused more on one thing, in the future “we want to focus on the local energy system in which many things come together” (P9). Furthermore, in the future cooperatives are aiming for local energy production, - storage, and – use (P4) which is termed “Local4Local” (P9). Energie Samen describes this as “tegen kostprijs plus” in which people invest in a renewable energy project, but instead of receiving money, they receive the produced energy, meaning there is no need for profits (P9). Energie Samen advocates this must still be defined in the new Energy Act as “energy sharing between or within energy communities” because only then it can be subsidized (P9). Additionally, Energie Samen wants to introduce an obligation for municipalities to prove they have tried to work together with energy cooperatives (P9). Finally, they advocate for the word “democratic” to be added to “energy community” in the new Energy Act to make it as open as possible for everyone to participate (P9).

The second theme is what role each ownership form is expected to play in the energy transition. If the new heat act (WCW) will go through P6 does not see any role anymore for private parties. The options are then to work on behalf of e.g. the municipality, “making [private parties] a kind of service provider” or by taking a minority interest “but you don’t want that [...] because your minority interest is not protected” and you will lose control over e.g. investments (P6). Hence, under the currently proposed legislation “[private companies] will want to transfer 100% of their shares to prevent having a minority interest” (P6). In the electricity sector P1 still expects private parties playing an important role as they “don’t see energy cooperatives pulling the kart themselves in the energy transition [...]. You need professionals [...] and that’s something the market will continue to deliver in the near-future”. Shared ownership may flourish in the future as P4 thinks “there will be a mix [of different types of ownership, as] private companies of course have the knowledge and cooperatives cannot handle everything. But they can work together”. Additionally, with more and more people wanting to join in the conversation of energy production “the role for cooperatives only gets bigger”. In public ownership, P2 sees the municipal role as one in support of energy cooperatives since the latter are important for creating a support base amongst local residents. P2 believes that also the municipality can play an important role in creating this support as they can “ensure revenues benefit everyone in the municipality, particularly lower-income groups”. P2 wants to co-invest in energy projects for maximal local ownership and hence can form a “stable partner” for cooperatives or other parties. P9 agrees that “[cooperatives] really need the national, provincial and municipal governments since [cooperatives] are a new party, that don’t make profits and are therefore unable to largely invest”. Hence, subsidies and collaborations between these parties are vital (P9). Various participants expect the role of cooperatives to increase in the future (P3, P4, P1). As P3 explains “people are tired of the market-based approach of large companies. [...] I think people are questioning why they have to pay so much money to put in the pockets of foreign shareholders]”. Contrastingly, “[cooperatives] are very personal and I think many people want

that” (P3). In line with this P1 states that “the charm is in the small scale of cooperatives”. However, “if they become really big and professional, then they are, I think, hard to distinguish from private parties”.

The third theme concerns what future expectations of ownership mean for energy justice and therefore what it will mean for a just energy transition. According to P6 the public vs private debate is irrelevant for a just transition. Instead everyone should be included in the transition and that has to do with other factors than who owns a company, e.g. via subsidies or compensation for lower-income groups. Moreover, making sure energy is affordable is important for all sorts of ownership forms, “this is also essential for us as private party”. However, contrasting to private parties, municipalities can play a role in making sure revenues benefit everyone in the municipality so everyone can be included in the energy transition. According to P2 “this is what will contribute to a socially more just energy transition”. It should be noted that this is a role municipalities can play in a partnership role as well. P8 states that for justice it is important that an initiative is “honest, fair and transparent” if this comes from a public or private company. People should be included but, “justice does not take away the possibility of aldermen or a municipal council to make decisions [on whether to allow an initiative or not]. In many cases you can’t cater to everyone’s needs’[...] but at some point you have to move forward”. As long as people understand why a certain decision is taking place, this will already “feel more fair and more understandable” (P8). In cooperatives, where people become (co-)owners, participants had different views on what this meant for the justice of the energy transition. It is new for people to live nearby [e.g.] windmills and hence “they may feel this is unjust” (P1). It is implied that “this becomes more just when you become (co-)owner of such a windmill. Whether this is more just, I don’t know because it also implies a risk” (P1). P8 states that it is important to “cherish local initiatives and help them professionalize”. According to P9 if you want a just transition, “this has to be done with local democratic organisations” such as cooperatives. What is important here is to include the cooperative principles regarding participation, inclusion and representation (P9). Hence, Energie Samen would like to develop a certificate to test whether these principles are actually carried out, making these organizations more just. Still, “if you set up democratic organizations [...] locally, then you will [automatically] get a much more democratic and just energy transition, than if this is done by a few [large] companies” (P9). Finally, several participants raise questions on why justice is something so important in the energy transition while it is not brought up around fossil energy or in the provision of other goods and services (P1, P2, P8). Questions raised include: “If a nuclear power plant is built somewhere, should the same principle [of (co-) ownership] not be applied?” (P1), “why is it only about energy? Why is it not about drinking water or other general resources?” (P2) or “how just is it to live near a highway that is constructed for [wider] social benefit?”(P1). This illustrates frustration amongst several stakeholders to why the discussion of justice is so specific to energy production and distribution.

### ***Interim conclusion***

To conclude, in the future the role for private companies may decrease and in the heat sector may even disappear completely. Theoretically, if public parties were to own all heat networks, this could allow for more distributional and procedural justice. However, in practice this does not seem possible to realize in the short term as there is not enough time and resources to make this drastic change for public parties. For this reason, several participants indicated that for the

transition is does not matter who owns production and distribution, but it is instead it matters whoever can contribute to the transition. Both public and private parties can become more just by becoming more inclusive and more open to participation processes. Furthermore, instead of having to develop their own heat companies, municipalities should be in support of cooperatives and should aim to include everyone in energy production and distribution and in that way help make the energy transition more just. In the electricity sector private companies will likely continue to play a significant role, but this may increase more towards shared ownership structures with cooperatives or other local parties, which may increase energy justice as this leads to, amongst other things, a more fair distribution of benefits and more active participation. Depending on the governmental support cooperatives will receive, the cooperative sector will only get bigger, with more collaboration and a higher level of professionalization. Cooperatives are working towards actually using produced energy locally and in this way are making cooperatives more just since community members of all groups and incomes can then simply receive this energy as a member of the cooperative, instead of basing cooperatives on financial rewards for people who have invested. Important for a just transition is that local democratic organizations based on cooperative principles do this. However, cooperatives do rely on support from the central and local governments.



## 7. Discussion

### **7.1. Conclusion**

In summary, the shift to more renewable energy technologies in the energy transition is leading to a more decentralized energy system providing more opportunities for local actors to own energy production and distribution. This is challenging the existing regime consisting of mainly large private companies who own energy production and distribution in a centralized manner. This is sparking debates on who should own these energy services. In the midst of this energy transition it is also important to consider what injustices may occur as not everyone may benefit equally from this and some may even be disadvantaged, highlighting the importance of a just transition. Prior to this thesis, no research had taken a broad perspective on what ownership meant for ensuring a just energy transition. Hence, this thesis filled this gap by researching what role ownership plays in ensuring a just transition, taking the Netherlands as case study. The concept of energy justice was used as analytical tool to determine how just different forms of ownership in energy production and distribution are, providing insights on what ownership means for a just transition. Data was gathered via literature reviews and via interviews with representatives from different ownership forms in the Netherlands, from both the electricity sector and the heat sector. The results per sub question are summarized in the following paragraphs, followed by a final conclusion, answering the main research question.

#### *Sub question 1*

There are different considerations to take into account for different ownership forms including e.g. capital requirements, social welfare concerns and consideration of risks which may explain why some forms of ownership are chosen over others. Historically, the debate on ownership was dominated by the discourse on public vs. private ownership. However, this has become less relevant as partnerships between these parties (public-private partnerships) started to emerge, offering benefits to issues full private or full public ownership face. Additionally, new ownership models have emerged where more local actors own energy services, which is referred to as community energy and takes the form of e.g. cooperatives. Various incentives exist for setting up such community projects ranging from economic, to social, to sustainability motivations. In the Netherlands, the energy system went from one based on municipalities to one characterized by mainly large-scale companies owned by foreign investors. The main ownership forms found in the Netherlands consist of private, public, shared (between cooperatives and private parties) and community ownership. Over the past few decades a more diverse set of actors has entered the market particularly for solar and onshore wind, seeing more locally (co-) owned projects, while offshore wind and heat is currently still almost all in private hands. In the current Dutch market private parties have it easier compared to other ownership forms, although in the social realm they may struggle. For this shared ownership can be a solution, improving e.g. acceptance. Public parties primarily face legal challenges, have limited access to finance, and may have less technical knowledge and experience, while they do aim to fulfil public values in the social realm. Cooperatives face challenges in entering the market, and their small scale and dependence on volunteers can result in financial and technical struggles, although they do enhance community feeling.

### ***Sub question 2***

The different ownership forms each have a different effect on energy justice and all deal with different energy justice issues. In private ownership revenues go to shareholders, meaning benefits are not distributed amongst people that may suffer negative effects from energy production and distribution projects. Hence, in private ownership compensation mechanisms may be used to improve distributional justice. Typically, citizens are involved in decision-making around these projects, however they do not actually have a say in decision-making. Increasing participation processes may improve procedural justice though. In shared ownership citizens do have a say in a part of the project since they can become co-owners via the cooperative party in the partnership. From a justice point of view it is important to know how meaningful and effective citizens' role in a project is and to know what the ratio of ownership between the associated two parties is, where 50% is an ideal ratio for local parties to not be overruled. Sufficient representation in decision-making in such shared projects is important since if only certain community members are included, views of marginalized groups may not be taken into account, playing into recognition justice issues. Community owned energy production and distribution can improve distributional justice since benefits go to the local community and can improve procedural justice as members are fully in control of decision-making. However, risks are partly shifted to citizens if they choose to participate financially. This also plays into recognition issues since not everyone may be able to participate financially and not all community members may be represented in decision-making. Public ownership, particularly municipalities, may allow for high distributional justice as revenues are either directly or indirectly reinvested in society, which is also the case for DSOs. Since a municipal council is a democratic organ this may be perceived as procedurally just, while this is not the case for all public organisations (e.g. DSOs). Finally, municipal organizations actively aim to improve accessibility and inclusion of all groups, aiming to improve both distributional and recognition justice. Although municipalities can also produce and distribute energy themselves, according to the research they are essential in forming a stable partner for cooperatives or other local parties producing and distributing energy.

### ***Sub question 3***

The future is of course uncertain and no one can predict how it will unfold. However, both European and Dutch (proposed) legislation can give an indication of the direction it is going in. The Dutch Climate Agreement aims for 50% local ownership of renewable energy production on land which should be facilitated by the proposed 'Energy Act. Additionally, the proposed WCW requires future heat production and distribution to be owned publicly for at least 50%+1 share. Particularly the latter is causing concern amongst private parties as this would mean they would be expropriated, while currently they make up 90% of the market. There are major concerns about whether it would be feasible to make such a drastic change towards a majority share being publicly owned in the heat sector. Moreover, cooperative heat companies struggle in terms of technical and financial capacity meaning we cannot leave it in their hands either, although both public and cooperative ownership are deemed more distributionally and procedurally just compared to the current ownership regime with mostly private parties. In renewable electricity production on land shared ownership is expected to increase, with the aim of 50% local ownership making it more attractive for private parties to cooperate in such structures. Furthermore, the role of cooperatives is expected to grow, although they must professionalize, collaborate with one another, and work together with local governments or

municipalities to reduce financial risks. Hence, according to the analytical framework of energy justice, these legislative developments will have a positive effect on energy justice, meaning it will also have a positive effect on how just the energy transition will be. However, at the moment we still need the knowledge, experience and scale of private parties. Hence, a mixed ownership structure would be most beneficial in the transition to a carbon neutral society. Furthermore, different actors may work together in Renewable Energy Communities, as specified in the CEP, forming the ultimate local ownership structure.

### ***Final conclusions***

Ultimately, with the knowledge gathered in sub question 1,2 and 3, the main research question can be answered: “What role does ownership play in ensuring a just energy transition in the Netherlands?” It can be concluded that ownership definitely plays a significant role in determining how just the energy transition is in the Netherlands, as different ownership forms have different implications for energy justice and therefore for the justice of the transition. Who owns an energy project can determine 1) how positive and negative effects are distributed amongst surrounding areas and communities 2) who has access to participation and actually has a say in decision-making processes and 3) who is represented and who may be excluded. Each ownership form has different goals and functions differently, resulting in different social consequences of energy production and distribution. Energy justice forms the bridge to determining what a just energy transition is, with this research portraying the role of ownership in this matter. The effects of ownership of energy production and distribution on energy justice forms the bridge to determining what a just transition entails. In this thesis, a transition is considered just when outcomes are fair (indicating distributional justice), decision-making is fair (indicating procedural justice) and when all groups are included equally with their views recognized (indicating recognition justice). Each form of ownership in energy production and distribution can aim to contribute to a just transition in their own way but some allow for more justice than others. What is important to take into account is that the more ‘just’ ownership forms (cooperative and public/municipal ownership) face challenges such as entering the market and acquiring sufficient funds. This makes it practically impossible to transition to a carbon neutral society before 2050 with e.g. only cooperatives or public ownership forms, as it will cost time for these forms to develop themselves further and for them to be integrated into the current energy landscape. This time is something we do not have in the battle against climate change. Therefore, we can conclude that each form of ownership in energy production and distribution can contribute to the energy transition, but for a transition to be just ownership must be taken into account. We should be aware of choosing which forms to help develop as this has consequences for how just the transition will be.

### **7.2 Theoretical implications**

This thesis has significant theoretical implications. It adds to the existing body of literature on ownership and energy justice, particularly on the connection between the two. This research gives a broad overview of different ownership forms in energy production and distribution in addition to what they each mean for energy justice, allowing for comparison between them, ultimately answering the question of what role ownership plays in ensuring a just transition in the future. It gives new insights on what ownership means for the justice of the energy transition as the development of these energy production and distribution projects are driving the energy transition. Hence, this thesis can be used as building block for further scientific research on the connection between ownership and energy justice and just transitions. Additionally, new

insights gained on energy distribution and public ownership in energy production and distribution can be used as stepping stones for further research in those areas. Furthermore, insights have been given on social impacts of ownership forms in energy production and distribution on individuals and communities amongst different groups of society. Particularly relevant to mention here is the potentially different impacts ownership can have on marginalized groups. This thesis can contribute to how we ought to design the energy transition towards the future in terms of ownership structures and particularly how this should be designed in a just manner for everyone. This thesis illustrates the importance of continuing to take into account justice in the energy transition and researching this topic.

### **7.3 Recommendations for future research**

As we have seen recognition justice has come forward as an important pillar in ownership structures, where there is a lot of room for improvement. Future research could focus more on this tenet by researching how to make different ownership structures more inclusive, particularly cooperatives, which should be open to everyone. It could be researched how to make them more representative and how to improve access by marginalized groups such as lower-income groups, groups with a migrant background, women and young people. Additionally, research could be broadened beyond the three core tenets of energy justice used in this research (distributional, procedural, recognition) to also include restorative -, cosmopolitan -, spatial -, substantive -, intergenerational distribution -, and transitional justice (van Bommel & Höffken, 2021). In order to gain a more holistic view on what ownership means for the energy transition, research could also include climate and environmental justice to gain a more integrated approach. Furthermore, research can examine what policies should be implemented to make it easier for cooperatives and municipal owned projects to integrate into the market and what policies can support their development, also taking into account shared ownership structures. Finally, the interviews held in this research could be expanded to also include people or communities affected by ownership projects so they can give their perspective on perceived justice, giving a better understanding of how people are affected.

### **7.4 Limitations**

This thesis has several limitations. Firstly, a more extensive methodology for the literature reviews could have been used to gather more information on each ownership form e.g. via a systematic literature review. Yet due to time constraints this was not possible and still sufficient information was gathered to form the basis for the interviews and to answer the sub questions. Secondly, not all anticipated interviewees were willing or able to participate. Ideally a representative from a public or municipal heat company and a representative from a shared heat company would have participated as well. The former would have been particularly significant to include considering the WCW, giving public heat companies a much bigger role in the future. Hence, this would have been an interesting perspective to include but unfortunately the approached stakeholders were not willing to participate. The latter is to my knowledge a rare ownership form in the Netherlands making it hard to find a participant at all. Thirdly, amongst ownership forms that were represented, there were only one or two participants per ownership forms. More stakeholders could have been used to provide more saturation within themes or topics. Still, many findings were in line with the literature meaning they are valid. Fourthly, it should be noted that the interview participants were people providing the service of energy production and/or distribution, while people or communities actually affected by these projects were not included in the research. Hence, participants could be biased towards provision of

these services or projects and also they could be biased towards the ownership form they represented. Again, findings were in line with the literature stilling making the results reliable and valid.

### **7.5 Managerial or policy implications**

This thesis can help policy-makers make more informed, and ultimately, more just choices around ownership in the energy transition. It provides them with information on how just each ownership form is and what these forms mean for the justice of the energy transition. In the Netherlands specifically this thesis is relevant to policy makers as they can take into account the findings in regards to current plans on 50% local ownership in onshore renewable energy generation and 50+1% obligatory public ownership in heat networks. Aiming for increased local ownership is a good idea, but it should be made easier for community energy initiatives such as cooperatives to enter the market and develop themselves. Additionally, public parties such as municipalities must receive proper guidance as they are expected to take the lead in this local energy production and distribution. For the heat sector the obligation towards public ownership may be reassessed as in its core, it may be a good idea and could improve the justice of the energy transition, however, practically many challenges will likely be met. Shared ownership between private parties and cooperatives or public parties may be something to encourage and aiming to include as many people as possible, particularly marginalized groups, must be a focus point. The question of energy ownership should be at the centre of public policy debates as this will have consequences for both the Earth's climate and society (Miller, 2023).

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## Appendix A – Interview Questions

### **Stakeholder 1 – Pure Energie (private ownership – electricity production)**

#### Part 1

- What does your company do and what is its main aim?
- Who owns your company?
- What considerations are important to take into account for a privately-owned company?
  - Economically, legally, socially, technically etc.

#### Part 2

##### Distributive justice

- What do you perceive to be the benefits of privately-owned electricity production?
  - How are these benefits distributed amongst places and people?
    - How are profits distributed?
    - Does everyone have access to the electricity you produce? Who does (not)?
    - Is the produced electricity affordable for everyone? Why (not)?
- What do you perceive the negative effects are of privately-owned electricity production?
  - How are these negative effects distributed amongst places and people?
    - How does siting of projects affect the distribution of these negative effects?
    - How are visual impacts and noise impacts distributed?
    - How are investment costs distributed?
    - How are environmental impacts distributed? (e.g. biodiversity loss)

##### Procedural justice

- Who is able to participate in your company's decision-making processes?
- Who has control over your company's decision-making processes?
- How would you describe the quality, transparency and timing of information you provide to stakeholders (e.g. consumers buying electricity from you, or people living near your energy projects)?
- Who is represented in your company's decision-making body and which views do these represent?
  - Who is not represented in your company's decision-making body?

##### Recognition justice

- Is anyone excluded from access to the electricity you produce? If yes, who?
  - What socio-economic status/education level/gender do these excluded groups have?
- Are the views and needs of marginalized groups/individuals acknowledged/recognized by your company?



Are there differences between you as private company and other larger private companies such as e.g. Vattenfall?

### Part 3

- What do you expect for the future of Dutch electricity production in terms of ownership?
- Do you expect privately-owned electricity production to stay the norm and continue into the future or could this change?
- Do you see a possibility of other actors becoming owners of the electricity production, such as municipalities or citizen-led cooperatives? Why (not)?
- What do you think this will mean for energy justice/ensuring a just transition? That it will have a positive/negative effect?

Is there anything you would like to add or do you have any final comments or remarks?

## **Stakeholder 2 - (municipal ownership – electricity production)**

### Part 1

- What does your company do and what is its main aim?
- Who owns the company?
- Why was this form of ownership chosen when setting up the project?
- What considerations are important to take into account for a municipal-owned company?
  - Economically, legally, socially, technically etc.

### Part 2

#### Distributive justice

- What do you perceive to be the benefits of municipal-owned electricity production?
  - How are these benefits distributed amongst places and people?
    - How are profits distributed?
    - Does everyone have access to the electricity you produce? Who does (not)?
    - Is the produced electricity affordable for everyone? Why (not)?
- What do you perceive the negative effects are of municipal-owned electricity production?
  - How are these negative effects distributed amongst places and people?
    - How does siting of projects affect the distribution of these negative effects?
    - How are visual impacts and noise impacts distributed?
    - How are investment costs distributed?
      - Is everyone able to invest? Who is able to invest and who is not?
    - How is funding for municipal projects structured? Does the funding structure allow everyone to benefit or does it only benefit certain groups?

- Is there a difference in funding between different municipalities? Do some municipalities benefit more from funding structures than others?
- How are environmental impacts distributed? (e.g. biodiversity loss)

#### Procedural justice

- Who is able to participate in the company's decision-making processes? Who is not?
- Who has control over the company's decision-making processes? Who has no control over this?
- How would you describe the quality, transparency and timing of information you provide to stakeholders (e.g. community members that are involved)?
- Who is represented in your company's decision-making body and which views do these represent?
  - Who is not represented in your company's decision-making body?

#### Recognition justice

- Is anyone excluded from access to the electricity you produce? If yes, who?
  - What socio-economic status/education level/gender do these excluded groups have?
- Is anyone excluded from investing or taking part in the company itself? If yes, who?
  - What socio-economic status/education level/gender do these excluded groups have?
- Are the views and needs of marginalized groups/individuals acknowledged/recognized by your company?

#### Part 3

- What do you expect for the future of Dutch electricity production in terms of ownership?
- What do you expect for municipal-owned electricity production into the future? An increase/decrease, why?
- What do you think this will mean for energy justice/ensuring a just transition? That it will have a positive/negative effect?

Is there anything you would like to add or do you have any final comments or remarks?

### **Stakeholder 3 – Amsterdam Energie (community ownership – electricity production)**

#### Part 1

- What does the cooperative do and what is its main aim?
- Who owns the cooperative?
- Why was this form of ownership chosen when setting up the project?
- What considerations are important to take into account for a community-owned company?
  - Economically, legally, socially, technically etc.

#### Part 2

## Distributive justice

- What do you perceive to be the benefits of community-owned electricity production?
  - How are these benefits distributed amongst places and people?
    - How are profits distributed?
    - Does everyone have access to the electricity you produce? Who does (not)?
    - Is the produced electricity affordable for everyone? Why (not)?
- What do you perceive the negative effects are of community-owned electricity production?
  - How are these negative effects distributed amongst places and people?
    - How does siting of projects affect the distribution of these negative effects?
    - How are visual impacts and noise impacts distributed?
    - How are investment costs distributed?
      - Is everyone able to invest? Who is able to invest and who is not?
    - How is funding for community projects structured? Does the funding structure allow everyone to benefit or does it only benefit certain groups?
    - How are environmental impacts distributed? (e.g. biodiversity loss)

## Procedural justice

- Who is able to participate in the cooperative's decision-making processes? Who is not?
- Who has control over the cooperative's decision-making processes? Who has no control over this?
- How would you describe the quality, transparency and timing of information you provide to stakeholders (e.g. community members that are involved)?
- Who is represented in the cooperative's decision-making body and which views do these represent?
  - Who is not represented in the cooperative's decision-making body?

## Recognition justice

- Is anyone excluded from access to the electricity you produce? If yes, who?
  - What socio-economic status/education level/gender do these excluded groups have?
- Is anyone excluded from investing or taking part in the cooperative itself? If yes, who?
  - What socio-economic status/education level/gender do these excluded groups have?
- Are the views and needs of marginalized groups/individuals acknowledged/recognized by your cooperative?

## Part 3

- What do you expect for the future of Dutch electricity production in terms of ownership?

- What do you expect for community-owned electricity production into the future? An increase/decrease, why?
- What do you think this will mean for energy justice/ensuring a just transition? That it will have a positive/negative effect?

Is there anything you would like to add or do you have any final comments or remarks?

#### **Stakeholder 4 – Brummen Energie (shared ownership – electricity production)**

##### Part 1

- What does your company do and what is its main aim?
- Who owns the company? What is the share owned by the developer and the local community?
- Why was this form of ownership chosen when setting up the project?
- What considerations are important to take into account for a shared-ownership company?
  - Economically, legally, socially, technically etc.

##### Part 2

##### Distributive justice

- What do you perceive to be the benefits of shared-ownership electricity production?
  - How are these benefits distributed amongst places and people?
    - How are profits distributed? How are these distributed between developers and communities but also within communities?
    - Does everyone have access to the electricity you produce? Who does (not)?
    - Do residents that do not purchase energy from the project receive compensation?
    - Is the produced electricity affordable for everyone? Why (not)?
- What do you perceive the negative effects are of shared-ownership electricity production?
  - How are these negative effects distributed amongst places and people?
    - How does siting of projects affect the distribution of these negative effects?
    - How are visual impacts and noise impacts distributed?
    - How are investment costs distributed?
      - Who is able to invest and who is not?
    - How is funding for shared-ownership projects structured? Does the funding structure allow everyone to benefit or does it only benefit certain groups (developers/community members)?
    - How are environmental impacts distributed? (e.g. biodiversity loss)

##### Procedural justice

- Who is able to participate in the company's decision-making processes? Who is not?
- Who has control over the company's decision-making processes? Who has no control over this?

- How would you describe the quality, transparency and timing of information you provide to stakeholders?
  - What degree of information do developers share with community representatives?
  - At which stage in the project did developers start collaborating with the local community?
- Who is represented in your company's decision-making body and which views do these represent?
  - Who is not represented in your company's decision-making body?
  - Do community actors have an effective partnership role in terms of resources, decision-making process and do they have a stake in the project (what %)?
- How is the power balance between developers and community representatives?

#### Recognition justice

- Is anyone excluded from access to the electricity you produce? If yes, who?
  - What socio-economic status/education level/gender do these excluded groups have?
- Is anyone excluded from investing or taking part in the company itself? If yes, who?
  - What socio-economic status/education level/gender do these excluded groups have?
- Are the views and needs of marginalized groups/individuals acknowledged/recognized by your company?

#### Part 3

- What do you expect for the future of Dutch electricity production in terms of ownership?
- What do you expect for shared-ownership electricity production into the future? An increase/decrease, why?
- What do you think this will mean for energy justice/ensuring a just transition? That it will have a positive/negative effect?

Is there anything you would like to add or do you have any final comments or remarks?

### **Stakeholder 5 – (DSO) (public company – electricity distribution)**

#### Part 1

- What does your company do and what is its main aim?
- Who owns your company?
- What considerations are important to take into account for a state-owned company?
  - Economically, legally, socially, technically etc.

#### Part 2

#### Distributive justice

- What do you perceive to be the benefits of a state-owned company owning the electricity distribution network?
  - How are these benefits distributed amongst places and people?

- How are profits distributed?
  - Does everyone have access to the electricity network? Who does (not)?
  - Is the distribution of electricity affordable for everyone? Why (not)?
- What do you perceive the negative effects are of a state-owned company owning the electricity distribution network?
  - How are these negative effects distributed amongst places and people?
    - How are investment costs distributed?

#### Procedural justice

- Who is able to participate in your company's decision-making processes?
- Who has control over your company's decision-making processes?
- How would you describe the quality, transparency and timing of information you provide to stakeholders (e.g. people connected to the distribution network)?
- Who is represented in your company's decision-making body and which views do these represent?
  - Who is not represented in your company's decision-making body?

#### Recognition justice

- Is anyone excluded from access to the distribution network? If yes, who?
  - What socio-economic status/education level/gender do these excluded groups have?
- Are the views and needs of marginalized groups/individuals acknowledged/recognized by your company?

#### Part 3

- What do you expect for the future of Dutch distribution networks in terms of ownership?
- Do you expect this form of state ownership to continue into the future or could this change?
- Do you see a possibility of other actors becoming owners of the electricity grid, such as private companies, municipalities or citizen-led cooperatives? Why (not)?
- What do you think this will mean for energy justice/ensuring a just transition? That it will have a positive/negative effect?

Is there anything you would like to add or do you have any final comments or remarks?

### **Stakeholder 6 - (private ownership – heat production/distribution)**

#### Part 1

- What does your company do and what is its main aim?
- Who owns your company?
- Why was this form of ownership chosen when setting up the project?
- What considerations are important to take into account for a privately-owned heat network?
  - Economically, legally, socially, technically etc.

#### Part 2

## Distributive justice

- What do you perceive to be the benefits of a privately-owned heat network?
  - How are these benefits distributed amongst places and people?
    - How are profits from the heat network distributed?
    - Does everyone have access to the heat network? Who does (not)?
    - Is the energy from the heat network affordable for everyone? Why (not)?
- What do you perceive the negative effects are of a privately-owned heat network?
  - How are these negative effects distributed amongst places and people?
    - How does siting of projects affect the distribution of these negative effects?
    - How are visual impacts and noise impacts distributed (if there are any)?
    - How are investment costs distributed?
    - How are environmental impacts distributed? (e.g. biodiversity loss) (if there are any)

## Procedural justice

- Who is able to participate in your company's decision-making processes?
- Who has control over your company's decision-making processes?
- How would you describe the quality, transparency and timing of information you provide to stakeholders (e.g. consumers connected to your heat network)?
- Who is represented in your company's decision-making body and which views do these represent?
  - Who is not represented in your company's decision-making body?

## Recognition justice

- Is anyone excluded from access to the heat network? If yes, who?
  - What socio-economic status/education level/gender do these excluded groups have?
- Are the views and needs of marginalized groups/individuals acknowledged/recognized by your company?

## Part 3

- What do you expect for the future of Dutch heat networks in terms of ownership?
- Do you expect privately-owned electricity production to continue into the future or could this change? Particularly taking into account the new Dutch heat act, aiming to make heat networks public ownership.
- What do you think this will mean for energy justice/ensuring a just transition? That it will have a positive/negative effect?

Is there anything you would like to add or do you have any final comments or remarks?

## **Stakeholder 7 - VlieWaCo (cooperative - heat production/distribution)**

### Part 1

- What does the cooperative do and what is its main aim?

- Who owns the cooperative?
- Why was this form of ownership chosen when setting up the project?
- What considerations are important to take into account for a community-owned cooperative?
  - Economically, legally, socially, technically etc.

## Part 2

### Distributive justice

- What do you perceive to be the benefits of a community-owned heat network?
  - How are these benefits distributed amongst places and people?
    - How are profits distributed?
    - Does everyone have access to the heat network? Who does (not)?
    - Is the energy from the heat network affordable for everyone? Why (not)?
- What do you perceive the negative effects are of a community-owned heat network?
  - How are these negative effects distributed amongst places and people?
    - How does siting of projects affect the distribution of these negative effects?
    - How are visual impacts and noise impacts distributed? (if there are any)?
    - How are investment costs distributed?
      - Is everyone able to invest? Who is able to invest and who is not?
    - How is funding for community heat projects structured? Does the funding structure allow everyone to benefit or does it only benefit certain groups?
    - How are environmental impacts distributed? (e.g. biodiversity loss) (if there are any)?

### Procedural justice

- Who is able to participate in the cooperative's decision-making processes? Who is not?
- Who has control over the cooperative's decision-making processes? Who has no control over this?
- How would you describe the quality, transparency and timing of information you provide to stakeholders (e.g. community members that are involved)?
- Who is represented in the cooperative's decision-making body and which views do these represent?
  - Who is not represented in the cooperative's decision-making body?

### Recognition justice

- Is anyone excluded from access to the electricity you produce? If yes, who?
  - What socio-economic status/education level/gender do these excluded groups have?
- Is anyone excluded from investing or taking part in the cooperative itself? If yes, who?



- What socio-economic status/education level/gender do these excluded groups have?
- Are the views and needs of marginalized groups/individuals acknowledged/recognized by your cooperative?

### Part 3

- What do you expect for the future of Dutch heat networks in terms of ownership?
- Do you expect community-owned electricity production to continue into the future or could this change? Particularly taking into account the new Dutch heat act, aiming to make heat networks public ownership.
- What do you think this will mean for energy justice/ensuring a just transition? That it will have a positive/negative effect?

Is there anything you would like to add or do you have any final comments or remarks?

## **Stakeholder 8 (Energie Nederland) – representing private & public heat sector**

### Part 1

- How has the heat sector developed in the Netherlands over the last years?
- Who has traditionally owned heat production and distribution networks and how has this changed in recent years?
  - Why has this changed?
- What are the pros and cons of privately owned heat networks?
- What are the pros and cons of shared ownership heat networks?
- What are the pros and cons of municipal owned heat networks?
- What are the pros and cons of community owned heat networks?
- What considerations are important to take into account for different ownership forms for heat networks?
- Does the scale/size matter when considering different forms of ownership for heat networks?

### Part 2

- What distributive justice issues occur for different forms of ownership in heat networks?
  - How are positive/negative effects distributed? Is this distributed in a just way?
- What procedural justice issues occur for different forms of ownership in heat networks?
  - How just are decision-making processes?
    - E.g. participation, transparency, representation
- What recognition justice issues occur for different forms of ownership in heat networks?
  - Are certain groups/individuals excluded? Why?
- Do you think the type of ownership matters for how just the Dutch transition will be? Why?
  - Which forms of ownership allow for a more just transition? And which forms do not?

### Part 3

- What do you expect for the future of ownership in heat production and distribution in the Netherlands? What changes do you expect to see?
  - What do you expect of the new heat act (Wet Collectieve Warmte), aiming to make all heat networks publicly owned?
- And what will this mean for energy justice in the Dutch transition?

Is there anything you would like to add or do you have any final comments or remarks?

## **Stakeholder 9 (Energie Samen) – branch organization of cooperatives**

### Part 1

- What does Energie Samen do and what is its main aim?
- What considerations are important to take into account for community-owned energy production and distribution?
  - Economically, legally, socially, technically etc.

### Part 2

#### Distributive justice

- What do you perceive to be the benefits of community-owned electricity production?
  - How are these benefits distributed amongst places and people?
    - How are profits distributed? Does this differ per cooperative?
    - Does everyone have access to the electricity you produce? Who does (not)?
    - Does everyone have access to participate?
    - Is the produced electricity affordable for everyone? Why (not)?
- What do you perceive the negative effects are of community-owned electricity production?
  - How are these negative effects distributed amongst places and people?
    - How does siting of projects affect the distribution of these negative effects?
    - How are visual impacts and noise impacts distributed?
    - How are investment costs distributed?
      - Is everyone able to invest? Who is able to invest and who is not?
    - How is funding for community projects structured? Does the funding structure allow everyone to benefit or does it only benefit certain groups?
    - How are environmental impacts distributed? (e.g. biodiversity loss)
- Are there differences between cooperatives focused on heat and cooperatives focused on electricity?

#### Procedural justice

- Who is able to participate in the cooperative's decision-making processes? Who is not?
- Who has control over the cooperative's decision-making processes? Who has no control over this?

- How would you describe the quality, transparency and timing of information you provide to stakeholders (e.g. community members that are involved)?
- Who is represented in the cooperative's decision-making body and which views do these represent?
  - Who is not represented in the cooperative's decision-making body?

#### Recognition justice

- Is anyone excluded from access to the electricity you produce? If yes, who?
  - What socio-economic status/education level/gender do these excluded groups have?
- Is anyone excluded from investing or taking part in the cooperative itself? If yes, who?
  - What socio-economic status/education level/gender do these excluded groups have?
- Are the views and needs of marginalized groups/individuals acknowledged/recognized by your cooperative?

#### Part 3

- What do you expect for the future of Dutch electricity production in terms of ownership?
  - Also considering the aim of 50% local governance in the electricity sector and the obligation of 50%+1 share public governance in the heat sector?
- What do you expect for community-owned electricity production into the future? An increase/decrease, why?
- What do you think this will mean for energy justice/ensuring a just transition? That it will have a positive/negative effect?

Is there anything you would like to add or do you have any final comments or remarks?