Energy poverty, bridging the gap between housing association and tenant

What measures housing associations can take to aid their tenants who are struggling with energy poverty

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Marvin Cairo

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Supervisors:	Dr. J. Hoekstra	TU Delft
	Dr. Q. Qian	TU Delft
	T. Croon Msc	TU Delft
Delegate Board of Examiners:	A. Mulder	TU Delft

ABSTRACT: Due to rising energy prices, an increasing number of households are experiencing difficulties with the affordability of their energy bills. As a result, households are unable to heat or cool their homes, or use electrical appliances as desired. This is known as energy poverty. This research focuses on energy poverty within housing associations. As two-thirds of households experiencing energy poverty live in housing association homes, this research is specifically targeted at housing associations. The research examines the possible gap between what housing associations are doing to combat energy poverty for their tenants, and what tenants would like to see housing associations do for them. Since renovation is simply too expensive and takes several years, it is excluded from consideration. As a result, housing associations will need to take other measures to help their tenants. This research will look at these taken measures and provides recommendations to housing associations to reduce and possibly solve the gap between what they can do and what tenants want to happen. The main question of this thesis is: **What can housing associations do to close the gap between them and their tenants in the social housing sector regarding combating energy poverty?**

This research will be carried out based on a qualitative study in which literature will be reviewed, and housing associations and tenant organisations will be interviewed. The aim is to identify the gap between what is desired by tenants and capable of housing associations and to draw up recommendations for housing associations to assist their tenants as well as possible. The recommendations of the research indicate that many of the gaps found during the comparison of the focus groups have to do with communication, both improving communication itself, and setting up communication between tenants and the association to reduce energy poverty.

ABSTRACT (DUTCH): Door stijgende energieprijzen hebben steeds meer huishoudens moeite met de betaalbaarheid van hun energierekening. Hierdoor kunnen huishoudens hun woning niet naar wens verwarmen of koelen, of elektrische apparaten gebruiken. Dit staat bekend als energiearmoede. Dit onderzoek richt zich op energiearmoede binnen woningcorporaties. Aangezien tweederde van de huishoudens met energiearmoede in woningen van woningcorporaties woont, is dit onderzoek specifiek gericht op woningcorporaties. Het onderzoek onderzoekt de mogelijke kloof tussen wat woningcorporaties doen om energiearmoede bij hun huurders tegen te gaan, en wat huurders graag zien dat woningcorporaties voor hen doen. Omdat renovatie simpelweg te duur is en meerdere jaren in beslag neemt, wordt dit buiten beschouwing gelaten. Hierdoor zullen woningcorporaties andere maatregelen moeten nemen om hun huurders te helpen. Dit onderzoek gaat in op deze genomen maatregelen en geeft aanbevelingen aan woningcorporaties om de kloof tussen wat zij kunnen en wat huurders willen dat er gebeurt te verkleinen en mogelijk op te lossen. De centrale vraag van dit proefschrift is: **Wat kunnen woningcorporaties doen om de kloof tussen hen en hun huurders in de sociale huursector te dichten met betrekking tot het tegengaan van energiearmoede?**

Dit onderzoek wordt uitgevoerd op basis van een kwalitatief onderzoek waarin literatuur wordt geraadpleegd en woningcorporaties en huurdersorganisaties worden geïnterviewd. Het doel is om de kloof tussen wat huurders willen en wat woningcorporaties kunnen, in kaart te brengen en aanbevelingen te doen voor woningcorporaties om hun huurders zo goed mogelijk te helpen. De aanbevelingen van het onderzoek geven aan dat veel van de hiaten die tijdens de vergelijking van de focusgroepen zijn gevonden, te maken hebben met communicatie, zowel het verbeteren van de communicatie zelf, als het opzetten van communicatie tussen huurders en de vereniging om energiearmoede te verminderen.

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CHAPTER 1
INTRODUCTION

The affordability of housing expenses is becoming an increasing problem for many households. Among other things, Energy poverty is becoming a growing problem on the research and policy agendas of the European Union (EU) and its member countries (Herrero, 2017). In contrast to other countries, the UK's old and inefficient housing stock drew the attention of academic and political circles to energy poverty as early as the 1970s (Koh et al., 2012). For a relatively long time, the topic has been the focus of academic and policy debate, with the United Kingdom leading the way in terms of extensive attempts to assess and characterize the condition (Robinson et al., 2018).
An individual is classified as energy poor if they are unable to effectively heat their house due to a lack of funds as well as the (in)efficiency of the housing insulation and heating system (Boardman, 2012; Bouzarovski et al, 2012; Liddell et al, 2012). According to Vattenfall NL (2022) people are already energy poor if they spend 10% of their monthly income on energy. People in energy-poor families, for example, will not turn on the heater to save money, or they choose not to warm up their meals because gas is too expensive.

Throughout Europe, energy poverty is a big issue. About 50 to 125 million Europeans, for example, cannot afford adequate thermal comfort indoors (European Commission, 2020). The problem is most severe in Central, Eastern, and Southern Europe inside the European Union. However, it is also a major issue in nations such as France and Ireland. It also affects many families in the Netherlands.
About 75% or 400,000 of the energy-poor households in the Netherlands are living in housing association homes. This means that one in six tenants of housing associations lives in energy poverty (Artiensis, 2021). Also, almost half of the Dutch households live in poorly or moderately insulated houses but cannot make it more sustainable (TNO, 2021).
In June 2022, 580,000 rental homes had a poor energy label (Label E, F & G) (Jasken, 2022). Aiming to eliminate rental units labeled with E, F, or G energy efficiency rating by 2028 is one of the objectives of the National Performance Agreements. Those who reside in these units and have a low income will receive specific rent reductions in 2024, according to Atriensis (2022). What's new is that both housing associations and private landlords are now legally required to do so. Housing associations and private landlords will be prohibited from renting out homes with a poor energy label beginning in 2030 (Label E, F, or G). Minister Hugo de Jonge mentioned this in the new sustainability plans unveiled on June 1st (Jasken, 2022). Another thing is greenhouse gas emissions. These greenhouse gas emissions must fall by 49% in 2030 compared to 1990 (Ministerie van Infrastructuur en Waterstaat, 2022), this means that many homes will have to undergo the energy transition to reach this goal.
Because the houses with the energy labels E, F, and G are slowly getting renovated and tenants and tenant organisations are getting closer to the energy transition. It is critical that tenants and tenant organisations participate in the planning process. This provides a smooth transition (Nederlandse Woonbond, 2022a).

Energy prices have also risen in 2022. The rise in energy prices is the most obvious economic consequence of the Russian invasion of Ukraine. The price of gas and coal more than doubled in the weeks after the invasion, and the price of oil shot up almost 30 percent (DNB, 2022). According to Resi Becker, CEO of energy company Essent, about 2.5 million households are faced with energy poverty due to the sharp increase in energy bills. This increase amounts to between four and six thousand euros per year (NPORadio1, 2022).
The government did step in to help households with their energy bills and counteract the high costs. VAT on energy (natural gas, electricity, and district heating) has been lowered from 21% to 9% from 1 July to 31 December 2022. The lower VAT rate is applied to all elements of the energy bill related to energy supply. Administration and network management costs, for example (Ministerie van Algemene Zaken, 2022). Households with an income around the social minimum will also receive extra support to

compensate for the high energy prices. This support is in the form of an energy surcharge of approximately €1,300 (Ministerie van Algemene Zaken, 2022).
From 1 January 2023, a price ceiling on energy will apply to all households and other small-scale consumers. For gas, the maximum rate will be €1.45 per cubic meter up to a consumption of 1,200 cubic meters to be eligible for the price ceiling. For electricity, the maximum rate will be reduced to €0.40 per kWh and the maximum consumption will be increased to 2,900 kWh to be eligible for the price ceiling (Ministerie van Economische Zaken en Klimaat, 2022). The only problem with the price ceiling is that households living in a badly insulated home with a bad energy label (E, F, and G) use more gas and electricity than households living in a better insulated home and a better energy label (A, B, C, and D). This means that the people living in worse insulated homes will more likely go over the threshold of 1,200 cubic meters of gas and 2,900 kWh of electricity and still have to pay the market price for gas and electricity, which is way higher than the price of the price ceiling. For November and December 2022, households received a fixed discount on the energy bill of €190 (Ministerie van Economische Zaken en Klimaat, 2022).

The measures taken by the government will possibly help households in 2023. Even though a price ceiling and VAT was lowered, TNO still advocates for faster home sustainability. But even though the TNO advocates for faster home sustainability, this is not as simple as it appears. Every industry is currently dealing with supply chain disruptions that can be severe (Mooij, 2022). There were disconcerting reports in April 2022 that increasing construction costs had brought construction projects to a halt. The main reason is the conflict in Ukraine. This has resulted in a price shock and the disruption of supply chains. This is mainly due to the rapidly increasing price of gas (Mooij, 2022). The production of construction materials frequently necessitates the use of a large amount of gas. Furthermore, the war also interrupted the supply of raw materials, particularly clay, steel, and aluminium. Building materials such as glass, wood, sealant, brick PVC pipes, taps, and roof tiles are also in short supply (Mooij, 2022).
It costs a lot of money to make these homes more energy efficient. This can cause a problem for housing associations and homeowners, as recent research shows that housing associations simply do not have enough money to take these homes off the gas. According to Aedes, the umbrella organisation of housing associations, it costs about 108 billion euros to make more than 2 million rental homes in the Netherlands energy neutral. This is approximately 52 thousand euros per home (EenVandaag, 2019). As a result, this transition will be delayed more quickly until it is really necessary. The tenants will, until then, still have to pay the high energy bill. There are compelling reasons to believe that the transition to sustainable energy will reduce the total cost of the energy system in the long run, due to the widespread use of efficient technology and reduced reliance on (imported) fossil fuels (Faaij and Van den Brink, 2019). However, the cost decrease is not linear over time. Energy costs will rise in the near and medium term as a result of the energy transition. As a result, the energy shift may aggravate the problem of energy poverty. The primary cause of the rise in energy expenses is the necessity to make investments in new technology. Electricity grid providers must invest in expanding their grid's capacity to accommodate new wind and solar farms. Additionally, households must make investments to adopt new energy sources (Feenstra et al., 2020). Ecorys conducted research that predicts the "heat transition" - the transition from natural gas to renewable sources for home heating - will result in a substantial increase in the number of households spending over 10% of their income on energy expenses. According to Ecorys, in the most unfavorable circumstance, this percentage could affect up to 18% of households in the Netherlands (Schellekens et al., 2019).

Because housing associations cannot renovate and make all homes more sustainable in the short term, construction costs are sky-high and there is a shortage of materials and manpower, this option is not possible in the short term to reduce energy poverty among households living in housing association housing. The measures taken by the cabinet will also not apply to everyone living in social housing, because there are households in housing association homes that simply cannot stay below the maximum of the price ceiling. In addition, the maximum energy prices permitted under the price cap

are still considerably higher than they were previously (Mulder et al., 2023). So, this will not solve the problem completely. A solution is especially needed in the winter of 2023-2024 because the rising prices and the lack of sustainability in the winter of 2022-2023 have caused a problem in paying the energy bills for households living in social housing due to the high energy prices. Because this is a major problem among households living in social housing, social housing associations will have to step in to help their tenants in these times and ensure that their tenants do not encounter bigger problems in the future.
Of course, the social housing associations are not solely responsible for lowering the energy costs of their tenants, tenants themselves are also responsible for reducing their consumption. For example, all sorts of things can be tried to keep the costs of tenants as low as possible, but if the tenants themselves do not try to reduce their costs and let everything depend on the housing associations, then nothing will change anytime soon. Housing associations and tenants will therefore also have to work together if this is to work out as well as possible. However, this also poses a difficulty, for example, because many tenants have the feeling that they are not being heard. Steps can therefore still be taken in the cooperation between tenants and social housing associations to reduce energy poverty.

1.1.2 MAIN AIM

In response to the above-mentioned problem statement, the main goal of this study is to gain insights into energy poverty in relation to the housing association and its tenants. It will look at the potential gap between housing associations and tenants regarding their views on how best to combat energy poverty. The role of the housing association will be examined, but also the role of tenants in relation to energy poverty. The aim of this study to shed light on the matter from both sides is to gain a better understanding of the potential gap and explore whether there are possible ways to close this potential gap.

1.1.3 RESEARCH QUESTIONS

The main question of this thesis is: **What can housing associations do to close the gap between them and their tenants in the social housing sector regarding combating energy poverty?**
This leads to the following sub-questions:

- What role can social housing associations play regarding combatting energy poverty?
- What role can tenants play regarding combatting energy poverty?
- What is the gap between tenants and housing associations in measures taken and prioritised interventions?
- What recommendations can be given to housing associations regarding combatting energy poverty?

1.1.4 CONCEPTUAL MODEL

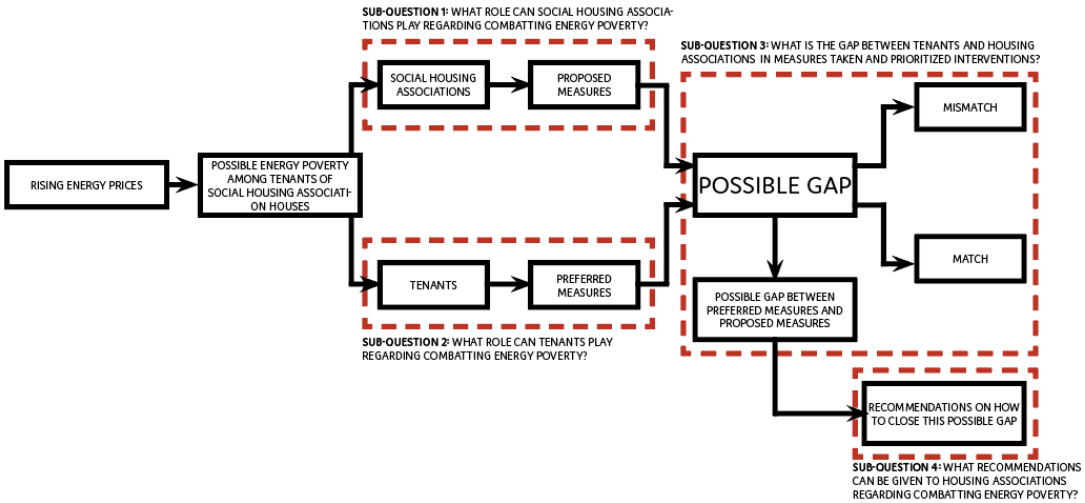

Figure 1: Conceptual model (own work)

CHAPTER 2
LITERATURE REVIEW

A literature review is conducted in this chapter to gain an understanding of energy poverty and what exactly causes it, what role tenants play in combatting energy poverty and what the role of social housing associations is and how they combat energy poverty. Lastly, a conceptual model is constructed to explain the relationships between the main concepts identified in the literature review.

The concepts to be investigated are:

- What energy poverty entails, and whom it affects
- The role of housing associations regarding energy poverty
- The role of tenants regarding energy poverty
- The gap between housing associations and tenants
- Possible measures on how to close the gaps

2.2.1 THE DEFINITION OF ENERGY POVERTY, AND WHOM IT AFFECTS

This section of the report looks at what exactly energy poverty is, what the cause is of energy poverty and who exactly suffers from it. This part is important because it is the basis of the research.

2.2.2 WHAT IS ENERGY POVERTY?

Energy poverty is frequently related to poor-country homes. Energy poverty is defined in this context as a lack of access to (cheap) contemporary kinds of energy such as electricity (TNO, 2020). As a result, most homes continue to rely on conventional biomass for heat and cooking (IEA, 2010).

However, energy poverty is not limited to developing countries. There must also be dealt with it in developed countries. An individual is classified as energy poor if they are unable to effectively heat their house due to a lack of funds as well as the (in)efficiency of the housing insulation and heating system (Boardman, 2012; Bouzarovski et al, 2012; Liddell et al, 2012). The phrase "energy poverty" derives from the notion of "fuel poverty," which was coined by Brenda Boardman in 1991. Boardman (1991) showed that occupants of cold dwellings experience negative health consequences, which are a result of a combination of factors such as low-income, high-energy costs, and buildings with poor insulation. People who live in energy poverty not only lack access to heating, lighting, and cooking, but they also suffer from mental and physical ailments (including long-term health repercussions for children) because of living in inadequately insulated and vented dwellings. Consider the health issues produced by severe heat during the summer and draughts and wetness in the winter (Straver et al., 2020).

The issues of energy poverty & general poverty are, obviously, inextricably linked. Financial issues result in overdue energy bills, the worry of those which cause health concerns that might affect income, and so on. This is also backed by a study done by Phimister et al. (2015). This study says that energy poverty has physical and mental health repercussions, particularly for elderly individuals and children, and has been connected to educational performance (Phimister et al., 2015). Phimister et al. (2015) also state that Individuals with low wages are more prone to slip into energy poverty, but a variety of other variables such as housing, rising energy prices, and climatic conditions are also likely to have an impact. A common policy argument is that rural families are disadvantaged due to the characteristics of rural home stock and the more restricted range of fuels accessible in rural locations. This, it is said, means that rural inhabitants are more prone to be energy poor and spend more time in energy poverty. However, there is little actual data to support either position, that rural inhabitants are more prone to be energy poor and spend more time in energy poverty. However, no perfect connection exists between the two types of poverty. According to analyses conducted in Poland, Spain, The Czech Republic, and Hungary (Bouzarovski and Tirado Herrero, 2017), a fraction of households experiencing financial difficulties because of their energy expenditures is not, in general, below the general poverty line. The opposite is also true: low-income households who spend little on energy and yet have no financial issues

(PBL 2018). This is seen in Figures 2&3, in which the disposable income of families in the Netherlands is compared to the percentage of their spending spent on energy expenses (the energy ratio). This has been completed for both tenants and homeowners. The households in red are among the most vulnerable: their disposable income is less than the minimum wage (about €19,000), and they spend more than 10% of their earnings on energy bills. Although the yellow households have a small income, they too have small energy expenditures; this category is rather large among tenants. Although the orange households earn more than the minimum wage, they too have greater energy bills - this group is rather big among homeowners (Straver et al., 2020).

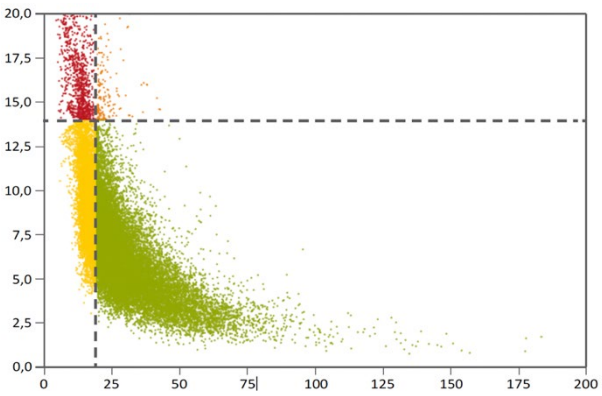

Figure 2: Energy costs as % of disposable income – Tenants (Straver et al., 2020)

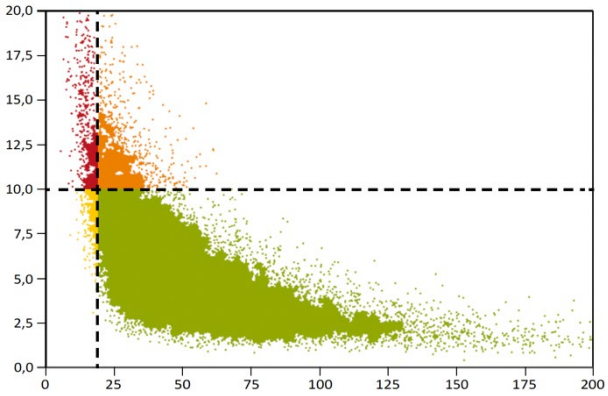

Figure 3: Energy costs as % of disposable income – Homeowners (Straver et al., 2020)

If the definition of energy poverty gets limited to just a payment problem, measured by the percentage of income spent on energy (the energy quote), the primary reason for high energy bills gets overlooked, which is poor energy quality in the home. This creates a blind spot for understanding the options that households have to reduce their energy bills through sustainable home upgrades. For instance, tenants living in poorly insulated homes who rely on their landlords to upgrade have fewer choices than homeowners and financially constrained homeowners to have fewer options compared to those who are financially well-off. To put it briefly, energy poverty is a problem that has several different dimensions and cannot be resolved through the sole transfer of money. Therefore, it is crucial to understand that energy poverty should not be measured solely in terms of the inability to pay for energy (Mulder et al., 2023).

2.2.3 NEGATIVE HEALTH CONSEQUENCES

In paragraph 2.2.1, it was already stated that energy poverty could have negative health consequences for people. After all, individuals with low incomes tend to be less healthy, which also results in greater expenses for healthcare and shorter life spans on average (CBS, 2020). Previously, research on energy poverty and its connection to health and education outcomes has been limited to household-level data in a single country or a small group of countries. The existing literature has very little international evidence on the relationship between access to electricity and energy use and their effects on health and education outcomes. However, a recent study conducted by Banerjee et al. (2021) provides empirical evidence at an international level, supporting the hypothesis that greater energy development is linked to better quality health and education outcomes. Specifically, the study found that increased energy development is associated with longer life expectancy rates, lower infant mortality rates, greater progression from primary to secondary schooling, and higher average years of schooling.

The link between energy poverty and health is also investigated by Zhang et al. (2021). Their study shows that adequate access to energy is crucial for a satisfactory standard of living and has a significant impact on people's daily lives. Using data from the CGSS 2015, this study evaluated multidimensional energy poverty in China and examined its effects on the physical and mental health of residents. The effects of multidimensional energy poverty go beyond physical health and also impact individuals' mental health, which can lead to increased health expenditure for the poor and further perpetuate the cycle of poverty. Additionally, the impacts on health outcomes were found to vary among different subgroups, worsening inequalities between subgroups and hindering poverty alleviation efforts.

A Dutch study, done by Maurik et al. (2023) from TNO also indicates that households that live in energy poverty have higher healthcare costs. With this study, Maurik et al. (2023) compared the healthcare costs of households that live in a house with a bad energy label, in this case, an E & F label and households that live in a house with a good energy label, in this case, an A & B label. Both groups had a low income. The results showed that the healthcare costs were 5 percentage points higher as a result of living in a house with a bad energy label. It got as high as 8 percentage points for the subgroup not heating their houses properly by turning their thermostat lower or even completely off.
The subgroup with the age of under 18 years, living in the houses with the worst labels (F and G) and their houses not heated properly thanks to lack of funds pay on average 24 percentage points for pharmaceutical costs and hospital costs were 40 percentage points higher compared to young people (under 18 years) living in the same kind of houses but without a low income. Looking at the group suffering from energy poverty where the thermostat is turned lower or completely off, the pharmaceutical costs were 12 percentage points higher, and the hospital costs were 23 percentage points higher for children and young people under the age of 18. This was compared to people the same age in the same sort of house where the thermostat is on.

2.2.4 WHAT IS THE CAUSE OF ENERGY POVERTY?

Like Mulder et al. (2023) said, energy poverty gets limited to just a payment problem, measured by the percentages of income spent on energy. In reality, energy poverty has a lot more factors in play. In this part of the text, these factors are explored.

2.2.5 HOW IS ENERGY POVERTY MEASURED?

In the TNO study done by Mulder et al. (2023), three dimensions of energy poverty are measured:

- The affordability of energy
- The energy quality of the house
- The ability to invest in the energy quality of the house

Variations of these three indicators are also derived, as shown in Table 2. These indicators are seen by Mulder et al. (2023) as causes of energy poverty among households. The variations will be explained below Table 2.

Indicator	Afkorting
Betaalbaarheid	
1. **L**aag **I**nkomen, **H**oge **E**nergierekening	LIHE
Woningkwaliteit	
2. **L**aag **I**nkomen, **L**age **E**nergetische **K**waliteit woning	LILEK
3. **L**aag **I**nkomen, **Z**eer **L**age **E**nergetische **K**waliteit woning	LIZLEK
Mogelijkheid tot verduurzamen	
4. **L**age **E**nergetische **K**waliteit woning, **W**einig **I**nvesteringsmogelijkheden	LEKWI
4a. Huiseigenaren	
4b. Huurders	
5. **Z**eer **L**age **E**nergetische **K**waliteit woning, **W**einig **I**nvesteringsmogelijkheden	ZLEKWI
5a. Huiseigenaren	
5b. Huurders	
Combinatie	
1 óf 2: LIHE *óf* LILEK	LIHELEK
1 óf 3: LIHE *óf* LIZLEK	LIHEZLEK

Table 1: Energy poverty indicators (Mulder et al., 2023)

Low income, high energy bill (LIHE)

These households are characterized by having a low income (LI) and a high energy bill (HE), which serves as an indicator of short-term payment risk. To be considered "low income," the standardized disposable

household income cannot exceed 130% of the poverty line. A "high energy bill" is one that exceeds the average energy bill of a label-C home in 2019, which is also known as the median energy bill (Mulder et al., 2023).

Low income, low energetic quality (LILEK)

These households have a low income (LI) and a dwelling with low energy performance (LEK). This criterion provides an estimate of the risk of long-term payment difficulties. The LIZLEK version focuses on households in this category that have the least energy-efficient dwellings (ZLEK). To qualify as "low income," the household's standardized disposable income must not exceed 130% of the poverty line, as defined for LIHE. A dwelling with "low energy performance" consumes more energy than the average energy consumption for homes with an energy rating of C in the base year of 2019. The "very low energy performance" variant (ZLEK) identifies dwellings whose quality is in the bottom 15% based on expected energy consumption in the base year of 2019, primarily homes with energy labels G and F (Mulder et al., 2023).

Low energetic quality, few investment possibilities (LEKWI)

These households live in homes with poor energy efficiency and have limited options for making them more sustainable. This metric shows how much people can contribute to the energy transition. The ZLEKWI variation focuses on households with the least energy-efficient homes (ZLEK) within this group. The distinction is made between homeowners and renters. Renters rely on their landlords to improve their homes' sustainability, while homeowners can make their own decisions but need financial resources.

The definition of "low income" is the same as for LILEK. If the income is below 130% of the poverty line, or if the sum of financial assets and housing equity is less than 40,000 euros, there is not enough money to make a dwelling more sustainable. These 40,000 euros includes a financial buffer of 10,000 euros and a limit of 30,000 euros in sustainable costs per average dwelling to fully fund insulation up to energy label B (Mulder et al., 2023).

Combination of LIHE or LILEK

These households have low income and either high energy bills or homes with poor energy performance. The LIZLEK variation targets households with the least energy-efficient homes (ZLEK) within this group. This combined metric gives the most accurate measure of energy poverty, as it includes households with both low income and high energy bills, as well as those with low income and homes with poor energy quality. It adjusts for the substantial overlap between these two groups (Mulder et al., 2023).

2.2.6 ESTIMATION ENERGY POVERTY 2022

With the study by Mulder et al. (2023), an estimation was made of the number of households experiencing energy poverty based on several scenarios. This was done based on energy consumption and average energy prices. Furthermore, financial compensation measures were examined, which made it clear how many households would experience energy poverty with and without these measures. In section 2.2.1 it was already mentioned that energy poverty is not only related to the affordability of energy. Despite not being solely linked to this, due to energy prices and compensation measures, people can still be labelled as energy poor or not, and this can be seen as one of the causes of energy poverty.

2.2.7 PRICE OF ENERGY

The Monitor Energy Poverty used the yearly average of monthly tariffs published by CBS to calculate the average energy price. The monthly rate is an average energy rate that consumers pay for the delivery of gas and electricity when signing up for a new contract during a particular month. Due to the unavailability of individual contract data, the report relies on an average price. For 2022, the average delivery price, including VAT, is €1.78 per cubic meter of gas and €0.45 per kilowatt hour of electricity. This calculation is based on the average of the months of January through November. To mitigate the impact of sharp monthly price fluctuations, an annual average price is computed, which is more representative of the typical rates that households pay. The graph in Figure 6 demonstrates these averages in relation to the monthly rates for 2022, as outlined by Mulder et al. in their 2023 report.

The average prices for gas and electricity supply in 2022 have increased significantly compared to 2020, rising more than five times over. Specifically, between 2020 and 2022, the average delivery price, inclusive of VAT, for gas and electricity increased by 526% and 540% respectively. This price disparity is relevant to the analysis that compares the two years. The majority of this price hike took place between 2021 and 2022, with gas and electricity rates increasing to €0.42 per cubic meter and €0.11 per kilowatt hour respectively. This resulted in an average price hike of 329% and 328% respectively for gas and electricity between 2021 and 2022. The graph in Figure 7 illustrates the rate of development over the period of 2020 to 2022, as described in Mulder et al.'s 2023 report.

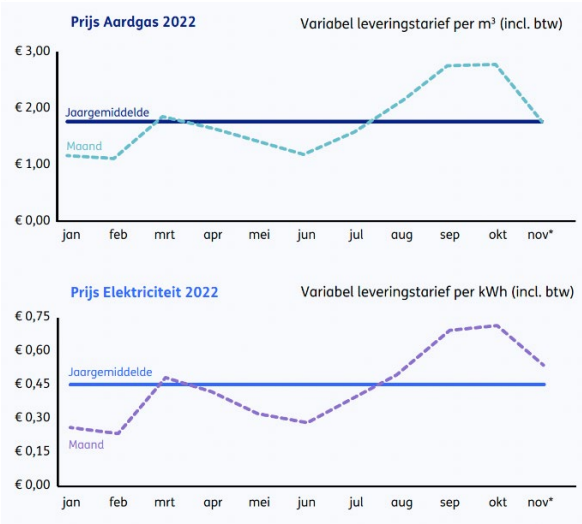

Figure 4: Price of gas and electricity in 2022 (Mulder et al., 2023)

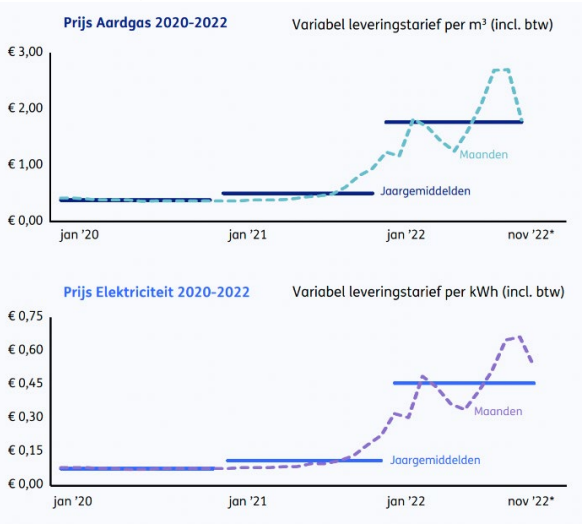

Figure 5: Price of gas and electricity from 2020 – 2022 (Mulder et al., 2023)

2.2.8 FINANCIAL COMPENSATION METHODS

The projected energy bill for 2022 has been adjusted to account for various financial support schemes, such as the energy allowance for low-income households, lower energy tax on electricity, higher energy tax refund, lower VAT on the rest of the energy bill, and an additional general discount. For example, households with a monthly income of up to €1,310.05 (if single) or €1,871.50 (if cohabiting) are eligible for an energy allowance of approximately €1,300. The energy tax rate in 2022 is lower than in 2021, and households pay a certain amount of energy tax per consumed kWh. Moreover, the energy tax refund has been increased to a fixed discount, which is not dependent on energy consumption. Additionally, the VAT on energy has been reduced from 21% to 9% for the latter half of 2022, applicable to all energy bills related to the supply of energy. Finally, to prepare for the energy price ceiling in 2023, each household received an extra discount of €190 per month on the energy bill for November and December 2022. (Mulder et al., 2023).

In 2022, the national government provided municipalities with a Specific Grant (SPUK) based on TNO's (2021) calculations of the number of people living in energy poverty. This allowed municipalities to provide energy-saving measures to households most affected by high energy costs at their discretion (Mulder et al., 2023).

2.2.9 WHO GETS AFFECTED BY ENERGY POVERTY?

In 2020, the number of household members that were part of the 513 thousand low-income households in the Netherlands in 2020 was over 900.000 persons. That corresponds to 5.5% of the population (CBS, 2021). A big part of these people also must cope with energy poverty. According to TNO research data, gathered by Longa et al. (2021), around 550,000 Dutch dwellings were energy poor in 2020. This represented around 7% of all households. On one hand, these households had a low income and, on the other, either excessive energy bills or a dwelling with poor energy performance. In comparison, around 15% of Dutch families are low-income; hence, in the Netherlands, the number of energy poor households was almost half that of low-income households.

In 2020, approximately 250,000 energy poor households had a low income and a house with inadequate energy quality and expensive energy bills. An estimated 140,000 families were living in hidden energy poverty; these really are people who used less energy than they'd like owing to budgetary constraints. Finally, the results revealed that nearly half (48%) of all Dutch households resided in a dwelling with a rather low energy performance that they were unable to make sustainable by themselves. And over half of them were renters who are not able to make their own sustainability decisions, while the remaining families were homeowners who lacked the equity or financial capacity to make major investments independently (Longa et al., 2021).

As a result of the high energy prices, there was an increase in energy poverty in 2022 when compared to 2020. Nevertheless, the increase was mitigated by financial compensation measures, while energy savings had a minor impact on the rise. It is estimated that the number of energy-poor households has increased by approximately 90,000 since 2020, bringing the total to about 602,000 households, which is equivalent to 7.4% of all households in the Netherlands. These households have low income and face either a high energy bill or have a poorly energy-efficient home (indicators of energy poverty 1 and 2 combined). In 2020, this group represented 6.4% of all households in the Netherlands due to low energy prices. However, despite the increase, financial compensation and energy-saving measures are still effective in reducing the impact of energy poverty (Mulder et al., 2023). This can be seen in figure 8.

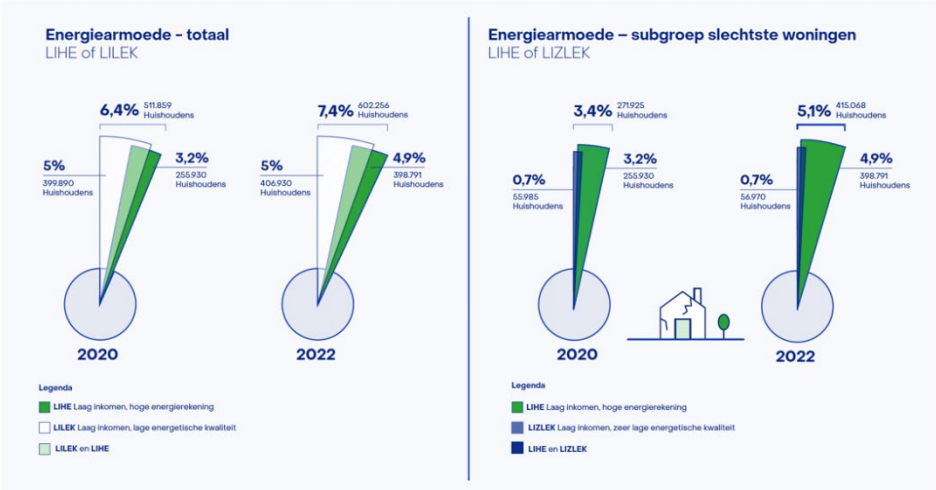

Figure 6: Extend of energy poverty in 2020 and 2022 (Mulder et al., 2023)

The data in table 3, provided by Mulder et al. (2023) reveals that the percentage of energy costs in relation to income, also known as the energy burden, has risen for low-income households (LIHE or LILEK) from 9% to 12.7% between 2020 and 2022 due to the increased energy prices. Consequently, the average monthly energy bill has risen by approximately €66 in 2022 compared to 2020, reaching about €190 per month. The energy burden has increased even more for the subgroup of low-income households with the most energy inefficient homes (LIHE or LIZLEK), reaching 16.3% in 2022, which corresponds to an average monthly energy bill of around €248. Despite financial compensation, this group has been impacted the most by the rising energy prices, experiencing an increase of about €98 per month compared to 2020 when the average monthly energy bill was around €149.
When looking at all households in the Netherlands, the energy burden has risen from 4.2% to 7.8% on average between 2020 and 2022 due to higher energy prices. Consequently, the average monthly energy bill has increased by approximately €131 in 2022 compared to 2020, reaching around €256 per month. Interestingly, while the absolute increase in energy bills for low-income households is less than the population as a whole, the percentage increase in the energy burden is similar at around 3.5 percentage points. However, the subgroup of low-income households with the most energy inefficient

homes has experienced a relatively strong increase in the energy burden estimated at 5.1 percentage points between 2020 and 2022.

Indicator	Afkorting	Baseline 2020	Scenario 1 2022	Scenario 2 2022 Zonder compensatie	Scenario 3 2022 Zonder compensatie en energie-besparing
% Energiearme huishoudens					
Alle huishoudens		4,2%	7,8%	9,9%	11,1%
Laag inkomen & hoge energierekening *of* Laag inkomen & lage energetische kwaliteit woning	LIHE *of* LILEK	9,0%	12,7%	18,4%	20,3%
Laag inkomen & hoge energierekening *of* Laag inkomen & zeer lage energetische kwaliteit woning	LIHE *of* LIZLEK	11,2%	16,3%	18,7%	20,5%
Aantal energiearme huishoudens#					
Alle huishoudens		€ 125,55	€ 256,00	€ 301,49	€ 337,85
Laag inkomen & hoge energierekening *of* Laag inkomen & lage energetische kwaliteit woning	LIHE *of* LILEK	€ 124,55	€ 190,23	€ 256,77	€ 282,91
Laag inkomen & hoge energierekening *of* Laag inkomen & zeer lage energetische kwaliteit woning	LIHE *of* LIZLEK	€ 149,40	€ 247,91	€ 260,92	€ 286,29
# Energiekosten *als aandeel van het inkomen*					

Table 2: Estimated level of energy poverty (Mulder et al., 2023)

2.2.10 DISTRIBUTION IN THE NETHERLANDS

In the Netherlands, energy poverty is not regularly distributed among neighbourhoods: there are numerous areas with low energy poverty and just a few neighbourhoods with an average high degree of energy poverty. Severe energy poverty is largely localised spatially: over 10% of households are energy poor within just 5 municipalities and 7% of neighbourhoods. In comparison, there are more communities with high and middle-income poverty. In the Netherlands, there are around 400 districts (13% of the total) in which the percentage of energy poverty is at least twice as large as that of the national average. The group of renters in energy-inefficient dwellings who cannot choose for themselves regarding sustainability is a notable exception to this pattern: they are scattered rather equally over the Netherlands, yet the dispersion is still not statistically typical. Homeowners with less sustainable dwellings who are unable to make their homes more sustainable hold an intermediate position (Straver et al., 2020).

Finally, there are major local disparities regarding energy poverty. Nationally, there is a stark geographical dichotomy: there is a substantial concentration of municipalities with a very significant degree of energy poverty in the north and (south) east of the Netherlands including Zeeland, contrasting to a comparatively low level of energy poverty in the Randstad metropolitan region. At the local level, there is a succession of energy poor areas spread over the remainder of the nation, including large cities. In essence, the spatial clustering of energy poverty in the Netherlands' north and (south) east, as well as Zeeland, is an important narrative, but it is not the only one. There are certainly huge disparities in energy poverty within a small distance, including districts and neighbourhoods with some very large percentages of energy poverty in municipalities, while the average energy poverty percentage is relatively low (Straver et al., 2020).

The top 20 most energy-poor municipalities in the Netherlands are nearly all in the northeast. The most energy-poor municipality under practically all categories of energy poverty is Pekela. This is not the case for income poverty, in which the top ten cities are dominated by the Randstad metropolitan area and several bigger cities in the east of the Netherlands. Unlike financial poverty, energy poverty is predominantly a rural issue (Straver et al., 2020).

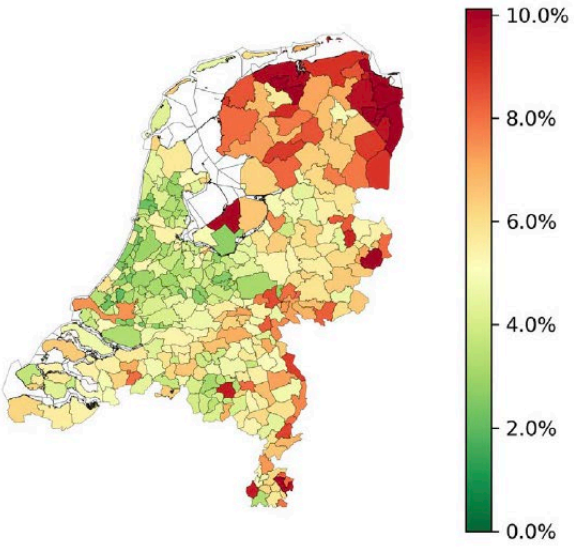

Figure 7: Level of energy poverty per municipality (Straver et al., 2020)

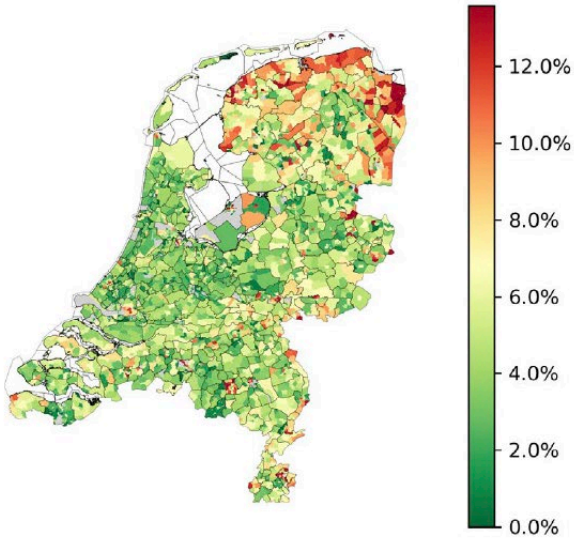

Figure 8: Level of energy poverty per neighbourhood (Straver et al., 2020)

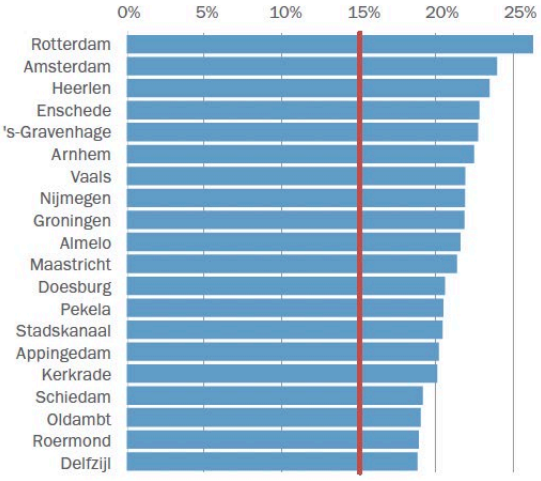

Figure 9: Top 20 municipalities with income poverty (Straver et al., 2020)

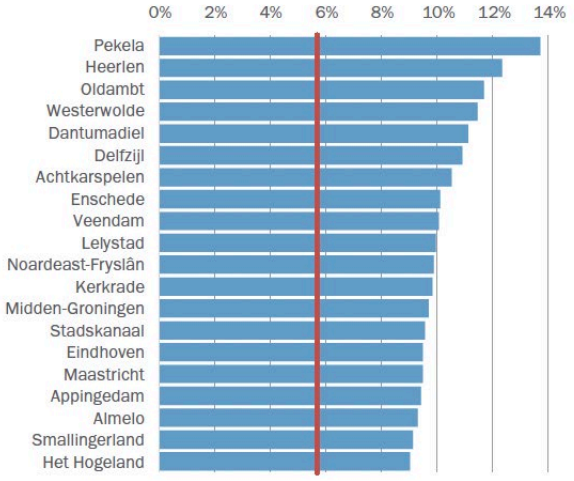

Figure 10: Top 20 municipalities with energy poverty (Straver et al., 2020)

Figure 13, by Mulder et al. (2023), displays the energy poverty map of the Netherlands for 2022, divided into municipalities. Figure 14 illustrates the proportion of households facing energy poverty, with low-income coupled with high energy bills and low-quality energy-efficient housing, in each municipality (measured by the energy poverty indicators LIHE or LILEK). In figure 14, we examine energy-poor households residing in the least energy-efficient dwellings (measured by the energy poverty indicators LIHE or LIZLEK).

Figure 14 displays that in 2022, the municipalities with the highest estimated percentage of energy poverty were located in South Limburg, Rotterdam, Northeast Groningen, the Arnhem area, The Hague, Almelo, and Enschede. Furthermore, Figure 14 highlights that in 2022, the regions with the highest percentage of households living in the most energy-inefficient dwellings affected by energy poverty were in Northeast Netherlands, The Hague, Enschede, Rotterdam, Almelo, Arnhem, and certain parts of (South) Limburg (Mulder et al., 2023).

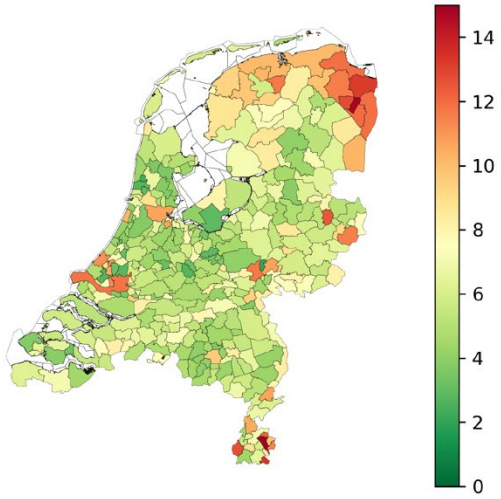

Figure 11: Percentage energy poor households per minucipality with LIHE or LILEK (Mulder et al., 2023)

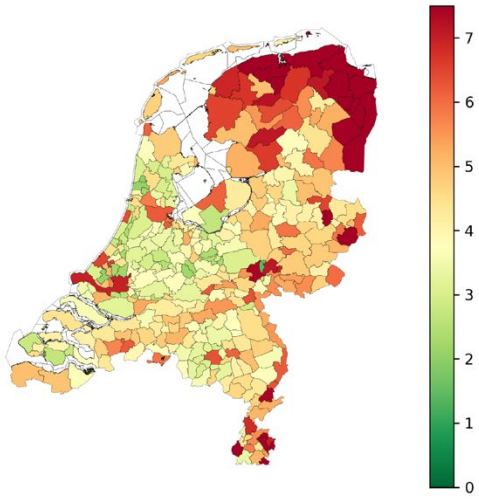

Figure 12: Percentage energy poor households per minucipality with LIHE or LIZLEK (Mulder et al., 2023)

Figure 15, by Mulder et al. (2023), provides a comparison between the estimated level of energy poverty in 2022 and the situation in 2020, showing the growth in percentage points of energy-poor households in each municipality. The left map depicts the total group of energy-poor households (LIHE or LILEK), whereas the right map focuses specifically on energy-poor households residing in the most energy-inefficient dwellings (LIHE or LIZLEK) (Mulder et al., 2023).

Helmond, Amsterdam, Diemen, Vlaardingen, Westervoort, Gorinchem, Flevoland (including Almere, Lelystad, and Dronten), Tiel, Enschede, Doesburg, Assen, and Rotterdam are among the various urban regions in the Netherlands that have experienced a significant surge in energy poverty, as shown in Figure 16.

Similarly, the growth of energy-poor households in the most energy inefficient homes has followed a comparable pattern, with strong growth in cities such as Almelo, Heerlen, Rotterdam, Schiedam, Tiel, Enschede, and Arnhem (Mulder et al., 2023).

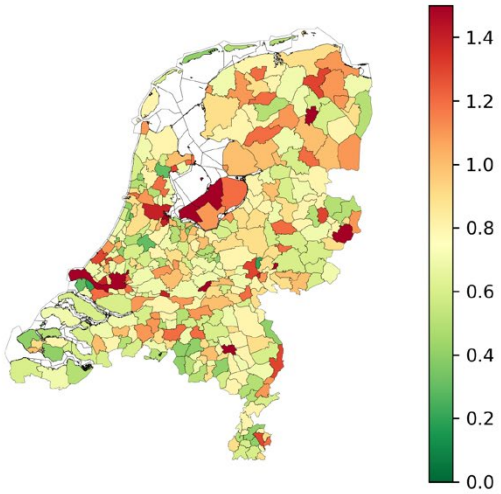

Figure 13: Increase of percentage energy poor households per minucipality with LIHE or LILEK (Mulder et al., 2023)

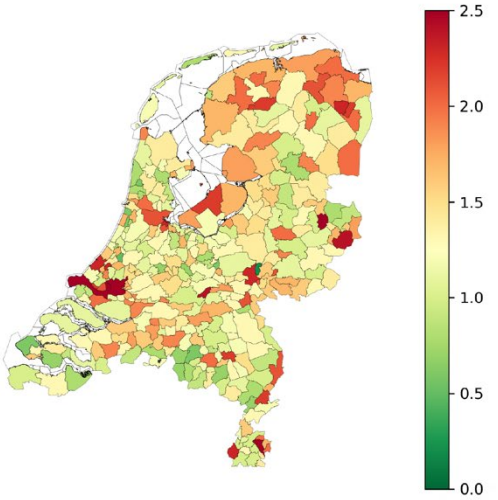

Figure 14: Increase of percentage energy poor households per minucipality with LIHE or LIZLEK (Mulder et al., 2023)

The UK Government recently established new goals to address the issue of energy poverty (DECC, 2013). Since energy poverty's complexity relies on various factors such as energy affordability, pricing, and individual and housing needs, it is challenging to allocate limited policy assistance effectively. Rural inhabitants are often considered to be particularly disadvantaged due to their structural characteristics, such as the lack of access to specific fuel types and the inefficiency of their housing stock. This study investigated this issue by analysing data from twelve years of the British Household Panel Survey (BHPS).

The study conducted by Roberts et al. (2015) aimed to investigate whether there were any differences in energy poverty levels and dynamics between rural and urban areas. This was accomplished through both descriptive analysis of the panel data and the estimation of discrete hazard models to examine energy poverty exit and re-entry.
When examining energy poverty rates over the entire period, there were no significant differences between rural and urban areas. However, there were notable variations in the extent of energy poverty changes during the period, and the survival functions for rural and urban inhabitants differed significantly, both for exiting and re-entering energy poverty. Specifically, a rural resident who had just entered a period of energy poverty was found to be more likely to recover from this condition in the initial years, but less likely to recover in later years than an urban resident (Roberts et al., 2015).

In the end, Mulder et al. (2023) also examined the correlation between urbanization and energy poverty in Figure 17. To accomplish this, municipalities have been categorized into five groups based on their level of urbanization. The definition of urbanization is from CBS and is based on the average residential address density, which is a gauge of the concentration of human activities. The graphs in Figure 5 display the five groups of municipalities, ranked from very urbanized (1) to non-urbanized (5). The vertical axis indicates the median percentage of energy poverty at the municipal level, measured across each of the five groups of municipalities. We are focusing on the energy-poor households living in the most energy-inefficient homes (LIHK or LIZLEK). Although not displayed here, a comparable pattern can be observed for the overall group of energy-poor households (indicator LIHE or LILEK), but it is slightly less pronounced (Mulder et al., 2023).
The graph depicted in Figure 17 illustrates a distinct U-shaped correlation between energy poverty and the level of urbanization: energy poverty tends to be the highest on average in (very) strongly urbanized and non-urbanized municipalities, while being the lowest in moderately and sparsely urbanized ones. Additionally, the graph indicates that between 2020 and 2022, energy poverty has shown the greatest increase on average in (very) strongly urbanized regions.

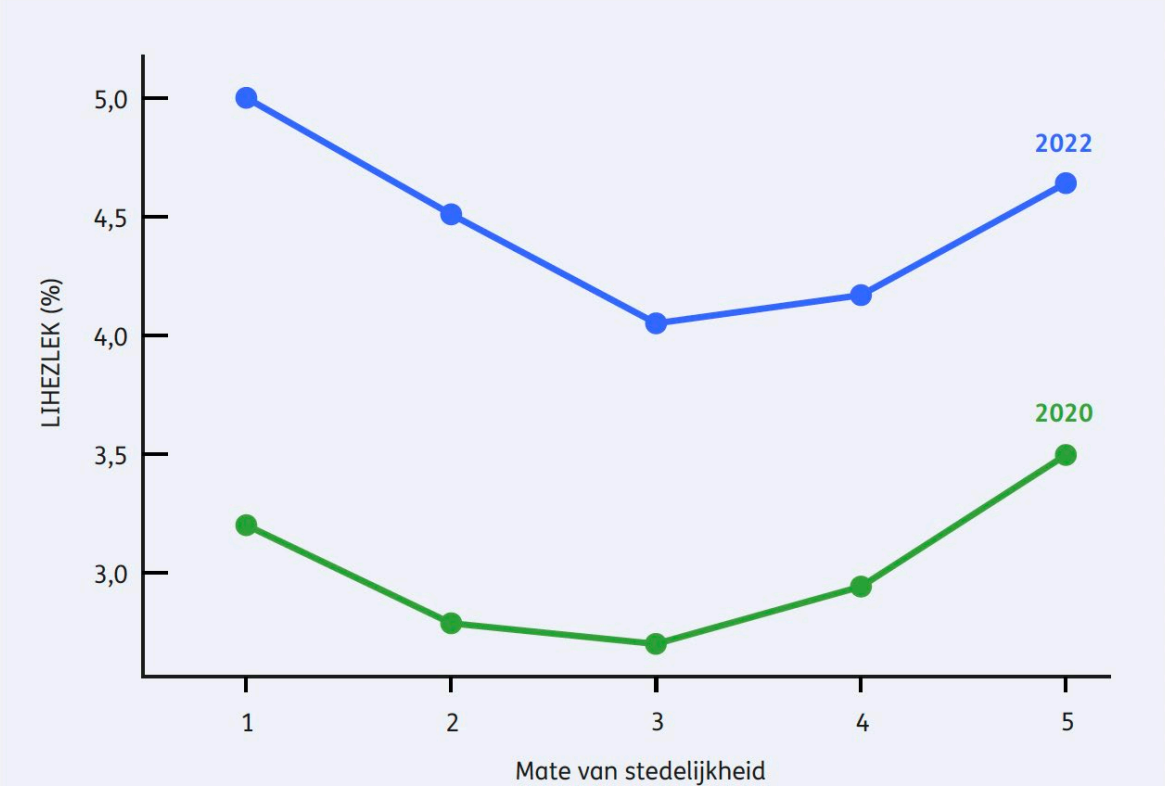

Figure 15: The median percentage of energy poverty across groups of municipalities, categorized by level of urbanization. (Mulder et al., 2023) (1: urban area – 5: rural area)

2.3.1 THE ROLE OF HOUSING ASSOCIATIONS REGARDING ENERGY POVERTY

The primary role of housing associations revolves around the construction, leasing, and maintenance of affordable housing units designed for individuals with low incomes or those facing challenges in securing suitable rental accommodations. Housing associations also undertake additional responsibilities, including investments in community infrastructure like local libraries and neighbourhood centers. Nevertheless, it is crucial to ensure that these supplementary tasks do not overshadow their core mandate (Rijksoverheid, n.d.).

Because a lot of people who experience energy poverty live in homes owned by housing associations, it is extra important for the housing associations to help these people, who are already less well-off economically, as much as possible where possible. Faaij et al. (2022) argue in a TNO whitepaper to accelerate the making of homes more sustainable. The houses with the lowest energy labels have to be renovated first. In this way, several goals can be achieved at the same time. Not only will this achieve one of the main goals of the energy transition, but it will also structurally solve the energy poverty problem. Furthermore, a major contribution is made to making the expensive Russian gas that has to be imported structurally superfluous, the decline in purchasing power is reduced and this strengthens the economy. So much win-win is rare.
However, these renovations cost a lot of money. Construction companies as well as their clients are arguing about how to pay for the rising cost of construction, material shortages, and delays. Consequently, some construction projects are halted or postponed. Typically, builders mitigate price risks by buying a large portion of the materials in ahead of time at fixed prices. They can also agree on price indexations with clients. These methods are no longer effective. Fixed agreed-upon prices aren't longer a viable option because suppliers can’t keep their promises. Indexes do not account for the explosively increased prices in steel, cement, and wood. The situation causes clients' plans to be pushed back, causes issues when signing new contracts, and necessitates a budget review (Mooij, 2022).

2.3.2 LABOUR SHORTAGES

Not only material shortages are slowing the progress. According to Duijn et al. (n.d.), the lack of skilled workers is impeding progress towards the transition to cleaner energy sources. This problem is particularly acute in professions associated with the shift to renewable energy. Unfortunately, in 2022, the Netherlands was unable to address this issue and the labour shortage in this field even reached a record high at the end of the year.
The next few years require swift action to achieve sustainable energy systems. The Dutch government has established a climate and transition fund of €35 billion to bolster the country's energy infrastructure, particularly for hydrogen and geothermal energy. Furthermore, financial support is available for insulation measures, solar water heaters, (hybrid) heat pumps, district heating connections, and electric cooking facilities to encourage their adoption (Duijn et al., n.d.).
Finding qualified workers has been a long-standing difficulty. As of late November, nearly 39% of vacancies for energy transition-related professions remained unfilled, as measured at the end of each month, and taking into account the job preferences and commuting distance of job seekers. By the end of December 2022, the labour shortage had slightly improved but still affected more than one-third of available positions (Duijn et al., n.d.).
While labor shortages are a widespread and persistent issue, the shortage of personnel in this particular group is notably larger than that for the labor market overall, as illustrated in the following figure.

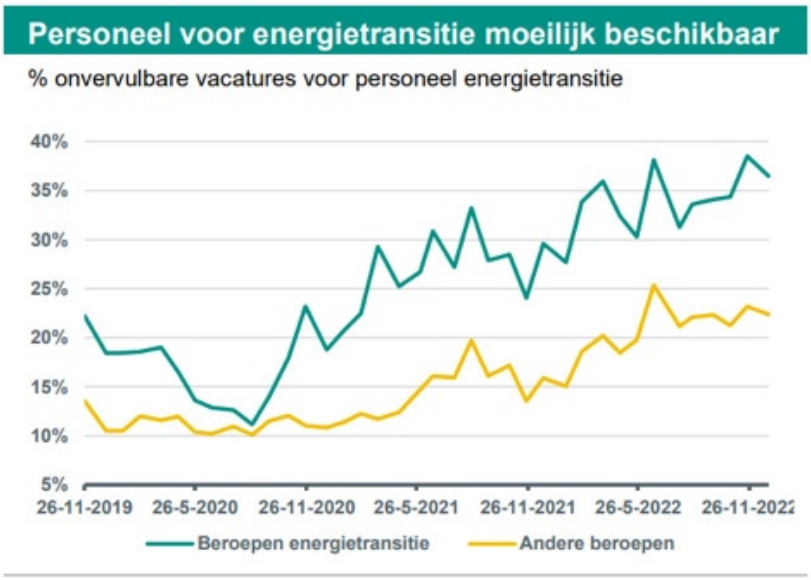

Figure 16: Percentage unfilled vacancies (Duijn et al., n.d.)

The personnel shortages in energy transition-related professions vary depending on the type of specialist. For instance, there is a high demand for installation technicians who specialize in roofing, plumbing, heating, gas and water pipes, work planners and calculators for installation technology and civil engineering, and insulators of walls, roofs, and floors of homes and offices, as well as technicians for electricity networks. However, there are also professions in this group that have a surplus of personnel, such as technological environmental experts (Duijn et al., n.d.).

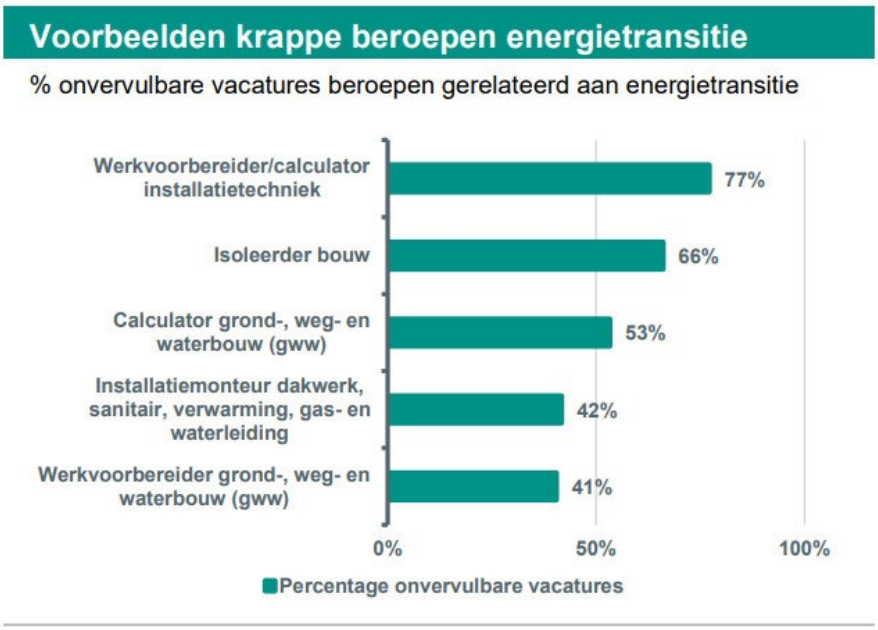

Figure 17: Percentage unfilled vacancies per profession (Duijn et al., n.d.)

In the coming five years (by 2025), several housing associations will not be able to construct an adequate number of social housing units, and they will also be unable to carry out necessary sustainability upgrades on their existing properties (Aedes, 2020).
This situation is becoming increasingly dire as more associations face financial difficulties. Even if they utilize all their resources, they will still face a shortfall of approximately €30 billion to complete the necessary work by 2035. This means that 125,000 social housing units will not be constructed, and

50,000 homes will not undergo necessary sustainability upgrades. These issues are not isolated incidents and are systemic in nature. Without any intervention, these shortfalls will continue to worsen over time. This conclusion was not only endorsed by Aedes but was also signed by three ministers (Aedes, 2020).

2.3.3 WHAT CAN SOCIAL HOUSING ASSOCIATIONS DO ALREADY

Consumption shifted partially to sectors which use physical materials during the Corona pandemic, such as electronics, supermarkets, and construction. "As a result, there is a rise in demand from the market in the building sector." This puts additional strain on supply chains" (supplychainmagazine, 2021). All this ensures that the renovations that are so badly needed are not possible in the short term and the many tenants whose homes have not yet been renovated are still faced with high costs. Social housing associations must therefore come up with alternatives that can help. What can housing associations do for their tenants:

- Identify households that potentially live in energy poverty. Indications are a poor energy label or high energy consumption, and priority is given to making the homes of these households more sustainable (Artiensis, 2021). Housing associations can also look at which investments yield the highest savings on the energy bill (Dankert, 2021).
- Deploy energy coaches to help residents with energy-efficient living (Artiensis, 2021).
- Prevent energy poverty. Help home seekers make an appropriate choice by providing information about total housing costs, including energy bills (Artiensis, 2021). This can come in handy when a higher-than-average payment risk is identified (Dankert, 2021).

In addition to these measures, many more measures can be mentioned, such as: Information about government regulations, collective action / reporting point, rent discount for low labels, allowing home sharing, more targeted relocation options, setting up collective spaces for meeting, rental price specific to target group, signaling and informing in advance, solidarity pot: tenants contribute for other tenants, walk-in consultation hours, refer to additional facilities for municipalities, match rent arrears with homes EFG labels or cooperation in neighbourhood teams (Ymere, personal communication, 2022).

2.3.4 PV- PANELS

In their study of low-income public housing in Seoul, Lee and Shepley (2020) found that the installation of solar PV systems on apartment verandas helped reduce the energy burden of low-income households. The study found that most participants reported lower or significantly lower monthly electricity bills after the installation of their solar PV systems. Additionally, the study highlighted the importance of increasing user engagement with renewable energy systems for the successful implementation of government renewable energy policies.

The study focused on a socioeconomically and geographically new context, which is often overlooked in existing studies that are typically centred on Europe and Africa and rural community energy projects. By installing solar PVs on urban apartment verandas, the study serves as an example of a government-led social energy system approach to addressing energy poverty. Participants rated their satisfaction with the solar PV systems installed on their verandas, with most expressing overall satisfaction, though some participants expressed concerns with glare or shading from neighbouring panels and a desire for higher-capacity PV generators and longer battery life for the inverter.

Table 3 presents a year-long record of electricity generated by the solar PV system (in kWh) and the corresponding percentage reduction in electricity costs. The impact of the solar PV system on the electricity bill depends on the household's energy consumption, but it is clear that the system helps to offset the monthly electricity load and reduce energy costs for low-income households. As demand increases due to higher-than-average summer or lower-than-average winter temperatures, the cost reductions are expected to be even greater.

Example user bills for one year (Apr 2018–Mar 2019).

	Solar PV generation	KEPCO meter		Total energy consumption = KEPCO - Solar PV		Cost savings
	kWh	kWh	Cost (KRW)	kWh	Cost (KRW)	%
Apr	24.3	217.0	26,650	192.7	16,950	57.2
May	24.5	183.0	15,890	158.5	13,340	19.1
Jun	22.2	167.0	14,200	144.8	11,860	19.7
Jul	13.9	198.0	17,480	184.1	16,000	9.3
Aug	15.7	274.0	38,840	258.3	35,420	9.7
Sep	20.8	194.0	17,060	173.2	14,830	15.0
Oct	19.2	170.0	14,510	150.8	12,490	16.2
Nov	19.9	197.0	17,370	177.1	15,250	13.9
Dec	21.2	199.0	17,590	177.8	15,360	14.5
Jan	20.9	200.0	17,690	179.1	15,470	14.4
Feb	19.9	208.0	24,730	188.1	16,420	50.6
Mar	21.8	213.0	25,800	191.2	16,740	56.6
Mean	20.4	201.7	-	181.3	-	24.7

1 USD = 1100 KRW

Table 3: Savings per month of the year (Lee and Shepley, 2020)

Overall, the study by Lee and Shepley (2020) demonstrates that slowly making homes more energy neutral through the installation of solar PV systems can be an effective solution to lessen energy poverty. This is particularly important in highly crowded metropolitan areas such as Seoul. The study also highlights the importance of engaging users in the implementation of government renewable energy policies. By doing so, the successful implementation of such policies is more likely to occur, resulting in a greater reduction of energy poverty.

2.3.5 WHAT IS ALREADY BEING DONE TO COMBAT ENERGY POVERTY BY OTHER PARTIES AND CAN ALSO BE DONE BY HOUSING ASSOCIATIONS?

To address energy poverty promptly, the municipality of Nijmegen combined its data with that of housing associations. By aligning this information, the municipality can prioritize assistance where it is most urgently needed. The municipality, in collaboration with housing associations, overlaid its own data onto the energy poverty data provided by TNO. This enabled them to quickly identify properties with lower energy labels and those experiencing significant payment difficulties. This approach swiftly pinpointed areas with the highest urgency. Once this information became known, the municipality took action in neighbourhoods through the deployment of energy fixers, energy coaches, an information van, and billboards. These initiatives aimed to educate residents on energy-saving practices. By July 2022, over 21,000 individuals had already participated in the municipality's initiatives. It is worth noting that the municipality of Nijmegen acknowledges the existence of significant skepticism among some individuals towards their efforts (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2023).

In Leeuwarden, the municipality also employed energy coaches who utilized their own data to visit households door-to-door. During the energy coach's visit, distressing situations are occasionally encountered, such as stacks of unopened letters, empty beer bottles scattered on the floor, and

ashtrays filled with cigarette butts. They initiated this program as early as 2016, and by 2021, they had established contact with a staggering 4,500 households.
Moreover, the municipality appointed a "boiler doctor" who ensured the hydronic balancing of central heating systems, leading to potential gas consumption reductions of up to 10% (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2022d). Given that there are “boiler doctors” needed to make the boilers of households more energy efficient implies that people don’t know how to do it themselves. The lack of technological knowledge, specifically the absence of the technical expertise commonly expected from well-educated individuals, is also called technology illiteracy (Sam, 2013).

In the municipality of Arnhem, the focus is placed on establishing trust in their approach. By deploying energy coaches who reside in the same neighbourhoods, individuals encounter familiar faces who can assist them in combating energy poverty (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2022c).
Similarly, in The Hague, a community-driven approach is embraced. Young individuals aged 16 to 22 serve as energy ambassadors, acquiring knowledge about the energy transition through interactive sessions. They apply this newfound knowledge first within their own parents' households, gradually extending their outreach to neighbors and the wider community (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2022b).

In Ede, the municipality takes a proactive approach by bringing together various stakeholders to gather their insights on energy poverty. This collaborative effort involves working closely with neighbourhood teams, welfare organisations, as well as village councils and religious groups (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2022a).
At the municipality of Helmond. The housing associations also take into account the experience of tenants. They emphasize that the experiential perspective of residents who experience energy poverty is crucial for policy making (Ministry of the Interior and Kingdom Relations, 2021a).
Meanwhile, in Apeldoorn, the municipality collaborates with debt counselling services and energy associations. They emphasize the importance of incorporating perspectives from different disciplines, as it allows for a comprehensive understanding of the problem and enables different aspects to be illuminated. The Apeldoorn initiative also acknowledges the presence of shame and the difficulty of reaching out to individuals in need. Specifically, they recognize that residents who have not yet sought assistance may feel hesitant or embarrassed to ask for help (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2021b).

What we observe here is that the Municipality collaborates with various stakeholders, including housing associations, social agencies, and resident councils existing of tenants in the neighbourhood. This means the tenants must be included well in the decision-making of the housing association to ensure good cooperation. Effective communication plays a vital role in ensuring smooth cooperation among these entities. Additionally, municipalities such as Nijmegen and Apeldoorn recognize barriers such as shame and mistrust that may hinder progress in addressing energy poverty. Housing associations also have the ability to implement the aforementioned measures, such as collaborating with municipalities and training neighbourhood ambassadors for the energy transition.

2.4.1 THE ROLE OF TENANTS REGARDING ENERGY POVERTY

Due to the high energy bills, tenants increasingly want to make their homes more sustainable and renovating, which means that they may have less high energy bills after the renovation. But tenants in housing association homes also are not required to agree to the renovations. According to the Civil Code (7:220 paragraph 2 of the Dutch Civil Code), the tenant must receive a reasonable proposal for a "renovation." If the tenant does not agree with the proposal, the landlord may petition the court to determine its reasonableness. If, at the landlord's request, the court rules that the proposal is reasonable, the tenant is required to cooperate with the renovation work. The court will consider the

duration and impact of the work, the amount of any rent increase, and the tenant's personal circumstances when determining the reasonableness of a proposal (Aedes, n.d.).

If tenants do want their homes to be renovated, they can of course also participate in this. Tenants and tenant organisations have various options to participate:

- Tenants can always notify the municipal government or association that they would like to contribute ideas for the energy transition. They should inform the policy officer in charge of the energy transition in his\her municipality, as well as the employee working at the housing association whose responsibilities include making the social housing stock more sustainable.
- Tenant organisations can also reach agreements with municipal governments and associations regarding participation in performance agreements.
- Tenant organisations have the right to be consulted in the event of a change in the landlord's policy under the Tenants Landlord Consultation Act (WOHV)/the 'Consultation Act'. Tenant organisations may use this consulting right to provide advice on sustainability policies and plans (Nederlandse Woonbond, 2022a).

Tenant organisations have the right to professional assistance in these types of operations as well (Nederlandse Woonbond, 2022a).
In the case of a complex renovation, the housing association may choose to conduct a tenant support survey. This saves the landlord from having to take the initiative to file a lawsuit. According to the law, if at least 70% of the tenants in a 'structural unit' of at least ten houses voluntarily agree to the renovation proposal, it is deemed reasonable. If, even with this majority, a tenant thinks that the proposal is not acceptable in his case, he has eight weeks to ask the court for a view on the proposal's reasonableness. If the tenant fails to appear in court or fails to appear on time, it is assumed that he has still agreed to the proposal. The tenant is then obligated to collaborate (Aedes, n.d.).
The rents can be raised because money is invested in the houses, and they are thus improved. This, however, will no longer be possible as of January 1, 2023. New agreements, known as National Performance Agreements, will go into effect on January 1, 2023. This means that tenants are no longer required to compensate the landlord for his investment in insulation. Rental homes will be insulated beginning January 1st, with no rent increase (Nederlandse Woonbond, 2022b). This may therefore mean that more tenants will agree more quickly to the renovation of their housing association homes, because rents will not rise, but the energy bill will decrease. This means the incentives for tenants are twofold. On one hand they don’t get a rent increase, meaning they don’t have to pay more money per month, and on the other hand their houses will be renovated, so the monthly energy bill will be lower. So at the end, the tenant will pay less rent. At the same time, this complicates the sustainability task of the housing associations. Because the associations are not allowed to pass on sustainability renovations into the rents, they will have to invest everything here themselves, without seeing anything in return.
The options mentioned above for tenants to do something about energy poverty work by far the best to keep bills low, because the better insulated your home is, the lower your energy bill with normal use. However, it is the case that the renovation of tenants' homes can be delayed for a long time, due to the high construction costs and insufficient capacity. As a result, tenants will also have to come up with measures to keep their energy bills low.

It is possible for tenants to collaborate as well. In an Amsterdam building complex, 40 out of 72 households have decided to invest in solar panels. Although it took a considerable amount of time to accomplish, one household said they were now paying two-thirds less in electricity costs (Nederlandse Woonbond, 2023).

2.4.2 BEHAVOURIAL CHANGES

Here it will be more about energy consumption itself or small measures like wind strips, as tenants can change this themselves. An example, the national government in the Netherlands (rijksoverheid) (n.d.) has started a campaign “Zet ook de knop om” (turn the switch) for Dutch people who want to save more energy. Hereby they give 3 measures that can be taken immediately.

The measures are:

- Set the thermostat to 19 degrees Celsius and only heat the rooms where people are.
    - According to the national government (rijksoverheid) (n.d.), this can save 1250 euros per year.
- Set the thermostat to 15 degrees Celsius in the evening and when no one is home.
    - According to the national government (n.d.), this can save 800 euros per year.
- Shower for a maximum of 5 minutes and shower less hot
    - According to the national government (n.d.), this can save 140 euros per year.

Desvallées (2022) conducted a study in southern Europe on how to measure energy poverty. The findings from the surveys conducted on low-income households in Porto and Barcelona reinforce the existing scientific knowledge that energy deprivation situations are multifaceted. Moreover, these surveys offer valuable empirical observations within an under-examined southern European context. However, the primary contribution of this research is to explore the disparities between these conditions and RP policies. The study draws three main conclusions, in line with previous research aiming to measure energy poverty using different methods of assessment across various EU contexts (EPOV, 2020).
One of her findings was that a self-reported consensual approach has revealed that the low energy consumption levels reported are due to the households' austere domestic practices. The households constantly control domestic temperatures, with a focus on areas where heat is deemed more important, such as children's rooms.
Mulder et al. (2023) also looked at the gas usage of households in the Netherlands. In response to the high gas prices in 2022, households have become more efficient in their gas usage on average compared to previous periods. Mulder et al.'s (2023) report cite the PBL's analysis of Gasunie's data on gas supply to small-scale consumers, which indicates that households have used 15% less gas on average than in previous years after adjusting for temperature differences.

Homeowners who possess a greater comprehension of renewable energy sources tend to exhibit more favourable attitudes towards them compared to those who have less understanding. Among the various factors influencing positive attitudes towards renewable energy sources, environmental concern stands out as the most powerful predictor. Homeowners who exhibit more significant levels of concern towards climate change are more likely to hold a positive stance on renewable energies. Additionally, homeowners who possess more positive attitudes towards renewable energy sources demonstrate a greater willingness to pay for them and invest higher amounts in them, compared to those with less favorable attitudes. Similarly, homeowners with better knowledge of renewable energy sources and heightened environmental concerns are more inclined to invest in them. (Zwaan, 2020).

2.4.3 PREBOUND EFFECT

The "prebound effect" is a phenomenon where the actual heating energy consumption in older homes is consistently lower than what is calculated by their energy ratings. This effect helps to explain why energy savings resulting from thermal upgrades are often lower than initially anticipated. The "prebound effect," a term coined by Sunikka-Blank and Galvin (2012), can serve as an indicator of households that are struggling with high energy costs, also known as fuel poverty. By combining this with existing formulations of the "rebound effect," we can better understand how energy efficiency interventions impact households and identify potential areas for improvement. On average, because of the prebound effect, occupants consume 30% less heating energy than was needed (Sunikka-Blank and Galvin, 2012).

2.4.4 ASHAMED FOR SEEKING SUPPORT

Over the past few decades, the Dutch government has increasingly conveyed a message to its citizens, particularly those who depend on government services, that they are not to be trusted (van Geuns, 2022). As a result, people have been subjected to increased accountability obligations, which has led

them to believe that the government does not trust them. This has resulted in a loss of faith in the government, causing people to withdraw and become cynical. This withdrawal has led to a decrease in the use of support services, and as a result, people's livelihoods have suffered. In addition, relying on self-reliance in government services has led those who need support to feel ashamed and not good enough, exacerbating feelings of shame already associated with poverty and debt. This sense of shame has contributed to further withdrawal and reluctance to seek support, and a lack of recognition for their vulnerability and problems has led to a deterioration of trust. Therefore, it is critical to address both trust and livelihood in tandem, particularly for the most vulnerable (van Geuns, 2022).
This pertains mainly to the government's trust in those who are most dependent on its services. In contrast, those in the upper echelons of society do not experience this trend as much due to their limited reliance on government services and their ability to circumvent legal obligations.
The institutionalized mistrust from the government affects the most vulnerable citizens who experience decreasing livelihood. This underscores the importance of addressing the issues of trust and livelihood together (van Geuns, 2022).

2.5.1 THE GAP BETWEEN HOUSING ASSOCIATIONS AND TENANTS

A gap occurs when something that is missing from a situation (Cambridge Dictionary, 2023). It goes without saying that the capabilities of the housing associations and the wishes of the tenants are not aligned. In this case, the gap being identified is something the tenants desire and what the housing association cannot provide.

2.5.2 THE EXPECTATION GAP

The concept of the "expectations gap" has been a frequent topic in the literature, referring to the discrepancies between what the public (tenants) expects and what the auditing profession desires to achieve (Chandler & Edwards, 1996). This gap is problematic because it undermines their credibility, earning potential, and prestige. It is also a concern for the public, investors, and politicians, as accountability processes are essential to the creation of wealth and political stability in a capitalist economy. The external audit of financial statements is a crucial aspect of these processes, and a significant expectations gap can erode confidence in them. Given its potential to harm effective corporate governance (The Committee on the Financial Aspects of Corporate Governance, 1992) and the legitimacy of auditing institutions (Auditing Practices Board, 1992, 1994a), the expectations gap has received substantial institutional attention (Sikka et al., 1998).

2.5.3 GAP ANALYSIS METHOD

To give recommendations on how to close the gaps, the gap analysis method will be used, as discussed in the method. These recommendations can be seen as potential steps forward to mitigate the likelihood of energy poverty. The recommendations are based on literature and on findings during the focus groups.
The process of gap analysis is utilized by organisations to identify the necessary steps required to achieve their business objectives. This involves comparing the present condition of the organisation with an ideal state, which helps to pinpoint areas that require improvement and opportunities for enhancement. It can be done in 4 steps: To perform a gap analysis, the first step is to examine the current state of the organisation. Next, the ideal future state needs to be identified. After identifying the gap between the two states, potential solutions need to be evaluated. Finally, a plan is created and implemented to close the gap between the current state and the desired future state (Lucidchart, 2019).

The first step, to examine the current state, has been done in the chapters 3 and 4 with the focus groups. Step 2 will be done in chapter 6. Here the gaps will be identified. In chapter 7, a plan needs to be created, to see how the gaps can be closed. With this report, step 4 won’t be done, because this research is about giving recommendations on how to close the gaps.

2.6.1 POSSIBLE MEASURES ON HOW TO CLOSE THE GAPS

Some gaps/ difficulties have already emerged from the previous literature review. The most important ones will be mentioned in this part of the text and explained on the basis of literature. Recommendations will also be mentioned on the basis of literature that can ultimately also be included in chapter 7 with the recommendations for the gaps. The gaps that will be covered in this part of the text are; trust, shame, tenant engagement, communication and technology illiteracy.

2.6.2 TRUST

What can be read in sections 2.3.5 and 2.4.4 is that people in the lower income classes often do not trust the larger authorities, such as governments. This is also confirmed in Grossmann et al.'s (2021) study. Grossmann et al.'s (2021) study showed that households experiencing energy poverty rarely had general trust in unfamiliar individuals based on shared moral values (Silva et al., 2017). In their interview, they reviewed 5 households in 10 different countries in Europe about trust. The interviewees tended to be distrustful of society and its institutions, such as the political system, welfare state organisations, and private companies, with some variations. The negative experiences that interviewees had with institutions discouraged the formation of trust, revealing that (energy) poverty increases the vulnerability of “trusters” when interacting with powerful institutions (Grossmann et al., 2021). The study found that energy-poor individuals associate their problems with the profit-making strategies of providers, the stubbornness and stinginess of street-level bureaucrats, corrupt politicians, or inefficient administrations.

A recommended course of action given by Grossmann et al. (2021) is to prioritise transparent and dependable communication, adopt a customer-oriented approach that acknowledges the emotional and physical needs of people, and consider using mediators such as ombudsmen (Hesselman & Herrero, 2020).

2.6.3 SHAME

Shame is also mentioned in sections 2.3.5 and 2.4.4. Both paragraphs talk about the shame of asking and seeking help because of the debts.

Past studies on shame have revealed its taboo nature (Scheff, 2003), its ubiquitous yet unspoken presence (Lynd, 1958; Retzinger, 1995), its significance as a social emotion alongside pride (Scheff, 2000), and its implicit recognition in concepts such as Adler's inferiority complex and Goffman's (1967) 'saving face'. The shame of poverty and its harmful effects on self-esteem and self-worth have also been extensively documented (Lister, 2004), and the participants in this study have attested to it. Shame, whether experienced or anticipated, represents a threat to a person's social bond with their environment. This research suggests that in the context of poverty, especially in a society where consumerism is increasingly associated with success, the potential for shame is limitless (Chase & Walker, 2013).

Dayal et al. (2015) found that psychoeducational groups, which utilize shared personal stories and education on issues, can effectively assist individuals with their issues. This approach fosters a sense of common humanity, which helps individuals feel a sense of safety and belonging and can be a key factor in overcoming shame.

2.6.4 TENANT ENGAGEMENT

Tenants play a crucial role in participation, as they are capable of identifying neighbourhood problems and contributing to feasible solutions. Evaluating the perspective of tenants regarding the neighbourhood is essential for the success of participation (Debusschere et al., 2010). This can also be seen at the municipality of Helmond. This is because it is also emphasized that the experiential perspective of residents who experience energy poverty is crucial for policy making (Ministry of the Interior and Kingdom Relations, 2021a). This was also mentioned in paragraph 2.3.5.

If tenants do not have a meaningful connection with the neighbourhood and its functional benefits are not evident, it could be challenging to involve them in neighbourhood activities or resident groups. As

tenants have diverse interests and concerns, it is possible that only a segment of them will actively participate. However, this does not indicate that efforts should not be made to engage as many tenants as possible, with a particular focus on hard-to-reach groups (Debusschere et al., 2010).
Tenant engagement programs can result in energy savings and modifications in consumption behaviour. In addition to energy conservation, other benefits, such as increased tenant satisfaction, reduced vacancies, and improved services, have been identified. Research by Roy et al. (2016) suggests that tenant engagement, when combined with retrofits, leads to higher energy conservation.
Engagement strategies have been categorized as low, medium, and high levels of engagement, with increased levels of engagement not resulting in a linear increase in energy conservation. Benefits tend to plateau after a certain level of engagement. Literature and case studies suggest that low-level engagement strategies, such as posters and prompts, can lead to energy conservation at minimal costs. Forgetfulness and laziness are often cited as barriers to energy conservation by tenants (Stokes et al., 2012).
To foster regular interaction with tenants, a communication strategy can be developed. This strategy can involve training staff and personnel to effectively engage with tenants. Collaboration with local community organisations and centres can also be pursued to make use of community spaces for workshops. The communication strategy can also include regular updates to tenants regarding program goals and progress, as well as celebrating achievements. Additionally, a community of practice can be established to encourage ongoing engagement and knowledge-sharing among tenants and program staff (Roy et at., 2016).

2.6.5 COMMUNICATION

Also in 2.3.5, there was stated that good communication is crucial for working together with other parties. Effective communication is a crucial aspect of creating and sustaining a positive relationship between housing associations and their tenants. However, current communication methods are not always efficient, and there is room for improvement in information sharing. For instance, informing tenants about available local services should go beyond simply mentioning their existence; tenants need regular updates that clearly explain what services are available, how they work, and their potential benefits. Building and maintaining a good relationship between tenants and the housing association is essential for the success of the recommendations put forward in this report. Tenants' previous experiences with housing providers significantly influence their opinions, positively or negatively, regarding the housing association's role as a housing provider and a broader range of services (Hill, 2020).
To further ensure effective communication with tenants, housing associations should explore a variety of communication methods that cater to the diverse needs and preferences of their tenants. This could include digital channels such as email, postal services, and customized apps, as well as crucially providing face-to-face personalized support. Expanding the role of local housing officers can help to establish a local contact and build relationships with tenants, encouraging them to seek assistance from the housing association when needed (Hill, 2020).

2.6.6 TECHNOLOGY ILLITERACY

Where it is mentioned in paragraph 2.3.5 that 'central heating doctors' in Leeuwarden help households to have their central heating boilers fired as efficiently, this indicates that people themselves do not know how these boilers can be set to a lower setting. So, this may indicate that people in the household do not know how to handle this technology properly.
Not being able to deal with technology in combination with energy poverty can sometimes result in difficulties when it comes to tasks like claiming benefits, paying bills, searching for jobs, accessing banking services, getting better deals for home energy and other expenses, as well as tracking rent payments (Hill, 2020)
According to a report by Roman (2004) on technological illiteracy, there is a strong correlation between age and literacy levels among Americans, with older adults having the highest rates of illiteracy compared to other age groups. Data collected from the National Adult Literacy Survey (NALS) revealed

that 44% of adults over the age of 65 are functionally illiterate (Baker et al., 2002). This trend is likely due to the cohort effect, as older adults grew up in a time when literacy was not highly valued, and as a result, they lack the necessary functional skills required today. On average, adults over 65 years old scored a full level lower than adults aged 40-54 years old in literacy tests (Kirsch et al., 2001).

Individualized face-to-face support and guidance is deemed the most effective way to assist tenants in developing digital skills, according to Hill's (2020) study. Here was suggested that all frontline staff should provide support while others proposed a separate role. Housing associations could support tenants in accessing digital skills training through signposting, welcome packs, or regular communication. They could also provide drop-in sessions and offer advice on other topics of interest to tenants.

CHAPTER 3
RESEARCH METHOD

This portion of the text will first describe how the various research questions will be addressed and what type of research reasoning will be used. Following that, it will be determined how the answers will be acquired via questionnaires, interviews, or surveys. Finally, the research method, specifically the questions that will be addressed, will be explained in greater depth. The research will be qualitative research, where qualitative data will be examined and gathered to answer the main research question. When the method has been discussed, it will be further discussed how the data of the research will be collected and a data plan will be drawn up that clearly states what exactly will be done during the research. Finally, the ethical considerations will be discussed, and more will become clear about this.

3.2.1 METHOD

The first and second sub-questions will be answered using a case study. With the first sub-question, the tenants' organisation was asked about the situation among tenants, what measures the housing association has taken in the 2022-2023 winter, what additional measures they would like to see from the housing associations and what kind of measures they consider most obvious to implement as a housing association. The second sub-question looked at the situation at the housing associations, what measures the housing associations took in the winter of 2022-2023, what measures they still want to take and what kind of measures they consider most obvious to take.Focus groups will serve as the primary data collection method for the case studies.
1 housing association and associated tenant organisation will come from the Randstad and the other from the northeast of the Netherlands.
First, the 2 housing associations are selected. According to TNO (2021), the top 20 most energy-poor municipalities are nearly all in the Netherlands' northeast, with Pekela being the most energy-poor municipality in the country. This is not the case for income poverty, as the top ten cities are dominated by the Randstad and a number of bigger cities from the east of the nation. Unlike income poverty, energy poverty is not predominantly a metropolitan issue. This is also the reason why there will be housing associations interviewed in the Randstad and in the northeast of the Netherlands. These two associations will also be compared to each other. The selection of the two housing associations and their tenant organisation will be discussed in more detail in section 1.3.3.

Region	Social housing provider	Rented units
metropolitan region of Amsterdam	Ymere	83.984
Groningen, Midden-Groningen, Stadskanaal, Borger-Odoorn en Emmen.	Lefier	33.744

Table 3: Selection of housing associations (own work)

Of course, different people are invited to the focus groups. For the housing associations, it is the intention that the people who are responsible for the strategies regarding energy poverty are present. For the tenant organisations, it is important that the people who are representing the tenant organisation are present because they come in contact with the housing association and the tenants. So, they will know what the tenants want and where the housing associations fall short.
The topics of the focus groups will be based on focus groups that were held for the Grenoble Conference “Housing co-creation for tomorrow’s cities” (Diaconu, 2023). The research that has already been done looks, among other things, at what is being done by Europe in various countries to combat energy poverty. Various measures are also mentioned here. The focus groups with the housing association and the tenant organisation will have the same setup, only different questions will be asked regarding energy poverty. The setup of the focus groups will be as followed:

Step 1: First exploration of energy poverty; here the group is asked what is already known about energy poverty among tenants.
Step 2: Measures against energy poverty; here the housing association will be asked what measures are being taken, both in the short and the long term. The tenant organisation will also be asked what measures are being taken, but also whether they notice anything of this. Finally, both groups are asked what barriers they encounter with these measures.
Step 3: Additional measures: Here the groups will be asked which measures are still missing according to them and which they would therefore like to see.
Step 4: Reconnaissance Measures: At this step, seven measures have been drawn up to choose from. Here the groups will have to choose from 2 good measures and 1 bad measure. These measures will then be discussed, and the good and bad points of the measures will be highlighted.
The drawn-up measures are seen in table 2 below:

POSSIBLE MEASURES	EXPLANATION
ASSIGNMENT & RENT	
More targeted moving options	Place tenants with a higher income in homes with less good energy labels and tenants with a lower income in a home with a better energy label. Tenants with a higher income can spend more on their energy bills, so will be less affected than people with a lower income if they are placed in homes with a less good energy label.
Rent specific to target group	Here, tenants with different incomes are divided into different target groups, with tenants with the lowest income receiving a lower rent and tenants with higher incomes paying a higher rent for their housing.
Rent discount for houses with bad energy label (EFG)	Tenants who live in homes with lower energy labels are given a rent discount, compensating them for the higher energy prices they must pay.
HOME IMPROVEMENT	
Indoor sustainability improvement	A housing corporation will renovate a home if it deems it necessary, allowing for a quick renovation of one home after another.
Address houses of tenants with rent allowance first	Here, the homes of people with the lowest incomes in the social system will be tackled first.
Fix teams	By deploying fix teams, tenants will be assisted with small energy-saving measures, such as placing foil behind radiators or installing draft strips.
Energy cooperatives in combination with solar panels	By collaborating with energy cooperatives in conjunction with solar panels, the solar panels will be supplied and installed by an external company. Residents can use the energy generated by the solar panels at a lower price than what is paid to energy companies. Any excess energy generated will be directed back to the energy cooperative.
BEHAVIOUR TENANTS	
Energy coaches	By deploying energy coaches, people will learn how to manage their energy consumption. This will enable them to adjust their usage in a smart manner, once they have learned how to do so, and ultimately reduce their energy bills on their own.
Insight in energy use (smart meters)	Through the use of smart meters, people will gain insight into their consumption and be able to adjust their usage accordingly.

Table 4: Possible measures focus groups (own work)

The focus groups conducted, will create a more detailed picture of what social housing associations do exactly and what they want to do to combat energy poverty among their tenants and what tenant organisations and tenants affiliated with this organisation arrange or want to arrange for the tenants. This process will be conducted using an inductive logic of inquiry.

To answer the third sub-question, the information collected during the answering of the first and second sub-questions will be looked at. With these sub-questions, it has become clear what tenants want to do about energy poverty and what social housing associations want and can do to combat energy poverty. There may be a potential gap between what is wanted and what is actually possible. This will be done by using the gap analysis method, this method is explained in chapter 2.
The wishes of the tenants and the capacities of the social housing associations are contrasted for both social housing associations to be studied, in order to find any differences between the west and the northeast. This process will be conducted using an inductive logic of inquiry.

To answer the fourth sub-question, there will looked at the gap identified in the third sub-question. By looking at this, it will become clear what the tenants would like to see and what cannot yet be achieved for the tenants. Because the tenants ultimately live in the houses and they need to be helped as much as possible, this sub-question will mainly be a recommendation to social housing associations and what they can do to help their tenants as much as possible during times of energy poverty. Although this is tenant-centred research, to see where housing associations can aid tenants better, it should be noted that housing associations cannot do everything tenants want them to do. This process will be conducted using an inductive logic of inquiry.

3.2.2 SELECTING HOUSING ASSOCIATIONS

As mentioned earlier, 2 housing and associated tenant organisations will be approached to participate in this study. It is the intention that both will participate in the focus group, both housing and the tenant organisations. In total there will be 4 focus groups.
The first housing association that will be approached is Ymere. Housing association Ymere manages a total of 83,984 units. This number is divided over, among other things, social rental homes, private sector homes, care units, business premises, shops, and garages (woningcorporaties.nl, n.d.). Ymere is a large housing association that is divided into Amsterdam, Weesp and Almere, among others. These 83,984 units will therefore fall under different districts, each with its own problems. The reason for choosing Ymere is that this housing association has many homes in its portfolio and is also a very large housing association with many resources. This will make it easier to release money, for example, but it will also create more difficulties, because Ymere's strategy will therefore have to be applied to many more complexes. For example, the strategy will also have to be devised much further in time in order to try to resolve as many issues as possible.
The second housing association that will be approached is Lefier. Housing association Lefier manages a total of 33,744 units. This number is divided over, among other things, social rental homes, private sector homes, care units, business premises, shops, and garages (woningcorporaties.nl, n.d.). Lefier has homes in many parts of Groningen and is also the largest in Groningen/Drenthe. The reason Lefier was chosen is because it is the largest in Groningen, so they will have the same kind of problems as Ymere, but in their own sub-area.

3.2.3 DATA COLLECTION

As mentioned earlier, the majority of this research will be done through case studies, in this way all data necessary will be collected. These focus groups will be done in small groups where people who are representative of the problem statement will be present to talk about how they experience it and what possible solutions they see. As mentioned before, the focus groups are the primary data source for the case studies.

It's also likely that the research may run into some issues or will be constrained in some way. An example of this is;

- The participants do not want to share the sensitive information that is requested.
    - Gaining the participants' confidence is necessary to minimise this danger. Therefore, prior to the focus group beginning, it should be made clear that certain questions will be asked and that the focus group will indeed be anonymous. It should be made clear how the responses will be used and exactly what will be conducted with them. It is crucial to be as open as honest as you can with the participants.
- Less participants than anticipated take part in the study, which might result in a lack of data being gathered that prevents the study from finding meaningful connections between the findings and, as a result, drawing sound conclusions.
    - This problem can be solved by ensuring that enough people are called up via a contact person at the organisations, so that there is actually too many people to choose from.
- Sample size does not represent the population.
    - This can be solved by inviting the right people for the focus group

3.2.4 DATA MANAGEMENT PLAN

For the Data Management Plan, see appendix 1.

REFLECTION DATA MANAGEMENT PLAN

In this part of the text, the data management plan will be reviewed and reflected upon. It will be about how the right data is collected, how it is stored, processed and how it is preserved and shared in the long run.

REFLECTION DMP | DATA COLLECTION AND STORAGE

Only primary data will be used for this research. This facilitates the research because the research team is not dependent on anyone but themselves. This method of data collection ensures that only the desired data can be collected by asking the right questions.
To ensure that this data is used properly and only by the right people, the focus group will be held in person or online via Microsoft Teams. The recordings will be stored online on the SURFdrive that only the researcher can access. Even though the focus groups are in person or online, the people participating will not be named and will remain unidentifiable. It is desirable that not just anyone can access the focus group data until it is complete, all data is processed, and it is completely impossible to find out who said what.
Before the focus group starts, it will be explained that it is anonymous and people will have to sign a form that they give consent that their opinion is used for this research and that they agree that this anonymous, yet sensitive information will be used for the research.
This way of proceeding will be chosen so that the people participating in the study can be immediately reassured that the confidential information will be properly handled and not used for other purposes.

REFLECTION DMP | DATA SHARING AND LONG-TERM PRESERVATION

In principle, all data can be shared, as it is impossible to find out who has participated in the focus group. The personal data can also be shared because these cannot be traced either. Because no names will be used in the recap of the focus groups, it will be impossible to find out who was present and who said what. The recaps of the focus groups will be completely anonymized.

According to the TU DELFT Research Data Framework Policy, data must be stored for at least 10 years. Therefore, it is again important that the focus group is done anonymously, and that this data is still handled properly. Furthermore, the data will be stored on a SURF Drive. This was chosen because the SURF Drive is user-friendly, and the data can easily be shared with other users at TU Delft.

3.2.5 ETHICAL CONSIDERATIONS

The researcher has a lot of responsibilities when conducting the research. As an illustration, all components of the research must be honest. As a result, it is necessary for a researcher to convey the research's objectives, results, and intents, as well as its methodologies and processes, and to recognise the work of earlier researchers. Furthermore, rigorous investigation is required, as is the use of the proper techniques, careful communication of the findings, and adherence to protocol. Finally, it's crucial to maintain open communication with all parties and look out for the wellbeing of the participants. Conflicts of interest should be cleared up, study findings should be made public (including outliers), and volunteers should be treated fairly.
The duties to the scientific community, research funders, participants, and the community are primarily that consent must be acquired from all parties engaged in the study for it to be conducted in a particular way, that the interests of all parties will be respected, that all sensitive information will be preserved, that all individuals will be considered equal, that the significance of the study will be proved, that all data will be adequately secured, and that legally permissible research practises will be followed. The study will be recognized more swiftly and have fewer detractors if all of this is done.

There are several things that may be done to safeguard the participants. For instance, consent must always be obtained before doing anything to a person. Additionally, it should be made sure that the study design does not involve any misleading tactics and that anonymity is assured. Finally, you must allow participants to withdraw from the research at any point if they do not longer choose to participate.

In the literature review, sincerity is crucial. Being truthful with the literature also makes it evident where the source of the used literature originates. In order to identify precisely what will be examined and to clarify your thoughts, the literature study is equally crucial. This will also become apparent throughout the data collection and analysis. Sincerity is also crucial in this situation in order to make everyone aware of what to anticipate from the study.
A good and reliable study must always be unbiased, trustworthy, and legitimate. The research's findings must also be broadly applicable so that they may be used by as many individuals as feasible. In this study, it is also true.

The occurrence of emotions during a study could potentially alter the way people perceive the findings, regardless of whether or not the emotions have a direct impact on the results. Therefore, it is advisable to take into account any emotional elements that may affect the interpretation and presentation of the study's conclusions. This may help to ensure that the results are viewed objectively and without bias.

3.2.1 RESEARCH OUTPUT

In this part of the text, the purpose of the research will be stated and in what form it will be presented. Finally, this section will discuss the audience at which this research is aimed and what further can be done with it.

3.2.2 GOALS AND OBJECTIVES

The purpose of this research is to draw up a report that makes it clear how large the gap between the tenants of social housing association homes and the social housing association is exactly and how this gap can possibly be reduced or even eliminated by means of recommendations. The report will provide insight into the current state of energy poverty in the Netherlands and what the causes may be, what the preferred measures are by the tenants and the possible measures by the social housing associations.

3.2.3 DELIVERABLES

During the investigation, various reports will show the progress of the investigation. Of course, it started with the P1, which mainly stated the problem definition of the research, presented the first research proposal and where a start was made on the literature search that is required for conducting the research. In the P2, these 3 issues are further elaborated, so that the necessary research can actually be started to answer the main question. In the P3, the next report, the literature search will have been finalized and the research itself, namely, the case studies, will have already started. The fourth report, P4, contains the full literature search plus the full research done through the case studies. This will include all research questions. In addition, conclusions will also be drawn from the research conducted in order to answer the main question. The last report, P5, will contain all the information reported in the previous 4 reports.

3.2.4 DISSEMINATION OF AUDIENCES

The intended target group of this research and report are mainly people who work for social housing associations, and people who are curious about what social housing associations can do about energy poverty. The research can be of value to people working for social housing associations who also experience problems with energy poverty among their tenants. Because this research is supplied with recommendations that can be made to help tenants, this can help with decision-making and devising measures against energy poverty.

3.3.1 RESEARCH PLAN

For the Research Plan, see appendix 2.

3.3.2 READING GUIDE

Chapter 4 will answer the first sub-question: "What role can social housing associations play in combating energy poverty?" Then, in Chapter 5, the second sub-question will be addressed: "What role can tenants play in combating energy poverty?" Once these two sub-questions are answered, Chapter 6 will examine the potential gaps between the policies of housing associations and the desires of their tenants. Chapter 7 will answer the final sub-question and present the recommendations made to reduce these potential gaps. The conclusion and discussion will be provided in Chapter 8. Finally, Chapter 9 will conclude the report with a reflective section.

CHAPTER 4, SUB-QUESTION 1
WHAT ROLE CAN SOCIAL HOUSING ASSOCIATIONS PLAY REGARDING COMBATTING ENERGY POVERTY?

In this part of the report, the firrst sub-question will be answered. This will be done by means of an inspection of the websites to gain information on what they are already doing and two focus groups with housing associations.

4.1.1 WHAT ARE SOCIAL HOUSING ASSOCIATIONS ALREADY DOING TO COMBAT ENERGY POVERTY

The main part of the research consists of the case studies of 2 different housing associations and the associated tenant organisation. The two housing associations have already been mentioned in the method, namely; Ymere & Lefier. This part of the report will show what housing associations do for their tenants in the combat against energy poverty.

4.1.2 YMERE (RANDSTAD)

For the case study, we first looked at what Ymere itself was already doing via the website. On the main page of the site there is a heading “Grip on your energy bill” where Ymere provides its tenants with information about the high energy bills. To make it easier for people from different backgrounds, text can be selected on the site and immediately translated or read aloud.
The page itself contains saving tips on how tenants can reduce their gas and electricity consumption. An overview is also given of useful products that can help with this, such as radiator foil or draft strips. It also states which dangers people should be aware of when they reduce their consumption.
The site also states that an energy coach can be requested, what financial measures (Applying for energy allowance, assistance with energy allowance application, emergency fund for energy, and tips on saving money can be found on the Geldfit website.) are available and can be applied for, and information about the costs of energy.

Focus group

The focus group with Ymere was held in combination with the project team energy poverty. First of all, Ymere has put together a project team energy poverty of people from different departments in order to tackle energy poverty. The focus group is divided into 4 parts: exploration of energy poverty among tenants lefier, energy poverty measures, additional measures and exploration of measures.

PARTICIPANT:	FUNCTION:
Participant 1	Special management
Participant 2	Strategy and policy

Table 5: Participants focus group (own work)

Exploration of energy poverty among Ymere tenants

In the first part of the focus group, Ymere was asked what they actually noticed about energy poverty among its tenants. Ymere itself has carried out an analysis based on the updated figures for 2022. They expected an increase in the number of people who could not pay their rent. Only what this showed is that there was actually no increase in the number of tenants who could no longer pay their rent. They even said it was at an all-time low. Even though they are now in an all-time low, they still thinking ahead of the coming winter and what measures they will be taking to aid their tenants. They assumed that people would rather use less energy than that they would no longer be able to pay the bills. The group of tenants who indicated that they wanted help has therefore not increased.
They also noticed that the measures taken by the government appear to be working. They explained that these measures make it easier for the tenants to bear the burden and that they would therefore be less likely to run into problems. They also saw an increase in the approval of the addition of solar

panels on roofs while renovating. At first 10 to 20% wanted the solar panels and now 50 to 60% want the solar panels added to their building.
However, the number of mold reports went up 2 ½ times. They found this out by analyzing the number of mold reports in January-February 2022 and the number of mold reports in January-February 2023. According to them, this increase in the number of mold reports had to do with the fact that people started heating less and kept their windows and doors closed, so that it became damp in the homes and thus mold was formed. They saw this as a negative side effect of the increased energy prices. To counter this, they eventually want to put in mechanical ventilation in every home of their stock. On average, Ymere also has an older stock, which means that it will occur more quickly. They also indicated that there should be a policy on this.

Energy poverty measures
The second part of the focus group discussed the measures Ymere has taken to help its tenants. First of all, the project team works on energy poverty, created by Ymere. They drew up a 14-point plan. This 14-point plan contains measures that Ymere has taken in the short term. This 14-point plan contains both measures to inform tenants and measures to save energy. However, they do not know whether all points have had an effect on everyone. Ymere has also ensured that communication with tenants has improved.

MEASURES 14-POINT PLAN YMERE
1. Deploy service technicians, district managers, signalling function.
2. Training employees to become energy coaches and/or fixers. Tenant helps tenant.
3. Water-saving shower head in all homes during alteration and repair.
4. Redesign welcome package for tenants.
5. Make agreements with municipalities about the use of government resources.
6. Educating tenants and referring to landing pages.
7. Limit heating in common areas in complexes.
8. Involve tackling energy poverty in social MOTs in 2023.
9. Warn tenants about the increase in energy costs and the final bill (for heating cost complexes).
10. Reduce administration costs in the final settlement of heating costs for complexes by 50%.
11. Solar panels: extra discount and regrets.
12. In case of payment arrears: offer customization (including Energy Coach and fixing).
13. Network Early On (helps tenants with payment arrears and provides information).
14. Reverse housing costs agreement.

Table 6: 14 measures (Ymere)

In the beginning there was also a lot of uncertainty about the tenants who had block heating. Because they shared their energy bills with everyone in the complex, they did not receive € 190 twice in the last months of the year. Ymere has come up with the arrangement that they have advanced € 190 on these two occasions to people with block heating to ensure that they are also helped with the energy bill. People who use block formation also have no insight into their energy consumption. Ymere is therefore also looking at the options for smart meters in these homes. People can also cook without gas on request. Ymere will provide the house with the necessary pipes and installations. The tenants will have to buy the induction plate themselves. Finally, Ymere provides a lot of information about the use of the shower, because people unnoticed pay a lot of money for energy.
For the long term, Ymere advocates maintaining the energy ceiling, at least for low-income households. Ymere also wants to invest heavily in fix teams and energy coaches, so that tenants can adjust their behaviour. They indicate that they want to keep repeating the message until everyone knows what to do to save energy. They also indicate that renovation will take a long time. As a result, they have come up with a scheme with fix teams. The households that are last to turn for their home renovation are the first to receive the fix teams at the door, so that these people can still be the first to help.

According to Ymere, behaviour is also an important factor, but not only the responsibility of Ymere itself. Ymere can manage behaviour by providing information and helping people where necessary, but the behaviour of the tenants themselves can only be changed by the tenants.

Ymere also saw a number of barriers. The biggest barrier, according to them, remains the financial possibilities. Housing associations simply do not have enough money to do everything for their tenants. In addition, a large group of tenants at Ymere have received a rent reduction to 575 euros per month if the income of these households is low. As a result, Ymere receives even less money that is needed to make the homes more sustainable. For example, rental income remains limited, but the task is getting bigger and bigger.
There is also a large silent group of tenants. These people will therefore not be noticed, but they are certainly in poverty or energy poverty. If people don't report anything, they can't be helped either. However, this is not a problem for households with block heating. Because it is known here how much people consume, Ymere wants to manage this and send energy coaches to the large consumers in the block. In the municipality of Haarlemmermeer they are also trying to solve this by writing to entire neighbourhoods where they think the risk of energy poverty is high. Here, households receive a letter asking if they want to participate in the energy bank. It is indicated that the households with the lowest incomes do not even open the letters, because they have many more things on their mind.
The technology itself is also a barrier. Because all technology is becoming increasingly new and therefore more advanced, Ymere indicates that they understand that not all tenants know how to use the installations in their homes properly. They tried to fix this with instruction videos on their website.
Capacity is mentioned as the last barrier. Ymere is also experiencing capacity problems. For example, there are too few installers to install everything, and resources are also limited.

Additional measures
For the third step, Ymere was asked which measures they thought were still missing. The only measure they felt was missing was the financial ability of tenants to get things done and to pay bills. They especially want to see the government meet the needs of people in the social housing system by reintroducing the price ceiling. This is because they believe that money really helps to combat energy poverty. When people receive more money, it will also be easier for them to pay their energy bills.

Reconnaissance measures
For the fourth and last step, the measures that worked best according to the employees of Ymere were highlighted and one measure was chosen that worked least well. Here, the measures of home improvement were viewed most positively, while allocation and rent are only seen as negative. Both the advantages and disadvantages of the measures were examined. The measures set out are; Indoor sustainability improvement, fix teams, tackle homes with rent benefit first and rent specifically by target group.

1: Indoor sustainability improvement (good measure)
The homes that need it will be helped quickly. The example given here was that there are still a number of homes in Almere with a bad label. These are scattered throughout the city. By using this measure, these homes can be tackled quickly. Of course, this will not mean that these people are rid of their energy poverty, but something has been done to improve the homes of these people.
A disadvantage of this measure is that people think they have a sustainable house, which means that they will use plenty of energy, which in turn causes energy costs to rise sharply. Households must therefore learn to deal with the new situation, otherwise their housing costs will remain high. This will therefore also include aftercare.
Another disadvantage is that the installations are becoming more and more complicated, as a result of which the tenants will understand less and less about the installations.

2: Deploy fix teams (good measure)
With fix teams, home-saving measures can be taken quickly, and a lot of savings can be made quickly. the problem with fix teams is that, according to Ymere, it is a plaster on the wounds and that it does not solve the big problem.

3: Tackle homes with rent benefits first and rent specifically by target group (poor measure)
These two measures have been taken together somewhat and would work the least well because Ymere does not have the correct information to implement these measures. Ymere will need to know the income of all its tenants. They indicated that this has been reported once via the tax authorities, but that they are not expected to do so again. So to find out the income, all tenants will have to provide proof themselves, which according to them is impossible.

Finally, Ymere indicated that more targeted moving options are not feasible in practice, because people who live in a house with a good energy label, and who earn more on the social scale, do not want to move into a new house with a bad energy label just because they earn more. Even if they want to move into a new house they wouldn't go to a house where they will have to pay more.

4.1.3 LEFIER (NORTHEAST OF THE NETHERLANDS)

For the case study, research was first done into what Lefier visibly does via the website. A separate page has been created on Lefier's website for the high energy costs of its tenants. This includes a video in which they explain the possibilities and what they can do. It also states that renovating all homes at once is a difficult task, which is in line with the earlier literature in this section. It does state what they can do to make the homes more sustainable, such as PV panels, double glazing, and a bag of energy-saving resources.
There is also additional information on the site about the measures they are taking, when the measures are available and how it works, what tenants should do if they can no longer pay the bills and tips to save even more energy. This information is also displayed in different languages, in order to best accommodate its tenants.
In the annual plan for 2023 (Lefier, n.d.), Lefier has also included energy poverty and making their homes more sustainable as priorities. This states that they give a high priority to this theme, whereby they will deploy an energy team that will come up with initiatives to tackle energy poverty and sustainability. These initiatives will also be coordinated by the energy team. Residential coaches will also be deployed to help residents get a grip on their energy costs. Finally, extra professionals are called in to implement energy-saving measures for its tenants. Lefier also strives to make 3332 homes more sustainable in 2023. Their goal is to improve the energy efficiency of 1022 homes to achieve an energy label A rating. Additionally, they plan to implement sustainability upgrades in 1000 homes based on tenant requests, install solar panels in 1000 homes, and upgrade 310 homes from their sales inventory to improve their energy efficiency. They also recognize that energy is becoming more expensive and that they must therefore fully focus on sustainability.

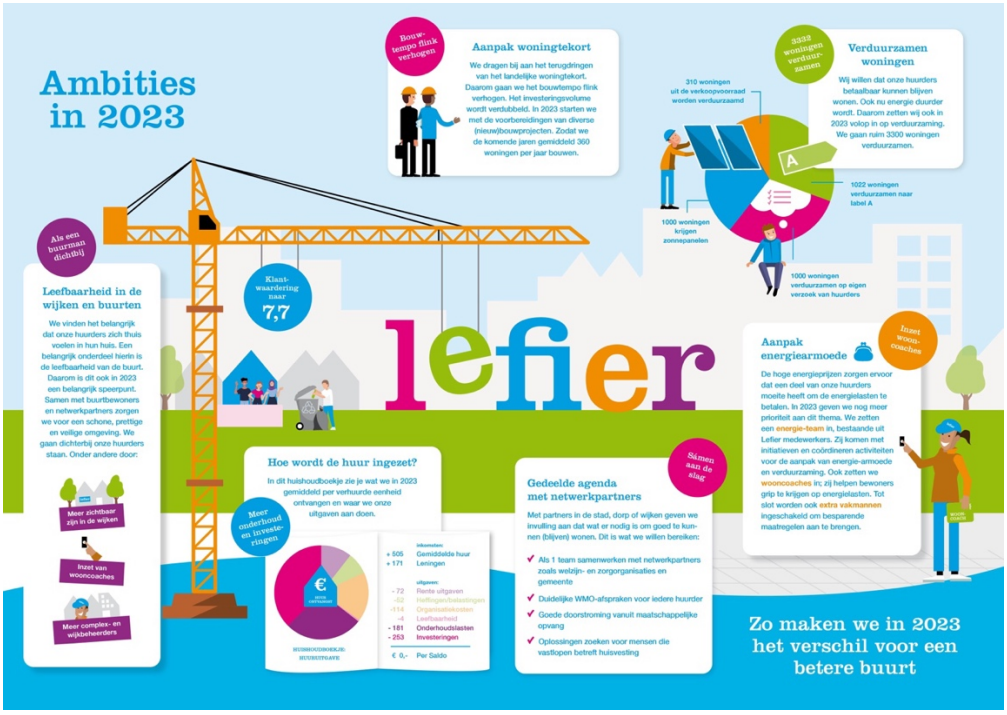

Figure 18: Yearplan Lefier (Lefier, n.d.)

Focus group

The focus group with Lefier was held in combination with the E-team. First of all, Lefier has put together the E-team (energy team) of people from different departments in order to tackle energy poverty. Lefier has a resident participant in each area team, the resident participants are also in the E-team. These are the eyes and ears of lefier in the city, neighbourhoods and villages, they bring this information back to the organisation and also bring information from lefier to the residents. The focus group is divided into 4 parts: exploration of energy poverty among tenants lefier, energy poverty measures, additional measures and exploration of measures.

PARTICIPANT:	FUNCTION:
Participant 1	Strategy and policy
Participant 2	Planned maintenance and safety
Participant 3	Communication
Participant 4	Resident participant
Participant 5	Organisational advisor

Table 7: Participants focus group (own work)

Exploration of energy poverty among Lefier tenants

In the first part of the focus group, it was asked what Lefier actually notices or knows about energy poverty among its tenants. This showed that at the peak of gas prices, the figures showed that rent arrears did not increase, but that some tenants who had payment arrangements wanted to adjust their payment arrangements. It can be seen that some residents who were already struggling to pay the bills during this time had even more difficulty in doing so, as payment arrangements were adjusted. It was noted, however, that residents became aware of what exactly is happening and what kind of home they live in, so they asked the association if something could be done about their homes. Many phone calls at the start asking what Lefier can do. There was also a lot of demand for home preservation over the telephone. For example, within 1.5 years there have been more than 2,000 requests to install PV panels by Lefier tenants. There was also a high demand for double glazing among tenants. Lefier also mentioned that mold was becoming an increasing problem.

Energy poverty measures

In the second part of the focus group, the measures Lefier took to help its tenants were discussed. Renovating all homes quickly is of course not an option, so there is more focus on what is really possible. First, we looked at what Lefier can do for its tenants in the short term. This showed that first of all many tips were given from many angles to save energy. Here they indicated that this was often done by Lefier, but also by municipalities. The strategy has also changed due to the high demand for PV panels. First, Lefier placed PV panels where they thought they were necessary. A schedule has now been made for installing the PV panels based on the requests that have been received.

Lefier has also started distributing simple energy-saving measures/energy materials such as moisture tape, door closers, door brushes, letterbox brushes, energy lamps and energy displays. They are also affiliated with a national project Smarter with your energy: with this, they hand out energy displays that are connected to your smart meter in the cupboard, which immediately reads when something or someone uses a lot of energy or gas at a certain time. This way people can make adjustments at the moment - an explanation is also given, so tenants are not left to fend for themselves with the displays. They are taught how to read it and how it works, how they can use it to their advantage. These short-term solutions were offered to the tenant out of the blue, not on direct demand. Professionals are also used when people could not install their own energy-saving devices. During delivery, it is asked whether the tenants can install the measures themselves, if not, professionals will come by. Lefier itself also focuses on more energy-efficient lighting, etc. These costs are passed on to the tenants via service costs. By focusing on more energy-efficient lighting, these costs are kept as low as possible and service costs will also go down.

Finally, housing coaches were deployed per area. Housing coaches are professionals already working for Lefier who took on the job and know a lot about energy poverty. These housing coaches are people to whom specific questions about energy poverty, making homes more sustainable, and arrears go. The housing coach also helps to provide insight into which subsidies and the like can be applied for.

In the long term, Lefier strives for sustainability and the housing coaches as much as possible. The housing coaches are especially important for the long term, according to Lefier, because these people must ensure that tenants gain insight into what they use and how to act further. These housing coaches therefore really respond to the behaviour of the tenants.

The behaviour of tenants was seen as an important factor at Lefier. As a result, they not only wanted to provide the measures but also give the tenants insights into how it works and show them how to act when things go wrong. Because Lefier had been working on the behaviour of its tenants for some time through the initiatives “get rid of natural gas” and “ready for NOM” (zero on the meter), they also gained a much better insight into the consumption of their tenants. At the start of the process, they already asked their tenants how their energy consumption was, so the figures immediately came to the table and sometimes they were shocked. Because of these initiatives, they have started to focus on energy displays, so tenants can see what the guzzlers are in their homes. Many tenants are not aware of how much energy, for example, an old refrigerator consumes. The measures they took for these initiatives were already in line with those they took for energy poverty.

Lefier also foresaw some barriers. They notice that the advice they sometimes give can sound contradictory in the eyes of tenants. For example: due to the high energy bill, people keep the windows and doors closed to keep it warm in the house, and ventilation means cold, with the result that moisture and mold problems arise. They also have the idea that "hail is being shot at a mosquito". A lot of advice is devised, but of course not everything fits every tenant. Only a little bit is useful for everyone. They hope that the good tip will reach the right resident. Finally, it is indicated that it is difficult for the cooperating companies to scale up in connection with the installation of solar panels and double glazing.

Additional measures
For the third step, Lefier was asked whether they would like to take additional measures that they are not taking at the moment. The answer to this was that what they think works, they have tried. Of course, they now want to bring all homes to label A, but this is not possible in terms of capacity and money. So, everything they are doing now they would have wanted to do is possible in terms of capacity and money. At Lefier, energy poverty has really become a priority within last year's annual plan. Energy poverty/sustainability is one of the big 3 priorities in the organisation.

Reconnaissance measures
For the fourth and last step, the measures that worked best according to the employees of the E-team were highlighted and one measure was chosen that worked least well. Here, the measures of home improvement and tenant behaviour are viewed most positively, while allocation and rent are only seen as negative. Both the advantages and disadvantages of the measures were examined. The measures set out are; Indoor sustainability improvement, insight into energy bills and energy coaches and rental price specific to the target group.

1: Indoor sustainability improvement (good measure)
It was assumed that this also means making the shell of the homes that are being made more sustainable. What was said about this is that the measure is aimed at isolating, isolating, isolating. All measures that ensure that less gas is needed for heating are necessary. Measures that mainly help to reduce gas consumption will therefore work best in their opinion. However, this measure is for the medium-long term. This requires good planning, but you do prepare the homes for the future and the long future. For example, they already have homes that are ready to be connected to the heat network, or that are suitable for hydrogen. They are also busy preparing the house in such a way that it goes beyond the period of sustainability itself.
A disadvantage of this measure is that if homes are to be tackled individually, no speed can be set. The fastest approach to sustainability is to take a project-based approach. Works well for residents whose homes are being renovated, but that does mean that the pace is a lot slower when done this way. So, there is more to be gained if it is done on a project basis.

2: insight into energy bill and energy coaches (good measure)
According to the E-team, it helps if tenants have insight into their use, especially due to the high energy prices. This makes tenants aware of what they actually use. It was also said that insulation mainly helps to reduce gas consumption, but that insight into consumption also provides more insight into electricity consumption. After all, the amount of electricity used has more to do with behaviour. An insight into this can bring many insights for the tenants.
A disadvantage is that tenants lack an overview, then you are talking about the least well-educated people, who also have the lowest incomes, this group is larger than they think. Low literacy is also a problem, non-native speakers. Large group who can read and write poorly or not at all. These people must be guided by very simple examples and practical examples. You don't hear much from this group of people either. This is the group you don't hear much from, sort of silent poverty. (Also noticeable with the distribution of energy packages. A lot of tenants did not understand the instructions).

3: rental price specific to target group (poor measure)
This was the measure that, according to the E-team, would not work. This is because there are many differences in target groups that are difficult to categorize. What kind of target group a tenant falls into does not say much about the behaviour of the tenant. You will have to know very specifically what makes someone lose more money and how to encode this in the rent. Of course, the houses with a bad energy label are already worth less points and the rent is therefore already lower. The downturn of this is that the energy efficiency is lower and therefore the energy costs are higher.

4.2.1 COMPARISON YMERE AND LEFIER

During the initial exploration of both housing associations, it was noted that both provide a lot of information on their websites regarding energy poverty. Both have done this in multiple languages to reach all tenants as easily as possible. On both web pages, there are tips on what tenants can do themselves, but also where they can turn if they can no longer manage on their own.

Both housing associations have first set up an energy poverty team. Ymere's team is called the Energy Poverty Project Team and Lefier's team is called the E-Team (Energy Team). Furthermore, the figures showed that the number of tenants who could no longer pay their bills remained the same. Ymere even found itself in an all-time low. However, they indicated that they were already working on measures for the next winter. While there was no greater demand for help at Ymere, this was the case at Lefier. They received over 2000 requests for the installation of PV panels within 1.5 years. Ymere did see the willingness of tenants to install PV panels on renovated buildings rise from 10-20% to 50-60%. Both parties also reported that mold became a bigger problem for their tenants because the heating was lower and tenants no longer ventilated their homes to keep the warmth inside. Ymere stated that they wanted to implement policies to address this.
Each housing association has taken its own measures to help its tenants. Ymere has drawn up a 14-point plan that includes 14 measures that could help tenants fight energy poverty. Lefier has focused more on arrangements with solar panels and double glazing. Lefier has also started distributing a package of energy-saving materials. Both housing associations also focus on changing their tenants' behaviour. Ymere also emphasizes that the later a tenant's home is renovated, the earlier a fix team will visit the homes to make them more energy-efficient.
Regarding barriers, both housing associations cite different factors. Ymere's biggest barrier is money, and with the rent for the lowest incomes now reduced to €575 per month, Ymere's budget is not improving. The silent group of tenants who cannot be reached is also a barrier. Finally, Ymere is struggling with capacity problems. Like Ymere, Lefier is facing a large group of tenants who cannot be reached because they do not understand, and they also have capacity problems. Finally, Lefier noted that they sometimes find the advice contradictory and that not everyone can use every tip, leading them to give many tips.

As additional measures, Ymere wants to advocate with the government to maintain a price ceiling next year, at least for the lowest-income tenants, and to provide compensation for its tenants. Lefier indicated that they are doing everything within their power and that they believe is useful at the moment.

In prioritising measures, Ymere, like Lefier, focused on home improvement. However, Lefier also considered the tenants' behaviour important. Both housing associations found that targeting rent specifically to a particular group was the least effective measure. Ymere also chose the measure "first tackle the homes of people with rent subsidies" as an additional measure that would not work.

4.3.1 CONCLUSION CHAPTER

In chapter 4, there was discussed what housing associations can do to combat energy poverty. Several findings can be concluded:

- The capacity problem identified in the literature is also confirmed by the focus groups, as both indicated that capacity is an issue.
- Ymere and Lefier are also focusing on installing solar panels on their homes to reduce costs for tenants. The literature in chapter 2 shows that the use of solar panels reduces energy bills.
- Both associations receive many reports of mold, which indicates that tenants are not adequately informed about how to ventilate their homes properly. The cause of these mold reports is that tenants keep windows and doors closed at all times to retain heat in the homes.
- Both associations experience similar issues regarding energy poverty, indicating that there is likely a similar trend in energy poverty in the Randstad and the northeast of the Netherlands. This is also seen in the literature on where energy poverty is present.
- The number of tenants who cannot pay their bills has not increased at either association, meaning that people are still paying their rent and energy bills but are sacrificing other things.
- The increase in requests for solar panels at both associations may indicate that tenants are more aware of their situation and want to take action.
- Both associations state that they do not want to decrease rent, as this would result in less rental income for renovation and maintenance. The literature also shows that housing associations in general have insufficient funds for renovations and construction of homes.
- Both associations are focusing on using energy coaches because renovating all homes will take a long time, and they are therefore focusing on the one factor that tenants can control themselves to keep costs as low as possible: their behaviour.

CHAPTER 5, SUB-QUESTION 2
WHAT ROLE CAN TENANTS PLAY REGARDING COMBATTING ENERGY POVERTY?

In this part of the report, the second sub-question will be answered. This will be done by means of 2 focus groups with the tenant organisations of housing associations.

5.1.1 WHAT ARE TENANTS DOING ALREADY TO COMBAT ENERGY POVERTY

The main part of the research consists of the case studies of 2 different housing associations and the associated tenant organisation. The two housing associations have already been mentioned in the method, namely; Ymere & Lefier. This part of the report will show what the tenants do in the combat against energy poverty and what they expect from the housing associations.

5.1.2 YMERE (RANDSTAD)

The tenant organisation represents the tenants of the housing association but has limited power to address energy poverty on its own. However, they can negotiate performance agreements with associations to encourage change and hold them accountable. They regularly remind Ymere that action is needed to address energy poverty, particularly through addressing overdue maintenance and renovating EFG labels. Additionally, they request evidence of progress towards resolving these issues.
Since the tenant organisation lacks power, they make sure to meet with the housing association as soon as possible when a new project is initiated and reach out to local residents to establish communication. Through this initial communication, they aim to recruit tenants living in for instance the building that's going to be renovated to be ambassadors and generate more support for Ymere's projects among other tenants in the same building, involving other local residents. In the municipality of Haarlemmermeer, the tenant organisation frequently refers many tenants to the energy bank for assistance. The Energiebank Haarlemmermeer has a mission to make energy affordable for everyone, particularly those with low incomes. With energy prices on the rise, they aim to help people save energy and gain more control over their bills. They do this by offering energy coaching, where they visit households to discuss ways to save energy and identify areas of energy waste. They also provide free energy-saving products to households with a minimum income and offer to install these products if needed. In addition, they offer group training and education about energy-saving, both at community events and to other organisations who work with low-income clients (Energiebank Haarlemmermeer, n.d.).

Focus group

The focus group was conducted with multiple members of SHY (Collaborating Tenant Organisations Ymere). During the focus group, they discussed several topics, including what was known about energy poverty among Ymere's tenants, what measures Ymere had taken, potential barriers and tensions, additional measures that were desired, and the prioritisation of the proposed measures.

PARTICIPANT:	FUNCTION:
Participant 1	Member tenant organisation
Participant 2	Member tenant organisation
Participant 3	Member tenant organisation
Participant 4	Member tenant organisation

Table 8: Participants focus group (own work)

What is already known about energy poverty among Ymere tenants?
In the first step, they looked at what was already known about energy poverty among Ymere's tenants. SHY indicated that they had mixed experiences regarding energy poverty among tenants. Ymere reported that only a small proportion of people raise concerns about payment difficulties. SHY also noted that tenants are more self-reliant than they originally thought and take several steps to keep their

energy costs low. Since energy costs are within people's control, they tend to make efforts to keep them low. According to SHY, low-income individuals spend roughly 70% of their income on fixed expenses. However, it was also mentioned that if things go wrong for tenants, they tend to go really wrong.
Furthermore, they indicate that energy poverty is easily concealed. People close their curtains and don't talk about it, so no one knows that someone is living in poverty. They also mention that those who conceal it are the ones who have more difficulty seeking help from institutions because they are ashamed. They also see that people shift their poverty to other factors. By paying their rent and energy bills, they have less to spend on food and groceries. As a result, a large part suffers from silent energy poverty. They also say that rising supermarket prices do not help. It was said, "People in social housing shop on their knees because the cheapest items are on the lower shelves." This is also known as the "prebound effect". Now that these items have also become more expensive, it is even harder for this group of people to make ends meet.
They do note that people are becoming increasingly inventive in order to cope with the costs. People distribute newspapers in the neighbourhood to earn extra money, or they cook with petroleum or barbecue gas.

Measures
In the second part of the focus group, the discussion is about the measures that have already been taken. The first thing mentioned about the measures taken is that tenants are not always informed about the decisions made by the housing associations. It is also said that many tenants are misled by poor communication, which sometimes leaves them confused about their situation. Tenant organisations also warn against removing gas pipelines from homes, as many residents may not switch to electric cooking because it is too expensive. Instead, tenants can opt for gas-free cooking and have everything prepared by Ymere. However, many tenants are not aware that they need to purchase their own induction stove and pans, which can be costly.
Furthermore, the participants noted that many tenants have too much on their plate to keep up with news about what their housing association plans to do and what measures they will take. The stress level is already high among low-income tenants, and they are simply not preoccupied with this issue. However, they do suggest that tenants can be informed earlier about all measures if they are alerted to them. An example was given that tenants could be approached as follows: "There are opportunities to save energy, see this page to see if there is anything for you."
The focus group also mentioned that there are many uninformed renters who simply do not understand the measures being taken. They also stated that the integration of many renters with a migrant background who do not properly speak the language has not gone well, making it difficult for them to understand the measures being implemented. While the group acknowledged that this is not something that can be addressed solely by the housing associations, they felt it was more the responsibility of the government.
The focus group participants suggested that more support should be provided for people with disabilities who are forced to stay at home, as they tend to use more energy throughout the day, leading to higher bills and greater hardship.

According to SHY, the biggest barrier that tenants face is shame. People feel ashamed to go to food banks or ask for help with finances. There is a high threshold for individuals to acknowledge that they have a problem and recognize that there is someone who wants to help them with these issues, and then to tell someone that they have a problem. There is also a great fear of the unknown. People are afraid that they will give up too much of their freedoms if they seek help and they want to keep a say in the matter. Trust also plays a role, as tenants often don't trust institutions, especially if they come from another country and had problems with institutions there.
However, tensions between tenants and housing associations can be avoided if housing associations communicate clearly and transparently with tenants from the beginning about their plans, as well as with fix teams and overall renovation plans.

Additional measures
The third step, the additional measures, was mainly focused on improving the current measures. It was suggested that when a home is being improved, it should not only focus on one aspect to improve the energy label but instead, the whole house should be improved to reduce the costs for the tenants. When the whole house is renovated, including insulation, and not only brought to a label D, the costs will drop for the tenants, because the energy bill will decrease.
They also want tenants to be better heard, by asking what they really need and want. They added that it is important to start exploring and considering the options in a timely manner.

Reconnaissance measures
The last step focused on the opinions of the members of the tenant organisation on the two best measures to take and the least effective measure. The measure of rent reduction for homes with low energy labels and the use of energy coaches were seen as the best measures to take, while more targeted moving options were seen as the least effective measure.

1: Rental discount for low labels (good measure)
The emphasis was mainly on the need to focus on homes with poor energy ratings. According to the members of the tenant organisation, these homes should be addressed first and foremost. The reason for choosing this measure is that tenants who have high energy costs often live in homes with poor energy ratings. As a result, they pay more for energy compared to households living in homes with good energy ratings. This measure aims to compensate tenants living in less energy-efficient homes. As a result, tenants living in better homes would pay higher rent and lower energy costs, while those living in homes with poor energy ratings would pay lower rent but higher energy bills.
It was also mentioned that this measure is in line with Ymere's multi-year plan, as Ymere aims to bring all homes to a label B rating.
However, the disadvantage of this measure is that it could lead to lower rental income for Ymere, as Ymere only receives rental income and not energy bill income, which goes to the energy company.

2: Use energy coaches (good measure)
Energy coaches help households take a lot of small measures that will save them money. They can also be connected with fix teams, who can implement energy-saving measures in the home. This can save money in a short amount of time.
It also promotes the self-sufficiency of households, as they learn to better manage energy with the help of energy coaches.
A disadvantage of this measure is that the capacity is still too low to be well implemented. However, it was mentioned that Ymere is working to scale this up.

3: More targeted moving options (bad measure)
Targeted relocation options were seen as a measure that would not work at all according to members of SHY. The reason for this is that it would not be feasible. The flow is not good now, meaning it takes a long time for people to be able to rent a social housing association home and it’s also difficult for tenants to change houses quickly. So, adjustments would have to be made to better the flow, which makes it even more difficult.
This could also mean that households could end up with worse housing conditions but higher energy costs. If households do not benefit, they will not want to move to another home. It also means that tenants will receive a new contract, which will likely result in higher rent payments.

5.1.3 LEFIER (NORTHEAST OF THE NETHERLANDS)
The focus group was held with multiple members of the tenant organisation of Lefier. During the focus group, they discussed what was known about energy poverty among Lefier's tenants, which measures Lefier had taken, possible barriers, potential tensions, additional measures that are still desired, and the prioritisation of the proposed measures.

PARTICIPANT:	FUNCTION:
Participant 1	Member tenant organisation
Participant 2	Member tenant organisation
Participant 3	Member tenant organisation

Table 9: Participants focus group (own work)

What is already known about energy poverty among the tenants of Ymere?
For the first step, they looked at what was already known about energy poverty among the tenants of Lefier. Firstly, it was mentioned that it has been an issue for a long time in the northeast of the Netherlands due to poorly insulated homes. According to the tenant organisation, energy poverty actually compounds existing poverty, as people who already have little money are also much more likely to be impacted by high energy prices. Thus, there are many households among the tenants of Lefier who put on an extra layer of clothing, turn down the heating, or even turn off the heating completely. Some even use petroleum or electric heaters.
The tenant organisation states that more and more people are struggling with high energy bills and that households are finding it increasingly difficult to stay afloat.
Finally, it was noted that there are increasingly more reports of mold. This is due to people keeping their windows and doors closed and not heating their homes, which causes the homes to become more and more humid. This has led to more mold reports than the previous year.

Measures
The second part of the focus group is about the measures that have already been taken. Firstly, it was mentioned that all measures taken by Lefier are communicated to the tenants through newsletters from the tenant organisations. This includes measures such as installing solar panels on request and replacing the glass in the homes with double glazing. However, it was noted that for these self-requests through the internet, the tenant was placed on a waiting list.
Furthermore, it was said that the measures taken by the housing associations at the moment are actually preparatory steps for the measures that will be taken in the future, while tenants want the measures as soon as possible. They are kind of intermediate steps. The "fix brigade" is also seen as a band-aid solution, it does not lead to significant changes or major steps being taken. However, the fix brigade reports a lot of moisture or drafts. These reports will eventually be passed on to the housing association through the tenant organisation.
It is only a problem that the fix brigades are on request and the group that requests these fix brigades is also small. This may be because people do not know where to go. Especially the group of low-literacy and immigrant people do not know this. This can be a result of poor integration, which was initially done by volunteers from Lefier, but there were few of them and most of them stopped during the pandemic. For these people, there will still be a report from the tenant organisation so that the housing association can help these people again. It was indicated that this was also a task for the government, to help these tenants integrate better.
It was also mentioned that not everyone is convinced of the measures being taken. Tenants need to have in writing what the association plans to do in order to be convinced. And even with examples and figures, it can still happen that tenants don't believe it. It is also indicated that tenants show a kind of non-interest; they know where to go, but they simply don't do it. Even during participation meetings, almost no one shows up.
During renovations, the tenant organisation is involved from the very beginning so that they can be immediately involved in the process and in turn, inform the tenants.

According to the tenant organisation, the biggest barrier that tenants face is shame. People are ashamed to go to food banks or to ask for help with their finances. Older people, in particular, are less likely to go to food banks. There is also a "voorzieningenwijzer" (a tool to inform people about the possibility to

receive care allowance, rent allowance, tax relief, etc.) that is funded by the government and Lefier to inform people about their rights. However, this tool is not used as much by older people because they are not familiar with it. They are not used to using digital tools. They are referred to the library or town hall, where they can receive further assistance. However, people still do not use these resources because they do not trust larger institutions. Social cohesion is also decreasing, which means that people are less likely to be helped by their neighbours.
Fear also plays a role, as some projects have not gone as they were supposed to, people are afraid that it will go the same way for them. This makes them less likely to trust the measures that housing associations want to take.
Capacity is also a major problem in addressing the issues. For example, there is a shortage of skilled workers who can install sustainability measures, as well as a shortage of materials. For example, the example was given that tenants went away from gas and got a heat pump. However, this heat pump broke down. Due to a shortage of people, these tenants had to wait all winter for a new heat pump. This in turn meant that these people, who had just switched off gas, also had to heat their homes themselves with the help of an electric heater. There aren't also a lot of people who are part of the fix brigade.

Additional measures
For the third step, the additional measures, it was mainly said that more control is needed on the application of the measures. Currently, it is stated that the installation of solar panels is done by certified professionals, but these professionals also have subcontractors. This is why control was deemed important. They also want to prioritise double glazing over solar panels. They would also have liked to see Lefier include the label D in the homes with a bad label.

Reconnaissance measures
For the last step, the members of the tenant organisation were consulted to identify the two best measures to take and the measure that would be least effective. The measures of rent reduction for homes with low energy labels and Indoor sustainability improvement were seen as the best measures, while targeted relocation options were seen as the least effective measure to take.

1: Rental discount for low labels (good measure)
If this measure is used for a short period, it will work very well for people who are currently struggling, and they will have a little more money left over. The part that the associations lose can then be regained by renters who have received a rent increase.
In the long term, this measure will work less well because incomes cannot be permanently reduced. This will result in associations receiving less income, making it harder for them to sustainably renovate properties.

2: Indoor sustainability improvement (good measure)
With this measure, people can be helped very specifically with the sustainability of their homes. This way, those who need help the most, because they live in a very poor home or because they can no longer pay their bills due to high energy prices, can be helped the fastest.
The disadvantage of this measure is that it cannot be scaled up. It is not efficient because blocks of houses will not be made sustainable all at once. The cost of making each home sustainable on an individual basis is also generally higher than making an entire block of houses sustainable.

3: More targeted moving options (poor measure)
According to the tenant organisation, this measure is not feasible. It's similar to the "passend wonen" (appropriate housing) measure, which also didn't work. People will not leave their homes to move to a worse one even if they earn enough money to move into a better house within the social housing sector. Meaning that if people earn enough to move into a house with a higher rent but a worse energy label, they won't do it, because they also know they will get worse out of the situation.

5.2.1 COMPARISON YMERE AND LEFIER

What both organisations indicate is that tenants are still quite self-reliant. The tenants of both housing associations have a lot to juggle, but when things go wrong, they go really wrong. The difference lies in the fact that the tenant organisation of Ymere indicates that it will not become a bigger problem, while it is mentioned by the tenant organisation of Lefier that it is becoming an increasingly bigger problem. Both tenant organisations also say that tenants find other ways to keep themselves warm, from putting on an extra coat to using petroleum and electric heaters.

Both tenant organisations state that communication can be a problem when implementing measures. Communication can sometimes be inadequate, causing messages to be perceived differently by tenants, leading them to expect something completely different. Both tenant organisations also report that many tenants are not aware of the measures taken or announced. One reason is that the poorest tenants have other things on their minds than looking for tips on saving energy. Another reason is because they are illiterate or do not speak the language. Regarding the second point, it is said that this often does not go well during the integration of these tenants, but this problem is attributed to the government.
Regarding barriers, the two tenant organisations are also not far apart. According to both organisations, shame is the biggest barrier preventing tenants from using the measures provided by housing associations and governments. The capabilities of the housing associations are also seen as a barrier.

The tenant organisation of Ymere would rather see the current measures implemented better with extra measures, meaning that not only the label is improved during housing improvement, but also that the homes are actually improved energetically to lower monthly expenses. The tenant organisation of Lefier is more concerned with control, ensuring that the measures being implemented are better controlled to minimize errors. They would also like to see a different prioritisation of the measures.
Regarding the prioritisation of measures, the tenant organisation of Ymere prefers a rent reduction for low labels (and poor energy performance) combined with improving the self-reliance of tenants so that they have more control over their usage. The tenant organisation of Lefier prefers a rent reduction for low labels and more targeted renovation of homes. Both organisations indicated that targeted relocation options were not feasible and therefore the worst measure of all.

5.3.1 CONCLUSION CHAPTER

In chapter 5, there was discussed what tenants can do to combat energy poverty. Several findings can be concluded:

- What is seen in the focus group of the tenants' organisation of Ymere, is that people living in social housing "go grocery shopping on their knees" to save money. This is called the prebound effect, where people with less disposable income use less energy or go for way cheaper groceries than necessary.
- Both tenants' organisations indicate similar problems with energy poverty, suggesting a similar trend in both areas.
- In the focus groups, tenants often feel ashamed to seek help from institutions because they feel embarrassed. Literature in chapter 2 also shows that people are ashamed to seek help when they are expected to rely on their own resources. This is especially the case for lower-income classes in the Netherlands.
- The focus groups indicate that tenants do not trust housing associations. A similar phenomenon is seen in the literature in chapter 2, which points to the fact that people in lower-income classes do not trust the government, which are both major institutions.
- Both tenants' organisations indicate that communication from the housing associations is a problem. This refers to clear communication; associations communicate, but it is not clear what exactly is happening or going to happen, which can mislead tenants and leave them confused.

- Many tenants are unaware of the measures taken because they have more pressing matters to attend to than the associations' measures, this is also indicated in chapter 2, where energy coaches enter homes and they see a lot of unopened letters.
- Both tenants' organisations also mention capacity as a problem, this is also seen in the literature of chapter 2, which hinders the implementation of sustainability measures.
- The tenants' organisations advocate for rent reduction for tenants living in homes with poor energy labels. This way, something can be done quickly for these tenants.

CHAPTER 6, SUB-QUESTION 3
WHAT IS THE GAP BETWEEN WHAT TENANTS WANT AND WHAT HOUSING ASSOCIATIONS ARE DOING?

In this part of the report, the fourth sub-question will be answered. This will be done by comparing what measures the housing association said they were taking (a common practice) and the experiences of the tenant organisation regarding the measures taken by the housing association. The preferred measures by the housing associations and the tenant organisations will also be compared with each other to see if there's a gap between what both groups want.

6.2.1 COMPARISON OF HOUSING ASSOCIATION AND TENANT ORGANISATION

When comparing the two groups, the gaps will first be identified. Then, examples from the focus groups will be used to clarify why these gaps actually exist. After comparing the focus groups, the following gaps have been identified:

6.2.2 TENANT INVOLVEMENT

When it comes to tenant involvement, one would probably first think of the tenant who is not included in the process. However, at Lefier, the opposite was indicated. In the focus group with the tenant organisation of Lefier, it was mentioned that Lefier and the tenant organisation participation moments are attended by few to no people. This is seen as a kind of disinterest; people know where to go or who to voice their opinions to, but they simply do not. Due to this disinterest, people may miss important news about renovations or the announcement of new measures that they could take to combat energy poverty.

6.2.3 TECHNOLOGY ILLITERACY

Ymere indicated that newer technologies are increasingly difficult to understand. As a result, tenants may not understand these technologies well and may even use them incorrectly. This can lead to the installations breaking down, requiring skilled professionals to come and repair them. The problem is that there are too few of these professionals, so it may take a long time before anything is fixed. Additionally, incorrect use of the installations can cause people to use much more energy, causing their energy costs to skyrocket and leaving them worse off than before.
Furthermore, the fact that older people may not be able to handle technology and therefore cannot find out which measures they can take or where they can ask for help can contribute to energy poverty among them.

6.2.4 COMMUNICATION

Both housing associations indicate that they communicate with their tenants as well as possible. However, tenant organisations indicate that there are often communication issues. For example, it is often not clear what is intended with certain renovations or home improvements, which can confuse tenants or make them dissatisfied with the end result. This can cause tenants to be less willing to agree to future renovations by the housing association, potentially making it difficult to achieve the required 70% approval rate.

6.2.5 DIVERSITY AND INCLUSION

Both housing associations acknowledge this problem. Due to the diverse ethical backgrounds of many tenants at both Ymere and Lefier, it can be difficult to provide assistance in a way that everyone understands. The websites try to address this issue by providing text in multiple languages. However, it is still challenging to reach the group of tenants who have immigrated to the Netherlands. Both tenant organisations explain this as a lack of integration of these tenants into society. Although they also state that this responsibility lies more with the government than with the housing associations, it can still cause people to feel disadvantaged or prevent them from seeking help if they are struggling with high energy costs.

Additionally, the tenant organisations of Lefier point out that social cohesion is also decreasing, which means that people are less likely to be helped by their neighbours.

6.2.6 TRUST

According to both tenant organisations, there are tenants who do not trust housing associations. At Lefier, it goes so far that tenants do not trust the measures. Despite the fact that the information mentions the (financial) benefit of making a rental home more sustainable, it appears that tenants do not yet trust the measures. At Ymere's tenant organisation, it is said that tenants often do not trust larger institutions. Because tenants do not trust the larger institutions, which they also rent houses from, they will also be more likely to ask for help or approve the measures that the housing associations want to take.

6.2.7 SHAME

Both tenant organisations first point out that shame is the biggest barrier that tenants face when seeking help. Tenants feel ashamed that they have problems, that they need help, and they do not want to give up too much control. As a result, many tenants experience silent poverty. They are living in poverty but do not report that they need help. This means that this group of tenants cannot be helped by housing associations.

6.2.8 MEASURES

The housing associations opt for targeted renovation and fix teams/energy coaches, whereas the tenant organisations would like to see a greater focus on reducing rents. This indicates that the tenant organisation believes that tenants can be best helped by paying less. This would give them more breathing room with their finances and enable them to use more energy.
The difference in measures is due to the fact that housing associations need to generate income to make homes more energy-efficient and ultimately reduce tenants' high energy costs. While tenant organisations look at the short term to help their tenants, housing associations look to the long term. This was also confirmed by Lefier's tenant organisation, who said that the housing association is also looking to the future.

6.3.1 CONCLUSION CHAPTER

In chapter 6, there was discussed what exactly are the gaps that were found during the focus groups between the housing associations and the tenants. Several findings can be concluded:

- At Lefier, low attendance at tenant participation events suggests that tenants may be disinterested, which could result in them missing important information about renovations or measures to combat energy poverty.
- Ymere highlights that the difficulty in understanding newer technologies can lead to incorrect usage and breakdowns, exacerbating energy poverty; this problem is compounded for older people who may struggle with technology and accessing help.
- While the housing associations claim to communicate well with tenants, tenant organisations report communication issues, such as unclear intentions with renovations or improvements, potentially leading to tenant dissatisfaction and reluctance to approve future renovations.
- The diverse backgrounds of tenants, along with a lack of integration and decreasing social cohesion, pose challenges for providing assistance and support to tenants struggling with energy costs.
- Both tenant organisations note that some tenants do not trust housing associations, with some tenants at Lefier distrusting even beneficial measures despite clear explanations, and some tenants at Ymere not trusting larger institutions in general, potentially leading to reluctance to seek help or approve proposed measures.
- The tenant organisations of both housing associations note that shame is a significant barrier for tenants seeking help, as they feel embarrassed or reluctant to give up control, resulting in many experiencing silent poverty and not reporting their needs to the housing associations.
- While the housing associations prioritize targeted renovation, fix teams, and energy coaches to reduce tenants' energy costs in the long term, the tenant organisations advocate for reducing rents to provide short-term relief to tenants who are struggling financially.

CHAPTER 7, SUB-QUESTION 4:
WHAT RECOMMENDATIONS CAN BE GIVEN TO HOUSING ASSOCIATIONS REGARDING COMBATTING ENERGY POVERTY?

This part of the report will look at what recommendations can be made to reduce the gaps identified in chapter 6 and thus help tenants who suffer from energy poverty. First the recommendations will be given on the hand of the acquired knowledge from the focus groups. After the recommendations are given, there will be a part where feedback on the recommendations is shown.

7.1.1 RECOMMENDATIONS FOR TENANT ENGAGEMENT

Information evenings or participation evenings can of course be organized to improve tenant engagement. The problem reported by Lefier's tenants' organisation is that there is a certain lack of interest, as a result of which tenants do not come to such events. The problem is therefore not that nothing is being done, but that tenants do not want to be involved in the housing associations' processes.

A solution for this has already been provided in the focus group with Ymere's tenant organisations. Here it was told that ambassadors are recruited at the start of a project who want to promote the project. In this case, it will not concern people who are already members of the tenants' organisation, but tenants who live in the neighbourhoods and want to commit themselves to this, who are even closer than the tenants' organisation to the local residents.

7.1.2 RECOMMENDATIONS FOR TECHNOLOGY ILLITERACY

With technology illiteracy, it might be obvious for a association to outsource it to an external party who can arrange it for the tenants like the boiler doctors in Leeuwarden. However, what can be seen in the literature is that the capacity of skilled workers in the energy transition is too small for this and something else will have to be devised, so that the tenants can take matters into their own hands with regard to technology.

For tenants who do not understand it all, for example, it can be ensured that an extra manual is available, which can also be consulted in addition to the normal manual. Information evenings can also be organised about the use of new technologies. This can be done in larger groups, smaller groups, but also through 1-on-1 conversations.

7.1.3 RECOMMENDATIONS FOR COMMUNICATION

The recommendations for better communication have actually already been given by both tenants' organisations. They indicated that it is important that housing associations indicate in detail exactly what will happen and when something will happen. So not only that, for example, a tenant improves his home, but also what will be improved, how that will be done and what is still missing. As a result, tenants know exactly where they stand and there is no confusion afterwards. During communication, therefore, mainly achievable goals will be told, not what the association hopes to achieve, which can lead to disappointment.

Also the use of different types of communication can work. Do not just use letters to get the important messages to the households. The focus groups show that people living in poverty often do not even open them. Because of this it is important to use the mediums over which these people may be using such as; email, digital newsletters or an app for mobile phones.

7.1.4 RECOMMENDATIONS FOR SOCIAL INCLUSION

Because it emerges from the focus groups that the integration of households is not properly regulated by the government, this does not mean that nothing can be done about it. Signals are now given to the housing association if a neighbourhood manager notices that a person does not mix well in the group.

The neighbourhood managers themselves can take matters into their own hands by going through the neighbourhood with these new people, introducing people to them or showing them new things, or

showing places where many people gather. When these households can make contact with other local residents in this way, it will ensure that these people feel more involved in the neighbourhood.

7.1.5 RECOMMENDATIONS FOR TRUST

The first recommendation that can be given has already been partly given in the communication section. By improving communication and ensuring that what is said or told is followed, tenants will be less suspicious of the associations. This is about the form of communication. It was mentioned in the focus groups that tenants often do not open their letters from the associations, so another form of communication will be needed to gain the trust of the tenants.

If the communication comes directly from the housing association, it will probably be received with suspicion. In this problem, intermediaries can be used, who are the bridge between the housing associations and the tenants. It is important that this person does not represent the housing association, but can and may provide independent advice that will help the tenants. This person will communicate transparently and reliably and the physical and emotional needs of the tenants will also have to be included in the help that is offered. Here, energy coaches are already a good first step in the right direction.

7.1.6 RECOMMENDATIONS FOR SHAME

In the case of shame, the main problem is that people do not dare to seek help, because they are therefore ashamed. Here the threshold must be lowered. This threshold can be lowered by inviting people to support groups where they can acknowledge a common problem. It will therefore become clear here that they are not the only ones who are struggling with this problem and a kind of group bond can therefore be created among tenants. If they know that their co-tenants are also affected by this, they can possibly contact them to talk about it. In this way, this threshold can be lowered. When these discussion groups are organized by the housing associations, they can also learn more about the problems that exist in the neighbourhoods.

If there is not enough enthusiasm for these types of support groups, a trusted person in the neighbourhood can also visit people who may already be aware that they are experiencing these problems in order to discuss this. By entering into a conversation with these people in this way, this threshold can also be lowered. This, in turn, may mean that these people will be open to discussing these kinds of issues with other tenants, or going to such support groups and hopefully seeking help afterwards.

7.1.7 RECOMMENDATIONS FOR MEASURES THAT CAN BE TAKEN

There is a gap between tenant organisations and housing associations due to their differing preferences, with tenant organisations preferring rent reductions for low-rated housing units and housing associations favouring sustainable housing.

Of course, we can consider the shared preferences of housing associations and tenant organisations. When looking at these preferences, 3 out of 4 choose Indoor Sustainability Improvement as a good measure. Although this measure may not be efficient in terms of time, it allows for quick action to be taken for those who need renovation the most. One recommendation here could be, if there is enough capacity, to consider selective renovations of specific homes alongside large-scale renovations of entire blocks. To determine which households would benefit from this, we can look at the work that Ymere is doing in Haarlemmermeer, where they overlay maps to identify areas where people potentially experience the most energy poverty.

If implementing this measure proves to be difficult, there are always less invasive alternatives to consider, such as energy coaches and fix teams. These measures still contribute to some savings on energy bills. Energy coaches and fix teams can be deployed similarly to how Ymere is doing it: households that are last in line for renovations are prioritized to receive an energy coach and fix team first. This approach can also be combined with the work that Ymere is doing in Haarlemmermeer. This way, energy coaches and fix teams can be sent to households that need them the most with even greater precision.

7.2.1 FEEDBACK RECOMMENDATIONS

As a final step to assess the value of the recommendations, the three gaps along with their corresponding measures have been sent to the housing associations to determine their views. These three gaps and accompanying recommendations are; communication, trust, and shame.

7.2.2 COMMUNICATION

Ymere: From Ymere's perspective, they state that no one would be against the recommendation to improve communication. However, they emphasize that the focus lies in how it is implemented. They also mention that they cannot achieve this alone and that they need the involvement of tenant organisations, both the overarching tenant organisation and local residents' committees. Only by working together can real progress be made. This is because tenant organisations often still have the trust of the tenants, which can make a difference in achieving the 70% acceptance rate for renovation proposals (Ymere, personal communication, 2022).

Ymere also indicates that they are already working hard to improve communication with their tenants. Currently, they are collaborating with the Tenant Organisation SHY to develop a "basic social plan." This plan will outline the specific actions that will take place during renovations of E, F, and G label homes, including the duration of the process, the participation structure, and the absence of rent increases. Ymere believes that this plan will be helpful. However, they acknowledge that such communication can also create new challenges. There may be requests for different types of renovations or the need for additional actions beyond what is outlined in the communicated program. This will lead to further discussions (Ymere, personal communication, 2022).

Lefier: It is noted from Lefier that they already implement this recommendation. They also mention that before distributing brochures, they review them with the tenant organisation (Lefier, personal communication, 2022).

7.2.3 TRUST

Ymere: Ymere emphasizes that the timing of interventions is crucial. During interventions, the relationship between the housing association and the tenant can be significantly tested. They also mention that there is a role for tenant organisations and residents' committees. However, Ymere states that these organisations should be (professionally) supported during interventions. This support is already provided wherever possible. According to Ymere, this support provider can also serve as the required trusted person (Ymere, personal communication, 2022).

Lefier: According to Lefier, they do not encounter these problems, and they do not send letters in the pre-process. They also mention that communication remains challenging, regardless of the good intentions of the housing association (Lefier, personal communication, 2022).

7.2.4 SHAME

Ymere: Ymere acknowledges that this problem seems less easily graspable. They believe that talk groups are a good idea, but they also express that reaching the intended target audience is challenging, as it requires them to overcome a certain level of shame, which they do not see happening easily. A trusted person going door-to-door would face the same difficulties.

However, Ymere mentions that they have multiple ways to find out what is happening in neighbourhoods. Their district managers serve as the eyes and ears on the ground. They also receive signals through tenant committees, local meetings, and surveys (BAR meeting, neighbourhood monitor). By combining these sources of information, they aim to get a comprehensive understanding of what is happening in the community. Nevertheless, they acknowledge that the issue of shame has not been resolved through these methods. When engaging in conversations with tenants, Ymere always strives to be as empathetic as possible, assess what more they can do, and pass on any relevant signals.

Ymere observes that individual staff members who have direct contact with tenants are often trusted and appreciated. For example, their service technicians have the highest tenant satisfaction ratings. They also state that they aim to improve the relationship with tenants through this approach, by having more Ymere service technicians visit tenants instead of unfamiliar contractors (Ymere, personal communication, 2022).

Lefier: Lefier suggests that such talk groups would be better organized by tenant organisations because they are closer to the tenants than housing associations. They also note that this issue was evident in the distribution of energy packages and when engaging in conversations with tenants who were struggling financially. Furthermore, Lefier questions whether this target group actually has a need for such talk groups because their experience indicates that withdrawn individuals typically have no desire to share their suffering (Lefier, personal communication, 2022).

7.3.1 CONCLUSIONS CHAPTER

In chapter 7, there was discussed what housing associations can do to reduce the gap between them and their tenants. Several recommendations were given:

- To address tenant engagement in participation events, recruiting neighbourhood ambassadors, who are closer to residents than tenant organisations, can promote housing association processes and encourage tenant engagement.
- To address technology illiteracy, tenants can be equipped with additional manuals, organize information evenings, and provide individual support, enabling them to independently manage technology despite the limited capacity for outsourcing.
- To address communication, housing associations should provide detailed information about improvement plans and timelines, utilizing channels like email, digital newsletters, and mobile apps for effective communication with tenants, including those facing poverty.
- To address social inclusion, action can be taken to address household integration. Neighbourhood managers can signal the housing association about individuals who struggle to mix in and personally guide them through the community to foster connections with other residents.
- To address trust, intermediaries acting as bridges between housing associations and tenants can provide independent advice, addressing physical and emotional needs. Energy coaches can serve as a positive initial step in this direction.
- To address shame, lowering the threshold is crucial for people to seek help. Support groups can be organized, creating a sense of community and normalizing shared struggles. Alternatively, trusted individuals can personally reach out to those affected, encouraging open conversations and facilitating participation in support groups.
- Tenant organisations and housing associations have differing preferences. Indoor sustainability improvements are favoured, but if challenging, alternative measures like energy coaches and fix teams can be considered. Combining approaches and mapping areas of energy poverty can enhance precision in providing support to households in need.
- When looking at the feedback on the recommendations, both groups indicate that cooperation with other parties, such as the tenant organisation, is crucial for implementing the recommendations, because the tenant organisation is closer to the tenants.

CHAPTER 8
CONCLUSION & DISCUSSION

The main aim of this research was to give out recommendations to housing associations on how to close the gap between them and the tenants who are experiencing energy poverty at this moment and in the future. This was done on the basis of a literature study and focus groups. In the conclusion, all the most important findings will be shown. The matters investigated will be discussed below in the discussion.

8.2.1 CONCLUSION

This research aimed to explore the actions that housing associations can take to narrow the gaps between themselves and their tenants in addressing energy poverty. The research was done on the basis of a literature review, in order to find out what exactly energy poverty entails and what tenants and associations are already doing themselves. A case study was also carried out in combination with focus groups to find out how tenants view this problem, what exactly they are already doing to combat energy poverty and what they would still like to see and how housing associations view this problem, what their findings are. what they are already doing and what they would still like to see. Several research questions formed the basis of this study, allowing for an in-depth examination of recommendations that housing associations can implement to tackle energy poverty. The main question of this research is: **What can housing associations do to close the gap between them and their tenants in the social housing sector regarding combating energy poverty?** This research question was answered on the basis of 4 sub-questions. These sub-questions are:

- **What role can social housing associations play regarding combatting energy poverty?**
- **What role can tenants play regarding combatting energy poverty?**
- **What is the gap between what tenants and housing associations are doing?**
- **What recommendations can be given to housing associations regarding combatting energy poverty?**

The following points can be concluded from the results of the study:

8.2.2 LITERATURE STUDY

Energy poverty affects households unable to heat their homes effectively due to lack of funds, poor insulation, and heating systems. This problem is prevalent among those living in poverty, which leads to higher healthcare costs and worsened health. Energy poverty is significant in the northeast, east, southeast, and major cities in the Randstad. Worst homes are located in city and rural areas, while moderately and sparsely urbanized municipalities have the least energy poverty. Sustainable and energy-efficient housing investment and affordable energy access are crucial to combat energy poverty and contribute to a sustainable future.

The slow pace of home renovation is attributed to multiple factors, including a shortage of materials, specialized workers, and funding. This capacity issue is also confirmed by focus groups, indicating that it is a prevalent problem. Due to a lack of funds, housing associations cannot renovate or build the required number of homes on time. As per literature, the use of solar panels can help reduce energy bills.

The issue of energy poverty affects many households in the Netherlands, particularly those in lower-income classes. However, there are some proactive measures being taken by tenants themselves to combat this problem. Despite financial constraints, households are also finding ways to make ends meet, such as only heating essential spaces in their homes. Additionally, there also was a 15% decrease in gas usage in 2022, which suggests a change in household behaviour. This can also be explained by the prebound effect, where people with less disposable income tend to use less energy than necessary.

It is worth noting that households with a positive view of the energy transition are willing to pay more for energy-saving measures.

8.2.3 CASE STUDIES

Housing associations

Fortunately, the number of tenants who cannot pay their bills has not increased at either association, indicating that people are still paying their rent and energy bills but may be sacrificing other things. The rise in solar panel requests at both associations may indicate that tenants are more aware of their energy consumption and want to take action. Reports of mold in homes indicate that tenants are not adequately informed about how to ventilate their homes properly. Tenants keep windows and doors closed at all times to retain heat in the homes, which leads to mold formation. The energy poverty trend is evident in both associations, indicating a similar trend in the Randstad and northeast of the Netherlands.

For the most preferred and least preferred measures, both associations state that they preferred indoor sustainability improvement as the first best measure, the second measure that was chosen was energy coaches and fix teams. Housing associations do not want to decrease rent as this would result in less rental income for renovation and maintenance. This aligns with literature that shows housing associations generally lack funds for renovations and construction of homes. Both associations are focusing on using energy coaches to educate tenants about their energy consumption behaviour as it will take a long time to renovate all homes.

Tenants

Both tenants' organisations mentioned the issue of energy poverty and lack of trust in housing associations. There is also a lack of clear communication from the associations, leaving tenants confused and unaware of the measures taken. Many tenants are also embarrassed to seek help from institutions, as shown in both the focus groups and the literature.

Capacity is also identified as a problem, hindering the implementation of sustainability measures. Both tenant organisations saw the rent decrease for households with bad energy labels as the best measure to take and saw indoor sustainability improvements and energy coaches as second best, to quickly do something about the high energy bills. Both organisations saw targeted moving options as the worst measure to take, because it is impossible to implement.

8.2.4 COMPARISON CASE STUDIES

The gap between housing association and tenant

The issue of energy poverty among tenants poses several challenges, including a gap between what tenants desire and what housing associations can provide. At Lefier, low attendance at tenant participation events suggests disinterest, leading to missed information about measures to combat energy poverty.

Similarly, at Ymere, tenants' difficulty in understanding newer technologies can lead to incorrect usage and breakdowns, worsening energy poverty, particularly for older people.

Communication issues also exist, with unclear intentions for renovations and improvements leading to tenant dissatisfaction and reluctance to approve future renovations.

The diverse backgrounds of tenants, along with a lack of integration and decreasing social cohesion, make providing assistance and support more challenging. Furthermore, some tenants do not trust housing associations or larger institutions in general, potentially leading to reluctance to seek help or approve proposed measures.

Shame is also a significant barrier for tenants seeking help, leading to silent poverty and underreporting of needs.

While the housing associations prioritize indoor sustainability improvements, fix teams, and energy coaches to reduce energy costs in the long term, tenant organisations advocate for reducing rents to provide short-term relief to financially struggling tenants. Second, the tenant organisations also preferred indoor sustainability improvements and energy coaches.

8.2.5 RECOMMENDATIONS COMING FROM THE COMPARISONS

Recommendations for closing the gaps.

To promote tenant engagement, housing associations can recruit neighbourhood ambassadors who have closer ties to residents than tenant organisations. These ambassadors can effectively promote housing association processes and encourage tenant involvement. Technology illiteracy can be addressed by providing tenants with additional manuals, organizing information evenings, and offering individual support to empower them in managing technology independently.
For improved communication, housing associations should provide detailed information about improvement plans and timelines through channels like email, digital newsletters, and mobile apps. This approach ensures effective communication, even with tenants facing poverty. To foster social inclusion, actions can be taken to address household integration by having neighbourhood managers identify individuals struggling to mix in and personally guide them through the community, fostering connections with other residents.
Building trust requires intermediaries who provide independent advice, addressing physical and emotional needs. Energy coaches can serve as a positive step in this direction. To address shame, lowering the threshold for seeking help is crucial. Support groups can be organized to create a sense of community and normalize shared struggles, or trusted individuals can personally reach out, encouraging open conversations and facilitating participation in support groups.
Cooperation with tenant organisations is crucial for implementing recommendations effectively, as both groups indicate in their feedback.

8.3.1 DISCUSSION

At the beginning of the report, in the introduction, a main question and several sub-questions were presented. This part of the report will examine whether the research questions have been completely answered, how they can be interpreted, how the acquired knowledge relates to previous research, the strengths and weaknesses of the research, and how the findings can be applied in practice. These will be discussed below.

At the start of the research, it was assumed that there is a certain gap between the policies of housing associations and the desires of tenants of social housing provided by these associations. This was attempted to be proven using one main question, a literature study and four sub-questions.

The research questions have been completely answered in this study, although further research is needed to see if the proposed measures work.
The major part of the first sub-question is based on qualitative research. The sub-question has now been fully answered. The activities of housing associations with regard to energy poverty were examined. The literature in the literature review in chapter 2 also formed the basis for this. Much of the literature can be found in the focus groups, such as that tenants have started to burn less fuel, or that housing associations see restrictions with both money and capacity. Both associations were asked exactly the same, in order to make the best possible comparison with each other to see whether the trends that occur in the Randstad are also occurring in the northeast of the Netherlands. It can be deduced from the research that there may be a similar trend in both areas, with both the tenants' problems, such as money, trust and shame, and the association's problems in the form of communication and capacity. The literature also shows that both trust and shame are also a hindrance. It was noticeable, however, that tenants were able to manage to a certain extent, according to the housing associations, since rent arrears also remained the same or even decreased. A point that must be mentioned is that the focus group with Ymere consisted of 2 people, while the focus group of Lefier consisted of 5 people. This way it may be less possible to answer on more than one level. This may have resulted in the study not being fully representative. However, both groups only included people who dealt with energy poverty, so they were specialists in that area within their own organisation. Finally, it was also indicated that the work not only lay with the association, but also that the government had to help to solve this problem.

For the second sub-question, qualitative research was also carried out for the majority of the participants in order to answer the sub-question in its completeness. The view of the tenants regarding energy poverty was examined. Here too, the literature search that was carried out in chapter 2 formed a basis. As with the first sub-question, much of the literature can be found in the focus groups. For example, in the literature and in the focus groups, the prebound effect, the fact that tenants use less energy, the capacity problem that the tenants' organisations see in the housing associations, but also the trust and shame, can be found. There are also many similarities in sub-questions 1 and 2. Both groups indicated that rent arrears had not increased. This while the problem of energy poverty has become bigger. This is also indicated in the focus groups and can also be found in the literature. Because there were many similarities in the answers given by the tenants' organisations, it can also be noted that the same trend may be occurring in both areas. What was striking about the first sub-question is that a call was also made to the authorities to solve this problem. This was also done in the focus groups of the tenants' organisations. So both parties are on the same page here.
The fourth sub-question involves comparing the responses from the focus groups in order to identify any gaps between tenant desires and housing association actions. Only the knowledge gained from the focus group discussions is used to answer this sub-question, in order to provide a complete answer based solely on the experiences of the participants. What was striking here is that major problems that play a role are shame and trust. Because these problems are major according to the associations and tenants' organisations, it will therefore happen that a lot of people cannot be helped, because they will never raise the alarm themselves.
The fourth sub-question provided recommendations for reducing any gaps identified in the third sub-question. The knowledge gained during the focus groups was used for this purpose. This knowledge is supported by literature. Among the recommendations, 5/7 recommendations are partly supported by literature. The core of the recommendations has been completely extracted from the knowledge gained in the focus groups, in order to match the gaps found during these focus groups as closely as possible. The core of a large part of the recommendations is that communication is not optimal or that trust is too low. This also arises from the literature in chapter 2. By asking for feedback from the housing associations after drawing up the most important gaps, the recommendations were immediately tested by professionals, which means that it is possible to look further than just the recommendations. From the focus groups, the impression was created that the housing associations are opposed to the tenants and that the recommendations will also only have to do with the housing associations. But the feedback shows that the associations can achieve a lot more in collaboration with the tenants' organisations.

The research can be interpreted in different ways. For readers who experience energy poverty, some parts of literature study can be seen as confronting because people read about what energy poverty exactly entails. This can cause an unpleasant feeling, as they may label themselves as energy poor. While some parts in the literature study can be confronting for people experiencing energy poverty, the first and second sub-questions can be confronting for housing associations. This can be due to the fact that the second sub-question discusses what housing associations are doing wrong or where they fall short. In the third sub-question, where the gap is identified, it may seem like housing associations are not doing enough to help their tenants, which can be confronting.

Because energy poverty has not yet received much attention in the Netherlands and has only really received a lot of attention since the enormous rise in energy prices, not much is known about it outside of TNO research. As a result, it is not really possible to measure how this study compares to previous studies. It can be said, however, that the results of the research that has been done are representative, because they have been confirmed by several parties. And not only by the associations, but also by the tenants' organisations.

On the part of the housing associations, the focus group participants are representative of other housing associations that are themselves already involved in energy poverty. When associations are not yet concerned with energy poverty, there will be some things (such as trust and communication) that are

comparable in other situations. Because these are two large parties in housing association land, this can also ensure that it is not representative, because smaller housing associations may experience completely different problems.
On the part of the tenant organisations, the participants are representative on the one hand and not on the other. On the one hand, because they are also in the middle of it and talk to the tenants, so they also know what is going on. On the other hand, because they are not the tenants who experience severe energy poverty, certain measures for tenants who have the lowest income in the Netherlands can turn out very differently.

The strengths of this study are that the different sides of the problem have been highlighted and that the problems at more than 1 housing association and tenant organisation have been investigated. By not only looking at what housing associations do or what tenants would like in the fight against energy poverty, but by highlighting both sides, the gap between what tenants want and what the associations do can be explained as well as possible. Investigating this at 2 housing associations also ensures that a more detailed picture is formed of the problems that tenants encounter and how housing associations try to solve this.
A weakness of this study is that even though the recommendations are supported by literature, it has not been proven that these recommendations actually work. Research on the given recommendations is needed to confirm their effectiveness. However, because feedback has already been requested from the associations, there is already some indication of whether the recommendations can be of benefit.

This report can be used by tenants who experience energy poverty as a means to see what housing associations are already doing and what they are trying to do, in order to keep tenants' costs as low as possible. For housing associations, this report can be used to see what the wishes of tenants are regarding energy poverty and to consider using the recommendations in their own organisation in the fight against energy poverty.
Lastly, this study can also be used by tenant organisations to compare the practices of their housing associations with those of others. This can help tenant organisations make suggestions to their own housing associations regarding their energy poverty policies.

CHAPTER 9
REFLECTION

In the beginning, the intention was to conduct this research through surveys sent to all housing associations in the Netherlands, to see which measures they thought worked or not. As the research progressed, focus groups were chosen to get a more detailed picture of the measures being taken and why they may or may not work. In retrospect, this was the right choice, as it also looked at how tenants view the issue of energy poverty. This created a much more detailed picture of the measures taken against energy poverty and whether they worked.
The feedback from my supervisors was well-founded and clear. With 3 official supervisors, I noticed that the feedback could sometimes be overwhelming, but because all 3 supervisors had different disciplines, issues and topics in my thesis were looked at from multiple perspectives, and I was not directed in just one direction. I think the processing of feedback went well. By writing down everything that was said, most of the feedback could be incorporated where necessary. By also asking questions about the feedback and about the thesis in general, I found that the feedback went even deeper into the subject matter.
What I learned from my own work is that communication really is the key to success. In my thesis, the recommendations are largely focused on communication. However, communication is also very important during the feedback moments of my thesis. The thesis showed that clear communication is important to avoid misunderstandings, and there was also a lot of clear communication during the feedback moments, to minimize misunderstandings.
The last part of my graduation will mainly be reserved for implementing the feedback given during the P4 presentation, finetuning the recommendations given and making the texts even more readable so that they are accessible to everyone.

Everywhere in the Netherlands people cope with high energy bills. This creates a group of people who are having a harder time paying their energy bills because of their low wages. This will create a greater inequality between households who can easily pay their bills and households that aren't able to. These challenges are also addressed in the master track (for instance with REM, G-buurt, where a lot of people live who aren't earning a lot of money, have difficulties paying their bills, are living in housing association homes but still have to make a living for themselves). By doing so, my topic is connected to the master's track and the master's program.
The research that was done by myself actually completely changed the design of my research. Because the research eventually focused more on the tenants, the research and the research questions eventually also went more in this direction, which led to this research. When the design of the research after the P2 was actually finished, it was possible to search very specifically for literature that helped answer the research questions, which made it easier for myself.
During the research, a lot of literature was searched and a lot of literature was used. Due to this method of working, too much literature was eventually used and a lot of literature had to be removed at the end, because it had nothing to do with the research. The large literature review made it easy to prepare the focus groups.
The societal value, scope and implication of the graduation project is great here for tenant organisations and housing associations, because they can see what the gaps can be between social tenants and housing associations. This allows them to see for themselves where there might be gaps in their organisation and what they can adjust if necessary.
Because the results of the study are recommendations based on previous research, the results will be easy to transfer to other studies and thus not only investigate gaps between housing association and tenant, but also, for example, how shame can be reduced in groups.

Biggest challenges:

The main challenge of the study was to organize the focus groups. Because there is not much time between the P2 date and the P4 date, everything had to be done at a rapid pace. The other major challenge of the research was also time related. Because the P3 date and the P4 date are exactly one month apart, there was not much time to properly put the results of the study in the report.

Project contributions future study:

This research that has been done can be the start of a subsequent study, where it can be investigated whether the measures also work in practice and whether the measures not only work, but are also easy to implement, so that the gaps can easily be reduced. become.

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APPENDIX

Energy poverty, bridging the gap between housing association and tenant

0. Administrative questions

1. Name of data management support staff consulted during the preparation of this plan.

My faculty data steward, Diana Popa, will review this DPM in the future.

2. Date of consultation with support staff.

2023-06-01

I. Data description and collection or re-use of existing data

3. Provide a general description of the type of data you will be working with, including any re-used data:

Type of data	File format(s)	How will data be collected (for re-used data: source and terms of use)?	Purpose of processing	Storage location	Who will have access to the data
Anonymised data on how tenants look at energy poverty	Voice recording - mp4	Focus group	To gain knowledge about what preferred measures tenants come up with regarding energy poverty	SURF Drive	Research team
Anonymised data on how housing associations look at energy poverty	Voice recording - mp4	Focus group	To gain knowledge about what proposed measures housing associations come up with regarding energy poverty	SURF Drive	Research team

4. How much data storage will you require during the project lifetime?

- < 250 GB

II. Documentation and data quality

5. What documentation will accompany data?

- README file or other documentation explaining how data is organised

III. Storage and backup during research process

6. Where will the data (and code, if applicable) be stored and backed-up during the project lifetime?

- SURFdrive

IV. Legal and ethical requirements, codes of conduct

7. Does your research involve human subjects or 3rd party datasets collected from human participants?

- Yes

8A. Will you work with personal data? (information about an identified or identifiable natural person)

If you are not sure which option to select, ask your Faculty Data Steward for advice. You can also check with the privacy website or contact the privacy team: privacy-tud@tudelft.nl

- No

8B. Will you work with any other types of confidential or classified data or code as listed below? (tick all that apply)

If you are not sure which option to select, ask your Faculty Data Steward for advice.

- Yes, politically-sensitive data (e.g. research commissioned by public authorities, research in social issues)

9. How will ownership of the data and intellectual property rights to the data be managed?

For projects involving commercially-sensitive research or research involving third parties, seek advice of your Faculty Contract Manager when answering this question. If this is not the case, you can use the example below.

The data is available for the project team conducting the research during the time the research is held. During the active phase of research, the on leading the project from TU Delft will oversee the access rights to data. Afterwards the datasets will be released to the public following the Delft Research Data Framework Policy if there aren't any reasons not to.

V. Data sharing and long-term preservation

26. What data will be publicly shared?

- All data (and code) underlying published articles / reports / theses
- All data (and code) produced in the project

28. How will you share your research data (and code)?

- All data will be uploaded to 4TU.ResearchData

30. How much of your data will be shared in a research data repository?

- 100 GB - 1 TB

31. When will the data (or code) be shared?

- At the end of the research project

32. Under what licence will be the data/code released?

- CC BY-NC

VI. Data management responsibilities and resources

33. Is TU Delft the lead institution for this project?

- Yes, the only institution involved

34. If you leave TU Delft (or are unavailable), who is going to be responsible for the data resulting from this project?

Joris Hoekstra is the supervisor of this project. He will be responsible for the data. (J.S.C.M.Hoekstra@tudelft.nl).

35. What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?

There is expected this research will take no more than 1TB of data. So it will be free of charge in the future.

APPENDIX 2: Research plan

WEEK 0	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11	WEEK 12	WEEK 13	WEEK 14	WEEK 15	WEEK 16	WEEK 17	WEEK 18	WEEK 19	WEEK 20
Contacting housing associations	Contacting housing associations	Contacting housing associations	Contacting housing associations	Contacting housing associations																
Contacting tenant organisations	Contacting tenant organisations	Contacting tenant organisations	Contacting tenant organisations	Contacting tenant organisations																
			Setting up focus group content	Setting up focus group content	Setting up focus group content	Setting up focus group content	Setting up focus group content	Setting up focus group content	Setting up focus group content											
					Focus group	Focus group	Focus group	Focus group	Focus group											
					Processing information focus groups	Processing information focus groups	Processing information focus groups	Processing information focus groups	Processing information focus groups	Processing information focus groups										
Continuing literature review	Continuing literature review	Continuing literature review	Continuing literature review	Finishing literature review																
Research question 1	Research question 1	Research question 1	Research question 2 + 3	Research question 2 + 3	Research question 2 + 3	Research question 2 + 3	Research question 2 + 3 + 4	Research question 2 + 3 + 4	Research question 2 + 3 + 4 + 5	Research question 2 + 3 + 4 + 5	Research question 2 + 3 + 4 + 5	Conclusion, discussion + reflection	Conclusion, discussion + reflection							

	WEEK 7, 8, 9 – P3 PRESENTATIONS
	WEEK 14, 15, 16 – P4 PRESENTATIONS
	WEEK 19, 20 – P5 PRESENTATIONS