university of groningen / faculty of spatial sciences

Implementation of energy transitions in housing: addressing energy poverty on a local scale.

A reflexive case study of the municipality of Oldambt

Bachelor thesis for BSc Spatial Planning and Design
Faculty of Spatial Sciences
University of Groningen

Author

R. J. Kemp
S3367703

Supervisors

Dr. M. T. van Geet
Dr. R. C. Spijkerboer

Date

June 16, 2023

Word count

6600

Abstract

This thesis explores the connection between energy poverty (EP) and energy transitions in housing. It stresses the urgency of climate change mitigation measures by looking at the local. In the Netherlands, municipalities have been tasked with reaching CO_2 emission reduction goals related to household energy consumption. The thesis is based on a case study of the municipality of Oldambt, which sees among the highest EP in the Netherlands. The case study consists of a mixed methods approach, seeking to answer the research question: How do local energy transitions in housing affect energy poverty in the municipality of Oldambt? The findings suggest that EP forms a hurdle in achieving CO_2 reduction goals, especially in municipalities like Oldambt. Simultaneously, it provides an opportunity for governments to cooperate in implementation of energy transition policies. Special attention is paid to the execution of PAW-project Nieuwborgen, which exemplifies the potential for municipal involvement in energy transitions, highlighting the issues local level governments might face when actively partaking.

Keywords: sustainability, energy transitions, energy poverty, policy, municipality

Contents

Achieving net zero emissions by 2050 will require nothing short of the complete transformation of the global energy system.

- IEA (2022)

List of abbreviations

CBS: *Centraal Bureau voor de Statistiek*

CO_2: Carbon Dioxide

EP: Energy Poverty

GHG: Greenhouse Gas

ISDE: *Investeringssubsidie duurzame energie en energiebesparing*

Kton: Kiloton (1000000 kg)

NPLW: *Nationaal Programma Lokale Warmtetransitie*

PAW: *Programma Aardgasvrije Wijken*

PBL: *Planbureau voor de Leefomgeving*

Pj: Petajoule (1000000000000000 joule)

RREW: *Regeling Reductie Energiegebruik Woningen*

RWLP: *Regionaal Woon- en Leefbaarheidsplan*

SDE: *Stimulering Duurzame Energieproductie*

Tj: Terajoule (1000000000000 joule)

TNO: *Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek*.

1. Introduction

Globally, 64% of anthropogenic greenhouse gas (GHG) emissions are linked to fossil-fuel based energy consumption. GHG emissions are the main driver of climate change and should be reduced quickly and drastically. In 2021, 10.8% of total Dutch energy consumption (including conversion losses) originated from renewable sources, meaning that 89.2% comes from fossil fuels. Dutch households are responsible for 14% of total energy consumption, which accounts for 10.3% of Dutch GHG emissions (Ruyssenaars et al., 2021; CLO, 2022).

After the Paris Climate Agreement of 2015, the Netherlands has set national goals regarding reduction of CO_2 emissions (88% of human-caused GHG) for 2030 and net zero goals for all GHG emissions, to be reached by 2050. These goals are essential in contributing to halting global climate change, which affects national and local weather systems (KNMI, 2021).

It is necessary to transition to renewable energy systems to achieve net zero GHG emissions before 2050 to limit further warming. This 'energy transition' requires large-scale socio-technical transformations across society, as well as unparalleled private and public investment (Geels et al., 2017). Councils and regional governments are crucial in achieving climate change mitigation scenarios resulting in less than 2 °C warming; they should therefore put climate change high on their agendas. Socio-technical transformations require swift implementation of changes in policy regarding the built environment (IPCC, 2022).

Governmental guidance (through e.g. subsidies and other means of incentivisation) can take away the obstacles introduced by costs. The involvement of governments on all levels is critical. Micro-level (individual households) improvements can be steered through project-based macro-level incentivisation (street, neighbourhood, town) aiming to decrease fossil fuel use. Municipalities can play a facilitating and informing role by e.g. approaching entrepreneurs, industry and farmers as well as households, creating a collective benefit, when cooperating with higher levels of government, responsible for strategies and visions (Geels et al., 2016).

Given the rapidly approaching emission reduction goals, Dutch municipalities have had to create a strategy for energy transitions related to energy usage in Dutch

households. This policy document, called *Transitievisie Warmte* focuses on the heating of homes, which is the main energy use for households (Programma Aardgasvrije Wijken, 2021).

Mulder et al. (2023) stated that due to high costs, energy crises and inability to improve housing, large parts of the population may be excluded from partaking in energy transitions. This could lead to higher energy poverty (EP), causing societal inequities and loss of public support for policies to increase, slowing down or halting energy transitions required for achieving net zero by 2050.

Due to (inter and supra)national legislation and shifts to renewable energy sources, fossil fuels will become more expensive in the future, hitting EP households. Furthermore, price uncertainties due to COVID and the Russian invasion of Ukraine have increased dependency on international markets (Van Schaik et al., 2022), another reason to move away from fossil fuel-based energy systems. It remains unclear what will happen to those suffering from EP in upcoming energy transitions.

Scope and research problem

Mulder et al. (2023) report that a large threat to energy transitions in housing is found in the 48% of Dutch households that cannot afford *or* are not allowed to improve their housing. This figure can be explained by the large share of social housing and home owners not being able to afford sustainability measures. This divide introduces difficulties in analysing figures of EP related to housing. Municipalities cannot locate EP, which is a necessary first step in executing the *Transitievisie Warmte*.

Despite total EP of the Netherlands being among the lowest in Europe (Van Ooij et al., 2023), certain areas in the Netherlands suffer more than others. The Eastern part of the province of Groningen, specifically the municipality of Oldambt (see figure 2), has among the highest percentages of EP and has therefore been selected for the case study. This thesis addresses the issues that arise when energy transitions coincides with EP. It tries to answer the central question:

How do local energy transitions in housing affect energy poverty in the municipality of Oldambt?

With the following sub-questions:

1. What is considered to be energy poverty in the municipality of Oldambt and how is it being addressed?
2. How does the municipality of Oldambt implement energy transitions in housing?
3. How does the municipality of Oldambt incorporate energy poverty in their policy on energy transitions in housing?

The aim is to add to a body of existing literature by performing a case study, as research on EP *and* energy transitions on a municipal (local) level, is scarce.

Structure of thesis

Chapter 2 contains the theoretical framework and conceptual model which explain all relevant concepts and chosen variables by looking at existing literature. Chapter 3 breaks down methodology and data collection instruments. Chapter 4 presents the results of the data collection, which are then discussed and reflected upon in chapter 5. Chapter 6 provides a conclusion and addresses future research.

2. Theoretical framework

Energy transitions

Geels et al. (2017) and Geels et al. (2018) refer to sustainability transitions as 'systemic innovations', where the main goal is to create a harmonious relationship between humanity and 'earth'. Part of the solution can be found in overhauling energy systems, which are the most damaging to climate, nature and health. On a large scale, energy 'production' will move to wind, solar and biomass.

On smaller scales, energy transitions in housing entail renovations and implementation of technological devices that improve energy 'efficiency' of households, ultimately moving away from fossil-fuel based energy systems, therefore relating to consumption. Heat pumps, insulation, insulated glazing, new energy carriers (e.g. hydrogen and green gas) and electric cooking can decrease and phase out household fossil fuel usage (Ürge-Vorsatz et al., 2015).

Heating currently accounts for 80% of housing-related household fossil fuel-based energy demand. Thus, large improvements can and should be made here first, but require large investments (Van Ooij et al., 2023). Renovations addressing energy savings are key. These transitions are costly, as addressed by Mulder et al. (2023), meaning that those who cannot afford energy as of now will not be able to partake.

Energy poverty

Globally, housing-related EP entails the 'lack of *access* to energy services', in the broadest sense of the word (Straver et al., 2020). According to Feenstra et al. (2021), literature on EP in developed countries considers it the inability for a household to afford the desired energy demand. This is defined by indicators based on energy expenditures as percentage of income, expressed as a 'payment risk'. They sought a new definition, together with PBL ('*Planbureau voor de Leefomgeving*'), to expose 'hidden' EP, where people who cannot afford their desired energy demand, cut down their consumption drastically. They strove to disaggregate households suffering from general poverty, as it is the households who suffer from EP specifically that are difficult to trace and target.

Straver et al. (2020) mentioned that a more holistic and in-depth definition, containing at least the inability to afford energy demand, inability to implement sustainability measures and inability to improve housing quality, exposes and addresses all EP relevant to energy transitions in housing.

Mulder et al. (2023), having updated these indicators in discourse with CBS, TNO and PBL, conclude that 7% of the Dutch households face direct issues, based on 1) energy affordability and 2) the quality of housing. Both indicators refer to the *inability* to afford energy or improve the quality of housing. A more precarious situation is exposed when a third, new, indicator was added: 3) the inability, both financial and legal, due to tenancy, to implement sustainability measures. Then, 48% of the Dutch households cannot participate in energy transitions and therefore become part of the EP-population, creating a significant hurdle in achieving nationally determined goals. They concluded that EP as such is more spatially distributed than income poverty, occurring predominantly in old dense inner cities and peripheral areas. The Province of Groningen stands out (see figure 2).

Given the common denominators in these definitions, housing-related EP will be considered *the inability to afford*: 1) energy, 2) improvements to housing quality and 3) to partake in energy transitions.

Interaction between energy transitions and EP

Though energy transitions and EP seem the responsibility of the individual, it is the government who can and should have a guiding role in addressing both (Ehnert et al., 2018). Feenstra et al. (2021) add that a national agenda regarding EP as part of energy transitions is necessary, as EP stands in the way of achieving energy transitions. They argue that policy helps establish guidelines for lower levels of government, who have more feel for their region. As the Netherlands currently lacks a clear agenda and definition of EP, the role of the welfare state in addressing EP and energy transitions simultaneously depends on the willingness and capacity of lower levels of government (municipalities and provinces), as well as RES-regions.

Van Ooij et al. (2023) suggest that differentiated approaches can help create or accelerate participation if governments focus on providing guidance and support for energy-saving measures that require reconstruction. To make assistance as effective as possible, policy should target groups within the EP population, as largest improvements are expected there. Municipalities are closest to citizens, therefore their involvement should be utilized and stressed, as they have the highest chance of moving people in the right direction. Municipalities play a key role in policy creation and execution while not forgoing other societal issues such as EP in addressing energy transitions, confirmed by Varo et al. (2022).

Conceptual model

Figure 1 below visualises the concepts used in this study and their assumed relationship. The core idea entails: municipal involvement influences energy transitions, which interacts with energy poverty by (implicitly) solving it through the indicators of *energy affordability, housing quality and the ability to partake in energy transitions,* which are therefore also affected by municipalities.

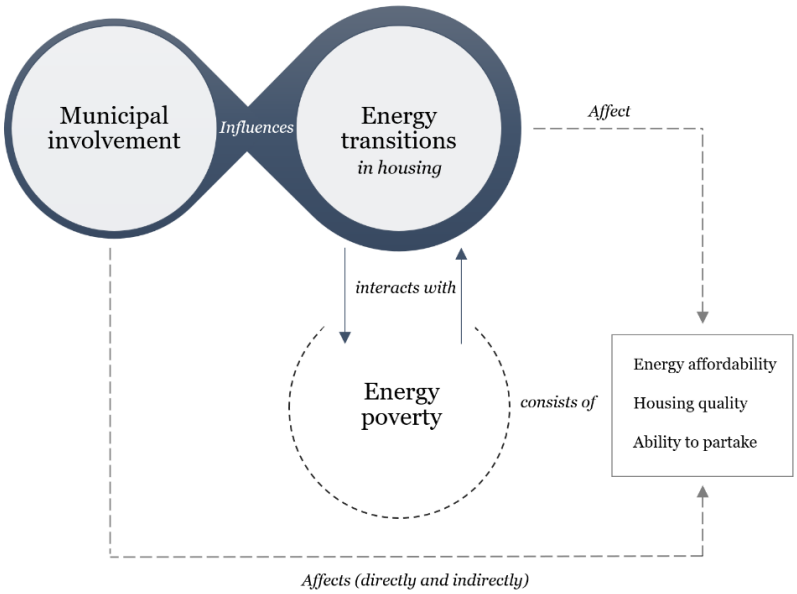

Figure 1: Conceptual model. Author, after: Mulder et al. (2023).

3. Methodology

Mulder et al. (2023) used CBS microdata covering 80% of Dutch households to come to a holistic yet statistical understanding of EP in the Netherlands. They acknowledge and argue, as do Middlemiss et al. (2018) and Straver et al. (2020), that in order to create complementary insight, it is highly valuable to consider qualitative research approaches in figuring out what the effect of policy is, on a local level.

A case study provides this data enrichment required to create a more complete picture of a given situation. If mixed methods are taken into account, reality can be portrayed increasingly realistically (O'Leary, 2004). The results below were therefore gathered using a mixed methods approach. Both quantitative and qualitative secondary data are used, as well as primary data by means of two interviews. The strength and depth of these interviews depends on the degree of knowledge and understanding derived from literature and contextual analysis done beforehand, as their goal is to create new insight.

Semi-structured interviews give verbal and topical freedom leading to the creation of a rapport with the interviewee, which has a positive effect on richness of data. Expert experiences are inherently subjective and thus more easily reported upon through such an interview, as surveys and structured interviews are too limiting for participants in case of qualitative research (O'Leary, 2004; Punch, 2014). The interview guide can be found in appendix chapter 1.

Two civil servants working for the municipality of Oldambt have been interviewed. Both are involved in policy and execution of plans related to energy (transitions). The interviews have been compared. Despite their combined duration being over two hours, clear themes have been identified, based on the indicators (or their synonyms) discussed in the theoretical framework.

Background information based on spatial data and statistics are brought forward to create an understanding of the municipality, which is then supplemented with (grey) literature, references to policies and interviews. This intricate framework of results is used to answer the research questions in the discussion, which carries the ability to help in policy creation, as does the conclusion.

Case selection

The municipality of Oldambt will be taken as a case because it scores poorly on TNO indicators of EP (see figure 3) (CBS, 2021). It hosts a *Programma Aardgasvrije Wijken* (PAW)-project called Nieuwborgen, which serves as an example of policy implementation, addressing energy transitions as well as EP.

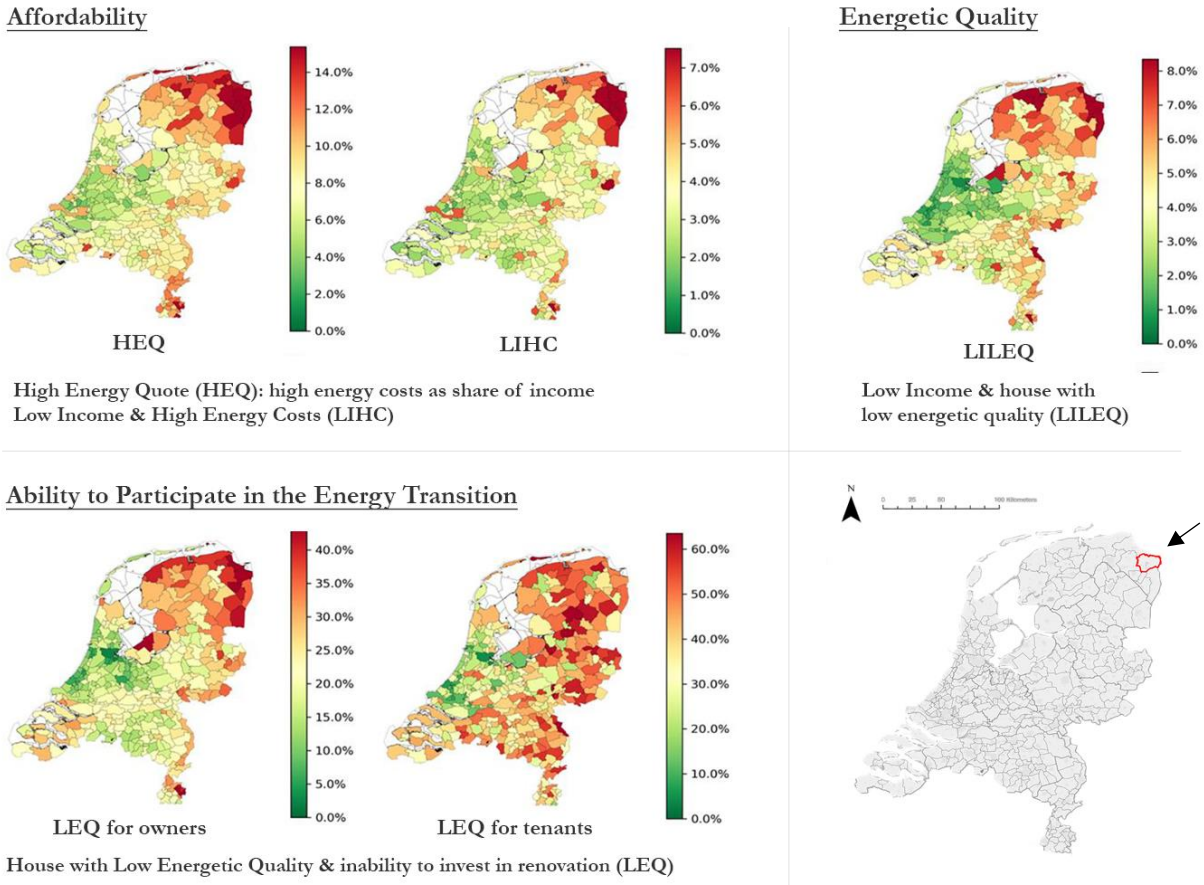

Figure 2: Energy poverty throughout the Netherlands and map locating municipality of Oldambt. Author, adapted from Mulder et al. (2023). EsriNL.

Ethical considerations

This thesis uses interviews to collect data. Participants have been informed of their rights and the scope of the thesis before the interview through a consent form (see appendix chapter 2), which included the right to withdraw. Their identities will remain anonymous. Characteristics and specific role within the municipality and Nieuwborgen project are not mentioned to guarantee anonymity. Data is stored on hard-drives until the thesis is graded, after which it will be destroyed. Due to the lack of sensitive data, no further measures have been taken.

4. Results

Energy transitions in housing in the municipality of Oldambt

In 2021, the municipality of Oldambt used 5734 Tj of energy across all sectors, resulting in 384 kton CO_2 emissions, of which 17.8% (68.7 kton) related to housing. The municipality's 9% decrease in gas usage in housing and 11% decrease in CO_2 emissions between 2013 and 2020 are in line with national figures (CBS, 2023b; RvO, 2021), but household natural gas usage remains exorbitantly high compared to national averages. Heating of housing accounts for 65% of household-derived energy demand, where, of the total energy demand attributed to housing (including cooking on gas and electricity from non-renewable sources), 85% finds its origin in fossil fuels (Gemeente Oldambt, 2021; Milieucentraal, 2022; CBS, 2022).

The municipality intends to reduce CO_2 emissions with 49% by 2030 and 95% by 2050[1], but faces difficulties due to its low population density and poor energetic quality of housing. In 2021, renewable energy production resulted in avoidance of emission of 38.3 kton CO_2 across all sectors (CBS, 2021a).

Interviewees stated that because municipalities have been tasked to reach '*Klimaatakkoord*' goals, Oldambt wants and needs to help and guide its inhabitants to the best of its ability. The municipality is not legally able to force people to partake in energy transitions. It does not have funds or power to transition entire neighbourhoods ('*wijkgerichte aanpak*', '*wijkuitvoeringsplan*'), therefore instead

[1] Compared to emission levels in 1990.

targets individual households. The goal is to inform and encourage inhabitants to partake in energy transitions by hinting at monetary reasons involving savings and payback periods. Inhabitants and municipalities have to address energy transitions together. Municipalities are now moving towards 'wijkgerichte aanpak', as is required by RES and '*Klimaatakkoord*', representing the provincial and national policies and guidelines regarding energy transitions (RES Groningen, 2021).

The *Transitievisie Warmte* of the municipality of Oldambt states that by 2030, 20% of housing stock is to be decoupled from natural gas. It uses 'Trias energetica', focusing on energy efficiency and reduction, minimising the housing-derived energy demand for heating. It stresses the importance of instruments such as '*Regionaalenergieloket*' and '*Jouwbespaarcoach*' and looks at ways of achieving the national 2030 and 2050 goals, considering electrification for new homes with good energetic qualities (Gemeente Oldambt, 2021). Supported by RES-region advice, this helps guide municipalities by learning from each other and nationally available data and subsidies. It refers to the '*Klimaatakkoord*' (national policy document), that explicitly mentioned green gas as key in hybridization of energy systems in rural areas, with the stakeholders aiming to produce 70 Pj by 2030 (17 Pj in 2022) nationally (RES Groningen, 2021).

Complete electrification of heating systems in existing housing would not only require huge individual investments, which large groups of inhabitants of the municipality of Oldambt are not able to make, it also depends on provincial and national guidance and investments in power infrastructure and renewable energy sources. Green gas has been framed as a cheaper alternative compared to traditional heat pumps or other electrification measures. Local production and consumption of green gas have been proposed to be cheap, reliable and fastest-to-realise renewable alternative for rural areas (Deen et al., 2022). For denser, more urbanised areas like Winschoten, the largest town in the municipality of Oldambt, heat districts are a feasible option (Sahoo et al., 2023).

In existing projects, green gas currently provides a 68% savings of CO_2 compared to standardized fossil fuel emissions. New technologies will increase this percentage, possibly going above 100% when taking into account more potent GHGs from animal manure (predominantly methane) (NVDE, 2020). The municipal involvement in a green gas project is discussed below.

Nieuwborgen

In 2050, all houses in the Netherlands are to be decoupled from the natural gas network. PAW (to be NPLW) provides pilot projects with subsidy, knowledge and guidance to explore ways of executing this rather Sisyphean task, appointed to municipalities through national *Transitievisie Warmte*-related policies.

The municipality of Oldambt is closely involved in PAW-project Nieuwborgen, a collaboration between the municipalities of Oldambt and Eemsdelta, the *'Groninger Huis'* housing association, '*Dorpsbelangen Nieuwolda*', '*Dorpsbelangen Wagenborgen'*, and Enexis, as well as Deeterink Bio Energie, a green gas production facility that can provide up to 1500 households with green gas.

The proposal developed in Nieuwolda and Wagenborgen to switch to locally produced green gas considers further sustainability measures in housing (e.g. insulation) to achieve the municipal emission reduction goals. The project was granted a €4759006 subsidy. Nieuwborgen deviates from PAW's goals by aiming to reduce gas usage by 25% through sustainability measures in housing and supplying the remainder through local green gas production, as opposed to completely decoupling neighbourhoods from gas network by 2050 (interviewees; Nieuwborgen, 2023).

Deen and Van Cappellen (2022) found that green gas can serve a crucial role in creating CO_2 reductions in Nieuwborgen, where heat districts or electrification are not feasible. Green gas uses the existing networks, resulting in low investment and consumption costs. Ultimately, the green gas would be produced relatively locally, for a lower price. It skips the step of electrification, which prevents conversion losses, increasing efficiency. Below, a reflection on what has been achieved so far and what difficulties are faced.

Achievements

Interviewees stated that Nieuwborgen has helped people implement sustainability measures by subsidising 50% of household investment. In the beginning [2020-2021], the subsidy requests were low. Both interviewees mentioned the Russian invasion of Ukraine as being the reason for people's increased interest in sustainability measures and therefore subsidies, due to higher energy prices, in line

with Van Schaik et al. (2022). Half of the households have participated, resulting in a 15% CO_2 reduction[2].

Challenges

Together with N-tra, representing network operator Rendo, experienced in green gas, Nieuwborgen asked CE Delft to conduct research to again test the feasibility and usefulness of the local production of green gas. The usability has been proven, yet the project remains halted. It meets resistance from a 'rules-of-the-game' perspective, making it impossible to deliver green gas due to national subsidy legislation and governance structures (Deen et al., 2022; interviewees).

Procap (Binnenlands Bestuur, 2022a) identified three obstacles: 1) SDE-subsidies do not apply to green gas production, withholding entrepreneurs from switching from electricity to green gas production, 2) green gas is taxed like natural gas, making it more expensive than necessary for local residents despite its emission savings, and 3) the network operators should be incentivized to invest in connecting the green gas providers to the network. This was confirmed by the CEO of Rendo who asked for more playroom for network operators (Nieuwborgen, 2023).

Procap stressed the importance of the role of municipalities to win back the trust in (local) governments and therefore support for policies regarding energy transitions, often perceived as expensive and drastic. Gaining back trust and understanding wishes of residents takes time but is essential. Projects should be started with close contact in mind. This requires capacity building (Binnenlands Bestuur, 2022b). Gert-Jan van 't Land, Nieuwborgen project manager and employee for the municipality of Oldambt, phrased the focus on the resident as key: "A fear in the towns is that slightly more expensive green gas will end up being used by those in the canal belts, with higher incomes. Social values should be the focus." (Nieuwborgen, 2023). These findings resemble findings in the reflective study done by Kooger et al. (2023) on PAW as a whole. Residents partaking in PAW demand communication, where the municipality could help facilitate, to make possible a street-level approach as to increase participation, including those who suffer from EP.

[2] Corrected for degree days (*graaddagen).*

Nieuwborgen employs a lobbyist to convince higher levels of government to speed up processes related to subsidies and legal boundaries regarding green gas to achieve emission reduction goals in rural areas. Recent developments show scheduled changes being sped up, as 2030 and 2050 deadlines make for urgency.

Energy poverty

Because of many large old farms, ribbon developments and clusters of detached housing spread across the municipality, population density is low at 170/km² (CBS, 2023a). The municipality stands out in the following way:

Resulting from bad energetic quality of said housing, among other things, as shown in figure 3, the 18 736 households in the municipality of Oldambt used, on average, 32.8% more gas than the average Dutch household in 2021 (CBS, 2021b). Oldambtster households spent 1.2%-point more of their income on energy compared to the national average in the 2010-2020 period, while their income was, on average, 17.2% lower (CBS, 2022a).

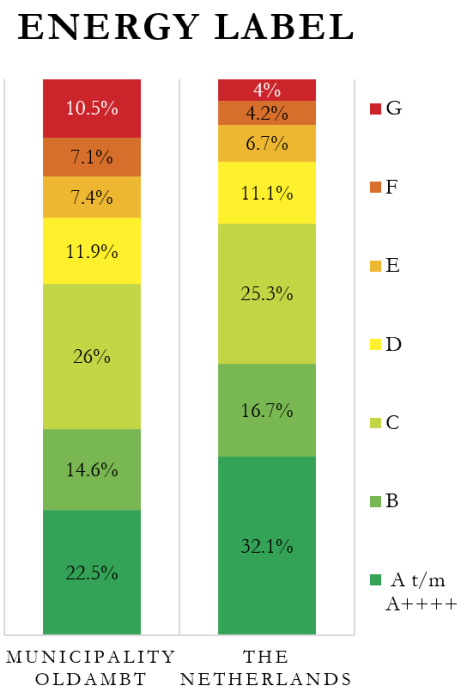

Figure 3: Energetic quality of housing, Oldambt vs Netherlands. After: RvO. 2022

How does the municipality address Energy Poverty?

The municipality uses the '*inkomenscheck*' and CBS data to identify EP as a whole, per area, but faces difficulties in tracing and approaching individuals. The municipality tries to alleviate EP for all but has to prioritize certain groups within the EP population. The goal is to help households with the worst energetic quality of housing (energy label E-F-G) improve to at least C.

In case of ownership and the inability to partake in energy transitions (LEQ for owners, figure 2), subsidies are in place as long as national budgets are created (e.g. ISDE). These subsidies are not accessible to those who cannot afford to invest themselves, or tenants who depend on their landlords. Interviewees stated that here, RWLP and RREW help municipalities who in turn create subsidy-budgets as part of

the '*regiodeal*', in addition to providing small but meaningful '*bespaardozen*' [boxes containing small energy saving measures] and handing out free advice. '*Jouwbespaarcoach*' introduces energy transitions in a grassroots manner from the idea of convincing, where money and energy savings are achieved at the same time through guidance. Those at 120% of minimum income fall outside these subsidies and extra financial incentives but are likely unable to partake in the energy transition. Those suffering from EP are likely to suffer from poverty in general, as reported by interviewees.

This is exemplified by interviewee 2 by drawing the case of the municipality working together with the '*warmtefonds*' helping a home owner living just above the minimum wage implement sustainability measures. An interest free mortgage, accompanied by financial advice, would ultimately be transformed to a gift if the financial situation has not changed during the term of the loan. The '*warmtefonds*' takes care of costs and subsidies. The municipality arranges advisors.

Interviewees allude to the fact that EP is difficult to trace and spread throughout Oldambt. Practice and theory (data) are not aligned, and it is costly and difficult to align them (interviewee 1). Tenants suffering from LEQ-EP are hard to address from a municipal level. Due to national agreements, municipalities can cooperate with housing associations in overcoming difficulties. Quid-pro-quo helps both actors in speeding up energy transitions at a lower cost (interviewee 2). Part of this cooperation has occurred in Nieuwborgen. Savings and energy coaches have been utilized to include those suffering from LEQ-EP.

Interaction between energy transitions and EP

EU-legislation mentions access to energy for all explicitly, while no such mention is present in '*Klimaatakkoord*'. The PBL advises the national government to create attention for EP in achieving emission reduction goals. Municipalities depend on guidance (Van Berkel et al., 2021). This guidance can only be achieved if capacity is available. Both interviewees stressed the lack of capacity for implementing all regulations and agreements hindering the proper execution of energy transitions, let alone including EP. They posed whose responsibility it is to make citizens participate in energy transitions. Homeowners able to bear the costs should be enticed but require less attention and subsidies than those suffering from EP. Nationally

organised subsidies lack the connection with the municipality, therefore not taking into account area-specific weaknesses. ISDE, for example, requires home owners to first bear the investments, then apply for subsidy. This system is not usable for people suffering from indicators 1 and 2, therefore also qualifying for indicator 3. Tenants are not allowed to use ISDE and have to wait for their landlords to implement sustainability measures. Subsidies are handed out in a skewed way, where only those who can afford the initial investment can apply.

Geels et al. (2016) ask the question 'who is responsible for achieving net zero?' and present German government structures as welcoming and incentivising towards systemic innovations such as green gas production on a local scale. This decentralized way of approaching energy transitions helps gain municipalities more insight into local developments. Higher levels of government are helping and not restricting municipalities by means of subsidiarity and financial 'freedom'.

As implicitly shown above, energy transitions and EP overlap. When municipalities strive to address both by being directly involved in projects such as Nieuwborgen, it can steer towards policy implementation. Nieuwborgen has exposed weaknesses in subsidy legislation. Subsidy-rules for entrepreneurs, who bear the responsibility of innovation and investments, allowing for EP to be addressed as well, are not aligned with nationally determined goals. Subsidy-rules are expected to change in 2023, as was alluded to by Ruud Paap (representing Platform Groen Gas): "SDE++ will get a special budget and arrangement for green gas, this year [2023]. Green gas will then be given an equal chance in getting subsidies." (Nieuwborgen, 2023).

Lamboo et al. (2022) stated that the production of green gas will only provide for those areas where no other options are feasible, *if* subsidized amply. They argue for a sped-up procedure regarding the change of subsidy rules, as the current situation halts development and execution. SDE++, HER+ and DEI+ should all be involved, form the largest obstacle when not available simultaneously, to achieve the largest societal benefits.

Interviewees posed that there might not be a big difference in ultimately eradicating EP on the one hand and actualizing energy transition goals, in the end, but it depends on what differentiation is applied in targeting groups. The PAW-project, however, was first and foremost created to achieve emission reduction.

5. Discussion

Neither of the interviewees questions the necessity of energy transitions in housing. Oldambt is unable to do everything, everywhere, all at once, across all sectors, resulting from capacity issues, which holds back the change in landscape as discussed by Geels et al. (2016). Money is not the issue in the Netherlands, as was posited by senator (Labour party) Ferd Crone during a PAW-project Nieuwborgen round table discussion. EU-legislation allows for more direct (financial) involvement of higher levels of government than currently occurs (Nieuwborgen, 2023).

The responsibility of partaking in energy transitions for those in EP cannot be carried by the municipality alone. Interviewees stated that better data, or a more close understanding on where EP cannot be solved by inhabitants could help municipalities reach out to those groups of households. The municipality needs to have 'power' and capacity in order to transform its tasks and ideas into practice. If more capacity is available, a more guiding and informing role could be realised, through e.g. coaches and financial advice. The municipality can create social incentives, making individual investment in energy transitions contagious by spreading the word on what subsidies are available, what guidance, what information and what practicalities entail, e.g. through public meetings in its '*Warmtehuus'*, focused on the ability to partake in energy transitions.

One critical question, namely 'how sustainable is green gas?' needs to be answered. Green gas is produced from agricultural, industrial and human waste, and though it makes the utmost use of residues, how come there is so much waste available from these sectors? Can energy not be harvested more efficiently, without conversion losses? Theoretically, yes, but this is practice. Green gas provides a solution to rural areas, adding social value. It helps agriculture close its problematically 'uncloseable' cycle. This is effect-oriented and not solving the core issue at hand (waste surplus). For the implementation of policy and plans through PAW and successor NPLW, this means that treating green gas as the end product, ready to consume, could have at least three clear 'efficiency' benefits, besides lowering CO_2 emissions:

1. The existing gas network is there[3], lowering overhaul investment costs.

[3] Though in case of Deeterink Bio Energie, the green gas producer close to Nieuwolda, a connection from facility to network has to be made. The infrastructure for the end users is already there.

2. Conversion losses would be minimised. (Gas is now being transformed into electricity and left to market processes. If electrification of household heating is the desirable choice, the electricity would have to be converted back to heat).
3. Waste is used more sustainably.

Taking into account all findings: energy transitions in housing can only be executed while helping and relieving those suffering from EP, where often the largest improvements can be made.

Reflection

This thesis partly goes beyond the technological requirements for sustainability transitions. The author acknowledges that large-scale energy transitions would require unprecedented but necessary investments in sometimes unproven technologies. As addressed by Geels et al. (2016), renewable energy sources oftentimes produce electricity. Power usage, however, resembles a small part of total energy demand in countries such as the United Kingdom, Germany and the Netherlands, who have very different (local) government structures and stances towards innovation and energy transitions. Trends in renewable *electricity* production may convince the reader that, overall, progression is made, yet it is the fossil-fuel based sectors industry and transport that need to electrify, or find non-fossil alternatives. Future renewable *electricity* production would still only account for a small percentage of total energy demand, as fossil fuels are embedded in current energetic (e.g. engines, boilers, cooking equipment) and therefore economic systems. These systems need to change *with* the transition to renewable energy production in order to make electricity a feasible alternative (CLO, 2022).

Specifically for Oldambt, household natural gas usage accounts for 18% of total energy demand (CBS, 2022). Questions should be asked on how relevant solving this problem is compared to making transport and industry more sustainable (18% and 50%, CBS, 2023b). This goes beyond the scope of this research, as the focus lies on energy transitions in housing. The municipality is involved in sustainability transitions in most other sectors, but for housing, municipalities have been tasked directly to achieve the nationally determined goals through the *Transitievisie Warmte*.

The reasoning behind people's investment in sustainability transitions has not been researched in this thesis, though interviewees and logic allude to external geopolitical forces having a large influence. This may not matter in the end, as long as increased '*verduurzaming'* is continued and goals are met.

Limiting factors

Due to the semi-structured nature of the interviews, TNO indicators were not as explicitly mentioned as intended. Synonyms and similar definitions have been used in interviews and analysis to create rapport between new data and existing literature. The author would have liked to conduct more interviews, but given difficulties regarding contacting intended participants and time constraints, the two interviews have been supplemented with secondary data. Patterns in answers show signs of data saturation, which was addressed by both interviewees.

On data precision: estimates made by CBS have been used[4]. Statistics approach reality, where oftentimes data does not cover the entire population. Interpretation of data means that the scale goes from local to national and back to local (municipal level), generalising very specific data (*reality)* in reports. Added to data being quickly outdated and prone to errors, it is therefore tricky to come to conclusions without understanding reality in a more bottom-up way. This was brought forward by both interviewees. Besides *Transitievisie Warmte*, very little information is public when it comes to EP and energy transitions.

This thesis does not use CBS microdata as primary data, it builds on research that did. Given the word limit of this thesis, in conflict with the abundance of available data, it was impossible to address all angles and all secondary data. The word limit also prevented the author from performing a more deep-digging journalist approach, where opponents of Nieuwborgen are heard.

6. Conclusion

Mulder et al. (2023) called for a nationally determined definition of EP to create more attention and take into account both EP and energy transitions in integrated

[4] For explanation of CBS methodology, see https://www.cbs.nl/nl-nl/onze-diensten/methoden

policies. The findings in this case study confirm the need for such a definition, as it could help all levels of government, but specifically municipalities, to trace and ultimately help those suffering from EP to further the energy transitions.

Geels et al. (2016) found that municipal involvement can have a positive effect on speeding up energy transitions. Translated to the case of Oldambt, the municipality should be given more capacity and insight into data (e.g. CBS Microdata presented in a way similar to '*klimaatmonitor*') to target households with energy labels E, F and G (who are likely to suffer from EP), where largest improvements can be made. The personal responsibility of the individual household or neighbourhood needs to be triggered to induce the 'right' action; municipalities play a key role here.

The PAW-project Nieuwborgen has served as an incentive and subsidy-framework for improving energetic quality of housing, bringing down energy cost, by letting residents partake in energy transitions. The project has met serious resistance, causing it to not help severely reduce the municipality's dramatically larger than national household gas usage, despite its intent, extent and scope (number of households and budget involved). The project has made clear that EP should and could be more explicitly addressed in large scale local subsidy-based municipal involvement. It does, however, make for a start. It shows the potential of the effect of municipal involvement in project-based energy transitions in housing. If the actual goal of the Nieuwborgen project, namely green gas delivery to residents, can be achieved, fossil fuel dependence and emissions from fossil natural gas can be reduced further.

The applicability and use of green gas have been proven, it is now the task of the national government to hit the figurative button. Regulations and (perceived) lack of funding, e.g. SDE++ and other subsidies, connected to entrepreneurs and network operators not daring to bear the investments, form the biggest obstacles in realizing the intention of increasing sustainability for all and especially those in EP.

To reach emission reduction goals, energy transitions should be sped up. This requires financial playroom. As the EP is high in the case study area, it should receive more subsidy to catch up and prevent lagging behind. Especially households suffering from EP need to be prioritized. Subsidies should be restructured in order to target four actors that can help decrease EP:

1. Households suffering from LEQ-EP, to implement sustainability measures in housing *en masse*, first focused on energy savings, then moving away from fossil fuels.
2. Municipalities for increased capacity to locate and differentiate among groups of EP, 'spread the word' and moderate interactions between actors by informing, convincing and facilitating.
3. Entrepreneurs willing to make investments (e.g. Deeterink Bio Energie) to decrease energy costs.
4. Network operators to leverage investments into existing networks both to accommodate green gas or hydrogen onto the network and allow for electrification.

The municipality can then address more of the EP population, focusing on *trias energetica* as mentioned in the *Transitievisie Warmte*, to account for the significantly higher than average gas usage in heating of housing as a result of quality of housing and spatial distribution of housing.

Multidisciplinary academic involvement could help facilitate more direct collaboration between bodies of government, '*proeftuinen'*, entrepreneurs and network operators as to not have them individually reinvent the wheel, regarding technical, political, economic and managerial aspects to achieve 2050 goals. Middlemiss et al. (2018) stress the necessity of the multidisciplinary research in addressing both the social and technical side of EP, resulting in more effective energy (transition) policy. Planning as a discipline connects academia and practice, where households should be involved directly in discussing demands and possibilities.

Future research should focus on where and for what reasons energy transitions are halted. It could take an activist stance, as sustainability transitions (in general, but specifically in housing) are of the utmost interest to *everyone,* but especially to those suffering from EP. Except for the obvious culprits, no one is benefiting from the current situation in both short and long term.

Humanity needs to overhaul its energy systems, quickly. Make energy poverty a driver of energy transitions to prevent worsening and increase of societal inequities (after IPCC, 2022; IEA, 2022; Ürge-Vorsatz et al., 2015).

7. Bibliography

Binnenlands Bestuur (2022a) Drie obstakels staan groen gas in de weg. Procap. Available at: https://www.binnenlandsbestuur.nl/ruimte-en-milieu/procap/drie-obstakels-staan-groen-gas-de-weg

Binnenlands Bestuur (2022b) Participatie: vertrouwen (her)winnen. Procap. Available at: https://www.binnenlandsbestuur.nl/ruimte-en-milieu/procap/participatie-vertrouwen-herwinnen

CBS (2021a) Regionale klimaatmonitor, Oldambt: rapportage CO2-uitstoot, Oldambt. Retrieved from https://klimaatmonitor.databank.nl/Jive?workspace_guid=2083f3b4-30d9-4f6f-8d65-24b65b2f8e61

CBS (2021b) Regionale klimaatmonitor, Oldambt en Nederland: CO2, kosten en energieverbruik. Retrieved from https://klimaatmonitor.databank.nl/Jive?workspace_guid=aa9ec316-549b-437c-b228-3fa274a5d359

CBS (2022a) Regionale klimaatmonitor, Oldambt: inkomens en energieuitgaven. Retrieved from https://klimaatmonitor.databank.nl/Jive?workspace_guid=65259c4d-d078-42b3-a520-22f53f9aeacf

CBS (2023a) Regionale kerncijfers, Oldambt. Retrieved from https://opendata-cbs-nl.proxy-ub.rug.nl/#/CBS/nl/dataset/70072ned/table?dl=8FC1C

CBS (2023b) Regionale klimaatmonitor, Oldambt: Rapportage Energietransitie gebouwde omgeving 2019. Retrieved from: https://klimaatmonitor.databank.nl/jive/viewerreportcontents.ashx?report=webrapport_energietransitie_go_2019andinput_geo=gemeente_1895andcreatepdf=true

CLO (2022) Energie en milieu: Stroomdiagram energie voor Nederland, 2021. Retrieved from: https://www.clo.nl/indicatoren/nl0201-aanbod-en-verbruik-van-energiedragers

Deen, M. and Van Cappellen, L. (2022) Maatschappelijke Waarde Groengas – casus buitengebied. CE Delft. Retrieved from: https://ce.nl/wp-content/uploads/2022/08/CE-Delft_220157_Maatschappelijke_waarde_groengas_casus_buitengebied_def.pdf

Deen, M., Van Cappellen, L. and Juijn, D. (2022) Maatschappelijke waarde groengas. Casussen voor mobiliteit, industrie en gebouwde omgeving. CE Delft. Retrieved from https://ce.nl/wp-content/uploads/2022/02/CE_Delft_210264_Maatschappelijke_waarde_groengas_DEF.pdf

Ehnert, F., Kern, F., Borgström, S., Gorissen, L., Maschmeyer, S. and Egermann, M. (2018) 'Urban sustainability transitions in a context of multi-level governance: A comparison of four European states.', *Environmental Innovation and Societal Transitions* 26, pp. 101–116. https://doi.org/10.1016/j.eist.2017.05.002

Feenstra, M., Middlemiss, L., Hesselman, M., Straver, K. and Herrero, S.T. (2021) 'Humanising the Energy Transition: Towards a National Policy on Energy Poverty in the Netherlands. *Front. Sustain. Cities 3*. https://doi.org/10.3389/frsc.2021.645624

Geels, F. W., Sovacool, B. K., Schwanen, T. and Sorrell, S. (2017) 'The Socio-Technical Dynamics of Low-Carbon Transitions', *Joule* 1 (3) pp. 463-479. https://doi.org/10.1016/j.joule.2017.09.018

Geels, F.W., Kern, F., Fuchs, G., Hinderer, N., Kungl, G., Mylan, J., Neukirch, M. and Wassermann, S. (2016) 'The enactment of socio-technical transition pathways: A reformulated typology and a comparative multi-level analysis of the German and UK low-carbon electricity transitions (1990–2014)', *Research Policy* 45 (4) pp. 896–913. https://doi.org/10.1016/j.respol.2016.01.015

Geels, F.W., Schwanen, T., Sorrell, S., Jenkins, K. and Sovacool, B.K. (2018) 'Reducing energy demand through low carbon innovation: A sociotechnical transitions perspective and thirteen research debates', *Energy Research & Social Science,* 40 pp. 23–35. https://doi.org/10.1016/j.erss.2017.11.003

Gemeente Oldambt (2021) Transitievisie Warmte. Retrieved from https://www.gemeente-oldambt.nl/transitievisie-warmte

IEA (2022) Net Zero by 2050. A Roadmap for the Global Energy Sector. Retrieved from https://iea.blob.core.windows.net/assets/deebef5d-0c34-4539-9d0c-10b13d840027/NetZeroby2050-ARoadmapfortheGlobalEnergySector_CORR.pdf

IPCC (2022) Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Pörtner, H.-O., Roberts, D.C., Tignor, M., Poloczanska, E.S., Mintenbeck, K., Alegría, A., Craig, M., Langsdorf, S., Löschke, S., Möller, V., Okem, A. Rama, B. (eds.)]. Cambridge University Press, Cambridge and New York.

KNMI (2021) Klimaatsignaal'21: hoe het klimaat in Nederland snel verandert. Retrieved from https://cdn.knmi.nl/knmi/asc/klimaatsignaal21/KNMI_Klimaatsignaal21.pdf

Kooger, R., De Koning, N., Tigchelaar, C., Van der Wal, A., Roelofs, M. and Slingerland, S. (2023) De klantreis complete: bewonerservaringen met de uitvoeringsfase van aardgasvrije wijken. TNO. Retrieved from https://publications.tno.nl/publication/34640541/kQBygh/TNO-2022-P12703.pdf

Lamboo, S., Lenzmann, F. and Van den Brink, R. (2022) Groengasproductie uit biomassavergassing: barriers voor opschaling en mogelijke oplossingsrichtingen. TNO. Retrieved from: https://www.rijksoverheid.nl/documenten/rapporten/2022/12/02/tno-rapport-groengasproductie-uit-biomassavergassing

Middlemiss, L., Gillard, R., Pellicer, V. and Straver, K. (2018) 'Plugging the Gap Between Energy Policy and the Lived Experience of Energy Poverty: Five Principles for a Multidisciplinary Approach', In: Foulds, C., Robison, R. (eds.) *Advancing Energy Policy*. Palgrave Pivot, Cham, pp.15-29. https://doi.org/10.1007/978-3-319-99097-2_2

Milieucentraal (2022). *Gemiddeld energieverbruik in Nederland*. Available at: https://www.milieucentraal.nl/energie-besparen/inzicht-in-je-energierekening/gemiddeld-energieverbruik/#welke-cijfers-gebruikt-milieu-centraal

Mulder, P., Dalla Longa, F. and Straver, K. (2023) 'Energy poverty in the Netherlands at the national and local level: A multi-dimensional spatial analysis', *Energy Research and Social Science*, 96, pp. 102892.

Nieuwborgen (2023) Samenvatting Rondetafelgesprek - Groen gas in het Buitengebied - 20 januari 2023. Available at: https://youtu.be/keavvE-5aFU

NVDE (2020) Groen gas: Feiten & Cijfers. Retrieved from: https://www.nvde.nl/wp-content/uploads/2020/05/Groen-gas-informatiedocument-mei-2020.pdf

O'Leary, Z. (2004) *The Essential Guide to Doing Research*. London, Sage Publications.

Programma Aardgasvrije Wijken (2021) Wat is de Transitievisie warmte? Retrieved from: https://www.aardgasvrijewijken.nl/themas/regieenorganisatie/transitievisie+warmte2/wat+is+een+transitievisie+warmte/default.aspx

Punch, K. F. (2014) *Introduction to Social Research: Quantitative and Qualitative Approaches*. Third Edition. London: Sage Publications Ltd.

RES Groningen (2021) Naslagwerk Regionale Structuur Warmte. Retrieved from: https://www.resgroningen.nl/over+de+res/achtergrondinformatie/handlerdownloadfiles.ashx?idnv=1990154

Ruyssenaars, P.G., Coenen, P.W.H.G., Rienstra, J.D., Zijlema, P.J., Arets, E.J.M.M., Baas, K., Dröge, R., Geilenkirchen, G., 't Hoen, M., Honig, E., van Huet, B., van Huis, E.P., Koch, W.W.R., te Molder, R.M., Montfoort, J.A., van der Zee, T. and van Zanten, M.C. (2021) Greenhouse gas emissions in the Netherlands 1990-2019, National Inventory Report 2021. RIVM. Retrieved from https://www.rivm.nl/bibliotheek/rapporten/2021-0007.pdf

RvO (2021) Monitor Energiebesparing Gebouwde Omgeving. Retrieved from https://www.rvo.nl/sites/default/files/2021/12/monitor-energiebesparing-gebouwde-omgeving-2021.pdf

RvO (2022) Regionale klimaatmonitor, Oldambt. Energielabels woningen. Retrieved from https://klimaatmonitor.databank.nl/Jive?workspace_guid=ad300bc4-d78f-4573-8a04-60fa95d8a15a

Sahoo, S., van Stralen, J.N.P., Zuidema, C., Sijm, J. and Faaij, A. (2023) 'Regionally integrated energy system detailed spatial analysis: Groningen Province case study in the northern Netherlands', *Energy Conversion and Management,* 277, p. 116599. https://doi.org/10.1016/j.enconman.2022.116599

Straver, K., Mulder, P., Middlemiss, L., Hesselman, M., Feenstra, M. and Herrero, S.T. (2020) Energiearmoede en de Energietransitie: Energiearmoede beter meten, monitoren en bestrijden. TNO. Retrieved from https://publications.tno.nl/publication/34637565/tst4jN/TNO-2020-energy.pdf

Thijsen, M., Kreulen, K. and Van Til, H. (2022) Maatschappelijke waarde groen gas: een onderzoek naar de (meer)waarde van groen gas in het Nieuwborgen project. Ecorys. Retrieved from: https://www.ecorys.com/sites/default/files/2022-11/2022%2006%2015%20Nieuwborgen%20meerwaarde%20groen%20gas.pdf

Ürge-Vorsatz, D., Cabeza, L.F., Serrano, S., Barreneche, C. and Petrichenko, K. (2015) 'Heating and cooling energy trends and drivers in buildings', *Renewable and Sustainable Energy Reviews*, 41, pp. 85–98. https://doi.org/10.1016/j.rser.2014.08.039

Van Berkel, P., Kruit, K. and Dehens, J. (2021) Energiearmoede in de Warmtetransitie: Onderzoek naar beleidsinstrumenten. CE Delft. Retrieved from: https://ce.nl/wp-content/uploads/2021/12/CE_Delft_200304_Energiearmoede_in_de_warmtetransitie_DEF.pdf

Van Ooij, C., Batenburg, A., Nguyen, N. C. and Straver, K. (2023) Energy Poverty: A Science and Policy State of Play. TNO. Retrieved from https://publications.tno.nl/publication/34640524/86Phvt/TNO-2023-P10119.pdf

Van Schaik, L., Molthof, L., Cuperus, R., Hofhuis, P., Schellekens, J. and Hylkema, D. (2022) Een eerlijke energietransitie voor iedereen: Eindaanbevelingen. The Clingendael Institute. Retrieved from: https://fair-energy-transition.eu/wp-content/uploads/2022/10/FETA-National-Report-NL_NL.pdf

Varo, A., Jiglau, G., Grossmann, K. and Guyet, R. (2022) 'Addressing energy poverty through technological and governance innovation', *Energy, Sustainability and Society,* 12 (1). https://doi.org/10.1186/s13705-022-00377-x

8. Appendix

8.1. Interview guide

Inleidende vragen

1. Kunt u me iets vertellen over uzelf en het werk dat u doet?
2. Welke rol vervult u binnen de gemeente Oldambt?
3. Heeft u nog andere relevante werkzaamheden verricht met betrekking tot duurzaamheid of energiearmoede voordat u bij de gemeente kwam werken?

Ik begin met vragen over duurzaamheidstransities in de woonsector.

Duurzaamheidstransities

1. Wat doet de gemeente op dit moment om duurzaamheidstransities in en ten behoeve van de woonsector vorm te geven?
2. Hoe is de gemeente betrokken bij de uitvoering van deze duurzaamheidstransities?
3. Vindt u het een taak van de gemeente duurzaamheidstransities in de woningsector te bevorderen?
    a. Zo ja: waarom wel?
    b. Zo nee: waarom niet?
4. Wordt er bij het uitvoeren van dit beleid ook rekening gehouden met energiearmoede?
    a. Op welke wijze wel/niet?
5. Is er sprake van beleid dat gericht is op zowel energiearmoede en duurzaamheidstransities in de woonsector?
    a. Hoe is dit beleid tot stand gekomen?

Dan volgen nu enkele vragen over energiearmoede

Energiearmoede

1. Welke definitie van energiearmoede hanteert de gemeente Oldambt?
2. In welke mate observeert u energiearmoede in de gemeente Oldambt?
    a. Zou u voorbeelden kunnen geven?
3. Op welke wijze is de gemeente Oldambt betrokken bij aanpak van energiearmoede?
    a. Is de gemeente in staat door beleid ook daadwerkelijk verandering teweeg te brengen?

TNO-kaartjes laten zien. Uitleggen betekenissen.

4. Op welke wijze is de gemeente in staat beleid te voeren om relatief hoge energiekosten naar beneden te krijgen, mocht de gemeente hiertoe in staat zijn?
5. Wordt er specifiek beleid gevoerd op huishoudens met lage inkomens en hoge energiekosten? Op welke wijze (niet)? Hoe zou dit verbeterd kunnen worden?
6. Bestaat er beleid voor huishoudens met lage inkomens en slechte kwaliteit van woning? Dus inefficient?
7. Is er beleid geschreven om slechte kwaliteit woningen, bewoond door mensen die niet in staat zijn
    a. Hoe is dit beleid in staat bij te dragen aan een verbetering van de situatie?
    b. Is dit beleid alleen gericht op huiseigenaren? Of ook op woningbouwverenigingen?
8. Acht u de gemeente in staat bij te dragen aan het verbeteren van het wooncomfort?

    Zo ja: op welke manier?

Zo nee: waarom niet?

- is het de verantwoordelijkheid van de gemeente het wooncomfort te verbeteren?

Dan volgen nu enkele vragen over het PAW-project Nieuwborgen

PAW:

1. Bent u op de hoogte van het Nieuwborgen-project?
2. Hoe bent u verbonden aan dit project?
3. Is bij het realiseren van dit PAW-project naast duurzaamheidstransities ook gedacht aan energiearmoede?
4. Het verslag 2020
5. Is het PAW-project Nieuwborgen een success te noemen?
    a. Ja? Op welke wijze.
    b. Nee? Wat schort er aan?
6. Wat is de verwachte uitkomst van het project? Wat zijn de geleerde lessen?

Slotvraag

Hoe zouden duurzaamheidstransities in de woonsector en energiearmoede samen worden kunnen aangepakt?

Stellingen. Eens of niet. En waarom? Hoe draagt de gemeente hier aan bij?

"Gemeentelijk beleid heeft genoeg slagkracht om de situatie van inwoners die leven in energiearmoede te veranderen."

"Gemeentelijke stimulansen helpen om duurzaamheidstransities betaalbaar en aantrekkelijk te maken voor mensen die lijden onder energiearmoede."

"Wie lijdt aan energiearmoede zal waarschijnlijk de vruchten plukken van het gemeentelijk beleid rond duurzaamheidstransities."

Afsluiting:

Heeft u nog iets anders dat u te binnen is geschoten?

Heeft u nog vragen?

Dit waren mijn interviewvragen. Bedankt voor uw deelname. Mocht u nog verdere vragen of opmerkingen hebben kunt u per email of telefoon contact opnemen.

8.2. Consent form

university of groningen / faculty of spatial sciences

Informatieformulier Bachelor project SPD Rijksuniversiteit Groningen 2023

Dit document verstrekt informatie betreffende het onderzoek waarvoor u heeft aangegeven mee te willen doen.

Ik, Ruben Kemp, onderzoek wat de interactie is tussen duurzaamheidstransities in de woonsector en energiearmoede. De indicatoren in het leven geroepen door het TNO, namelijk betaalbaarheid van energie, kwaliteit van woonruimte en de mogelijkheid de woning te verbeteren, staan centraal in dit onderzoek.

Middels semigestructureerde interviews tracht ik hier licht op te werpen met als onderwerp de gemeente Oldambt.

Als interviewer wil ik u wijzen op het volgende:

- Er wordt een geluidsopname gemaakt. Deze wordt bewaard zolang nodig, ten hoogste drie maanden vanaf moment van opname.
- De interviews worden getranscribeerd en verwerkt in een analyse.
- De onderzoeker houdt toegang tot opnames, transcripties en toestemmingsformulieren gedurende het gehele onderzoek. Begeleiders hebben toegang tot de transcripties en toestemmingsformulieren.
- In het rapport wordt gebruik gemaakt van een tabel met algemene persoonlijke kenmerken van elke deelnemer, waarbij persoonsgegevens zo anoniem mogelijk worden gemaakt.
- U kunt uw deelname op elk moment zonder opgaaf van reden staken door contact op te nemen via e-mail of telefoon, ook na opname.
- Inzage in documenten is mogelijk. Vraag per email of telefoon om deze te ontvangen.
- Dit onderzoek wordt enkel intern gepubliceerd op de website van de Rijksuniversiteit Groningen.

Alles wat u wilt weten over de ethiek van de betreffende onderzoek doen aan de RUG vindt u op deze website https://www.rug.nl/about-ug/policy-and-strategy/research-ethics

Voor vragen kunt u te allen tijde contact opnemen met de onderzoeker:

R. J. Kemp
06 3734 2229
r.j.kemp@student.rug.nl

De deelnemer bevestigd hierbij:

- Informatie met betrekking tot rechten en privacy te hebben gelezen.
- In de positie te hebben verkeerd vragen te kunnen stellen.
- Genoeg tijd gehad te hebben om vragen te kunnen stellen en af te zien van deelname.
- Dat deelname volledig vrijwillig gebeurd.
- Zich op enig moment terug kan trekken uit het onderzoek.

☐ Ik ga akkoord om deel te nemen aan dit interview.

☐ Ik geef toestemming om de interviewgegevens te gebruiken voor educatieve doeleinden.

☐ Ik ga akkoord met het feit dat dit interview wordt opgenomen.

Naam deelnemer	Handtekening deelnemer	Datum
.....	.....	.....

Ik verklaar dat ik de geïnterviewde participant op de hoogte heb gebracht van het onderzoek.

Naam onderzoeker	Handtekening onderzoeker	Datum
.....	.....	.....

o