

Energising Equality

Realizing the potential of energy cooperatives to tackle energy poverty.



A multi-case study of the Netherlands



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Sol Iustitiae Illustra Nos

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A handwritten signature in black ink, appearing to read 'Aldo Baan', with a long, sweeping horizontal stroke extending to the right.

Aldo Baan

Abstract

The invasion of Ukraine by Russia has exposed the fragility of our fossil-based energy system leading to soaring energy prices and widening economic disparities. This crisis, together with the impending climate catastrophe underlines the urgent need for a transition to a sustainable and just energy system. Energy cooperatives are heralded as catalysts for change, offering a pathway towards a more democratic and inclusive energy paradigm, promising equitable distribution of benefits and burdens.

However, despite the recognized potential of energy cooperatives, research indicates a risk of propagating inequalities between those with and without the means. This study seeks to find how the potential of cooperatives can be realized to benefit vulnerable groups, tackling energy poverty. A qualitative multi-case study of four established energy cooperatives was conducted, employing desk research and semi-structured interviews with experts and cooperative representatives.

Examining the potentials through an energy justice framework revealed that cooperatives, through their democratic, non-profit nature and local embedment, have significant potential to address energy poverty. They foster local collaboration, build long-term relationships, and implement concrete energy-saving measures through energy coaches. However, their activities do not always reach vulnerable groups, for whom other pressing priorities and distrust form important barriers.

In terms of ENCI this research has shown the value of a more reformative approach in a debate where energy cooperatives are often glorified as bringers of radical, transformative change. Although the democratic structure and ideas of the studied cooperatives are transformative, their system orientation and core activities are more reformative in nature. This more reformative approach has allowed them to enable collective action and initiated large-scale, democratically owned sustainable energy projects.

The studied energy cooperatives raise interesting questions on responsibility for tackling energy poverty. There are other actors more suited, besides cooperatives' potentials being dependent on the action of these actors. Municipalities and housing associations can greatly enhance the impact made by cooperatives through shared information, financial support, and integrated efforts. When empowered in this collaboration, cooperatives have shown they have the means and skills to roll-out effective energy poverty approaches.

At the same time cooperatives must continue to critically assess the role they can play, and the people they cater to. An energy justice framework can be a helpful tool to evaluate their contribution to a just transition, however transformative or reformative that may be.

Executive summary

The transition from fossil-based energy systems to sustainable alternatives carries the risk of propagating existing inequalities. Participation and benefits from this transition often favour those who are already financially well-off. To ensure a just transition, it is essential to critically assess how benefits are distributed among all members of society, including those without the means to participate.

Energie Samen, the umbrella organization for energy cooperatives in the Netherlands, advocates for increased citizen involvement in transitioning to local and sustainable energy systems. Embracing the principles of open membership and equitable distribution of benefits, it recognizes the importance of ensuring vulnerable groups can actively participate in the transition.

This research, supported by Energie Samen, aimed to explore the relationship between energy cooperatives and energy poverty, with a particular focus on large-scale cooperatives involved in establishing local energy hubs. By understanding this dynamic, Energie Samen can proactively address energy poverty within the evolving role of energy cooperatives.

The recommendations outlined here provide guidance for Energie Samen and other stakeholders to maximize the potential of energy cooperatives in combating energy poverty and facilitating a more equitable transition. Through strategic actions and inclusive practices, energy cooperatives can play a pivotal role in realizing a just transition to sustainable energy systems.

1. **Local collaboration:** fostering local collaboration has proven to be essential for realising a comprehensive energy poverty approach. Involved actors can explore possible partnerships, coming together to exchange ideas and making sure their approaches complement each other. Municipalities can leverage the unique position cooperatives take by providing adequate funding. Other initiatives to explore local partnerships, such as LEA (LEA, n.d.) by Energie Samen are excellent examples. Realising they cannot address energy poverty alone, cooperatives can also take a leading role in seeking out other cooperatives, municipalities, and social organisations.
2. **Adopt energy justice principles:** cooperatives could adopt energy justice as a guiding principle in their initiatives, ensuring that they recognize and include needs of vulnerable groups. This would allow them to continually evaluate how their activities are contributing to energy justice, and what more could be done. Concrete activities are going door by door and being present in the neighbourhood. Lowering barriers for vulnerable groups by simplifying membership processes and offering varied or lower membership fees can also improve justice impacts.
3. **Balance financial and social goals.** While financial incentives can drive the realization of energy projects, ensure that these do not overshadow the social justice objectives of energy initiatives. Cooperatives should strive to maintain a democratic decision-making process that prioritizes social impact alongside financial sustainability
4. **Conscious transformation:** in the exploration of local energy hubs, it is important to consider what role cooperatives will take. By critically examining who the main beneficiaries are and what barriers emerge for vulnerable groups local energy hubs can become accessible to all community members.

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Abbreviations

ENCI	Energy Citizenship
L4L	Local for Local
REScoop	Renewable Energy Sources Cooperative Europe
GMM	General Members Meeting

1. Introduction

The Russian invasion of Ukraine has exposed how fragile our fossil-based energy system is, with soaring energy prices burdening vulnerable groups and widening wealth disparities (Antje et al., 2023). 34 million Europeans were unable to adequately heat their home in 2021 and Antje et al. (2023) estimate that this number has now more than doubled. ‘Wealthy’ countries are by no means exempt with 7-9% of the households in the Netherlands estimated to suffer from energy poverty (Van Ooij et al., 2023). Together with the impending climate catastrophe this puts unprecedented pressure on the current fossil fuel system to shift to a just and sustainable one.

Energy citizenship (ENCI) is put forth as a catalyst in this transition, offering a more sustainable and democratic energy system (Pel et al., 2021). It is seen as a form of civic involvement that goes beyond the traditional view of citizens as consumers and paves the way for new, bottom-up forms of participation that can shape the energy system (Dellavalle & Czako, 2022). According to the European Commission, the future ‘Energy Union’ should have citizens at its core, ‘empowering energy consumers to play an active role’ (European Commission, 2019). In academics a growing body of research is investigating the concept ENCI: what it means and what role it can play to shape the energy transition (Wahlund & Palm, 2022).

This research focuses on collective forms of ENCI, in the form of renewable energy cooperatives. In these cooperatives, individuals come together to generate, share, and consume renewable energy sources (Tarhan, 2015). Members gain access to sustainable and affordable (below market price) energy, are usually able to elect the board and can vote over decisions (Hanke & Guyet, 2023). The decentralized, democratic form energy cooperatives often take have the potential to empower citizens, shifting power away from the dominant centralized players (Wahlund & Palm, 2022).

These potentials for energy cooperative to contribute to a just energy system are not always realized. They run the risk of excluding those that do not have the means, information, and skills to partake (Dellavalle & Czako, 2022). Vulnerable groups are faced by various barriers inherent to the solution offered by energy cooperatives. Membership fees can form a barrier for people with a low income, for example (Hanke & Guyet, 2023). As can the focus on homeowners, typically reserved for the upper and middle class (Ameli & Brandt, 2015).

People that are not able to meet their energy needs, also known as energy poor, are excluded from the transition in which citizens are expected to play such a vital role. This group has difficulties becoming involved due to limited available income, unaffordable energy prices, and inability to invest in energy efficient appliances or housing (EPAH, 2022; Dellavalle & Czako, 2022).

This discussion of cooperatives' potential revolves around questions on their role and responsibility. On the one hand policy makers and scientific authors herald them as essential actors in realizing a just transition. On the other, authors point at the risk of 'fetishizing' energy cooperatives, disregarding the broader context they are a part of and the actors they interact with (Bouzarovski et al., 2021). This research hopes to contribute to this discussion by delving into the potentials of cooperatives and what affects them coming to fruition. It does so by answering the question:

How can the potentials of energy cooperatives to tackle energy poverty be realized?

To address this the research is divided into four sub-questions:

1. What are the perceived potentials of energy cooperatives?
2. What opportunities and barriers are there for cooperatives to realize these perceived potentials?
3. How does the ENCI of cooperatives influence their potential?
4. How does the future identity cooperatives aspire influence their potential?

The qualitative approach of this research complements quantitative studies like the one by Young and Halleck Vega (2024), who examined barriers and drivers experienced by energy cooperatives in the Netherlands. Although it gives a comprehensive overview of measures taken and support required by cooperatives, it raises questions on the values and thought processes that underlie them. Similar questions are raised in the otherwise solid quantitative study done by Hanke et al. (2021), in which the authors investigate how energy cooperatives approach energy poverty in the German context. This study hopes to add a layer of depth to this existing knowledge, delving into the relationship cooperatives have with energy poverty.

The research was conducted through an internship at umbrella organisation Energie Samen, who promotes and represents the interests of energy cooperatives in the Netherlands. The organisation advocates increased citizen involvement in local energy systems and provide support for initiatives through services and knowledge sharing (Energie Samen, n.d.). Energy

cooperatives are ‘for the community’ and offer opportunities for those living in energy poverty to become involved, be heard, and partake in the benefits of the energy transition (Energie Samen, 2022a). This research is embedded in the exploration of Energie Samen into the role energy cooperatives can play in realizing a more just transition now and in the future.

This research contributes to a growing body of literature in ENCI, specifically on how it can tackle energy poverty, which has been under-researched (Campos & Marín-gonzález, 2020). It will specifically look at ENCI in energy cooperatives which are prone to take a larger role in the energy system of the future with a 50% local ownership requirement for (new) sustainability projects (Klimaatakkoord, 2019) and prognoses of 0.5 – 1.5 million people receiving electricity through an energy cooperative by 2030 (Energie Samen, 2022b). This prospect also lives amongst policy makers in the Netherlands who are developing new legislation to accommodate energy cooperatives (Jetten, 2023).

The energy transition offers opportunities to unburden vulnerable groups, with energy cooperatives having the potential to realize a system in which all citizens can fairly partake. This is an important potential to realize as “*how we distribute the benefits and burdens of energy systems is pre-eminently a concern for any society that aspires to be fair*” (Sovacool, 2014).

2. Theory

In this section the theory is described. The dark sides of the transition to a more cooperatively governed energy system are discussed in section 2.1. Next, ideas surrounding ENCI are explored (section 2.2), describing the used typology and how it can take form in cooperatives. In section 2.3 the dimensions that make up energy justice are described. Finally, in section 2.3 the two theories are integrated.

This research focusses on the potentials of cooperatives to tackle energy poverty, and the effect ENCI has on these potentials. The frameworks of ENCI and energy justice are used to embody the two sides of the energy cooperatives – energy poverty relationship. Energy justice is used to conceptualize the injustices that underlie energy poverty and the energy cooperatives' potentials to tackle them. On the other side ENCI is used to depict how their orientation affects these potentials. Together they depict the breadth of potentials cooperatives have and what is affecting their realisation.

There are various other frameworks that could be applied to study the relationship of energy cooperatives and energy poverty. The multi-level perspective (Geels, 2002) would show the important dimensions surrounding cooperatives that affect how it is embedded in the new energy system. The diffusion of innovations (Rogers, 1995) is valuable in that it could provide insights into how and by whom energy cooperatives are adopted over time. To ensure appropriate coherence and depth these two theories are not incorporated in the conceptualisation.

2.1 Dark sides of transitions

Although the transition to cooperatively governed energy system is widely celebrated, it is important to take the potential dark sides into consideration. According to Andersson et al. (2021) transitions can go in favourable or unfavourable directions, under influence of the context and actors involved. This recognizes the dark sides that can accompany social innovations, such as commercialization, instrumentalization and projectification (Pel et al., 2023b). In case of energy cooperatives, it is important to recognize its potential dark sides: the exclusion of groups (energy poor), as discussed in the introduction. We must be aware of how injustices from our fossil society are seeping through in new 'sustainable' ideals, despite the promises of energy cooperatives.

An example of a ‘dark side’ seeping through is in energy cooperatives of which members were found to generally be well-educated, knowledgeable, financially situated and dominantly male (Radtke, 2014; Yildiz et al., 2015). These are not characteristics associated with the energy vulnerable so burdened in the current paradigm. Through this form of ENCI the position of this ‘elite’ is strengthened, as they reap the benefits from their involvement (Pel et al., 2022). These investments will be recouped as they lower the energy bill, improving their financial situation. It is mechanisms like these that substantiate concerns of a widening wealth disparity gap (Asenova et al., 2023).

ENCI and energy justice are valuable tools to study the directionality of the transition to a more cooperatively governed energy system. ENCI shows how involved actors position themselves and affect the transition. On the other hand, energy justice is a tool to take the dark sides into consideration, making sure energy justice is improve and not perpetuated.

2.2 ENCI

Energy citizenship (ENCI) is a conceptualization of a new way of viewing citizen’s role in the energy transition. A transition that offers opportunities to shift our perception of energy from that of a consumable good to a holistic, communally owned entity (M. Lennon, 2017). No clear definitions of ENCI exist, although various scholars have tried to capture its meaning. Devine-wright (2007) made an early effort, outlining the energy citizen as one who actively participates in the energy transition and the political discourse surrounding it. Although such definitions are important, Silvast and Valkenburg (2023) argue that the concept is often used indiscriminately, leading to confusion and it being exploited as a neo-liberal buzzword. This risk is also emphasized by B. Lennon et al. (2020), who see that in policy the role of the energy citizenship is being reduced to that of an individualistic consumer. The concept of ENCI has appeared in various EU policies, where the responsibility of the consumer is emphasized, who can decide, on their own, what and how they consume energy (B. Lennon et al., 2020).

2.2.1 ENCI typology

In this light, a broader perspective of ENCI is necessary, in which the complexities surrounding individuals are considered. There are various studies aiming to acknowledge the breadth of ENCI. Chilvers & Longhurst (2016), for example, present the different forms in which citizens can take part: as activist, consumer, resourceful or deliberate citizens. Schot et al. (2016) use the multi-level perspective to describe how users can bring about change as producers,

legitimators, intermediary, citizen, or consumer. A more recent typology was presented by Debourdeau et al. (2021) as part of the Energy Prospects project (Prospects, 2024). Their typology was the main input for the ENCI as understood in this paper. Their study is recent, thorough, and most importantly makes a distinction between individual and collective energy citizenship. This allowed a focus on collective forms, as can be observed in energy cooperatives. An overview of the typology is given in table 1 below, followed by an explanation of the dimensions.

OUTCOME-ORIENTATION	AGENCY				
	INDIVIDUAL			COLLECTIVE	
	PRIVATE	ORGANISATIONALLY EMBEDDED (E.G. WORKPLACE)	PUBLIC	CITIZEN-BASED AND HYBRID	SOCIAL MOVEMENTS
	Manifest and latent forms can be differentiated				
REFORMATIVE INCREMENTAL SOCIO-TECHNICAL CHANGE LOW ENERGY DEMOCRACY SHALLOW ENVIRONMENTAL SUSTAINABILITY	1. DO THEIR BIT (in the household) Complying with the green energy transition	3. DO THEIR BIT (within organisations) Energy citizenship within organisations	5. MAKE THEIR VOICE HEARD Participating in societal energy discussions	7. DO THEIR SHARE Joining green energy projects	9. DO THE JOB Facilitating the energy transition through alignment activities
TRANSFORMATIVE RADICAL SOCIO-TECHNICAL CHANGE HIGH ENERGY DEMOCRACY DEEP ENVIRONMENTAL SUSTAINABILITY	2. DO THEIR OWN (in the household) The change-making energy citizen	4. DO IT THEIR WAY (within organisations) The energy-related change maker in organisations	6. MAKE THEIR VOTE COUNT Mobilising votes for energy transition	8. GO AHEAD Building, expanding and linking citizen-based organisational forms	10. MAKE THEIR CLAIMS Protesting against the current energy system

Table 1: Overview of the ten ENCI types.
From "Conceptual typology" (p. 35) by Debourdeau, A., Schäfer, M., Pel, B., Kemp, R., Vadovics, E., & Dumitru, A. (2021).

This typology considers two main dimensions that characterise energy citizenship: agency and outcome-orientation (Debourdeau et al., 2021). In terms of agency an important distinction is made between individual and collective agency. While ENCI is often attributed to individuals (who is doing what?) they can also come together in collectives to achieve a sustainable goal or make their voice heard. Extinction Rebellion is an example, where individuals come together to take social action (Extinction Rebellion, n.d.). By including this collective agency, a broader understanding of the ways it can take shape is formed.

Outcome-orientation focusses on the desired outcomes of ENCI efforts, making a distinction between reformative and transformative orientations. Reformative outcome-orientation emphasizes pragmatic engagement in the energy system, through specific projects or technological interventions. An example is energy projects in which citizens can invest and receive interest but without being able to influence decisions. It could also take shape in

cooperatives with high-membership fees, where the largely anonymous membership is a vehicle for people to invest in wind parks or solar farms. On the other hand, transformative outcome orientation encompasses “broader energy transition goals and climate change” (Armstrong, 2021). The latter is seen as more radical, in which the current energy system is contested. In cooperatives this means creative financial schemes (crowdfunding for example) to realize a democratically owned solar farm. Active engagement of members is also indicative, in contrast to the focus on investments in reformative initiatives.

2.2.2 ENCI in cooperatives

These dimensions, together with some sub-categories enable the researchers to distinguish the ten forms ENCI can take shown in table 1. This study focusses on collective forms thereby ruling out the first six individual forms. The remaining four are categorized as ‘social movements’ or ‘citizen-based and hybrid’ forms. Cooperatives fall under the latter, leaving types 7 ‘do their share’ and type 8 ‘go ahead’. These are highlighted in the overview of the typology in table 2 below:

OUTCOME-ORIENTATION	AGENCY				
	INDIVIDUAL			COLLECTIVE	
	PRIVATE	ORGANISATIONALLY EMBEDDED (E.G. WORKPLACE)	PUBLIC	CITIZEN-BASED AND HYBRID	SOCIAL MOVEMENTS
	Manifest and latent forms can be differentiated				
REFORMATIVE INCREMENTAL SOCIO-TECHNICAL CHANGE LOW ENERGY DEMOCRACY SHALLOW ENVIRONMENTAL SUSTAINABILITY	1. DO THEIR BIT (in the household) Complying with the green energy transition	3. DO THEIR BIT (within organisations) Energy citizenship within organisations	5. MAKE THEIR VOICE HEARD Participating in societal energy discussions	7. DO THEIR SHARE Joining green energy projects	9. DO THE JOB Facilitating the energy transition through alignment activities
TRANSFORMATIVE RADICAL SOCIO-TECHNICAL CHANGE HIGH ENERGY DEMOCRACY DEEP ENVIRONMENTAL SUSTAINABILITY	2. DO THEIR OWN (in the household) The change-making energy citizen	4. DO IT THEIR WAY (within organisations) The energy-related change maker in organisations	6. MAKE THEIR VOTE COUNT Mobilising votes for energy transition	8. GO AHEAD Building, expanding and linking citizen-based organisational forms	10. MAKE THEIR CLAIMS Protesting against the current energy system

Table 2: Cooperative ENCI types

Type 7 involves citizens participating in green energy projects by ‘doing their share’. This participation typically occurs in either citizen-based agencies or more hybrid forms: working alongside businesses and public authorities. This type reflects incremental changes and confirmation to the current energy system. Citizens involved are willing to contribute but without extensive commitments. Their participation is often limited by finances and ability,

limiting true empowerment and energy justice effects. Examples are citizens being minority shareholders in wind or solar farm projects.

Type 8 has the same forms as type 7 but often originates from grassroots movements, aiming to drive innovation and to realize alternative energy projects. These types of initiatives take a proactive stance in pushing forward the energy transition, attracting frontrunners and engaging in long-term relationships with local actors. They emphasize democratic principles, empowering citizens and facilitating radical change towards decentral and sustainable energy systems. Equity and energy justice considerations are at the heart of their activities. Examples are citizen-led energy communities and cooperatives promoting active engagement.

Cooperatives rarely identify as either type 7 ‘do their share’ or 8 ‘go ahead’ and it is more realistic to view this identity as a spectrum rather than a dichotomy. Cooperatives might be more inclined to one but still have characteristics of the other, whilst also shifting between the two in time. This duality will be further explored in the empirical observations of section 4.3. By identifying which characteristics relate to which type, a cooperative can be positioned in the described spectrum. The goal of this research is to study the effects this positioning has on cooperatives’ potentials to tackle energy poverty. In policies and literature, the focus seems to lie on the radical change cooperatives can bring, ushering in a new energy system. The question is how realistic this is and how cooperatives reflect on their projected role.

2.3 Energy Justice

People living in energy poverty are often stuck in vicious cycles of vulnerability. The groups that are most affected are those that are already vulnerable: separated families, elderly living off minimal support and people with mental and/or physical health problems (Straver et al., 2020). Inadequate heating of homes leads to perpetuation of these problems, which then causes increasing health bills (Straver et al., 2020). Children growing up in energy poor households were found to pay up to 40% more in hospital bills than those that do not (Van Maurik, 2023). They are also more likely to be absent from school and show lower social and emotional wellbeing (EPAH, 2022). Recognising the evolving circumstances of these vulnerable groups the term ‘energy vulnerable’ is more comprehensive than ‘energy poor’. Addressing the energy vulnerable not only leads to improving their circumstances, but it can also break vicious cycles, increasing levels of education, improving economic situations, and cutting (governmental) expenditure on health (EPAH, 2022).

Energy poverty is a complex problem of systemic injustices. On the surface it stems from distributive justice: households that do not have enough available income to pay their rising energy bills (Dellavalle & Czako, 2022). Conventional definitions focus on this dimension, with energy poor households being defined as those that spend more than 10% of their income on energy, for example (Straver et al., 2020). According to Dellavalle and Czako (2022) this injustice, however, is underpinned by lacking recognition of their needs and under representation in decision making processes. Varying needs of energy are rarely recognized, despite the vulnerable groups mentioned before (elderly, sick and children) generally needing more energy (Dellavalle & Czako, 2022). In terms of representation, the interests of the energy vulnerable are not often heard, leading to limited political support for these groups (Walker & Day, 2012). Lacking information can also form a barrier with these groups lacking the time or energy to investigate what the best energy provider is or what subsidies they have a right to (Walker & Day, 2012).

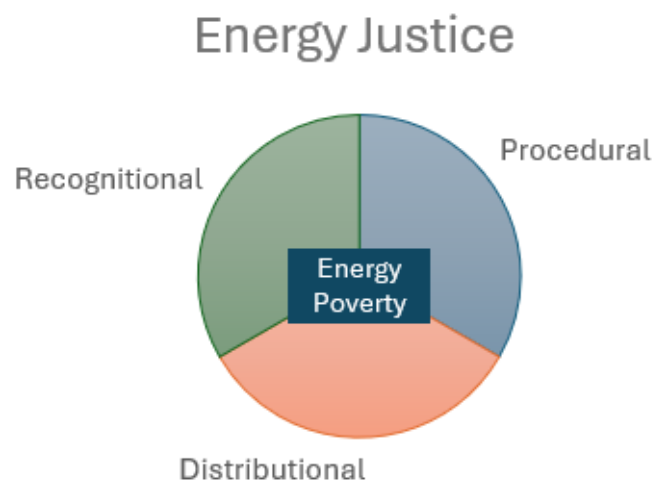


Figure 1: Positioning energy poverty in energy justice

Figure 1 depicts how energy poverty can be placed on the nexus of the three justice tenets. Where exactly it is placed is ambiguous and dependent on the perspective people have on what underlies energy poverty. For the purpose of this study the justice tenets will be used to determine what potentials energy cooperatives have to tackle energy poverty and what concrete measures they take.

2.4 Theory integration

In this section the integration of the two theories, ENCI and energy justice, will be discussed. A visual representation is shown in figure 2 below followed by an explanation.

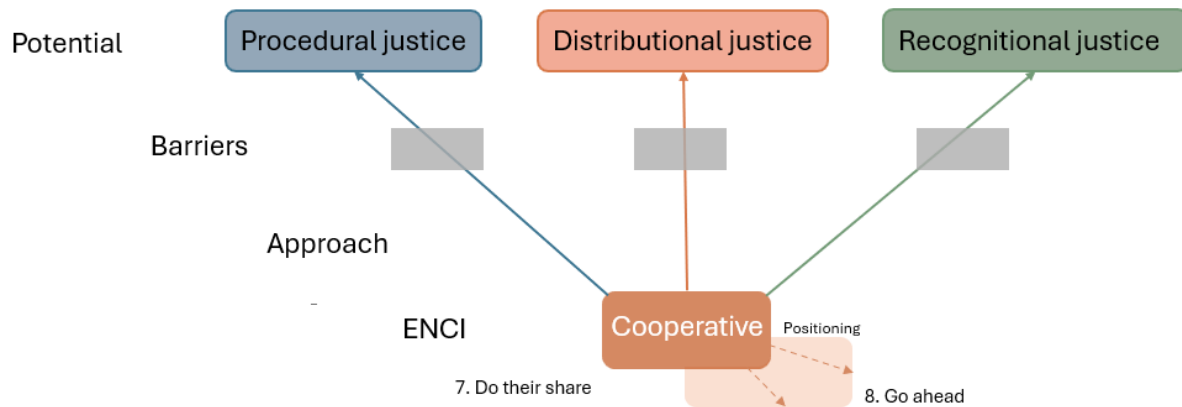


Figure 2: Integrating the theories

The top of the figure shows the potentials of cooperatives to tackle energy poverty, along the dimensions of energy justice. Energy cooperatives, as a form of ENCI, can offer access to local, sustainable energy (distributional). They can empower citizens to decide over energy resources, with members voting for where their electricity should go (procedural). Through member meetings their needs can be heard, and decisions can be influenced (recognitional). This potential is in theory, and the lines leading up to the three tenets represent the approach of cooperatives in practice. Does the cooperative make sure vulnerable groups also gain access to the sustainable energy, for example? In their approach cooperatives can encounter barriers, represented by the grey boxes. Are their laws that prevent them from acting as they would like to? Finally, the bottom of the figure shows how cooperatives can be positioned on the ENCI spectrum of types 7 and 8. This positioning affects the potentials the cooperatives have. Perhaps they are more focussed on realizing more sustainable energy projects than on tackling energy poverty, for example. This theoretical framework is operationalised in section 3.4.

3. Method

This research investigated the research question: *How can the potentials of energy cooperatives to tackle energy poverty be realized?*

The sub-questions imply four phases in the research process:

Phase 1: Investigate what perceived potentials cooperatives have.

Phase 2: Discover the barriers and opportunities cooperatives have, to tackle energy poverty.

Phase 3: Determine how the ENCI of cooperatives affects their potentials.

Phase 4: Explore how a changing ENCI will affect cooperatives' potentials.

This section describes how these steps will be carried out during the research process. A deductive qualitative approach is proposed, analysing case studies through the lens of the theories of ENCI and energy justice. The case selection procedure and the studied energy cooperatives will be described in sections 3.2 and 3.3. The subsequent sections show how data will be collected and how the theories will be operationalised to interpret this data. Finally, sections 3.6 and 3.7 discuss the validity and ethics of the research.

3.1 Research design

This research aims to gain an in-depth understanding of how energy cooperative can realize their potential to tackle energy poverty. An explorative approach is suited as information on the relationship between energy cooperatives and energy poverty is scarce (Yin, 2017). To study this relationship a multi-case study is implored, allowing the researcher to delve into specific contexts to learn how the dynamics of the cooperatives impacted how they relate to energy poverty. Case studies are suitable, as they provide an understanding of 'the dynamics present in unique contexts' (Eisenhardt, 1989). A qualitative approach also facilitates investigation of values and perspectives of people involved in the cases, which is integral to understanding how the ENCI of cases influences their relationship to energy poverty. Studying multiple cases allows comparison of the outcomes, increasing the validity of presented perceptions. Answers to the questions were sought through desk research of existing literature and online presence cooperatives had. Interviews with experts and respondents from cooperatives formed the majority of the study.

3.2 Case selection

To ensure the research maintains depth and quality, purposeful sampling is implored selecting cases with specific criteria (Yin, 2017). The chosen scope of this study is the **Netherlands**, meaning the first criterion is that selected cooperatives must be active there.

The second criterion relates to the type of energy cooperative. As was briefly shown in the theory, there are a multitude of initiatives that can be categorized as an energy cooperative: from a local sowing club that sows curtains that isolate homes (Duurzaam Den Haag. n.d.) to a national energy supplier that is made up of dozens of cooperatives supplying cooperatively owned electricity (Samen OM, n.d.).

On the one hand these cooperatives are celebrated, shaping a more just energy system, and on the other scholars warn of ‘dark sides’ seeping through (see section 2.1). If membership fees are high, for example, being included in a cooperative will remain reserved for those that have the means. To study this contradiction, cooperatives should be selected that are **mature**. This allows for empirical observations on what potentials cooperatives have, to shape a just energy system and how they are realizing them. Their maturity also allows the study of dark sides that might have seeped through in their growth or professionalisation.

Another important factor that influences how relevant cases are for the research questions is their **size**. Larger cooperatives, especially those with their own sustainable energy assets (solar parks and windfarms), are already dealing with the energy system, and must relate to it in a certain way. That makes studying these cooperatives interesting as how cooperatives relate to a system is an important part of their ENCI.

To find suitable cases the umbrella association for energy cooperatives in the Netherlands (Energie Samen) was contacted. They are leading a pilot with seven cooperatives that are exploring local generation, sharing, and using of electricity (L4L). The cooperatives involved in the pilot were deemed to be suited as they were mature, owned assets and were exploring new ways of approaching energy. Furthermore, this allowed for results about the future of energy cooperatives (section 4.4) to be linked back into the project. Of the seven cooperatives, there were three overarching cooperatives consisting of multiple smaller ones. Although energy cooperatives, these are not as directly citizen led, making it difficult to study the influence of members. As this is an important factor to consider in the ENCI of initiatives, the final criterion became **direct citizen involvement**, leading to four final cases to study.

3.3 Case studies

Here an overview of the cases is given.



Zonnedorpen is an energy cooperative in Noord-Oost Groningen. It was founded in response to frustrations over gas extraction damages. This led to pro-actively pursuing alternative forms of energy to reduce dependency on natural gas and generally improve living conditions. Five enthusiasts from five different towns got together to realise an externally financed 1500 panel solar field. Leveraging the old ‘zip code scheme’ they were able to offer a competitive energy price. They support gas-free neighbourhood programs, assisting residents with energy assessments and heat pump installations. They focus on a couple of towns and have around 200 members (Zonnedorpen, n.d.)



Energie Samen Rivierenland is an energy cooperative dedicated to sustainable energy solutions in the ‘Rivierenland’ region. Originally there were local initiatives there that were being developed independently. Recognizing the benefits of shared knowledge and collective effort, they decided to work together, forming an overarching cooperative. This has led to them encompassing a wide range of activities, from supporting various solar and wind projects to energy efficiency programs. They operate an energy advice centre to help homeowners improve the efficiency of their home and also advise businesses on saving energy and electrifying their ventures. They are a unique case in this study as they have a regional program (Energie Vitaal), which assists low-income households with practical energy saving measures (Energie Samen Rivierenland, n.d.)



Deltawind is the oldest cooperative, with activities dating back to the 1980s. It was founded by residents of the islands in Zuid-Holland, motivated by a desire to harness the abundant wind in their coastal region. Over time Deltawind embraced larger initiatives, culminating in the development of Windpark Krammer. The steady income this has brought has given room to explore different activities. From organising collective purchasing schemes to establishing an energy advice centre. They also use their income to fund social projects and employ people dedicated to reach vulnerable groups. Deltawind has around 2500 members, and continues to grow (Deltawind, n.d.).



Grunneger Power is quite a large cooperative active in Groningen, with around 2700 members. It was originally founded as a working group to promote solar panel adoption and organize collective purchasing. As interest grew, they explored the possibilities of establishing an own energy company, now known as 'Energie van Ons'. To be able to grow as an energy supplier they realized a large-scale solar park together with the municipality, with 100% citizen ownership. Besides solar parks they are engaged in piloting projects for solar collectors and heat pumps. They work together with other organisations to stimulate people to make their homes more sustainable (Grunneger Power, n.d.).

3.4 Interviews

Cases were analysed using data available from the umbrella association Energie Samen and any online presence they have. Six interviews were conducted with representatives of the above cooperatives, of which three were board members and the other three employees. One interview was conducted with each cooperative to understand what drives the cooperative, where they originated from and how they relate to energy poverty. With two of the cooperatives a second interview was held to get a second perspective and to delve into their plans and ideas around local energy hubs. This second perspective was also aspired for the other two cases but, due to practical constraints was not possible. Four other interviews were conducted with experts, from Energie Samen but also one with a research institute. These all had experience with projects involving people in energy poverty or researching it.

All interviews were conducted in a semi-structured manner. The structure was based on the theories about energy cooperatives and energy poverty. Questions were consciously held open, to avoid steering interviewees to 'desirable' answers about their perception of energy poverty. This allowed interviewees to speak freely in the one-hour interviews, with the research asking follow-up questions about research themes that they mentioned. Sub-questions were added, providing guidance if necessary. Three general interview guides were made (see Appendix A - C):

1. For the experts of Energie Samen and a research institute.
2. For a general understanding of the cooperative.
3. For a second perspective and local energy hub interest.

The questions were formed using the operationalisation in the following section (section 3.5).

An overview of the interviews is given below:

Organisation	Who
Energie Samen	1. Project manager energy poverty alleviation
	2. Consultant inclusive energy projects
	3. Director sector association
Research institute	4. Expert energy poverty
Cooperative 1*	5. Board member and founder
Cooperative 2	6. Employee energy poverty alleviation
	7. Project lead L4L
Cooperative 3	8. Board member
	9. Board member L4L
Cooperative 4	10. All-round employee

Table 3: Overview interviews

* Note: numbers are randomised to increase anonymity respondents

3.5 Data collection and analysis

The research was carried out in four phases, outlined below, with their goal and the sources used to carry out the phase.

Phases	Goal	Source
1. Investigate potentials	Investigating what potentials cooperatives have, to tackle energy poverty	For this phase input from the interviews with both cooperatives and experts about what makes cooperatives unique was used.
2. Opportunities and barriers	Discover how cooperatives are approaching energy poverty and what barriers they struggle with.	Input from online presence and interviews with the cooperatives was used to discover their approach and both cooperative and expert interviews were asked about barriers.
3. Effect of ENCI	Research how ENCI affects (the realization of) their potentials.	In the interviews with cooperatives questions were asked about their origin, identity and orientation.
4. Future ENCI	Explore how the changing role of cooperatives affects their potentials.	Both experts and cooperatives were asked to explore what the future role of local energy cooperatives could mean for the potentials of cooperatives.

Table 4: Research phases

Phase 1: Investigating what potentials cooperatives have, to tackle energy poverty

To research how cooperative can realize their potentials, it is important to first understand what potentials they have. As explained in the theory (section 2.3) this research conceptualizes the potentials of cooperatives as how well they are able to tackle energy poverty through the three energy justice tenets. These tenets are operationalised using Hanke et al. (2021) in table 5 below. The final column shows the ‘desired outcomes’ for the ideal energy poverty approach.

Justice tenets	Theme	Desired outcome
Procedural justice	Access to information	- Targeted information - Targeted activities
	Access to membership	- Member diversity
	Representation of stakeholders	- Diversity board - Involvement with varied social stakeholders
Distributional justice	Access to outcomes	- Diversified services
Recognitional justice	Awareness of energy vulnerability and energy poverty	- Level of knowledge about energy poverty - Engagement with energy poor households
	Awareness of communities’ role in energy justice	- Responsibility of cooperatives - Alleviation of energy poverty

Table 5: Operationalisation justice tenets (Hanke et al., 2021).

This operationalisation led to the questions in table 6 below being asked in the interviews with the cooperatives (see appendix B - interview guide). The ‘general questions’ were also used in the interviews with experts, although formulated about cooperatives in general. This operationalisation was used for both phases 1 and 2.

Theme	Specific questions	General questions
Procedural justice	- Are you aware of who the vulnerable groups are in your community?	- What makes a cooperative approach to energy unique? - What are measures that successfully tackle energy poverty - Who do you work together with? - What are measures you take to ensure vulnerable groups are included? - What barriers are there for you to do more?
Distributional justice	- How do vulnerable groups profit from cooperative x?	
Recognitional justice	- How are vulnerable groups signalled by cooperative x? - What is the societal responsibility of cooperatives such as your own?	

Table 6: Interview questions related to energy justice themes

To answer the first sub-question observations by the interviewees about the more theoretical potential of cooperatives was distilled (section 4.1). Could their presence in neighbourhoods allow them to reach vulnerable groups, more easily for example. That would be a potential related to procedural justice. In this way the observations of the respondents were coded into the three justice tenets. Experts formed an important source of insights as they reflected more generally and theoretically on the added value of cooperatives. About the cooperative principles for example, and how equal access to membership should be a part of every cooperative (R2).

Phase 2: discovering opportunities and barriers of cooperatives in their approach of energy poverty

To analyse the barriers and opportunities of cooperatives, their activities must be understood. Insight into measures cooperatives take was obtained partly by online presence but mostly by asking representatives of cooperatives about them in the interviews. Depth was sought by asking interviewees to compare measures, to mention examples of how measures take form in practice and what other parties were involved in their development and implementation. These types of questions were all incorporated in the interview guide for cooperatives (see appendix B).

In contrast to phase 1 this analysis focussed on concrete measures being carried out by the studied cooperatives. What are they doing and with whom? (see questions table 6). The cooperatives were also asked about experienced barriers. The results were coded and structured according to the three justice tenets giving an overview of what is limiting or stimulating cooperatives in tackling energy poverty in each justice dimension (section 4.2).

Phase 3: Research how ENCI affects (the realization of) their potentials.

As explored in the theory (section 2.2), the ENCI of an initiative influences their potentials. If a cooperative is focussed on realizing a return on the investments of its members (reformative), less funds and time will go into including vulnerable groups in the activities of the cooperative. Similarly, if a cooperative is the owner of a wind park it can be democratically governed (transformative), ensuring everyone in the affected community, including vulnerable groups can be heard. This phase studies which ENCI type the studied cooperatives relate to more: the reformative type (type 7, do their share) or the transformative type (type 8, go ahead).

Subsequently how this position effects the way they approach energy poverty is studied. To do this the typology by Debourdeau et al. (2021) is operationalised below:

Theme	Type 7 ‘Do Their Share’	Type 8 ‘Go Ahead’
Agency	Taking part	Pushing forward the energy transition
Outcome-orientation	Reformative	Transformative
System orientation	Confirmation	Contestation
Energy democracy	Low	High
Environmentally	Shallow	Deep

Table 7: Operationalisation ENCI, adapted from Debourdeau et al. (2021)

During the interviews with the cooperatives, questions were asked relating to the themes. These are shown in table 8 below and were incorporated in the interview guides (see appendix B & C). They were also used, although formulated more generally, for the interviews with the experts (see appendix A).

Theme	Questions
Agency	How did the cooperative emerge? What is the added value of a cooperative approach?
Outcome-orientation	What need did the cooperative fulfil? Why do people become a member of your cooperative?
System orientation	What is the societal responsibility of cooperatives to tackle energy poverty? How do cooperatives contribute to tackling energy poverty?
Energy democracy	How do members exert influence in the cooperative?

Table 8: Interview questions related to the ENCI themes

To form general ideas of the ENCI of the studied cooperatives their characteristics were categorized using the two types. This was done by coding responses of interviewees according to the themes outlined in table 7. The reflections on their identity and approach to energy poverty are presented in section 4.3

Phase 4: Explore how cooperatives can tackle energy poverty in the future.

This step is more explorative, looking into how the role of cooperatives could change and how this would affect their potentials to tackle energy poverty. The energy system is becoming increasingly decentralized with increasing opportunities for local energy hubs (Ford et al., 2021). The studied cooperatives are all engaged in the realisation of a more local energy system, with coupling and storage of power and smart home devices to regulate use. This phase studies how this changing role could affect their potentials to tackle energy poverty.

To obtain relevant data the second interview of each cooperative, besides offering a second perspective, was more focussed on cooperatives’ ideas about the potential of local energy hubs to alleviate energy poverty. For the cooperatives that could not facilitate a second interview, the first one was expanded to incorporate these themes. The same operationalisation as in phase 3 was used to formulate the questions about local energy hubs presented in table 9 below.

Theme	Questions
Agency	How did the idea for L4L* emerge? How does the role of cooperatives change when shifting to L4L?
Outcome-orientation	How will people benefit from L4L?
System orientation	What is the added value of L4L for vulnerable groups? What opportunities does L4L offer to target these groups? What barriers does it raise?
Energy democracy	What changes for members/citizens in L4L?

* L4L (local for local) is a pseudonym for local energy hubs in the pilot

Table 9: Interview questions for the future of cooperatives

Section 4.4 present how the ENCI of cooperatives will shifts according to the respondents. It also explores what opportunities and barriers this shift raises.

3.6 Validity and reliability

According to Quintão et al. (2020) four criteria must be considered to improve the validity and reliability of a case study approach.

Criterion	Within this study
Construction validity	Using different sources to triangulate data is essential to validate results from cases studies (Yin, 2017). In this study that is done by obtaining through Energie Samen, online presence and interviews with different types of actors. The energy poverty researchers claim that energy cooperatives are intrinsically motivated could be substantiated with observations from interview with the different energy cooperatives, for example
Internal validity	Although less significant in exploratory research, internal validity is still important to ensure that any relationship identified between the energy cooperatives and energy poverty is plausible. This is upheld by a theoretical framework identifying both sides of the relationship and the research that clearly distinguishes between the two. Interviewees were asked about their cooperative first, before exploring perceptions of energy poverty, for example.
External validity	This factor ensures analytical generalisation in which empirical observations can be generalized. It is upheld by the careful defining and applying of case selection criteria in section 3.2 (Yin, 2017). The description of the cases in section 3.3, also help, enabling researchers to compare the studied cases to those in other contexts (Levy, 2008). Finally, the insights from different cases were compared in the different sections of the results, allowing for more generalisable conclusions.
Reliability	Reliability is maintained by a thorough research approach. Through umbrella association Energie Samen relevant stakeholders were identified and contacted, with whom standardised semi-structured interviews were conducted. These were recorded, transcribed, and coded using the approach outlined in section 3.5. By keeping the code schemes consistent within each type of interview the reliability was upheld.

Table 10: Validity and reliability criteria

3.7 Ethics and consent

As described by Bryman and Bell (2011) there are ethical principles that should be adhered to in social research. These were upheld by ensuring confirmed consent with all interviewees. Before each interview they were informed on the purpose of the study, how the information would be used and that they had a right to withdraw at any time. Data was processed anonymously with names and references to traceable subjects being removed in the thesis. Interviewees were asked if they wanted to check transcript allowing them to remove answers, they were not comfortable sharing. This also allowed them to address misinterpretations. No information about interviewees was used without their consent.

Critically engaging with the data requires reflections on my own positionality. During the interviews and subsequent analysis, I was aware of my own assumptions about energy poverty and its origins. It was sometimes easy to agree with respondents who, like me are well-off and engaged with the energy transition. During my research I became enthusiastic about the activities cooperatives pursue, from realising energy projects to balancing your energy use with solar panels and electric cars. To avoid biases seeping into the thesis I rely solely on external sources and stay close to the data. In my results, for example, I rely heavily on quotes from respondents to depict their ideas, avoiding too much interpretation. I try to place the observations I made in a larger context of cooperatives and the literature that exists around them.

4. Results

In this section the results will be presented, structured by the four sub questions. First the perceived potentials of cooperatives to tackle energy poverty will be explored (**section 4.1**). This is followed by how they are realizing this potential and what barriers they encounter (**section 4.2**). Section 4.3 describes how the ENCI of cooperatives influences their potential. Finally, the way their identity might change and the affect that will have on their approach to energy poverty will be explored in section 4.4.

4.1 Perceived potentials

In this section answers are sought to the sub question: *What are the perceived potentials of energy cooperatives to tackle energy poverty?* In literature and policy, cooperatives are claimed to help realise a just energy transition. These claims are discussed empirically in this section by relaying the perceptions of both cooperatives and experts.

4.1.1 Procedural justice

Procedural justice comes from procedures that ensure everyone is engaged and can participate in the energy transition in an inclusive way (Jenkins et al., 2016). Specifically for energy cooperatives this means making sure vulnerable groups are actively approached and can become involved (Hanke & Guyet, 2023). According to the respondents there are three key ways cooperatives can contribute to this form of justice: they can raise awareness and promote behavioural changes that lead to energy savings, build trust through repeated, personalized interactions and contribute to local networks that support vulnerable households.

Interviewees identified that raising awareness on how people can approach their energy problem is an important first potential for cooperatives. A board member of one of the larger cooperatives explained that *“People need to realize that there is a solution to a problem. Even if they don't see that solution yet.”* (R8). A board member of a different cooperative described an example of someone who had a problem with their energy use, without realising what the solution was: *“and then it turns out that the good man has 4 or 5 of those very old freezers, because he has a gardening hobby for which he freezes everything”* (R5). Cooperatives *“have a lot of knowledge in-house”* (R10) an employee explains, making them well suited to advise people on potential solutions. Take the man with the freezers: *If you then measure the energy use for a day or so and show him how much energy the freezers use, it won't take long before they take them out to the side of the road for the trash collectors”* (R5). This combination of

raising awareness on technical solutions and behavioural change allows cooperatives to realise concrete (energy) savings.

The second potential for cooperatives identified by respondents is overcoming barriers of mistrust often observed in energy poor households. A consultant for inclusive energy poverty explains why mistrust forms a barrier: *“Let's say you are in energy poverty and you receive a letter on your door from the municipality. Yes, there is a good chance that that letter will not even be opened, because letters can be quite frightening or frightening”* (R2). This makes it difficult to reach these groups even with the best intentions. A project lead of energy poverty alleviation explains that a cooperative approach is different, as it consists of people, volunteers and employees that gain trust by show up to places many times (R1). This ‘human’ approach also allows cooperatives to cater to the specific needs of households: *“by knocking on doors in neighbourhoods where energy poverty is probably prevalent and asking what kind of support is needed”* (R1). The importance of such a targeted approach is underline by an energy poverty researcher: *“there are intersectional characteristics of humans that lead to a greater or lesser or greater experience of energy poverty”* (R4). There is no one-size fits all, and by gaining trust cooperatives are able to learn of the needs of people and provide support in the appropriate domains.

Advancing local collaboration is the third potential cooperatives have, as identified by the spoken experts. The project lead of an energy poverty approach explained how a local network is fundamental for the projects they are involved in: *“we actually say that you can only tackle energy poverty if you build a solid local foundation”* (R1). They mention that foodbanks are an example of an important actor cooperatives sometimes collaborate with: *“people who come for a food package are also asked if they would like an energy coach, a conversation or can be helped with the implementation of some small measures”* (R1). This holistic approach allows for cooperatives to address the needs of people they would otherwise have a hard time finding. A consultant of inclusive energy projects confirms that through a local network it *“is easier to get to the front door if it is someone you know and trust and who you do not have to be ashamed of that you may be in such a bad financial situation”* (R2). If there is already an organisation in contact with vulnerable households, these contacts can be used by cooperatives to provide support for their energy related struggles.

4.1.2 Distributional justice

The second energy justice tenet examines how the benefits and burdens of (sustainable) energy are distributed (Jenkins et al., 2016). In the case of cooperatives this relates to the access people in energy poverty have to the outcomes of the activities cooperatives pursue (Hanke & Guyet, 2023). According to the respondents, cooperatives' distributive potential stems from enabling proactive agency to change how energy systems are currently run, focussing on benefits flowing back to the community, and intrinsic motivation to tackle energy poverty and include a wide range of people.

The studied cooperatives all emerged from a frustration with the current energy system and have taken matters in their own hands to pursue alternative energy solutions. A board member engaged with cooperatives since 2009 explained that by bundling individual agency into collective agency, *“people realise something they couldn't have alone”* (R8). There were different motivations for the cooperatives to do so: from frustration with big companies exploiting the region (R5), to the municipality being slow to change things (R10) and wanting to keep profits in the region (R9). Similarly motivated people sought out each other, to seek alternatives (R8). These alternative ideas, such as using a solar farm for energy instead of gas from local gas fields (R5) were then realised through creative ways of funding, such as crowdfunding in combination with subsidies (R5, R7, R8, R10).

Once a cooperative is founded, it differentiates from other institutional forms as it has a mission, with articles of association, a board and then the general members meeting (GMM) as the highest body that decides (R8, R10). An employee of a cooperative explains the benefits of this public form: *“you don't really have the hassle of a private company that is always about shares, valuation and profit maximization”* (R10). Instead, as a cooperative, people can decide what to do and what is best for the community the members are a part of. An employee of a different cooperative explains that: *“With people owning a part of the energy system they might make different choice with different values than just putting profits first”* (R9). Maximising profits might mean expanding a wind park or selling to a foreign investor, whilst members of a cooperative can decide to have profits flow back to the community (R7). An energy poverty researcher explains that cooperatives are intrinsically motivated to tackle energy poverty (R4), meaning these profits could flow back to the vulnerable groups in the community.

A consultant for inclusive energy projects explained the potentials there are for cooperatives to reach a large group by making thresholds low (R2). They mentioned an

example in Rotterdam, where, by extensively explaining the different options to residents to become involved and accommodating lower membership fees, a diverse group was reached (R2). This group can profit from their investments with small yearly refunds and collective energy contracts, for example (Energie Samen, 2023).

4.1.3 Recognitional justice

This final justice tenet examines how the needs of all societal groups can be understood and accommodated (Jenkins et al., 2016). Energy cooperatives can do so by ensuring they engage with energy poor households, and that they are aware of energy poverty and cooperatives' responsibility to alleviate it (Hanke & Guyet, 2023). The potentials of energy cooperatives come from them engaging in long-term personal connections, and a broader understanding and approach of energy poverty than is given in traditional metrics.

Hard metrics for energy poverty such as 10% of your income going to energy were debunked by an energy poverty researcher: *“that 10% has been a totally arbitrary indicator, right? ... Energy poverty is more of a concept that is about access to energy”* (R4). A leader of an energy poverty project also preferred a broader definition: *“For me personally, and you see this more and more, energy poverty is about energy inequality. Often experienced by people with an older home: poorly insulated, whether it is your own home or a rental home, leading to relatively high energy costs. In addition, they (people living in energy poverty) also have far fewer options to invest in their home: insulation or solar panels, which actually puts them in a very unequal position.”* (R1). This recognition of the inequalities underlying energy poverty is an important starting point for a broader approach.

One of the potentials of cooperatives stems from their long-term engagement with vulnerable groups. An energy poverty researcher explained that for people living in energy poverty *“There really are no options or no opportunities to become very involved in the energy transition and I think that can be done very well through these types of cooperatives and initiatives”* (R4). Current approaches of municipalities are accused of not actually involving people in energy poverty. Municipalities often work through tenders, which are won by commercial parties (R1, R2). A consultant of inclusive energy projects explains why this approach does not work long-term: *“In a year, you have to reach so many conversations with so many people and a certain amount of small energy-saving measures, such as draft strips and radiator foil and similar things. And then, once these numbers have been reached, the party that carried out the project leaves”* (R2). A project lead of an energy poverty approach

explains that cooperatives are different as they are part of the community, engaging with people for the long-term which enables them to “*look more broadly than just some saving measures*” (R1). As explained in 4.1.1, cooperatives can build trust and learn about the problems each individual household has.

Local energy cooperatives have the potential of maintaining the link between people and national and regional projects and policies (R2): “*it is much easier to call someone you already know, instead of someone who works nationally*” (R2). According to the spoken experts, an important aspect of involving vulnerable groups is reaching them: *What I think is that we all still must learn, throughout the Netherlands, in an extremely segregated society ... how do we reach someone else? How do we get in touch with them? How do we get out of our bubble?* (R4). To do so, a consultant of inclusive energy systems explains, you must rethink your communication channels: “*There are many cooperatives that communicate through a newsletter or something, but you only see that if you are already in the bubble*” (R2). Instead, they explain, you should communicate through locally important places like football clubs or key figures that others look up to (R2). A researcher of energy poverty said there are questions you can ask yourself: “*How do we do that with diversity? How do we do that with cultural sensitivity? How do we speak at B2 level so that things become understandable, I just think those kinds of elements are already done very well on the one hand and on the other hand there is still a lot of potential*” (R4). They did also observe that there is an intrinsic motivation in cooperatives and that there is a lot already happening (R4).

In figure 3 below the identified potentials of energy cooperatives are presented. They are categorized according to the three justice tenets discussed in this section.

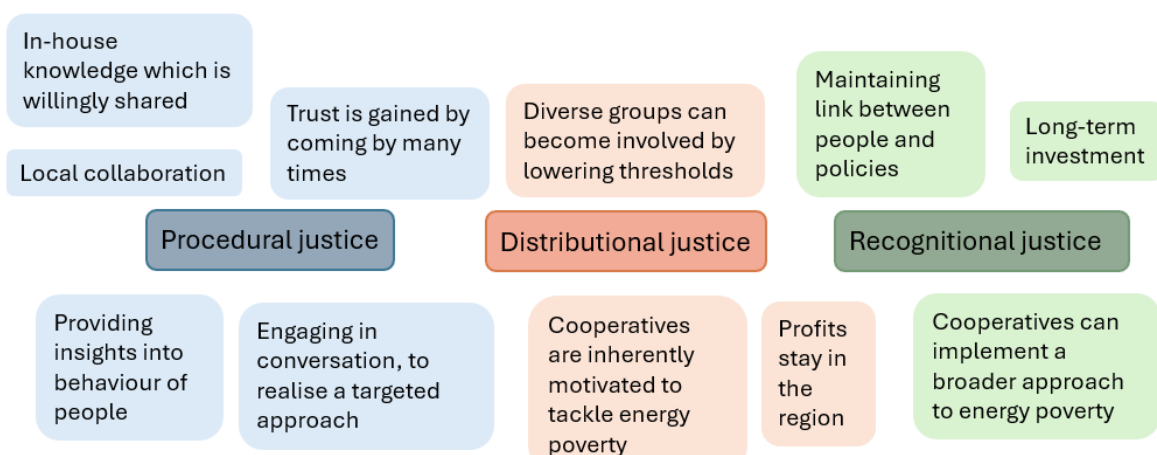


Figure 3: the perceived potentials of cooperatives to tackle energy poverty

4.2 Opportunities and barriers for energy cooperatives to realize the potentials

In this section the opportunities and barriers are identified through the activities that are undertaken by the cooperatives along the lines of the three justice tenets. A separate section (section 4.2.4) is dedicated to barriers experienced in collaboration.

4.2.1 Procedural justice

In terms of procedural justice, the approach of cooperatives focusses on building trust through neighbourhood presence and long-term engagement, allowing them to inspire behavioural change and offer tailored solutions.

Across the studied energy cooperatives distrust is experienced as a barrier for cooperatives to reach their potential, as people do not believe in the benefits that are offered. People are wary of strangers, coming from outside of their neighbourhood with an idea or project (R8). An employee of a cooperative explains that people experience *“smooth talking at the front, and then, once they get a contract, they find out they were screwed over”* (R10). They believe *“what we offer is too good to be true”* (R10). That makes it difficult for cooperatives that come from outside to convince people that becoming a member is a good idea. An employee engaged in an energy poverty approach of their cooperative explains that convincing people takes a lot of time: *“Talking to these people, getting to know them and their problems is a form of social work and requires time”* (R6). This is confirmed by the board member of a different cooperative: *“You cannot visit people just once; you may have to visit people 8 times before anything happens”* (R8). The smaller cooperative struggles less with this trust as the members of the board are rooted in the community. One of them explains that trust is a given as *“you (the board members) know those people by name: you meet them in the village hall or at the football club”*.

The larger energy cooperatives find the best way to gain trust is by just being present in the neighbourhood. One of the board members explains that *“Our most important added value is that cup of coffee and the conversation”* (R10) in which they ask people what they need and give them advice. A board member of a different cooperative explained how they hired two people simply to be present in the neighbourhood: setting up a caravan and inviting people for coffee (R8). Even then they only started getting results after 9 months, once they started revisiting places (R8). One of the employees of a cooperative engaged in tackling energy poverty explained that once they have been *“working somewhere for a while, people start to hear it through the grapevine, making their name better known, which helps* (gaining

trust)” (R6). Through their presence these cooperatives are kindling trust through long-term relationships.

Once a base level of trust is gained, cooperatives focus on informing people. Partly this is to change behavioural. Information is mainly focussed on how people can save energy, and thus costs with simple adjustments such as taking shorter showers (R10) or throwing out appliances that use a lot of electricity (R5). More extensive advice relates to how they can insulate their homes (R10), what subsidies and sustainability loans the municipality offers (R5) and what rules they must consider when taking measures to make your home more sustainable (R5). An employee engaged in tackling energy poverty explains that this conversation is quite delicate: “*We have really had to learn: how can you have that conversation in a way that makes people feel comfortable and motivates them?*” (R6). They emphasize the importance of such conversations: “*Everything we do is accompanied by a conversation and really looking together: What is the right solution and what else can you do to reduce that bill? Or just to increase your comfort without the bill going up? So it remains very much social work*” (R6). Once they are engaged a great value lies in these cooperatives striking up a conversation, looking at concrete adjustments that can be made but also tailoring an approach to the needs of households.

4.2.2 Distributional justice

The studied energy cooperatives demonstrate distributional justice by ensuring both members and the community benefit: either directly, enjoying reduced energy costs or indirectly through funds and the support of local initiatives. Where possible they work together with municipalities and housing associations to directly impact energy costs of vulnerable groups.

Distributional justice can be observed most clearly in the measures cooperatives take to redistribute outcomes. The cooperatives earn a steady profit over their assets, more so if these consist of windmills, and especially when energy prices increase, as they did with the energy crisis of 2022: “*We earned money like water*” (R8). They must constantly decide how they distribute these profits: focussing on benefits for members or setting up funds to help the community in other ways. For tackling energy poverty, the distinction is made between supporting in partnership, where these household are participating in the core activities of the cooperative or in solidarity where vulnerable households benefit from external activities (CEES, 2024).

The cooperatives believe the best way for them to help is in partnership, with vulnerable households profiting directly from the benefits the cooperative offers. This, however, requires the households to initiate membership and there are only a couple “*That were smart enough to sign-up*” (R8). If they do, they can directly they benefit from cheaper energy prices (R5) or a discount on their energy bill (R8). Cooperatives can also provide help in asking for subsidies and using them in the most optimal way (R5). Three of the studied cooperatives also have energy desks people can go to for advice (R6, R9, R10). This way of tackling poverty focusses on the core activities of the cooperatives.

Most of the activities related to vulnerable groups the cooperatives are engaged in, are done in solidarity. They donate a set percentage to sustainability funds anyone can write a proposal for (R9) or donate to food banks and other aid organisations (R8). In one of the cooperatives a wind park, together with the municipality is funding an energy poverty approach team consisting of 30 people (R6). In this approach vulnerable households profit indirectly from cooperatives that are supporting local initiatives, as a way ‘keeping benefits in the region’ takes shape.

Other cooperatives set up fix brigades with energy coaches for minor insulation interventions and equip them with the necessary tools (R10). They “*do not want to get involved in income politics*” (R5), but if the municipality tells them which households or neighbourhoods require help, they can go there to help people with small interventions or to inform them (R5, R8). In these types of activities an extension of cooperatives’ core activities can be observed. Cooperatives also seek out housing associations, offering to install solar panels on their rental units, granting these households access to more affordable sustainable energy (R10).

4.2.3 Recognitional justice

In terms of recognitional justice the studied cooperatives are careful to pinpoint what exactly energy poverty is. They highlight the various barriers that make it difficult for them to engage with vulnerable groups such as mistrust, unawareness and other pressing issues. Despite these obstacles the studied cooperatives are committed to an inclusive energy transition and see themselves as suited to respond to local needs due to their local embedding and independent character.

Recognizing the needs and circumstances of people in energy poverty is an important first step in addressing the problems faced by these vulnerable groups. Similarly to the experts the energy cooperatives were careful in pinpointing what energy poverty is: *“We are not in favour of the term energy poverty, because it does not exist.”* (R8). This board member explained that it is more meaningful to speak of poverty in general and the problems that underlie it (R8). This generalizes the problem back to the overarching ‘poverty’ faced by these households, though energy poverty presents unique problems that are distinct from it (as discussed in section 2.3). An employee of a different cooperative also expressed concerns with the term ‘energy poverty’ deeming it to stigmatising (R6) and thus renamed their approach ‘vital energy’ (R6). Other respondents mentioned characteristics that can help identify who is living in energy poverty such as them often being *“people who rent from housing associations.”* (R10). A board member also mentioned vulnerable groups such as refugees often being energy poor (R8) but refrained from more exact wording.

Engaging with this group is perceived as quite difficult due to levels of mistrust, and unawareness of the problem and solutions (as mentioned in section 4.2.1). They think they can’t do anything *“because they never have any money to spare”* (R8). Besides being unaware, many of the respondents mentioned people in energy poverty having other priorities. A project lead on inclusive energy projects explained that people think: *“I already have so much on my plate, so I shouldn't add more things”* (R2). Similarly, an employee of a cooperative said people are *“busy with their daily worries”* (R10). These observations relate to understandings of behavioural economics, where it is said that living in conditions of scarcity taxes cognitive resources, leaving less for decisions to be made (Mani et al., 2013). A board member of a cooperative believed energy poverty led people to become short-sighted: *“your IQ decreases, and you no longer see opportunities and you can often no longer make rational choices because*

you are in survival mode” (R8). These are reflections of cooperatives about the barriers experienced by people in energy poverty to become involved.

Despite these barriers the spoken representatives of the cooperatives are all driven for an inclusive transition: *“I believe that if we embark on an energy transition together, we must ensure that that people with a smaller wallet can also participate.”* (R6). This employee also mentioned how driven other employees are: *“We have quite a few people who work here who have had large corporate jobs, for example. And who have come here because they want to do something good for the world, so to speak.”* (R6). Board members of other cooperatives said: *“We want to make the energy transition accessible”* (R5) and: *“If you want to change a total system, everyone must be able to go along with it”* (R8). This last representative reflected on the board of the cooperative identifying as ‘dark green’ meaning they are driven to realise a sustainable and inclusive energy transition. A consultant of inclusive energy projects that an inclusive transition in which ‘everyone is able to participate’ is one of the 7 principles endorsed by all cooperatives (R2). In section 4.3 this drive is compared with other priorities and feelings of responsibility a cooperative and its members might have, that influence the concrete actions of the cooperative.

The studied cooperatives observe that they are well suited to pick up signals from local society and convert them into action. One of the board members observed that by being present in neighbourhoods their employees pick up on problems members of the community have, about the housing association being difficult to reach for example (R10). According to a board member of a different cooperative these signals are also more easily picked up by cooperatives as they are *“sitting at the kitchen table”* (R5). Another board member explains these signals can be transferred into action more easily as, unlike the municipality, cooperatives do not have to wait on a council or changes in policy to act on these signals: *“We realize that things can sometimes be very complicated at the municipality: they have to follow a whole process and decisions must fit exactly into policy. Use us as a cooperative to get things done a little faster, right? If you are afraid that the municipal council will vote against it, the cooperative can sometimes pick things up”* (R8). Being independent of policies and bureaucratic processes makes cooperatives able to act quicker. The director of the sector association also observes that cooperatives *“get things done that the municipality simply cannot achieve, in the neighbourhood, carried out by the residents themselves”* (R3).

In figure 4 below the opportunities that the studied cooperatives realise are presented. They are categorized according to the justice tenet they enact on.

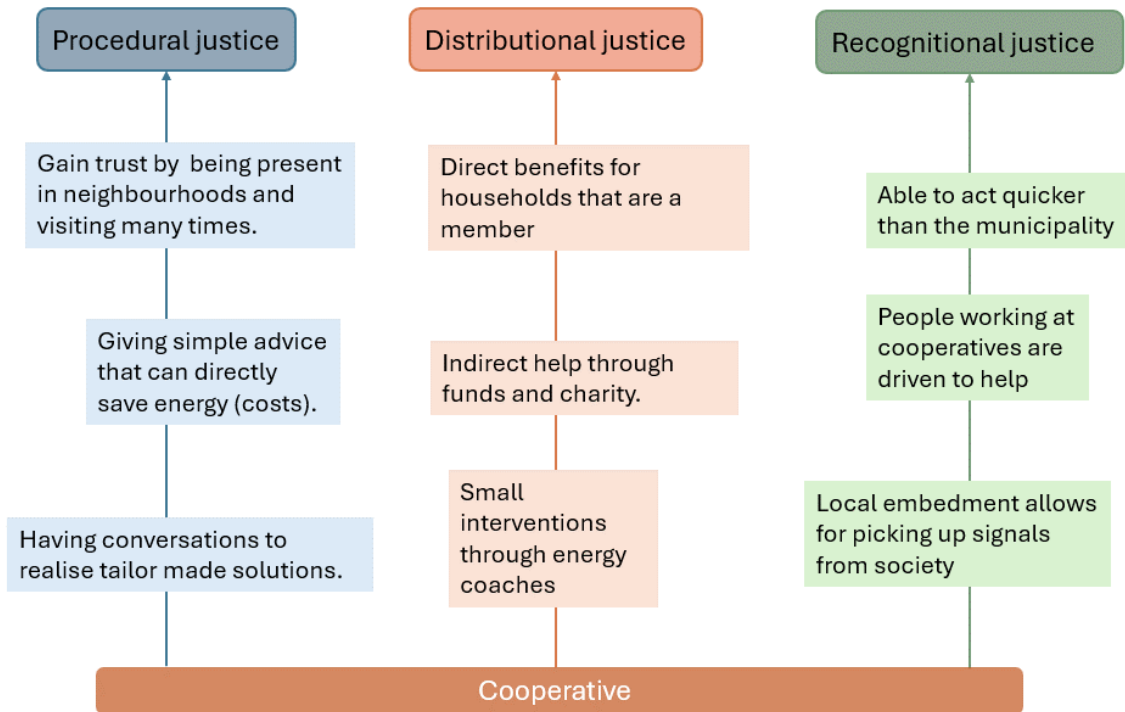


Figure 4: opportunities for cooperatives to tackle energy poverty

4.2.4 Barriers in collaboration

In the approach of the studied cooperatives various barriers were identified, preventing cooperatives from reaching their full potential. Many of them, such as distrust and stigmatisation, have already been discussed in line with the three justice tenets above (sections 4.2.1 – 4.2.3). In this section the barriers related to collaboration, experienced across the tenets will be discussed.

Municipalities are seen as an important partner in tackling energy poverty, but sometimes they are too focussed on their own solutions. A board member explains that municipalities might think: *“That’s what we are for, isn’t it?”* (R8). They seem to prefer to carry out the plan themselves, either because they feel responsible or want the credits to be able to say ‘we achieved this’ (R8). In one of the cooperatives the municipality took over the lead of a fix brigade the cooperative had initiated. They professionalised it, bought a new bus with new tools and started paying the volunteers (R10). After a year it had died out: *“It’s about connecting with these people, not replacing as many lightbulbs with LEDs as you can”* (R10).

Experts also pointed to municipalities as sometimes too much focussed on short wins. A project lead of an energy poverty approach explained *“So issuing tenders and having commercial companies carry out one-off actions is no problem at all. That is, if you want quick results, if you want to achieve a lot of volume that is the route you should choose, but of course it does not help with real energy poverty to be tackled structurally”* (R1). A consultant also observed that *“With tenders you often see that a commercial party will win”* (R2). Cooperatives are not suited to win these tenders that are focussed on quickly delivering a lot of tools or having a lot of conversations. They are, however, suited to offer the long-term approach needed to tackle energy poverty (see 4.1.3). The director of the umbrella organisation of cooperatives explained that cooperatives are *“focussed on surviving where funding is not stable”* (R3). They flourish in deep-rooted partnerships with municipalities which can share (anonymous) information about people in poverty and provide stable cash flows.

Another partner that can be difficult is housing associations. Tenants, who are often more vulnerable (R10), are dependent on what the housing association wants (R5). A board member explains that if they are *“unwilling to make roofs available (for solar installations), then that’s simply the end of it”* (R8). In general, they seem to want to do things themselves, without going into action (R5). One case is particular in that the housing corporations receive funding when they demolish buildings and build new ones, though the old ones could be

improved with the cooperatives' help (R5): *“in these towns the character of the villages has really changed”* (R5). A board member explained a situation where the housing association wanted solar panels on the roofs of buildings they were selling. *“But then for some reason they backed away from that”* (R8). *“After that they wanted us to come up with a proposal and they would say whether we think it is a good proposal. I don't think that's what collaboration is”* (R8). The lack of transparency and will to collaborate makes it difficult for these cooperatives to get things done for the tenants of these housing associations.

The barriers that are identified by the interviews are presented in figure 5 below. They are categorized according to which justice tenet the mainly form a barrier for, with the collaboration factors extending across all three.

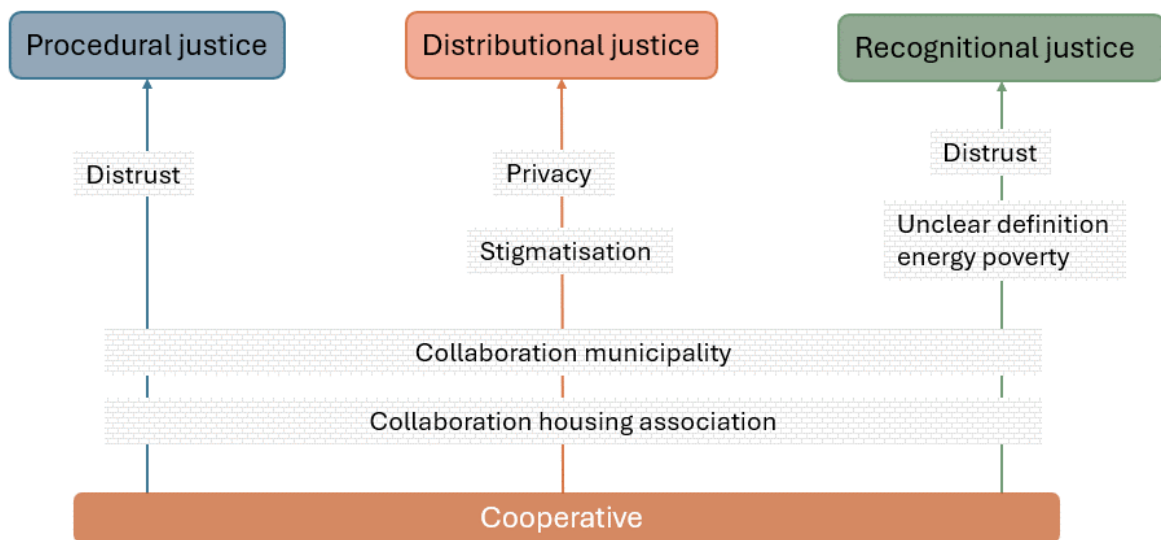


Figure 5: barriers for cooperatives to tackle energy poverty

4.3 Effect of ENCI orientation on potentials

In this section the sub question: *How does the ENCI of cooperatives affect their potentials?* is explored. As explained in the theory (section 2.2), the ENCI of a cooperative is dependent on how reformative or transformative it approaches the current energy system. Does it propose a radical alternative with democratic structures and energy being equally shared amongst members (transformative)? Or does it propose incremental steps, realizing an energy project with some funding of citizens but otherwise acting as just another energy company (reformative)? This section describes which characteristics the studied cooperatives have of the two types. It then goes into the effects this categorization has on the potential's energy cooperatives have, to tackle energy poverty. This contributes to the discussion put forth by Debourdeau et al. (2021) who claim a transformative approach has more potential to tackle energy poverty.

In the studied cases, some reflections can be identified as more transformative, showing awareness of energy poverty and the role cooperatives can play. Others show the risks of cooperatives that have professionalized and have activities more geared towards front-runners, displaying reformative tendencies. The reflections are presented using the themes of ENCI as described by Debourdeau et al. (2021).

The theme 'agency' describes how cooperatives organise collective action relating to the energy transition. 'Outcome-orientation' depicts whether the cooperative activities are geared towards incremental reformative action or more radical, transformative action. Finally, 'system-orientation' relates to how cooperatives relate to energy poverty and 'energy democracy' explores the influence members have.

Cases were selected that were more developed (existed for some time) and were engaged in transformative activities. It comes as no surprise then that the studied cooperatives have characteristics of the more transformative type (type 8). On the other hand, characteristics of type 7 can also be observed in the different cooperatives. This section explores these characteristics and how they affected the potentials of the cooperatives.

4.3.1 Agency

In the context of energy cooperatives, agency takes the form of groups of individuals or organizations come together to produce, distribute, or manage energy resources collaboratively (Debourdeau et al., 2021). The studied cooperatives show their transformative nature in their pursuing of local and decentral energy production in the form of local energy hubs. They also show transformative characteristics in undertaking projects that are deemed to risky by others, going beyond financial motives. On the other hand, growth and consequent professionalization can lead to dilution of their grassroot origins and principles, as they lose some of their connection with the community.

The studied cooperatives pursue projects that are radical and deemed to risky by others. The studied cooperatives are all engaged in exploring local energy hubs, pushing forward the energy transition by exploring how an energy system with local ownership can be realized. They undertake *“projects that others think are too risky, or that are not yet financially interesting”* (R8), contesting the market which consists of *“mainly transactions: energy contract here, a product there, solar panels, storage systems, often for the happy few”* (R10). These reflections indicate the involved cooperatives observe an energy system that is unfair. In their activities they are exploring transformative activities, striving for a different organisation of the energy system, less focussed on financial logic and more on local ownership and fair distribution.

On the other hand, cooperatives show more reformative characteristics in their growth. One of the board members explained that they feel they are *“already part of an established order”* (R8). They have become more professional, becoming engaged in installing heat pumps (R5) for example or realizing collective insulation (R1) They observe smaller cooperatives that are able to tackle problems as soon as they are observed: *“we don't have those groups of volunteers”* (R8). As they are no longer a volunteer association, they can no longer do everything they like as the activities must be paid for (R10). The director of the sector organisation explained that professionalisation is inevitable *“to be able to scale with financial possibilities you have ... otherwise things will stagnate, because you do not have a strong fundament”* (R3). Professionalisation seems to be necessary for cooperatives that are getting a larger role to play in the energy system, but struggle with the limitations, such as the necessity of activities being backed financially, it brings.

Cooperatives can flourish in their professionalisation if there are consistent funds available to pursue their activities. This can be observed in cooperative 2, that receives funding from multiple municipalities *“Because municipalities also see that it is important that a local organization plays a role in this”* (R6). According to this employee they receive these funds *“Because we have been active for a while and yes, we already had that relationship with the municipalities.”* This allows them to run a project with 30 employees that go door by door and help households with measures, advice, and tools to lower their energy bill (R6).

4.3.2 Outcome-orientation

The outcome-orientation of energy cooperatives relates to the activities they pursue (Debourdeau et al., 2021). In the studied cooperatives these are more geared towards people that are well-off, an indication of a reformative orientation. A consultant for inclusive energy projects observed that being involved in *“sustainability and especially in generation has always been for a very specific group of leaders. These are often people who have money to invest in solar panels, for example. Or have the time to work on a business case for a long time at a cooperative* (R2). One employee of a cooperative observed members are often people that are engaged, reading newsletters and the newspaper to *“stay abreast of developments in technology and what is going on in terms of energy transition”* (R10). The activities of the cooperatives seem to be geared towards these more ‘front-runner’ people, originating as a working group to explore solar panels (R10), buying, and installing cheaper heat pumps (R5) or facilitating investments in a local wind farm (R8). These types of activities are reformative in nature, enabling people with means to engage in sustainable activities. How cooperatives relate to people that do not have the means is described in the following section.

4.3.3 System-orientation

System orientation refers to how energy cooperatives perceive and interact with the broader system. It encompasses their awareness of systemic issues, their approach to inclusivity and their relationship with other actors in the energy system (Debourdeau et al., 2021). The studied cooperatives are aware of issues of energy poverty and the importance of realising an inclusive energy transition. The role for cooperatives remains dubious with cooperatives explaining they are not always suited to tackle energy poverty, besides other actors also playing an important role.

The cooperatives seemed to be quite aware of problems of inequality that are seeping into the energy transition. An employee stated that *“I can see that there is a huge gap growing*

between the people who know about it and work on it and the people who do not have access to the same techniques or resources” (R10). Similarly, a board member of a different cooperative explained: “The energy transition simply does not stop at your front door. We are all connected to the same cable, we are all connected to the same gas line” (R8). This awareness of the problem and the drive to tackle it is an important starting point for approach energy poverty.

Despite this drive, the studied cooperatives originate from collectively owned assets, risking their orientation to be focussed on investments and returns. An initiator of a cooperative emphasized that their cooperative does not want to become an “investment object” (R5). An energy poverty researcher described that cooperatives in the Netherlands are often organised through collective ownership *“The cooperative world of sustainable generation in the Netherlands has a certain origin. It is collectively owned, which is a very nice thing, but it runs the risk of becoming just an investment vehicle, with a return perspective” (R4). This can be observed in one of the studied cooperatives where “members primarily being moneylenders and I think 95% has bonds” (R9). The studied cooperatives are oriented as organisations that collectively realise large energy parks, through creative financing. This has the benefit of realising collectively owned sustainable energy, but risks excluding certain groups in the core orientation of these cooperatives. The members of the cooperative are an important factor in their orientation, which will be further discussed in section 4.3.4.*

Although having a promising potential, the role cooperatives can play must be critically accessed (Young & Halleck Vega, 2024). The cooperatives in this study also emphasized they cannot offer the sole solution to energy poverty. To start, the cooperatives don’t identify as a relief organisation (R8), having *“no illusions that I will keep vagrants off the streets” (R8). There are other actors perfectly capable of offering relief (R1), besides the municipality having an important responsibility in tackling energy poverty (R8). Cooperatives “do not want to become involved in income politics... because that is none of our business” (R5). They aspire to be fair to their members, and as a cooperative, value is shared through the “equal monks, equal hoods” principle (R5). An employee of a cooperative that is doing quite well financially stated: “as a member that has put money in wind turbines you have taken a risk and therefore are most entitled to the benefits” (R9). The studied cooperatives raise questions on what their role exactly is in tackling energy poverty. They aspire to be fair for their members, but do not believe it is their role to alleviate societal inequality.*

According to some of the respondents the question of responsibility is an important one to ask. One of the cooperatives mentioned that they “*try to make contact and help from the domain that we are active in ... from an energy perspective, exploring if we can help bring down the energy bill*” (R9). This means staying away from other domains that bring inequality such as people being sick or having a low-income. When tackling energy poverty, a project lead of energy poverty explains, you must assess who is most suited to take responsibility: *if you discover that the municipality has all the resources and possibilities for tackling energy poverty and has a fantastic program, why would you start one yourself?* (R1). The studied cooperatives claim the municipality and other organisations are sometimes more suited to tackle energy poverty and question how far their own responsibility reaches.

4.3.4 Energy democracy

Debourdeau et al. (2021) relate energy democracy to principles and practice that ensure members have control, participation and decision-making power in the energy system. Members of the studied cooperatives have an important role in the organisation, although the demographic remains one-sided. Growth and financial incentives further limit the democratic character of the cooperatives.

The studied energy cooperatives strive for high levels of energy democracy. They have a mission, carried out by the board, with the general members meeting (GMM) as the highest body that decides (R10). Members have a say in the cooperative in-between as well, deciding individually what should be done with a one-time ‘gift’ of 330 euros (R8) or being organised in working groups to discuss policy before presenting it at a GMM (R10). They seem to struggle with the one-sided demographic of people that are involved. People present in GMMs have characteristics of early adopters, for example: they are already interested in the developments of green technologies (R10) In general, a consultant of inclusive energy projects observed: “*In the cooperative world the age is quite old and the gender is quite one-sided, as is the skin colour*” (R2). Despite participatory governance structures the demographic of involved members is one-sided which hampers cooperatives potential to reach under-represented vulnerable groups.

The growth of the organisation also hampers its democracy as parts of their organisation shift and become too complex or focus on different target groups. A board member of a cooperative explained that in exploring local energy hubs, things became “*far too complicated to discuss every step with our members*” (R8). This means not everyone can be included in the

processes and at least some decisions are reserved for those in the board that understand the complexities. In their growth the studied cooperatives have all developed some form of energy provision. You can purchase their energy without becoming a member through the national cooperative energy supplier 'Energie van Ons' (Energie van Ons, n.d.). This means that members can decide and contribute to realising sustainable energy projects but do not have direct control over how produced energy is divided.

Although many members are driven by idealistic motives, there are also attracted by financial incentives which influences democratic potential. Especially during the energy crisis, sustainable energy became an attractive alternative source for energy as gas prices increased (R5, R8). In one cooperative a board member observed the number of members soaring and "*You can assume that 80 percent had that (cheaper energy price) as their main motivation*" (R5). Financially motivated members can also be observed in other cooperatives, where they were critical on how money was spent claiming it "*shouldn't just be given to anyone*" (R9). This can influence decisions made by the cooperative, as members that are financially driven might make decisions more in the interest of profit. The director of the sector organisation explained that as a cooperative "*It is important to steer on principles, to prevent people from coming purely for financial gain*" (R3). Cooperatives' idealistic principles risk being diluted by members more focussed on financial gain, although this can be prevented by taking in a clear standpoint as a cooperative.

The democracy strived for in the cooperatives characterises a transformative approach, in which "citizens are meant to govern control and take decisions regarding the initiative" (Debourdeau et al., 2021). On the other hand their growth in complexity and financially has put a strain on the democratic principles, identifying them as more reformative.

In figure 6 below the insights of this section are presented according to the four themes: agency, etc. on the left hand of the figure and categorized into two columns that represent the two ENCI types of energy cooperatives: type 7 (do their share) and type 8 (go ahead).

	7. Do their share	8. Go ahead
Agency	<ul style="list-style-type: none"> Professionalisation 	<ul style="list-style-type: none"> Exploring new energy systems
Outcome-orientation	<ul style="list-style-type: none"> Activities geared towards front-runners 	
System - orientation	<ul style="list-style-type: none"> Investment vehicle Energy poverty is mostly up to other actors 	<ul style="list-style-type: none"> Aware of growing gap with energy poor
Energy democracy	<ul style="list-style-type: none"> Involved members are well off Financially motivated members 	<ul style="list-style-type: none"> Members have the last say

Figure 6: ENCI identity cooperatives

4.4 Evolving ENCI of energy cooperatives

This section explores answers to the question: *How does the future identity cooperatives aspire influence their potential?* What makes the four cases studied unique is that they are engaged in realising local energy hubs. They aspire decentral energy systems in which cooperatives can ensure a transparent price for energy, which is separate from the market (Local4Local, 2024). This is realized by coordinating supply and demand, increased (smart) storage and transferring electricity to heat, minimizing the need to interact with the energy market (Local4Local, 2024). The goal of this section is to understand what the implications of these types of systems are for cooperatives' approach to energy poverty.

Local energy hubs provide radical alternatives to the current energy system, with members of cooperatives becoming less dependent on profit-maximising businesses. According to an employee of one of the cooperatives, the main benefit of local energy hubs is that instead of getting your electricity from “*capitalist market-driven electricity company, you have a social electricity company (that provides electricity)*” (R10). The cooperative will deliver electricity through contracts but with the benefits cooperatives offer: transparent pricing, not focussed on profit maximisation, independent of geopolitical situations (R7, R9, R10). An employee focused on realizing local energy hubs explains that: “*What we want is to be transparent and clearly show that electricity simply costs more than at other times, to encourage people to take advantage of using it at another time.*” (R7). If this so-called ‘simultaneity’ of electricity generation and use is increased, local cooperatives and their members become less dependent on the market and profit-maximising businesses (R7). This way of approaching energy, separate from the current dominant market-driven system can be seen as quite transformative.

Despite these benefits, involved respondents do not believe this new way of approaching energy will directly benefit vulnerable groups. An employee committed to realising local energy hubs voices their doubts: “*We ask participants of the energy community to actively adjust their energy consumption. I think there are a lot of people that have other things on their mind than adjusting their consumption*” (R9). Participants are given insights into their use through dashboard in their home, for example, which they can use to see when energy is produced (R10). According to Hrynkiv and Lavrijssen (2024) here-in lies a risk of local energy hubs worsening vulnerabilities of people that are not as tech-savvy, flexible, or able to deal with uncertainty. The gap in flexibility is also mentioned by an employee of a

cooperative engaged in L4L: *“If you have an all-electric house with a heat pump and two electric cars in front of the door then you have a lot of power that you can control. You can have them charged earlier or later or you can turn on your heat pump a little earlier. Then you are very flexible, and we can probably make a nice offer. On the other hand, if you have a rental house with a central heating boiler and basically no electrical use, then you can maybe turn on your washing machine at another time, but you can't actually do many other things”* (R7). The new system seems to take a more reformative character as it will be interesting especially to those already quite engaged with the energy transition, having the means to play into varying local production.

The discussion around citizens being reduced to consumers, as described in the introduction (section 1) and theory (section 2.2) also reignites with this transition. Devine-Wright (2019) critically questions whether local energy systems will make long-term social transformation possible. He highlights the risk of them maintaining the status quo by providing new ways in which citizens are seen as a consumer (Devine-Wright, 2019). In the proposed local energy hubs cooperatives will still work with contracts, meaning people *“can contribute in their own way, by going over to this energy contract (as offered in L4L)”* (R7). According to a board member of a different cooperative deciding over the contract *“is up to the members themselves. We offer something and we are not going to force anyone”* (R5). Although the mentioned transparency is essential for a transformative transition, cooperatives must be wary of not reducing their offerings to a product consumers pay to consume. This would mean use of local energy hubs remains reserved for those with the means to participate.

5. Discussion

In this thesis the question *how can the potentials of energy cooperatives to tackle energy poverty be realized?* was researched. This was done with a qualitative multi-case study of four mature energy cooperatives. Desk research combined with semi-structured interviews with experts and representatives of the cooperatives led to a deeper understanding of the relationship between energy cooperatives and energy poverty. Energy justice was used to understand what potential energy cooperatives have (**section 4.1**) and how they approach tackling energy poverty (**section 4.2**). The lens of ENCI led to a more in-depth understanding of how reflections of cooperatives affect their potential now (**section 4.3**) and in the future (**section 4.4**). The interpretation of these results is presented in this section, using seven concluding statements.

1. Cooperatives have the potential to tackle energy poverty through their unique position in society, as a democratic non-profit organisation, embedded in the local community and independent of politics. Reflections from both cooperatives and experts confirm that this leads to ample potential to tackle energy poverty (section 4.1). Cooperatives emerge from citizens taking their agency to change something: to ensure benefits from wind parks are kept in the region (R9) or to become more independent of large energy companies (R5). This can still be observed, with all respondents living in the region their cooperative is active in. Being locally embedded like these cooperatives ensures that the threshold for members to address them is low, although this differs per cooperative. One board member meets members in the queue of the supermarket (R5), while the other cannot hope to oversee its thousands of members (R8).

Their embedment makes cooperatives unique as it allows for them to engage with other local actors (municipality, housing association, NGO's). In one cooperative this leads to vulnerable individuals becoming embedded in a network with appropriate actor(s) becoming engaged to help (R6). It also ensures that long-term relationships can be fostered, in contrast to commercial companies coming in 'from outside' and leaving once their project is done (R2). Cooperatives are run by driven 'dark green' individuals who believe in a transition in which everyone should be able to partake. They often have quite some knowledge in-house about energy saving measures (R6) and available subsidies (R5), for example. This knowledge, together with conversations about behavioural change can lead to very concrete energy savings. Finally, they are often able to act quicker and more decisively than municipalities who need to go through tedious processes and are dependent on local politics.

2. Cooperatives tackle energy poverty through their core activities, but these do not always reach vulnerable groups. Several cooperatives explained the best way people in energy poverty can profit is if they become a member or come to energy counters to ask for advice. Some of the studied cooperatives have funds people can apply to, energy offices that can answer your questions, or direct financial benefits for members. One of the board members explained this is the preferred way for them to tackle energy poverty, because they do not want to become involved in matters unrelated to their core activities (R5).

The studied cooperatives realise that taking the first step can be difficult for those struggling with energy poverty, because they have other priorities, and lack cognitive space to recognize their problems and possible solutions. This resonates with a study done by Mani et al. (2013) showing how poverty impedes cognitive function. Distrust was also identified as a barrier, as doors are not opened for people coming from outside the neighbourhood. The studied cooperatives found the best way to gain trust and reach this group to be present in the neighbourhood and visiting the same household many times (section 4.2). This has led to advice for behaviour and technical interventions in households that would not have been reached otherwise. It also led to more recognition of struggles people in the neighbourhood had, which could be voiced to the municipality.

3. Financial incentives can hamper the justice effects of cooperatives, although it also allows for the realisation of democratically owned large scale energy projects.

One of the greatest contributions of the cooperative movement is the democratisation of energy with ‘democratic member control’ being one of the seven cooperative principles. This can also be seen in the studied cooperatives which all have highly democratic structures. These structures greatly enhance energy justice as people’s needs and worries are recognized, and they are empowered to influence decisions. However, similarly to conclusion 1, this recognition holds for a specific group of people that have actively chosen to become a member. These are often well-off and already interested in developments in energy (typically front-runners) (see section 4.3.4). There is a risk that this group uses cooperatives primarily as an investment vehicle, becoming even more well off than they were. One board member recognised that 80% of its members were probably financially driven (R5), and an employee of a different cooperative estimated 95% of the members to have bonds (R9). Their decision

making in democratic processes could influence the direction of cooperatives, although one board member observed that the GMM always approves of the social projects put forth by the board.

The question arises whether the financial orientation is a problem, as regardless of the motivation, this group is supporting democratically owned local and sustainable energy production. The studied cooperatives all originated from collectively realising energy projects and continue to do so. The director of the umbrella organisation mentioned “*we shouldn't compare something that is good to something that is perfect*” (R3). As long as you maintain clear basic principles you want to adhere to as a cooperative, ensuring everyone has a vote for example, these types of cooperatives offer the opportunity of realizing impactful projects

4. Although cooperatives take responsibility for tackling energy poverty, they believe other actors also have an important role to play. Cooperatives are aware of the growing gap between those engaged in the energy transition and those that are not, but do not always perceive themselves as the main solution (section 4.3). They mainly perceive themselves as enablers of collective action to address regional energy issues, keeping benefits from energy projects within the community. Almost all spoken representatives emphasized the importance of including everyone in the transition, but also raised the question about who is responsible for doing so. This emerges in discussions about what ‘energy poverty’ is exactly, with some preferring not to use the term as “*there is no such thing*” (R8). Instead, it is considered to be more a problem of poverty in general. In this discussion tackling energy poverty is seen as a form of social care to some, not logically something cooperatives should have to engage in.

Cooperatives take their responsibility in different ways, largely dependent on how they perceive energy poverty and if they are supported by the municipality. The board member of one of the cooperatives explained that they have no illusion of “*keeping vagrants off the street*” (R8). An employee of this same cooperative explained that instead their cooperative focusses on helping people purely with energy related issues, pursuing activities directly related to lowering the energy bill (installing draft strips for example) (R9). Similarly, a board member of a different cooperative explained they can help with installing heat pumps and isolating your home but do not want to become involved in activities outside their expertise (R5). A different cooperative approaches energy poverty more holistically, redirecting households they encounter to other social organisations that can provide appropriate support (R7). Thanks to

the funding of multiple municipalities this cooperative was able to set up a division with 30+ employees focussed on tackling energy poverty (R7).

This brings us to other actors that are deemed to also be responsible or even essential in tackling energy poverty (section 4.2). The municipality can increase the reach of cooperatives by providing information on households or neighbourhoods that could use support, and through funding, as empirically observed in the cooperative mentioned above, drastically increase the impact cooperatives have. The cooperative in question has teams training people, often in vulnerable positions themselves, to become energy coaches, investing in neighbourhoods, giving advice, and carrying out (small) interventions. As people in energy poverty often live in social housing, housing associations are essential partners in providing households the necessary support (section 4.2). They must provide access to roofs for example and allow changes to be made to the homes of residents.

5. The evolving role of cooperatives offers both opportunities and challenges for involving vulnerable groups. More mature cooperatives, such as the one in this research, are exploring a shift towards local energy hubs, where energy will be generated, shared, and used locally. In this transformative idea cooperatives will become involved in managing electricity flows ensuring as much as possible is used simultaneously with the production. This new role will allow them to come 'behind the front-door' more easily thereby overcoming barriers of mistrust and privacy that cooperatives currently experience in reaching vulnerable groups. Instead of the current more distant energy providers, cooperatives can offer transparent pricing and a clear contact point for users, which can foster trust and participation.

However, in the exploration of local energy hubs there is a notable risk as the current focus appears to be on the technical implementation and business model of these initiatives, with social effects seemingly being of secondary importance. According to involved interviewees, the primary driver for people in energy poverty to become involved will continue to be the price, which is not necessarily guaranteed to be lower than alternative options. Participation becomes more interwoven with individual ENCI as it is more appealing for those who can regulate their energy use, through timed appliances and electric cars. These tools are often not available to vulnerable groups, besides this change in behaviour being cognitively taxing. This means the opportunities local energy hubs offer are interesting mainly for those

already involved in the energy transition. This more reformative characteristic risks maintaining the divide between those that have the means to be involved with the energy transition and those that do not.

This raises the same questions on the responsibility of cooperatives brought up in conclusion 4. Cooperatives can, however, continue to be mindful of their evolving role and as one respondent noted: *"We must ensure that within L4L we will not again release products that are of interest for only a handful of people"* (R10). The focus on providing a product, where citizens are at risk of being reduced to consumers, is also a point of attention. In this, cooperatives must continually assess who is benefitting, and if benefits are equally shared amongst local actors (Devine-Wright, 2019). To ensure inclusivity, cooperatives must prioritize the social implications of these initiatives, actively engage with vulnerable groups, and balance technical advancements with efforts to reduce cognitive and financial barriers, thereby avoiding the risk of maintaining or exacerbating existing divides.

6. The dichotomy that emerges from the ENCI typology by Debourdeau et al. (2021) does not recognize the depth and breadth of cooperatives. As can be seen in the studied cooperatives, collective ENCI is much more of a spectrum, with cooperatives having characteristics of both reformative and transformative ENCI (section 4.3). One of the studied cooperatives explains that without including everyone in the energy transition, it will not be complete, showing transformative tendencies. On the other hand, they cannot do as much as they would like to tackle energy poverty because they have professionalized (*"being somewhat part of the established order"* R8), and every activity must be backed financially. The same duality can be observed in the cooperatives being organised highly democratically (transformative) but also must accommodate financially oriented members (reformative).

The reformative characteristics of the studied cooperatives have tendencies that resemble the 'dark sides' of innovation Pel et al. (2023) identify. Firstly, their core activities cater mostly to 'front-runners' that already have a strong position in the energy transition. Their identity of collective investment attracts people more financially oriented. And finally, selling their energy through contracts poses the risk of reducing citizens to consumers as highlighted by B. Lennon et al. (2020).

Although this may be the case; this research shows that the reformative orientation of the studied cooperatives has important benefits and might sometimes even be preferred. To start, a transformative grassroot approach is likely to encounter the same barriers of distrust and cognitive space observed by people in energy poverty. Providing support, in solidarity, then seems to be a more productive route, in which these cooperatives excel: they have the means through their assets and the knowledge to tackle energy poverty through interventions and inciting behavioural change. Furthermore, these cooperatives are contributing to other societal goals through realising large-scale energy projects that are democratically and locally owned, with benefits staying in the region the burdens are carried. They are able to do so because they operate close to the system enabling collective ownership of energy assets and energy supply. It is also important to note that ENCI evolves over time, with the studied cooperatives often starting as small working groups focussed on taking power into their own hands, eventually evolving into the larger cooperatives they are today. Smaller cooperatives continue to emerge, emphasizing the spectrum of cooperatives and how different types can coexist and complement each other.

7. Although the potential of cooperatives is interwoven with the ENCI of other actors, energy justice can form an overarching guideline to realise an inclusive transition.

This research focussed on the ENCI of energy cooperatives, although the typology itself is broader, encompassing ten ENCI types. The collective agency of cooperatives is interwoven with the agency of individuals: people in energy poverty, the members of the cooperative and other actors, such as the municipality and housing association. The potential cooperatives have is dependent on whether someone in energy poverty wants help, for example, or if cooperatives are willing to collaborate.

Energy justice can provide a more nuanced view of roles and responsibilities within ENCI types, specifically for cooperatives. Regardless of whether an initiative is reformative or transformative it can be assessed on how well it tackles energy justice. This gives cooperatives a responsibility to reflect on how well they cater to diverse groups, and what they can do to better reach and involve those that are vulnerable. Ideally, they can collaborate with other actors, forming a network to provide tailor made support to those in need. A prime example is the cooperative that collaborates closely with other local organisations through its energy poverty division, which is enabled by funds from the municipality.

Limitations and further research

This research contributed to providing descriptive insights into the relationship between cooperatives and energy poverty. It delved into the patterns that precede the approach cooperatives take, critically assessing what their role can be. Four cooperatives were studied in-depth using interviews with various involved board members and employees of cooperatives and experts surrounding them. This was supplemented with internal documents about the cooperatives and available information online.

Focussing on four mature energy cooperatives allowed for in-depth reflections of the role cooperatives can play and how the ENCI of cooperatives evolve over time. It does not, however show the full spectrum and **it would be interesting to research other sizes and types of energy cooperatives**. This would give insight into how other types of cooperatives can complement the ENCI of more mature cooperatives in their approach of energy poverty.

In the sampling there is always a risk of a bias. In the case of this research the studied cooperatives were connected through the umbrella organisation Energie Samen, and were willing to discuss their energy poverty approach. **Results could be verified with follow up research including a broader selection of energy cooperatives**. This would also reduce the effect of subjectivity that occurs in semi-structured interviews. Interpretation of both the researcher and respondents affects how questions are approached and results portrayed. This was minimized by grounding questions in theory and verifying transcripts with interviewees.

The study has raised interesting questions on what energy poverty is exactly, who is responsible for tackling it and what role energy cooperatives can play. **It would be interesting to study the perspective of those living in energy poverty** to recognize their challenges and to distil how they could become empowered to become active energy citizens. Furthermore, the claims respondents made in this study about the barriers and opportunities for people in energy poverty could be verified. **Further research could also expand on the agency of different ENCI types**, such as those of individuals as part of the cooperative and that of the municipality and how they influence the potentials cooperatives have.

6. Conclusion

Energy cooperatives have various potentials to tackle energy poverty and are realizing many of them through activities related especially to procedural and recognitional justice. In their approach of energy poverty cooperatives are not as transformative as is sometimes propagated in policy and literature. The question is whether they necessarily need to be. In their current state they are able to reform the dominant energy paradigm, towards a more sustainable and locally owned one. In other areas cooperatives are showing transformative tendencies: exhibiting how a basic need, such as energy, can be collectively governed, contesting the dominant market-system in which it has been reduced to a commodity. A critical look at who can do what in an energy poverty approach is in order, examining what the role can be of these mature cooperatives in relation to other actors in the energy eco-system.

They have potentials to gain trust, pick up local signals and act quickly in providing in energetic needs of vulnerable groups. These potentials are interwoven with that of other, local actors most notably the municipality, but also housing associations and social care organisations. Local collaboration between these actors proves an essential prerequisite for fulfilling of their potentials. Although a certain degree of awareness is present, cooperatives must continue to assess which groups they are catering to. An energy justice framework can provide tools to ensure cooperatives realise their potentials of realising a more inclusive transition, however transformative or reformative that may be.

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8. Appendix

Appendix A – Interview guide experts

The interview guides were translated from Dutch for purposes of this report.

- **Consent:** participation is voluntary, and you are free to refuse answering questions and end the conversation at any time you like. If you consent to recording the conversation will be transcribed and sent to you. You may change or remove any answers you gave. Data will be made anonymous and used solely for academic purposes.
- **Introduction:** on behalf of Energie Samen, I am researching how energy cooperatives approach and tackle energy poverty.
- **This conversation:** a better understanding of ...
- **Feedback:** Once finished I will send you the report. Furthermore, a brief summary of the main conclusions will be used on the website of Energie Samen

This was used at the beginning of each interview, but not restated in Appendices B and C

Subject	Purpose	Questions
Introduction	Getting to know the interviewee	Would you like to introduce yourself?
Project expert	General	What does the project you are involved in do? <ul style="list-style-type: none"> - What exactly has been done? - How did it come about? - What is the goal? - Who was involved?
Experiences	Specific questions about projects	What seems to work in the tackling of energy poverty? <ul style="list-style-type: none"> - Who plays a role? What limits effective approach of energy poverty?
Responsibility	Ask about responsibility	Which actors play an important role in tackling energy poverty? What role do energy cooperatives play in combating energy poverty? <ul style="list-style-type: none"> - What else could they be doing?
Energy Poverty	Perspective on energy poverty	What is according to your energy poverty? <ul style="list-style-type: none"> - How does it come about? - Who is most likely to fall into energy poverty?
L4L	Ideas around local energy hubs	Introduce L4L <ul style="list-style-type: none"> - How can people in energy poverty best be included in local energy hubs?
Take aways		What would advise cooperatives when it comes to tackling energy poverty?

Appendix B – Interview guide cooperative

Theme	Subject	Ask
Introduction	Getting to know the interviewee	<ul style="list-style-type: none"> - Would you like to introduce yourself? - What is your role within cooperative x?
Cooperative	Values and basis of the cooperative	<ul style="list-style-type: none"> - Could you tell me about cooperative x? <ul style="list-style-type: none"> o From what need did it originate? o Is this now fulfilled? o What is the most important value of a cooperative approach? o How does this manifest itself (which activities)?
ENCI	Positioning the cooperative	<ul style="list-style-type: none"> - What is the main reason that people become a member? <ul style="list-style-type: none"> o What does being a member entail?
ENCI	Perception of the cooperative	<ul style="list-style-type: none"> - What kind of social responsibility do cooperatives like yours have? <ul style="list-style-type: none"> o In the tackling energy poverty?
Energy poverty	Measures that are now being taken	<ul style="list-style-type: none"> - How do vulnerable groups benefit from your cooperative? <ul style="list-style-type: none"> o What are the most important measures you are taking? o Who do you work with for this? o What can other cooperatives learn from you? o What is holding you back?
Energy poverty	Approach	<ul style="list-style-type: none"> - What helps you in your approach to energy poverty? - How would you like to grow in this?

Appendix C – Interview guide Local4Local

Theme	Subject	Questions
Introduction	Getting to know the interviewee	<ul style="list-style-type: none"> - Would you like to introduce yourself? <ul style="list-style-type: none"> o What is your role within Cooperative x? o And within the realisation of L4L?
Cooperative	General	<ul style="list-style-type: none"> - What do you think is the added value of Cooperative x? <ul style="list-style-type: none"> o Do the members agree with this?
Energy poverty	Perception of the cooperative	<ul style="list-style-type: none"> - What role can cooperatives play in the fight against energy poverty? - Where else does the responsibility lie?
L4L in general	Origin L4L	<ul style="list-style-type: none"> - How did the idea of L4L come about at Cooperative x? <ul style="list-style-type: none"> o What need is fulfilled? o Who was involved?
Positioneren ENCI	Position L4L	<ul style="list-style-type: none"> - What will change for members within the L4L model? <ul style="list-style-type: none"> o What will be the role of members? o What is the main reason members support L4L?
Energy poverty	Change to L4L	<ul style="list-style-type: none"> - How is the role of cooperatives shifting in the transition to L4L? <ul style="list-style-type: none"> o In terms of energy poverty?
Energy poverty	Potential L4L	<ul style="list-style-type: none"> - What opportunities does L4L offer for these vulnerable groups? - What barriers does L4L give for involving these vulnerable groups?
Energy poverty	Strategies	<ul style="list-style-type: none"> - How could the fight against energy poverty take shape in L4L? <ul style="list-style-type: none"> o Which actors can play a role? o What can cooperatives do?