

Bachelor Thesis

Unveiling the layers: Analysing intersectionality in energy poverty policymaking in Germany

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Abstract

Ongoing political changes and the climate crisis are drawing more and, above all, new socio-economic issues which need to be tackled by countries and societies all over the world. One issue which is currently striking, especially since the war in Ukraine, is the increasing danger of energy poverty. The following thesis examines the issue in Germany by questioning who is most likely to suffer from energy poverty and why it is important to approach this issue from an intersectional perspective. To answer this question the theory of intersectionality will be explained, and a qualitative content analysis will be carried out. The analysis examines three studies published on energy poverty in Germany, to assess the connection between multiple discrimination and the risk of energy poverty. Furthermore, a second qualitative content analysis will be carried out to examine the recent policymaking of the German government regarding energy poverty and whether an intersectional approach was pursued. Seeing that the climate crisis is the biggest crisis humanity has had to face in recent history it is necessary to question how this crisis can be overcome in favour of all people and not just people who benefit from inherent privileges and power.

Keywords: energy poverty; intersectionality; race; class; gender

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1. Introduction

1.1 Background

According to a study published by the German Institute for Economy in July 2022 a quarter of the German population spends more than 10% of their monthly loan on energy (Henger & Stockhausen, 2022). This particularly affects people in the lower middle class and those below the poverty line. The latter group is predominantly affected, with more than 65% of the people spending more than 10% of their income on energy bills each month (Henger & Stockhausen, 2022). But not only people who live below the poverty line in Germany are conspicuously affected by or at risk of energy poverty, different studies show that women are also at a higher risk of energy poverty in Germany (Luschei et al., 2016). The rising energy bills households must pay monthly create the risk of falling into energy poverty which can be described as “a situation where a household cannot meet its domestic energy needs” (Strück, 2017 p. 9) . Suffering from energy poverty can be subject to a variety of reasons, including a low household income, high energy prices or low energy sufficiency of buildings or appliances (Strünck, 2017). The risk of energy poverty in Germany is striking. What was long perceived as an issue which exclusively affects people in the global south is now increasingly becoming a fear of many people in the global north.

The fact that lower income groups and women are more heavily affected shows that energy poverty would be well-served by an intersectional approach. Treating the topic of energy poverty intersectional means that variables like *race*, *gender* and *class* are included in the debate on discovering the origins of and solutions for energy poverty (Center for Intersectional Justice e.V., 2023). This is even more important because all forms of inequalities are mutually reinforcing and therefore need to be analysed and tackled simultaneously to prevent one form of inequality from reinforcing another (Center for Intersectional Justice e.V., 2023). First attempts to include intersectionality in the issue of energy poverty represent organisations like the *Women in Europe for a Common Future (WECF)* which are actively working on the topic of energy poverty and gender in Europe and trying to draw more attention to the topic (WECF, 2022). The German Federal Environment Agency also published a report on the importance of a gender-specific view on energy policy (Röhr et al., 2018).

1.1 Social and Scientific Relevance

Since 2016, when the research by Luschei et al. (2017) was published, political events caused ongoing tensions regarding the energy economy in Germany as important gas deliveries from Russia were missing (Bundesverband der Energie- und Wasserwirtschaft, 2022). The existing factors that cause energy poverty among low-income households are exacerbated by political events like the Russian war of aggression in Ukraine which led to an enormous increase in energy bills all over Germany because of missing gas deliveries from Russia (BMWK, 2022). Another driving force behind the increase in energy poverty is the ongoing climate crisis, which calls for an energy transition away from fossil fuels and towards renewable energy sources (Schöllgen & Kosbab, 2017). The planned energy transition in Germany has been associated with high and long-rising costs for consumers for several years. This is particularly troubling for private households which have higher monthly electricity bills and are therefore at the potential risk of falling into energy poverty. Considering that the climate crisis and the resulting need for an energy transition are as urgent as ever (European Commission, 2022) as well as the war in Ukraine which through rising energy prices and persistent inflation in Germany creates new risks of energy poverty (BMWK, 2022), this topic is gaining a new dimension of societal relevance and the associated need to act quickly. The topic of energy poverty can hereby be seen as exemplary for the importance of intersectionality as a theoretical approach to combat social issues generally. To aim for a society which is based on solidary coalitions and perceives capitalism as the driving factor for increasing injustice on both social- and economical level, an intersectional approach to combat social issues is deeply needed (Ganz & Hausotter, 2020). Considering the climate crisis which requires new forms of solidarity within society, approaching social issues intersectional can be attributed to a high level of social relevance (Matthies, 2021). Therefore, the research question of this thesis has a high relevance both thematically and in relation to groups of people who are affected by different forms of discrimination. It further examines why it is important to prioritize social responsibility in combating social problems and crises. The results of this research can be relevant for future research on the causes as well as combating energy poverty in Germany but possibly also other EU countries.

1.2 The Research Question and Sub-questions

Although there are various pleas for an intersectional approach, how these issues play out in political reality in Germany has been widely understudied (Strünck, 2017). Thus, this thesis aims to fill this research gap by explaining the importance of intersectionality for future policymaking and investigating if and to what extent Germany currently pursues an intersectional approach in combating energy poverty. This leads to the following research question:

To what extent does the German government make use of an intersectional approach to combat energy poverty?

To answer the research question, the following sub-questions will direct the analysis:

1. How can we study energy poverty from an intersectional perspective?
2. To what extent do intermediary expert reports show awareness of race, gender and class in addressing energy poverty?
3. What are key themes in the German policy debate on the risk of energy poverty in Germany?

The theory part depicts the important key concepts of each dimension and illustrates the concept of intersectionality, which is then coded into different dimensions to examine recent studies about energy poverty. This analysis is limited to Germany since a larger investigation would go beyond the scope of this work.

1.3 Research Approach

It is important to conduct further research in this field because not only energy poverty in Germany itself is largely understudied (Strünck, 2017, p. 15), but using an intersectional approach while researching social problems also implies taking a long history of systematic discrimination and violence into account and advocating for a society in which all people have equal rights and equitable chances (UN Women, 2020). Considering the many facets of the issue, the research design of this thesis will include a qualitative content analysis of three different studies on energy poverty in Germany (from 2013 until 2021), as well as three representative policy documents published by the German Government (published between 2020 and 2022). This kind of research design is meant to add a new perspective by not only looking at solutions of energy poverty policy making but also policy making regarding other social inequalities in Germany. Through this method, the research is hoped to provide an in-depth analysis of intersectional approaches within German energy policies.

2. Theory

The following part consists of the theoretical framework which includes the existing scientific literature and theories that have been conducted in this field of research, it is divided into four parts starting with a general introduction into the theory of intersectionality to furthermore explain the three dimensions of intersectionality. To explain the dimensions under which the studies in this thesis are analysed, it is important to define the key concept of intersectionality including its relevance and influence on different social phenomena.

2.1 Intersectionality

Intersectionality was first raised as a theory by Kimberlé Crenshaw (1989) who wanted to emphasize how power revolves and varies within the developments of institutions, social practices, cultural identities, and social groups. In 2016 Collins and Bilge defined intersectionality as “a way of understanding and analysing the complexity in the world, in people, and in human experiences” (Cooke & Few-Demo, 2021). It serves as a theory to better understand how the interaction of interpersonal, institutional, and intrapersonal factors shape the behaviour, ideas, and life trajectories of individuals. It promotes a multidimensional and inclusive point of analysing social identity and different types of communities (Runyan, 2018). Hereby intersectionality for the first time offers a new perspective on the issue of multifaceted oppression regarding the spheres of Race, Class and Gender, by suggesting that discrimination is in fact additional to each other and not separated (Runyan, 2018).

Intersectionality relies on several key concepts which describe and identify social categories which rely on factors that are socially constructed to formulate a social location in society. These factors can, for example, be Ethnicity, Class, Gender, Race, Sexuality, Religion, Nationality, and (Dis-)ability (Cooke & Few-Demo, 2021). The components which are most dominantly found in literature when talking about intersectionality are *race*, *gender* and *class*. Hence, these are analysed in this thesis as the scope of this research is not broad enough to sufficiently focus on all factors which compose intersectionality. Taking the perspective of Race, Gender and Class in social science can open a conversation about the issue of power in social life as well as in research. It emphasizes both, the oppressor and the oppressed, explaining that a system which claims to have equal chances and opportunities for all is always influenced by an interplay of various circumstances that consequently put people in different positions of power (Godfrey, 2012). These overlaying factors lead to discrimination on multiple levels and explain that one chance in life does not only rely on the resources a person has but on the mutually reinforcing restrictions a person is exposed to in society (Großmann, 2017). In the following the three factors are explained and their relation to the overall research topic of the thesis is presented.

2.1.1 Race

Firstly, it is important to state that with Race as a concept in social science, the social construct based within a context of society and politics is meant rather than any essential biological differences between groups of people (Garcia, 2017). Race is not a fixed entity and not only relates to the perceived skin colour of people but the control, oppression/privilege and system of thought that are associated with a certain skin colour (King & Chandler, 2016). As Race is associated with oppression and a certain system of thought, racism is not only an act of any individual who is treating people differently because of their skin colour, but also a systematic belief which is maintaining White supremacy through various social contexts (King & Chandler, 2016, p. 7). Considering Race and racism as structural issues in social sciences and analysis of social issues is crucial as it proves that people have a different reality within social constructs because of their skin colour.

When looking at energy poverty and its risks for people in Germany, structural racism does influence whether people struggle with it (Großmann, 2017). This risk arises because people affected by structural racism are treated differently in the German housing market. Therefore, the underlying assumption of this thesis is based on Müller, 2015 whose results show that discrimination can make access to well-insulated housing more difficult in the first place, which drives up energy bills and thus increases the risk of energy poverty for these people (Großmann, 2017). The thesis therefore examines whether German energy policy takes Race into account.

2.1.2 Gender

In research, Gender can be a very complex term to define as it has several meanings in different contexts and different theoretical approaches. The definition that will be used in this thesis is provided by Lindqvist et al. (2021) who refer to gender as consisting of many facets which are (a) physiological/bodily aspects (sex), (b) gender identity or self-defined gender, (c) legal gender, and (d) social gender in terms of norm-related behaviours and gender expressions. Additionally, the term transgender is used to describe individuals who do not identify with their assigned gender at birth which can go outside or beyond the traditional dichotomy of woman/man. The term cisgenderism refers to the assumption to visually see one's gender through the bodily characteristics of an individual based on their appearance (Lindqvist et al., 2021) which can also lead to discrimination. For this thesis, gender will be seen as the social construction which describes any individual apart from the cis male. By using the term women in this thesis, I would also like to state that other forms of gender identity are included, just for the sake of consistency, clarity as well as the right translation of studies which often only use the term women, this term is used. This Thesis does not intend to exclude any form of gender identity.

Gender in the context of energy poverty can have an influence in the same way as Race has, since women, especially single moms, have a tough position on the housing market as they often have fewer monetary resources as they are doing most (care) work unpaid (European Parliament, 2023). There has already been research done on the struggle between gender and energy poverty, e.g., by WECF (2022), explaining why Gender is a crucial aspect in this field of research. Hence, this thesis examines if the factor gender is considered in German policymaking regarding energy poverty.

2.1.3 Class

Class as a dimension in recent social science has been the assumption that within democratic capitalism there is a system which divides people according to monetary resources and works through different cultural dynamics that are responsible for social inequality (Savage et al., 2015). It describes the position a grouping of people occupies in the economic system and is constituted by similar socio-economic conditions, like income, power, and education (Pollak, 2018). Although it serves as one of the most central concepts in sociology it lacks a clear definition as it is subject to different approaches of perceiving class which depends on different accentuations (Pollak, 2018). In this thesis, class is perceived as a form of discrimination which can include any form of obstacles an individual faces because of their monetary resources, in the present or growing up, as well as the consequences this entails.

One example that illustrates the connection between class and energy poverty is the risks of falling into energy poverty. Many people who suffer from energy poverty in Germany have a small monthly budget that they can spend on rent or housing. Therefore, these people live in houses which are structurally inferior, thus heavier and more expensive to keep warm in the winter (Luschei et al., 2016). Therefore, monetary resources and class can be seen as another decisive factor when analysing energy poverty.

3. Methodology

With the categories previously presented, the first sub-question of how to examine energy poverty from an intersectional perspective can be answered. Studying how the key concepts of intersectionality Race, Gender and Class are interlinked, provides numerous possibilities of translating theory into empiricism, and therefore study societal phenomena like energy poverty. The following chapter hereby provides a transparent overview of the methods used in this thesis. Firstly, the chosen research design is explained to illustrate how it contributes to answering the research- and sub questions. Subsequently, the method of data collection is disclosed. Then the method of data analysis is explained to make it replicable how the choice of data analysis is suitable to provide a comprehensive assessment for answering the research question(s).

3.1 Case description and selection

A qualitative content analysis of three different studies on energy poverty in Germany is conducted to analyze the extend of how intersectionality influences policy documents on energy poverty in Germany. In addition to that a qualitative content analysis of three different policy documents by the German government is carried out to assess to what extend the German Government considers Intersectionality in the fight against energy poverty policy decisions.

The policy documents were chosen from the German feral council as well as the German federal parliament, as they present the two constituting institutions in the legislative process of the country as well as a document by the German Ministry of Economy and Climate Protection as it is the responsible ministry regarding energy policies. The three selected studies for this analysis therefore all deal with the topic of energy poverty in Germany, its causes and its effects.

3.2 Research Design

Qualitative content analysis provides the opportunity of a subjective interpretation on the context of certain text data (Hsieh & Shannon, 2005). In this thesis it serves the purpose of evaluating the issue within the themes mentioned in the theoretical framework. With a qualitative content analysis an evaluation of the connection between different forms of discrimination and the risk of energy poverty in Germany can be assessed. To further appraise whether the German government takes this relation into account and to assess how the risk of energy poverty will continue to develop in Germany, a second qualitative content analysis, with the same coding scheme. of policy documents by the German Government will be conducted. The time frame for the analysis of the legislative processes is limited to the years of 2020 to 2023, on the one hand to assess the social relevance of the current political present and to provide a better assessment of the future, and on the other hand because the scope of this thesis would otherwise be exceeded.

3.3 Method of data collection

The data collected for this research consists of three different studies, one by the large and reputable *Hans-Böckler foundation* in Germany, where the study *Energiearmut bekämpfen - Instrumente, Maßnahmen und Erfolge in Europa* by Strünck, C. (2017) was published. The registered association *VerbraucherzentraleNRW* is the source for the study *Energiearmut – Nein Danke! Ideen und Hilfestellungen für die praktische Arbeit vor Ort* by T. Schellenberg et. al. (2021). *VerbraucherzentraleNRW* is also a large and reputable organization which deals with the needs and concerns of consumers and conducts various research within this framework. Finally, the *Freie Universität Berlin* where the report *Energiearmut definieren, identifizieren und bekämpfen - Eine Herausforderung der sozialverträglichen Gestaltung der Energiewende* by Tews, K. (2013) was published. The texts were chosen as they have a high degree of validity and theoretical penetration which are two of five quality criteria for qualitative social research (Strübing et al., 2018).

These studies all focus on the different causes of energy poverty from a social scientific perspective. The data was selected as the different table of contents consider the impact of various socio-economic factors on the risk of energy poverty. This focus of the studies provides a direct connection to the theoretical framework of this thesis and is therefore suitable for the analysis. Additionally, these studies are covering a relatively long period of time (2013 to 2021) which gives the thesis a more nuanced review of origins of energy poverty in Germany.

To further assess the current policy making of the German Government three different documents and reports published by the German Government are analyzed. These consist of a proposal of the committees of the German federal council, a statement of the German federal parliament and the Integrated national energy and climate plan published by the German ministry of economy and climate. Since energy poverty is a largely understudied research field itself (Strünck, 2017 p. 15) as well as an underrepresented topic in policy making (Epp, 2017 p. 5), the analysis of intersectionality requires a comprehensive view on policy making. Due to the multidimensional nature of the theory itself, these three documents were chosen as a representation for the German policy making. The German legislative process involves the federal council and the federal parliament, hence two documents published by the federal council and the federal parliament on fighting energy poverty are used in this analysis and can be seen as representative for an assessment of the policy making process (BMI, 2022). Furthermore, the national energy and climate plan is analysed. It is a publication by the German ministry of economy and climate which is intended to contribute to improved coordination of European energy and climate policy and is the central instrument for implementing the EU 2030 goals for renewable energies and energy efficiency (BMWK, 2020). For this thesis it is highly expedient as it comprises an overview of the current energy policies and governance structures as well as the future goals of the German government.

By applying the coding scheme to this mix of sources it is expected to gain an elaborate insight into what the German Government does to prevent and fight energy poverty and furthermore helps to

answer the research question. Analyzing only legislative documents published by the ministry for economy and climate protection proved difficult as the topic of energy poverty is underrepresented and mostly finds mentioning in the context of energy production and energy efficiency, which is not necessarily of interest for this thesis. It would have not brought much insight and sufficient information to provide an assessment on energy poverty and intersectionality, which is crucial for analyzing the sub- and research question. The selection of the three documents was carried out by a keyword search on the respective website of the German federal parliament and federal council, as well as the German ministry for economics and climate protection.

Due to the aforementioned importance of intersectionality in academia in social sciences and highly representativeness and time relevance of the chosen data sources it is specifically interesting to see how far policy making processes in Germany interfere with each other regarding the overall topic.

3.4 Method of data analysis

To analyse these studies and the legislative drafts of the German ministry a coding scheme is used to analyse the documents in Atlas.ti which are explained in more detail in the method of data analysis part. To carry out the textual content analysis the key theoretical concepts are converted into shorter and more tangible data. These codes enable an analysis which is specifically tailored to the topic. In this thesis specifically the dimensions of (1) *race*, (2) *gender* and (3) *class*. With each of these dimensions different codes are generated. The categories were chosen based on the focus of intersectional literature and theory, as presented by Kimberlé Crenshaw and others. These codes contain words which are exemplary for the specific dimensions mentioned in the theoretical framework (Saldana, 2012 pp. 223 – 224). The codes are used as indicators to see to what extent the different text data deals with the dimensions of *race*, *gender*, and *class* to further identify what this implies for the future of people who are affected by multiple types of discrimination and either the risk of energy poverty or the ones who are already suffering from it. The coding tables in this part contain the English words as the thesis is also written in English but a translation of the English word into German can be found in the appendix (see Appendix 1 and 2). The example key words are used for both studies and policy documents as it gives the opportunity to check what has been found in theory can also be found empirically. The following table shows the codes used for the analysis of the three studies and for the policy documents of the German Government. Based on the theoretical background of this thesis, the documents are expected to show relevant results regarding the influence of intersectionality presented as multi-faceted forms of discrimination. To apply the coding scheme to the different documents the software Atlas.ti will be used for a process of in-vivo coding. Atlas.ti is a qualitative data analysis software which helps with the coding of different text documents (Atlas.ti, 2023). Furthermore all quotes used in the thesis, which were in German, were translated by the author.

Theory	Category	Codes
Intersectionality	Race	Nationality/Citizenship, Ethnicity, Racial Bias, residency status, Migrants, Asylum seekers
	Gender	Women, Single Mothers, care work
	Class	Social benefits, poverty, low-income households, welfare recipients

Table 1: Coding scheme for the Analysis

4. Analysis

The following chapter provides answers to the remaining two sub questions proposed in the introduction and eventually the research question by interpreting the results of the coding from Atlas.ti. It is structured by firstly exemplifying the findings of the coding of the three studies to explain, to what extent the reports show awareness of Race, Gender and Class when discussing the origins of energy poverty (sub-question 2). The same method is used to further explain the results of the coding of the three different policy documents and to answer the research question, as well as sub-question 3. Because the text documents used for the analysis are individually very extensive, there are only 6 individual documents in total, thus the structure for this analysis is based on the individual documents. The most important findings related to the research question are then answered for each document.

As described in the Method of data analysis part, the text documents used for the analysis were coded through Atlas.ti from which several graphical representations of the data will be used to make the results of the coding clearer.

4.1 Studies on energy poverty

Within this paragraph the results of the empirical analysis regarding the three studies on energy poverty as introduced before will be presented.

4.1.1 Study 1 by Tews, K. (2013)

The study “Energiearmut definieren, identifizieren und bekämpfen - Eine Herausforderung der sozialverträglichen Gestaltung der Energiewende” by K. Tews was published in 2013 and is one of the first larger investigative studies and reports on how energy poverty is defined and conceptualized within German political debated (Tews, 2013, p. 3). The author defines energy poverty as a structural problem of low-income households and analyses the at that time applicable instruments of measures in the fight against it. The author uses the term social compatibility of energy transformation in their executive summary which refers to the concepts that can also be found within the theory of intersectionality – perceiving social inequality as an interaction of many factors (Race, Gender and Class, for example) which makes individuals more likely to suffer from different forms of poverty, including energy poverty. The term highlights the authors intention when analysing the text which makes it suitable with regards to the research- and sub questions of this thesis.

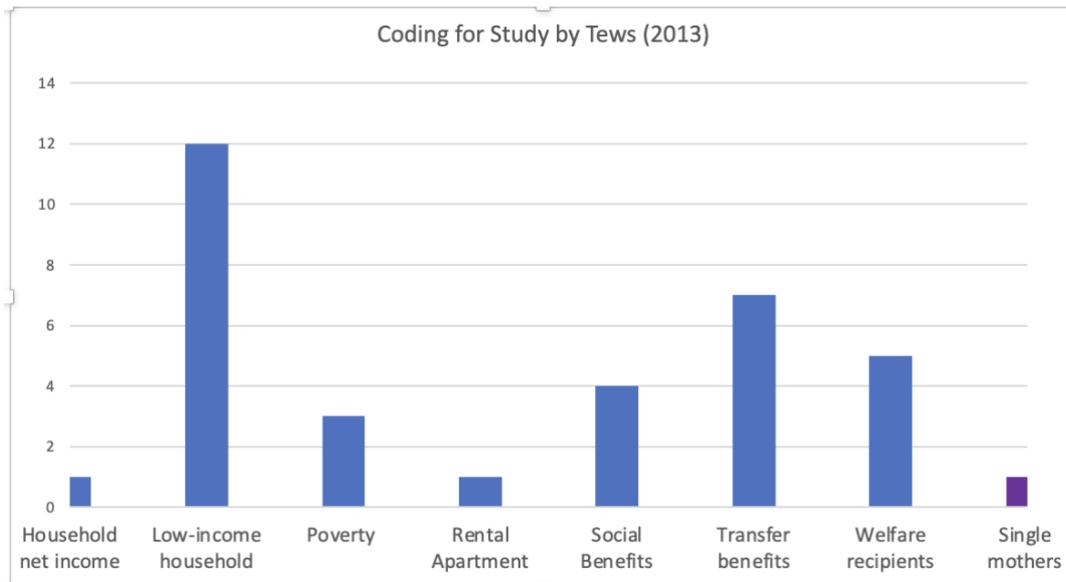


Figure 1: Coding Results from Atlas.ti for Study by Tews (2013)

The diagram shows the coding results from the study by K. Tews. As blue represents the codes from the category *class* it becomes evident that this study mainly mentions class as having an influence on an individual’s likeliness of suffering from energy poverty. She stresses that “[h]igh energy prices are therefore a problem for low-income households in particular, which should be addressed by policymakers.” (Tews, 2013 p.7) and concludes that “[l]ow-income households are therefore rarely able to tap into significant consumption and thus cost savings.” (Tews, 2013 p. 9). She notes that energy poverty is also dependent on how energy efficient someone’s apartment or house is which depends on how much money someone has.

“The term "energy poverty" was introduced into the political discussion in Germany several years ago, particularly by social and consumer protection associations, in order to draw general attention to the growing risk of poverty in Germany and to the insufficient coverage of needs through the definition of the socially legally relevant minimum needs within the framework of social assistance (SGB XII) and basic benefits for jobseekers (SGB II) (Tews, 2013 p. 16) .“

In her study regarding the calculations for the money that social benefit recipients receive for heating, Tews found connections towards even deeper problems within the German welfare system. Referring to the code *transfer* benefit, she highlights the following:

"Transfer benefit recipients in particular can be affected by this to an excessive degree, as the (lower) local comparative rent is used in many municipalities as the assessment basis for evaluating the appropriateness of rental costs and the heating cost savings that can be achieved through energy-efficient refurbishments are not taken into account in parallel.” (Tews, 2013 p.50)

“In view of these and other researchers' calculations, as well as the extremely limited possibilities of an "internal compensation" of higher electricity costs at the expense of other essential consumption expenditures (cf. section 3.1.1), it can be assumed that the state transfer payments for household energy (especially electricity) tend to represent an undercoverage of actual needs, which policymakers should remedy by increasing the transfer payments.” (Tews, 2013 p. 22).

She mentions the code single mother at one point where she writes about the existing social benefits regarding different groups of people in society and how these existing regulations can have certain gaps in the calculation of consumption expenditure and ultimately result in this group having too little money to cover for example, energy costs.

“This means that only 72 per cent of the consumption expenditure of the lowest-income single [mother] person is recognised as relevant to regular needs (ibid.). The accumulation of the normative deductions from the actual consumption expenditure of the lower income group not only represents a shortfall in needs for all eligible households - also for those who do not even make these expenditures relevant to regular needs.” (Tews, 2013 p. 18).

4.1.2 Study 2 by Strünck, C. (2017)

The second study analysed is an extensive study done by C.Strünck in 2017 and gives a comprehensive overview on the origins as well as current measures to fight energy poverty in Germany.

The coding in atlas.ti showed significant amounts of mentioning words or sentences related to codes like *low income households*, as well as *female head of households*, *single mothers* and *women*. The results of the coding can be seen in the diagram below.

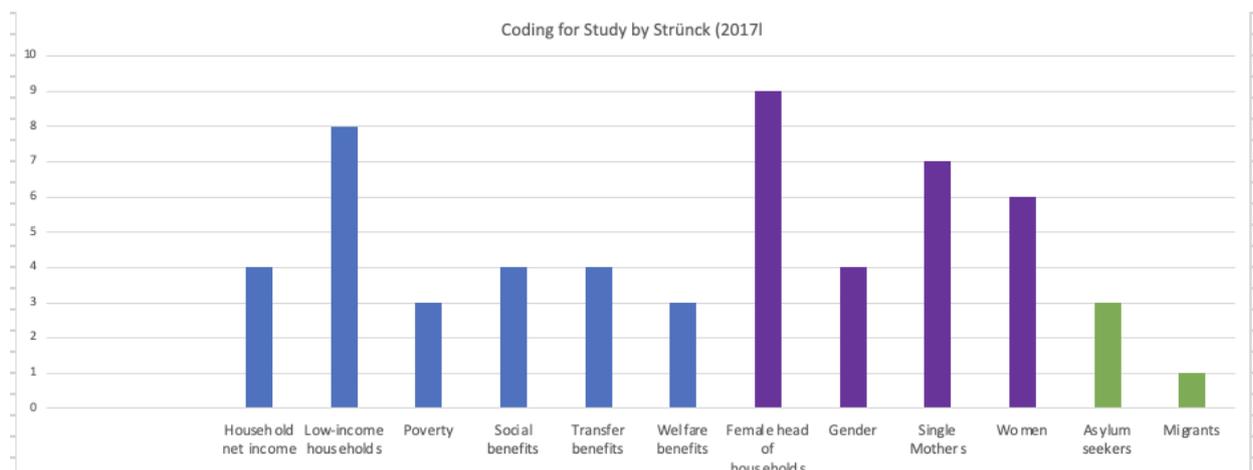


Figure 2: Coding results from Atlas.ti for study by Strünck (2017)

Strünck mentions low-income households as one of the core group of people who suffer from energy poverty: *"According to this, households with high incomes, with two or more employed persons in the household and house and flat owners are relatively less likely to be affected by energy poverty, and households with low incomes, no employed persons and single parents are relatively more likely to be affected."* Strünck, 2017 p. 145). Social benefit recipients are according to Strünck the most affected group of energy poor people in German: *"Of all households receiving unemployment benefit II or social benefit, 91.3 per cent are considered to be energy poor."* (Strünck, 2017 p. 140). Striking about his study is the huge significance he pays to influences that fall under the category *gender*. He writes: *"Female-headed households are almost twice as likely to experience energy poverty (29.6%; 4.7 million)." (Strünck, 2017 p. 140).* which does support the hypothesis that *gender* has an influence on an individual's risk of suffering from energy poverty. This also goes for the code *single mothers* where Strünck mentions: *"Women are also more affected because they make up the largest proportion of single parents. And single-parent households (2.3 million in total) are the most affected by energy poverty of all households (Strünck 2017, p.127).* " While Strünck does not mention the influences of *race* directly on the likeliness of suffering from energy poverty, he mentions people who are under especially difficult life circumstances. These were connected to the code *Asylum seekers* as people who are not permanently granted to stay in a country, but also cannot go back to their home country because of reasons like a war or political persecution etc. Strünck mentions them in the context of different strategies of overcoming energy poverty: *"The assistance to overcome particular social difficulties includes, among other things, counselling and personal care for the beneficiary and his or her dependents. (Strünck 2017, p. 47)".*

The analysis of the study by C. Strünck shows that factors like Gender, Race and Class have a significant influence on someone's risk of suffering from energy poverty in Germany and highlights the complexity of the factors itself. While a common belief might be that only income of a person makes it more likely for them to suffer from (energy) poverty, Strünck demonstrates in his study that, while it is true to some extent, it is way more complex than that (Strünck, 2017 p. 29).

With regards to the second sub-question of the thesis, this study shows that Race, Gender, and Class do influence the debate on energy poverty in studies and reports.

4.1.1 Study 3 by T. Schellenberg et al (2021)

The following analysis is about a final report on a project conducted in North-Rhine-Westphalia, Germany with the title "Energiearmut – Nein Danke! Ideen und Hilfestellungen für die praktische Arbeit vor Ort" which is intended to help citizens who were at the risk of falling into energy poverty or were already suffering from it (Schellenberg, 2021 p. 3). While the report does inform about the project and its results it also provides a theory section on the backgrounds and risks of falling into energy poverty which makes it suitable for the answering of the second sub question and for the research question of

this thesis. Additionally, the report was published in 2021 and therefore considers more recent political events which had an influence of the topic.

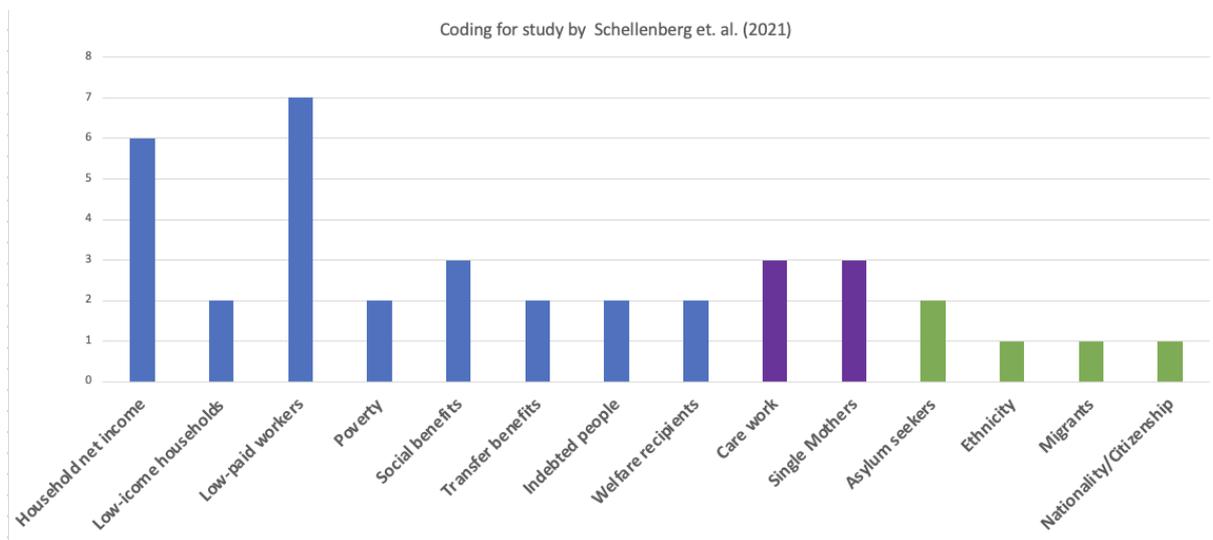


Figure 3: Coding results from Atlas.ti for Study by Schellenberg et. al. (2021)

A significant difference to the other studies is the mentioning of codes from the category *race*. The author provides, similarly to the study by Strünck (2017), a list of causes and exacerbating factors regarding the risk of falling into energy poverty (Schellenberg, 2021 p. 14).

Different than Strünck (2017) is that these factors are from empirical results from the project rather than theoretical driven ones and are also more prevailing. The results from atlas.ti show a fairly even distribution of the codes used.

“There are people who fall through the cracks of the social security systems because of their income structure. There are people who have little influence on the efficient use of energy because they live in unrenovated flats with high energy requirements and use outdated household appliances. And then there are the people who, due to a multitude of other personal difficulties, only have low self-help skills and simply do not manage to sufficiently organise their everyday affairs” (Schellenberg et. al. 2021, p 12).

While explaining the distribution of people who were helped in their project, it is striking that “Children live in 41 percent of the advised households. In almost 42 percent of these households, one parent is a single parent.” (Schellenberg et. al, 2021 p. 19). The authors highlight the complexity of the problem and put it into a different perspective by mentioning individuals’ capacities of self-help as a source and possible explanation for their risk of falling into energy poverty. These capacities can be traced back to numerous reasons which can be caused by discrimination of the individuals’ Gender, Race, or income. This can be seen in the diagram above in which the authors summarize the problem situation recorded,

which led to energy poverty for these people. In 23% of the cases language and understanding problems (Schellenberg et. al, 2021 p. 14) are the leading cause for energy poverty. This was coded as *Migrants*, *Ethnicity* and *Asylum seekers*, people who have a different mother tongue than German or are only learning German have higher difficulties of understanding the administration process (including, bills, documents from the council, the welfare system etc.) than people who can understand German without problems. Not to mention that the language used in these types of documents are often very hard to understand for people who normally don't struggle with the German language.

The results of the coding show that all coding categories and a lot of codes were mentioned in the report which proves that the coding categories *race*, *gender* and *class* influenced the report.

The report also provided an overall more nuanced assessment on factors driving energy poverty in Germany as it uses data which was conducted in real life.

4.1.2 Remarks on the analysis of the studies and discussion of findings

With this part of the thesis, it is now possible to answer the second sub-questions: *To what extend do intermediary expert reports show awareness of race, gender and class in addressing energy poverty?* All of the three studies analysed in this thesis showed significant mentioning of the different codes which were used to test the theory of intersectionality. The diagram below shows the number of codes for each study:

The different years of publishing of the studies do influence the coding outcome as for example the study by Tews (2013) which was published 10 years ago and back then there was not much research conducted on energy poverty (Tews, 2013 p. 8) and therefore the causes of energy poverty have not been analysed as multidimensional as now where there is several research on the causes and origins of energy poverty. When looking at the study by Strünck (2017) it is striking to see the huge significance the author pays to influences that fall under the category *gender*, especially in comparison to K. Tews study from 2013.

This is amplified when looking at the development from the study by Strück (2017) and the study by Schellenberg et. Al (2021) while Strück (2017)

4.2 Policy documents on energy poverty (2021)

The following chapter will display the results of the analysis of three different policy documents from the German government. As the analysis of the three studies above, these policy documents were also coded through in Atlas.ti and with the results the second sub-question of this thesis will be answered as well as new insights towards the answering of the research question will be provided.

4.2.1 Policy-Document 1 by German federal council:

This document “Proposal for a directive of the European Parliament and Council on Energy Efficiency (recast)” is a proposal made by the German federal Council, which intends to suggest a new directive of the European Parliament regarding energy efficiency. Although it does not propose particular policies for Germany (and even though Germany is part of the European Union and will be affected by this directive) this document gives insights on how the German Government frames energy poverty and will therefore be helpful with regards to the research question. The overall content of the source hereby gives an overview on how the German federal council assesses the topic of energy efficiency from a social perspective. The results as presented in the figure below show significantly high results for the code *low-income households* and *welfare recipients*. As well as high results for the code *low paid workers* and *social benefits* which all belong to the category *class*.



Figure 4 : Coding results from Atlas.ti for policy document by German federal council

The text hereby especially mentions groups of people living in social housing as vulnerable to the issue by stating:

“Taking action against energy poverty and using energy efficiency measures to strengthen and protect people affected by energy poverty, vulnerable customers and people living in social housing should be expressly supported in the Bundesrat's view.” (Bundesrat, 2021 p. 2).

Especially low-income households are explicitly mentioned in the proposal, saying that *“In principle, the Federal Council welcomes the objective set out in the proposal for a directive, namely financially weaker households.”* (Bundesrat, 2021 p. 2). Furthermore, the federal council and their concerns for the future developments of energy poverty the proposal mentions that *“The [federal councils] considers it particularly important to ensure equal opportunities in the relevant measures and to avoid exacerbating the risk of energy poverty for socially disadvantaged groups and low-income households* (Bundesrat, 2021 p. 15).”

Finally, the coding of this proposal showed a one-sided distribution regarding the coding category's as only the codes from the category class were mentioned.

Especially interesting to see was the use of the word “in need of protection” which was often used in connection with the phrasing “*low-income households*” as for example in the context of the European context.

“*A particular challenge for Member States is to ensure that energy efficiency measures do not have a detrimental impact on vulnerable end-users, in particular do not exacerbate existing inequalities, but effectively reduce energy poverty.*” (Bundesrat, 2021 p. 3) or “*The Federal Council supports the approach that Member States must achieve a share of the required cumulative final energy savings among people experiencing energy poverty, vulnerable customers and, where appropriate, people living in social housing, that is at least equal to the share of households experiencing energy poverty as estimated in their national energy and climate plans.*” (Bundesrat, 2021 p. 3) Using these words “in need of protection” can be interpreted differently as for example in the context that they wanted to summarize a group of people, but not once mentioning who these people are can lead to the assumption that the federal council used this term as a shortcut to not have to mention particular groups in need of help, either because they do not have the intention of helping for example single mothers or asylum seekers as the analysed studies above show that these people are in particular at risk of falling into energy poverty (Schellenberg et. al 2021, p. 14).

4.2.2 Policy Document 2 by the parliamentary groups SPD, BÜNDNIS 90/DIE GRÜNEN and FDP

This draft legislation “German Federal Parliament: Draft legislation” was proposed by the social democratic party (SPD), the green party (BÜNDNIS 90/ DIE GRÜNEN) and the liberal democratic party (FDP) in the German Parliament in February 2022 (Bundestag, 2022). This draft legislation was later approved by the parliament and therefore can be seen as exemplary for policy making in Germany. The draft legislation contains a proposal for granting a one-off heating subsidy due to the striking rise of energy costs. According to this draft legislation low-income households as well as people with low income in an apprenticeship who receive funding from the state should receive a one-off heating subsidy (Bundestag, 2022). People who are in apprenticeship are coded as *low-income workers*.

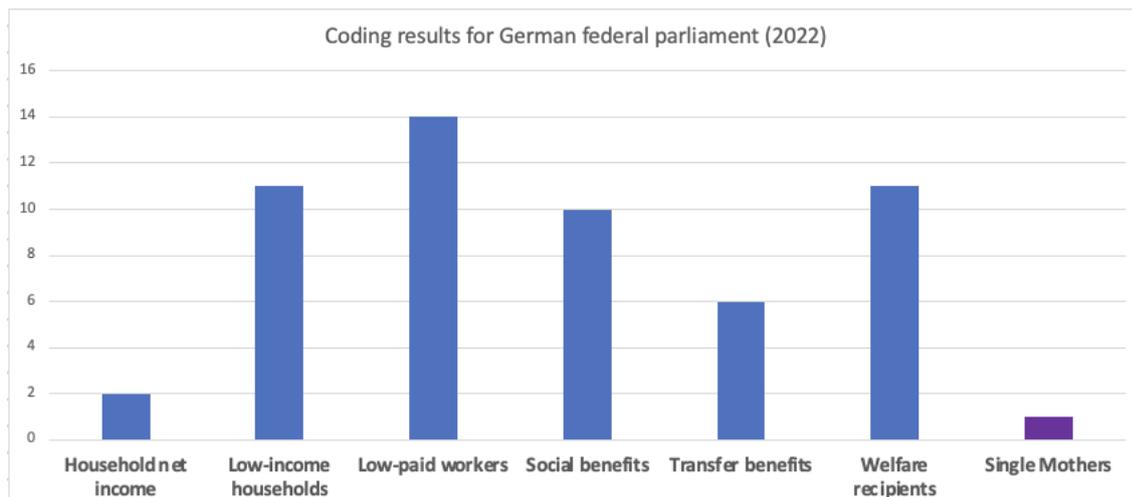


Figure 5 : Coding results from Atlas.ti for policy document by German federal parliament

This draft legislation does not explicitly mention energy poverty as a term, it mentions the word “poverty” only once and that is under the section of *sustainability aspects*: “*The payment of such a one-off heating allowance contributes to sustainable development. The German Sustainability Strategy 2021 has been reviewed. Principle number 1 "End poverty - in all its forms" is affected*” (Bundestag, 2022 p. 8).

This can be interpreted as exemplary for the framing of the party’s perception of the problem itself, not using the word “poverty”, which for most people is perceived as something negative can understate the issue raised. As the coding results show the code *low-income households* which in this context is used as a 1:1 translation of the word was used a substantial amount of time which can be interpreted as sounding more neutral than the word “poverty”.

Apart from the framing and the use of a particular language the distribution of codes shows a high number of codes used from the category *class* for example: “*Compared to households with medium and high incomes, the share of housing costs in disposable income is in part significantly higher for households with lower incomes. Significant price increases in heating costs therefore burden these households on average more than households with medium or high incomes,*” (Bundestag 2022, p. 1).

The same results apply for the use of the category *low paid workers*: “*The Federal Training Assistance Act, the maintenance contribution under the Upgrading Training Assistance Act, and the vocational training allowance and training allowance under the Third Book of the Social Code provide corresponding relief for the housing costs of low-income training and upgrading participants.*” (Bundestag 2022, p.1). The results regarding the draft legislation show an uneven distribution of the codes from the different categories which does confirm the influence of the category *class* but not the consideration of the categories *race* and *gender*.

4.2.3 German Ministry of Economy and climate protection: Integrated national energy- and climate plan

The integrated national energy- and climate (NECP) plan published by the German Ministry of Environment is a new monitoring instrument by the European Union and its member states and obliges each member state to reveal an overview on their energy and climate policies as well as their current policy plans, between 2020-20230 in that field to contribute to an European wide energy transition to combat the proceeding climate change (BMWK, 2020). For this research question the NECP provides an expansive summary on Germanys climate policies from which energy poverty and the influence of intersectionality can be analyzed.

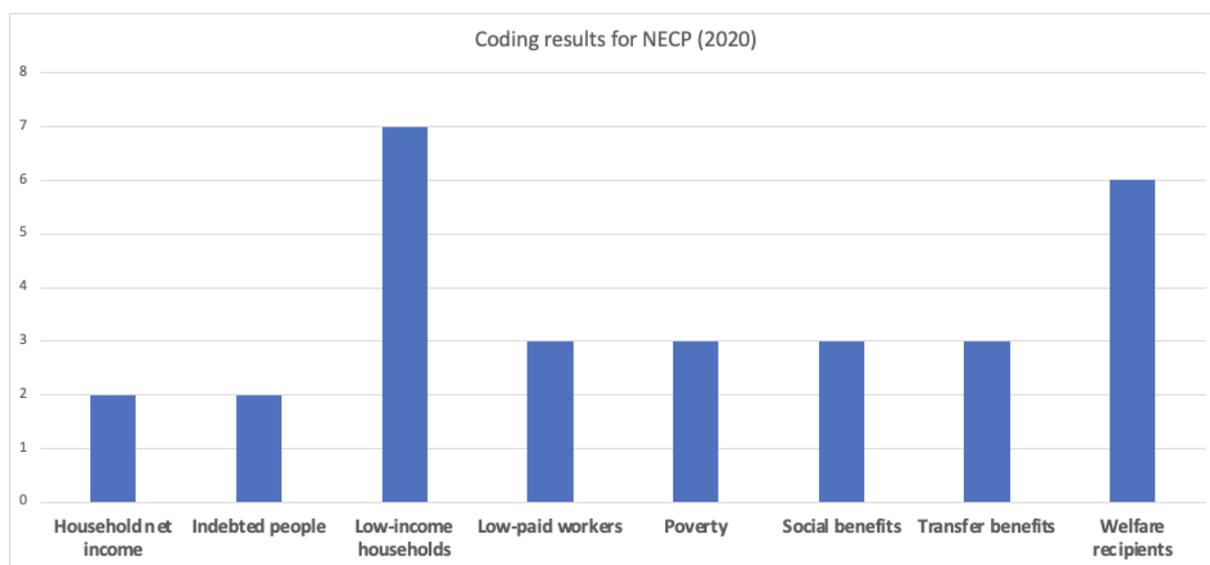


Figure 4: Coding results from Atlas.ti for policy document NECP

As the figure above shows, the key-words most used were *low-income households* and *welfare recipients* as correlating to the category *class*. Overall, the distribution of the codes show similarities to the other documents published by the government: general high numbers of codes from the category *class*.

The report mentions the importance of affordability and importance of social equality when it comes to the energy transition: “*Ensuring the security of supply must be guaranteed at a high level. Cost efficiency is an important prerequisite for keeping energy affordable; it is therefore an important contribution to social justice.*” (BMWK, 2020 p. 16) and presents a dedicated section to energy poverty which both show that there is awareness regarding the topic. By looking at the distribution of the codes it is evident to see that this mostly counts for codes from the category *class*. Looking at the section of energy poverty the plan suggests: “*The Federal Government pursues a comprehensive approach to poverty reduction that does not focus on individual elements of need, such as energy. Costs that households incur from the*

purchase of energy are considered just as much as other elements of subsistence needs.” (BMWK, 2020 p. 133).

With this sentence the ministry discloses that energy poverty will not be approached as a problem within the bounds of the ministry for economy and climate protection which covers the energy sector, but rather refers to the overall combat of poverty through other branches of the government. This can be interpreted as a different form of negotiating and not really dealing with the problem at its core.

The plan does mention the codes at other points where they propose their strategy of future measures to protect consumers (including energy poor ones). The ministry explains its *Concept of the basic and substitute supply* (BMWK 2020, p. 129) and says: “[...] *the law restricts the basic [electricity] supplier's right to immediately interrupt the supply or disconnect from the customer in the event of late payment. There is also no contractual minimum term for the basic supply; it can be terminated by the customer at short notice at any time and without cause.*” (BMWK, 2020 p. 129). Given that this is the extreme case scenario for someone suffering from energy poverty it is not a measure that would combat energy poverty in general. Other mentions for the codes of *class* were regarding social benefits and transfer benefits where the plan says: To avoid social hardship in the event of rising heating costs, housing benefit recipients are supported by a 10% increase in the housing benefit volume. (BMWK, 2020 p. 130) and *“Increased energy costs are already taken into account in the transfer payments according to the established procedures.”* (BMWK 2020, p. 130).

Considering that this plan should involve the future plans of the German Government with regards to energy (especially energy transition) the topic of energy poverty or potential people suffering from it does not play a substantial role in the NECP.

4.2.4 Development on the Analysis of the policy documents

Through the analysis of the three policy documents published by the German federal council, German federal parliament as well as the Integrated National Plan on Energy and Climate the third sub-questions *What are the key themes in the policy debate on the risk of energy poverty in Germany?* can now be answered. The analysis showed that policies made by the German Government show awareness of the risk of energy poverty and that it is increasing as climate change is getting worse e.g., Bundesrat, 2021 p.3. The framing of the topic of energy poverty within these documents refers mostly to welfare recipients or people receiving social- or transfer benefits e.g., BMWK, 2020 p. 130 in general than on certain groups of people for example people who are single mothers or women living alone who are, as the analysed studies show more affected by energy poverty (Strünck 2017, p. 127). The German Government does react to the ongoing danger of energy poverty as shown is draft legislation analysed above (Bundestag, 2022) but is only doing so as reactive interventions in moments of crisis and not as a long-term solution for people who are still at risk of being affected by

it. This also confirms the NECP which shows that the German Government does not intend to deal with the problem as an issue for the energy and climate change branch but rather generalizes the problem as something the whole government must work on (BMWK, 2020).

The third sub question can therefore be answered by saying that the analysed documents for this thesis do not show influence of intersectionality.

5. Conclusion

The conclusion will summarize the most important findings from the analysis and provide answers to the research- and sub questions of this thesis. It will also explain how this research contributes to overall research that has been conducted in this field of study and what it contributes to the social and societal relevance and future research on the topic. In line with that this section will also explain the limitations and boundaries of this research, as well as the practical implications of the findings.

5.1 Answer to the Research Question and Sub-questions

Within this thesis, the theory of intersectionality, referring to the critical reflection of Race, Class, Gender, Age, Sexuality and others, as well as their interconnection leading to complex social inequalities was introduced (Collins, 2016). Hereby, the three key categories Race, Gender and Class were extracted to analyze their dimensions and presence within the chosen datasets, as the inclusion of all dimensions of intersectionality as presented in scientific literature would have broken the scope of this thesis. Therefore, to assess whether intersectionality is addressed in the policy debate, studies published on energy poverty in Germany were analyzed. The three studies chosen for this research were covering the time frame from 2013-2021.

To answer the sub-question 1 “How can we study energy poverty from an intersectional perspective?” as presented in the introduction, the analysis has shown that this is best possible by looking at literature, media contributions, official government statements and other sources which already describe the causes and effects of energy poverty. As a following step, they should be analyzed by using categories that reflect Intersectionality and its core principles. In doing so, we need to look in particular at the extent to which the correlation between forms of discrimination is taken into account and how the interplay between them is framed. Otherwise there is high risk of parallelly analyzing the issue but separately.

To furthermore find an answer regarding sub-question 2 “To what extend do intermediary expert reports show awareness of Race, Gender and Class in addressing energy poverty?”, the presented results can be best understood by considering the time frame and the development in time of the analyzed data sources. While the data from 2013 almost did not show any awareness of the issues at all, there were already big changes made when the data from 2015 was published. Finally, the literature from 2017 shows a clear difference, as a fairly large extent of intersectionality was present

For the final sub-question 3 “What are key themes in the German policy debate on the risk of energy poverty in Germany?”, the empirical analysis has found most of the major themes were found in regard to the category *class* only, oftentimes taking into account the background of the German social security system and already existing measures to combat poverty. These findings can be underpinned with the processes of weighing up due to incrementalism. What is also important to consider here is that it seems that the German government does not have much interest in fighting poverty, as otherwise the basic capitalist system would no longer function.

Finally, the overarching research question of this thesis “*To what extent does the German government make use of an intersectional approach to combat energy poverty?*” can be answered.

The analyzed data sources showed that the categories *class*, *race*, and *gender* influenced the likeliness of suffering from energy poverty. Hereby, the dimension of *class* especially showed that living in a low-income household or receiving transfer benefits increases the chances of suffering from energy poverty (see results from 4.1). The analyzed policy documents did not show any signs of consideration for intersectionality regarding the a priori coding categories *race*, *gender*, and *class*. This is proven through the circumstance that even if the category *class* was covered, which also has not been the case in all sources, no other categories were set in correlation with the issue. Therefore, as intersectional approaches would mean the consideration of multiple discrimination approaches in relation, an intersectional approach could not be found. However, to point out existing awareness within the policy debate on energy poverty, results regarding people’s income and status regarding their education must be highlighted, as they received multiple special mentioning’s within the literature and frequently were used in relation to each other.

The analysis of the policy documents revealed that the German Government proclaims awareness for the topic and sees the risk for individual households and citizen but based on the analyzed data, does not consider an intersectional approach. The analyzed studies showed that the interconnection between the categories *race*, *gender*, and *class* are important to consider in the making of policies to combat energy poverty, and while the Government does that to some extent (e.g. Bundestag 2022) it only goes back to the category of *class* which refers to people who are already in the welfare system and not the ones who are on the verge of falling into it or are more prone to fall into energy poverty because of their *race* or *gender*. This also shows the NECP where energy poverty is referred to as not being a problem for the ministry of energy and climate protection but should be part of the overall fight against poverty (BMWK, 2020 p. 133). The following aspects should be considered when looking at the results of this research: The complexity of the whole problem which is related to the economic system of a country. Germany is a country which claims to have a free-market economy but at the same time secures social security and prosperity (BMWK, 2023). The issue with that is that the free-market economy needs poverty to keep the system working, so it is questionable in how far the German Government is interested in really combating (energy) poverty for all people or only for some as it always relies on an amount of people who need to live in poverty (Butterwegge, 2017). Considering this fact, it is not surprising that the only

question in the German federal parliament about a unified definition and a plan to combat energy poverty, in the last six years, came from the party DIE LINKE, as the only active party in parliament trying to fight capitalist market structures (DIE LINKE, 2017).

The theory of intersectionality is taking the power relations in a capitalist system as a reference point to analyse in how far different forms of discrimination play together and give an explanation to why an individual is for example more likely to suffer from (energy) poverty (Ganz & Hausotter, 2020 pp. 37-38). Another point that needs to be taken into consideration is the German policy system itself which has flaws, and that might not work in favour with the current time of different crises that need to be dealt with at the same time. One of them being Incrementalism which describes a strategy of pursuing a problem in small steps (Bundeszentrale für politische Bildung, 2021). While this can have many positive impacts it also means that problem tend to be ignored and prioritising problems becomes difficult or the urgency of a problem seems very sudden (Heinze, 2006 p. 257).

The general combat of poverty in Germany as well as certain policy making procedures are possible explanation why intersectional concepts could not be found within the German policy debate, based on the data analysed in this thesis.

5.2 Strengths & Limitations

The limitations of the research can be summarized in two main points, the first one being the fact that only three categories (*race*, *gender*, and *class*) were analyzed. Intersectionality covers way more dimensions, but these three were chosen as they revealed to allow more data to analyze for a textual content analysis and seemed the most sensible when looking at reasons for energy poverty. This choice was made mainly because of the available documents to analyze.

The second point has already been partly answered and that is, that there is not a lot of research on that field to analyze for a qualitative content analysis. As stated before, energy poverty is an understudied field in Germany. In comparison to other countries in the EU, there is very little research done in this field of research. For example in Austria where the government published a study regarding energy poverty from a socio-economic perspective (Matzinger et al., 2018).

In retrospective and for future research *age* could be an interesting dimension to also take into consideration when analyzing energy poverty from an intersectional perspective as not only does poverty among seniors is becoming a rising issue (Greyer et al., 2019 p. 9) it was also mentioned as an influencing factor in some of the documents analyzed in this thesis (e.g., Strünck, 2017 p. 29). Additionally for future research, it would be interesting to see how other dimensions of intersectionality affect the risk of energy poverty.

5.3 Discussion

The results of the analysis stating the higher risk of energy poverty for people from low-income households as well as the relevance of the category *class* within this chain might seem obvious,

considering that it is common knowledge that people with little access to resources will most likely be more severely affected by the emergence of high energy prices. Still, what is interesting to see is the correlation that if people are already low on monetary resources *and* are also having issues to understand certain documents and agreements *or* are single mothers, the chances are even higher to suffer from energy poverty (e.g. Schellenberg et. Al. 2021). This leads to the assumption that single mothers who have problems understanding German documents and at the same time are already low on monetary resources are the hardest hit. This reflects the core of intersectionality and proves the problem. The fact that intersectionality is still not mentioned by name or at least looked at in context and fought against is therefore particularly bad.

The analysis of the studies showed that the *concept of intersectionality is applicable to the issue of energy poverty in Germany and suffering from multiple forms of discrimination does increase an individual's chance to suffer from it*. However, were these connections only seen in some parts of the study from 2017 and in the study from 2021, while the study analyzed from 2013 only saw codes from the category *class* as relevant for an individual suffering from energy poverty. This can be explained by the fact that research in 2013 on the topic was rather new and still to this day remains very small. Considering that the concept of intersectionality is also rather new and not very established these results can be explained by the point of time the study was conducted.

Additionally, the selection for documents to analyze the policy debate proved as rather difficult as the topic of energy poverty is closely connected to other topics (e.g., energy efficiency of buildings) which were of no interest for this research. Also, the topic itself is largely underrepresented in policy making in general (Schellenberg et. Al. 2021 p. 11).

5.4 Social and scientific relevance

The scientific relevance of this paper lies within its contribution to the advancement of the field including an increase in the visibility of marginalized groups and groups that are already underrepresented in scientific work. Through this lens, this paper can contribute to more efficiency regarding the making of future energy policing for vulnerable people. In addition, this study is closely linked to the urgency of climate action and therefore contributes to intersectionality in climate awareness studies as well. Finally, it also has a significant contribution on a methodological level as these documents have not yet been analyzed using an intersectional approach before, leading to the interdisciplinary findings of the study.

As to the social relevance of the paper, the topic of energy poverty is an issue that is regarding the immense equity and social justice gap in Germany. This study has hereby not only shown who is most affected by the problem, but also unveiled the importance of intersectional approaches generally. Hereby, the visibility of the victims of unsuccessful energy policies in Germany can also lead to empowerment, as it is easier to be heard when having empirical evidence to back up your own claims.

Considering this background, this study provides necessary information for people who suffer disproportionately under energy poverty, due to intersectional discrimination.

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Appendix

List of translation for Coding scheme 1

Codes	English	German
Race	Nationality/Citizenship	Nationalität, Staatsangehörigkeit
	Ethnicity	Herkunft
	Racial Bias	Rassistische Vorurteile
Gender	Women	Frauen
	Single Mothers	Alleinerziehende Mütter
	Care Work	Sorgearbeit
Class	Social Benefits	Sozialleistungen
	poverty	Armut
	Low-income households	Einkommensschwache Haushalte

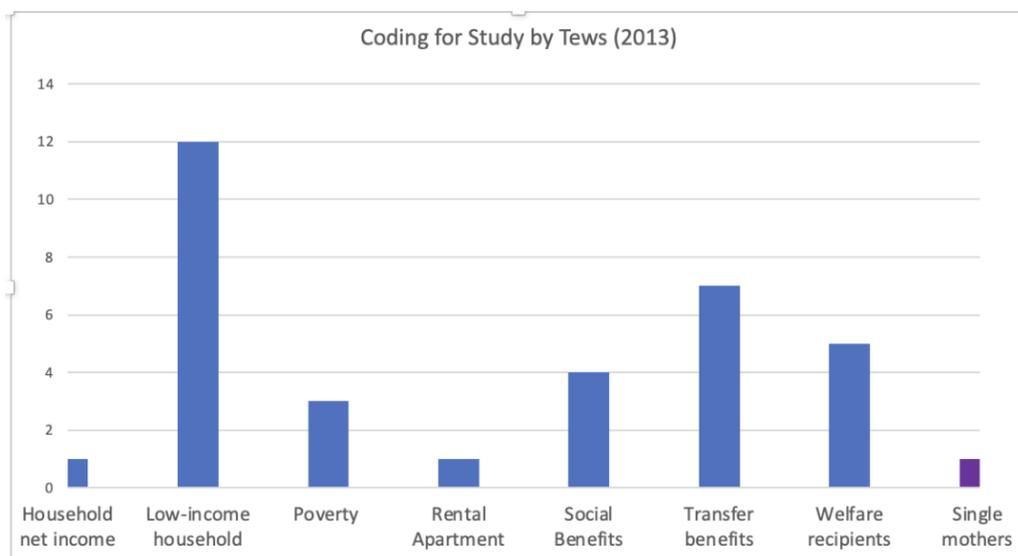
Race	Migrants	Migrant*innen
	Asylum seekers	Asylsuchende
	Nationality/Citizenship	Nationalität/ Staatsangehörigkeit
	Residency status	Aufenthaltsrecht
Gender	Women	Frauen
	Mothers	Mütter
Class	Low-wage sector	Niedriglohnsektor
	Welfare recipients	Sozialleistungsempfänger*innen

Appendix 1

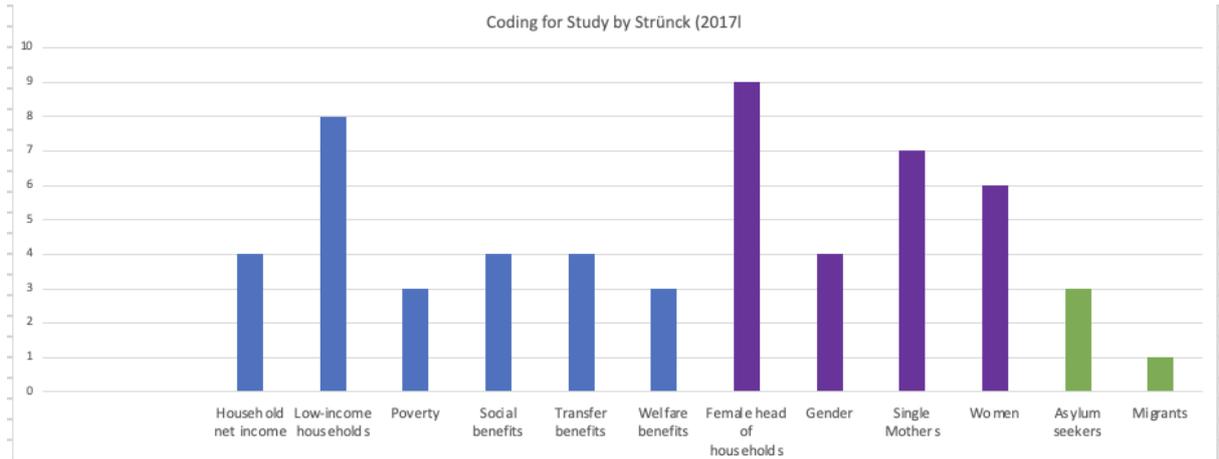
Table including all data sources used for the coding process

Category (studies on energy poverty =1; Policy documents on enery poverty =2)	Document Nr. in Atlas.ti	Source
1	2	Tews, K. (2013). Energiearmut definieren, identifizieren und bekämpfen – Eine Herausforderung der sozialverträglichen Gestaltung der Energiewende.
1	4	Strünck, C. (2017). Energiearmut bekämpfen – Instrumente, Maßnahmen und Erfolge in Europa.
1	5	Schellenberg, T. (2021). Energiearmut – Nein Danke! Ideen und Hilfestellungen für die praktische Arbeit vor Ort.
2	9	Recommendation of the Committees in the german federal Council: Proposal for a directive of the European Parliament and Council on Energy Efficiency (recast)
2	12	Draft legislation by the parliamentary groups SPD, Bündnis 90/ DIE GRÜNEN and FDP (German Federal Parliament)
2	11	Integrated national energy- and climate plan by the German Ministry of Economy and Climate Protection

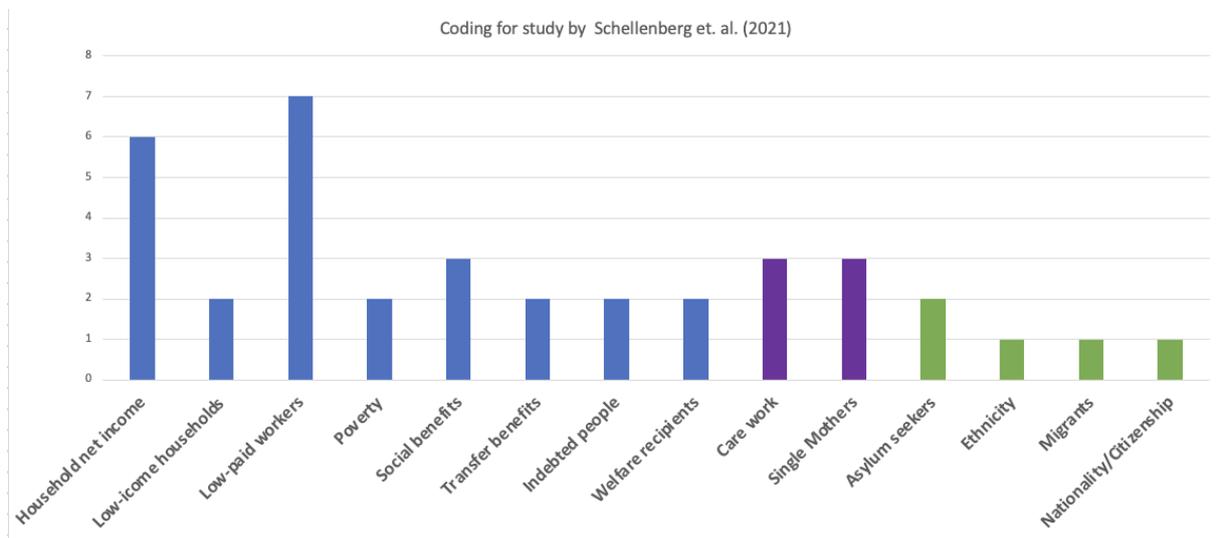
Appendix 2



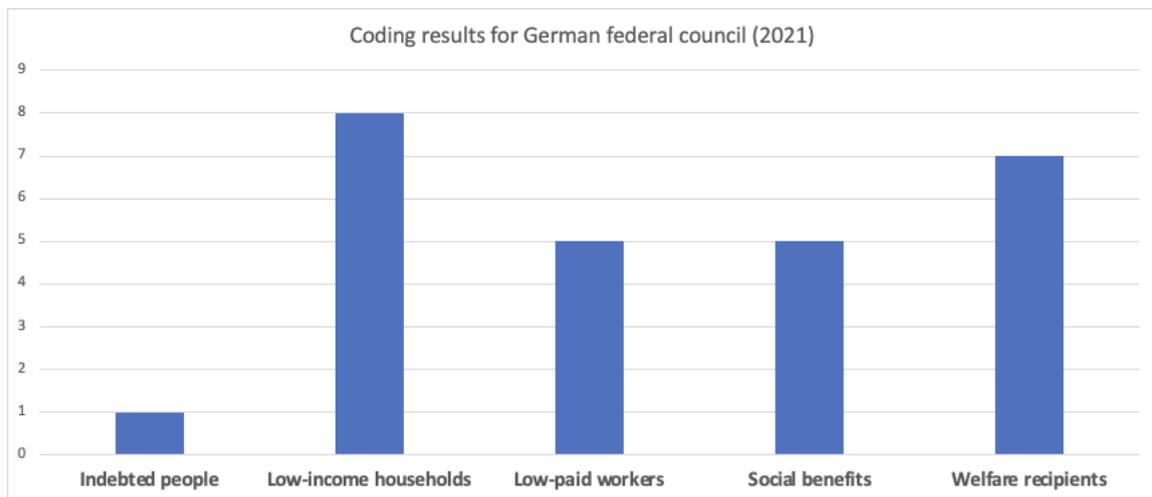
Appendix 3



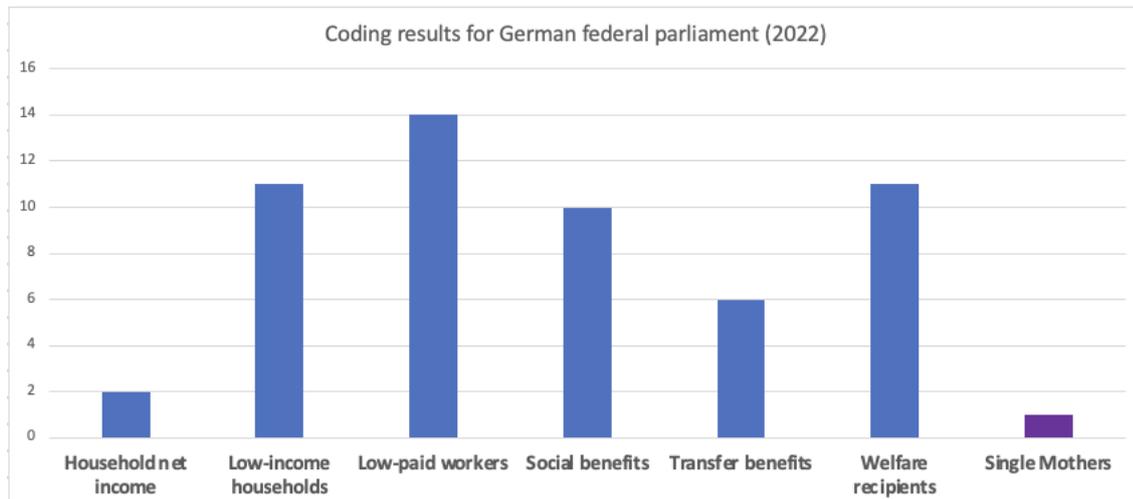
Appendix 4



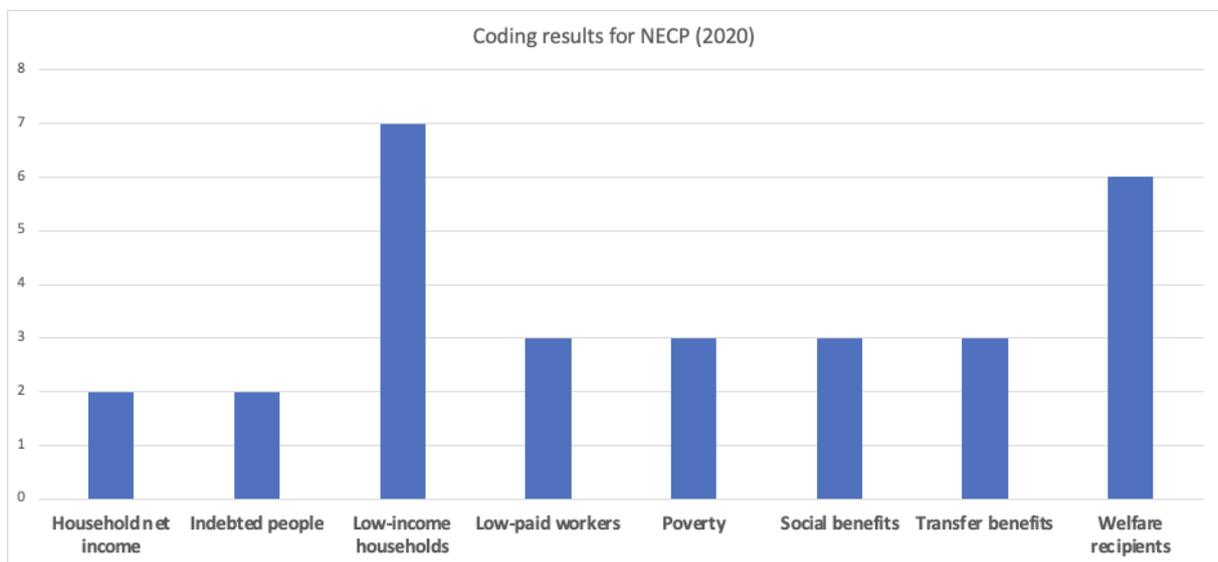
Appendix 5



Appendix 6



Appendix 7



Appendix 8