Maddalena Josefin Lamura*

Energy poverty across Europe: Problematisation and policy measures through the lens of energy justice

Abstract

In addition to technological challenges, the energy transition involves societal, political, and economic rearrangements. These rearrangements may exacerbate existing inequalities and injustices or generate new ones. To shed light on how just energy transitions are currently envisioned, this article assesses which injustices are recognised and addressed in four National Energy and Climate Plans (NECP) mandated by the European Union. The plans of Austria, Denmark, Poland and Italy are compared via qualitative content analysis. The articles focuses on how countries problematise and plan to address energy poverty, which is conceptualised as energy injustice, adopting an energy justice perspective.

The analysis shows that all plans are limited in their appreciation of energy poverty along the three energy justice tenets discussed in the literature (recognition, distribution, procedural justice). All plans disregard gender, and other vulnerabilities to energy poverty and spatial injustices are rarely mentioned. The Italian plan appears the most detailed in problematising energy poverty, while Denmark provides the least detail on the issue, assigning energy poverty to social policy, which is considered separately from the NECP. All countries identify energy-efficient buildings as a promising intervention area, but measures targeting the specific financial obstacles faced by people in energy poverty still need to be clarified. Generally, a wider acknowledgement of structural injustices associated with energy poverty is needed to integrate social and energy goals and reach a "justice-aware" energy policy.

Keywords: energy poverty, energy justice, EU, energy policy, eco-social policies, socio-ecological justice

1. Introduction

In 2019, the EU launched the European Green Deal (EGD; European Commission, 2019), which seeks to achieve net-carbon neutrality in Europe by 2050. At the core of the EGD lays the energy transition of member states' current energy systems; an urgent action to face and adapt to climate change and limit as far as possible the trespassing of planetary boundaries (IPCC, 2022; Steffen et al., 2015). Besides technological challenges, energy transitions involve societal, political, and economic rearrangements. Alternative transition pathways entail different equity and justice implications (IPCC, 2022; Newell & Mulvaney, 2013). Energy transitions might exacerbate existing inequalities, for instance by interacting with regional inequities in poverty and development (Bouzarovski & Tirado Herrero, 2017). At the same time, they can generate new injustices arising from unfair decision-making processes or unrecognised needs and injustices (Castán Broto et al., 2018; Finley-Brook & Holloman, 2016).

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On the consumption side, for instance, injustices and inequalities are linked to energy poverty, access and affordability, and broader dimensions of wellbeing and health (Thomson et al., 2017). Transitional policies and rising electricity prices could have regressive distributional effects (García-García et al., 2020). Geels et al. (2018, 27) also point out that the impacts of transitional energy policies range from equity improvements through, for instance, energy-efficient building refurbishments targeting low-income groups to opposite examples of "subsidies for EVs [electric vehicles], solar-photovoltaic (PV) and whole house retrofit […] often disproportionately benefitting wealthier households." Instead, on the production side, justice implications arise from the distribution of production sites, extraction and manufacturing processes, and changes in employment and job safety (Newell & Mulvaney, 2013). While in some cases energy transitions lead to small increases in employment, particularly in the construction and energy sectors (García-García et al., 2020), they are counteracted by job losses and restructuring occurring in carbon-intensive sectors and regions.

We can observe increasing efforts in the academic and political domains to consider synergies and trade-offs between energetic and social justice issues. Grossmann et al. (2021) investigated the scientific discourse in the energy field. Across diverse streams, ranging from descriptive to explicitly normative positions, the authors identified a discourse shift from sustainability to socio-ecological justice in recent years. In particular, the transdisciplinary energy justice stream has rapidly grown in popularity (Jenkins et al., 2016; Sovacool et al., 2017). It builds on social and environmental justice theories and understands energy transitions as multidimensional challenges which need corresponding multifaceted responses (Bouzarovski & Tirado Herrero, 2017; Healy & Barry, 2017; Jenkins et al., 2016; Sovacool et al., 2017; Walker, 2012). To support the latter, energy justice scholars have been developing frameworks to assess and support energy policymaking in considering justice dimensions.

On the policy level, there is a growing awareness and engagement with justice aspects of energy transitions at various governmental levels (Bouzarovski et al., 2020). At the EU level, the European Green Deal proposes synergic social justice and energy goals (European Commission, 2019) and the National Energy and Climate Plans (NECPs), on which the European Green Deal builds, include energy poverty and just transition, two concepts salient to energy justice. The conciliation of efforts to counter energy poverty and climate change has been identified as one of the main challenges for energy justice (Newell & Mulvaney, 2013). At the same time, the growing popularity of justice concepts in energy transitions discussions is accompanied by concerns over their seriousness, implications and underlying justice conceptualisations, as exemplified by discussions around the term just transition (Gündüzyeli & Moore, 2020; Morena et al., 2019).

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This paper sheds light on how just energy transitions are envisioned and, thus, which injustices are recognised and addressed, at the national planning stage, when future pathways are set out. The focus is on energy poverty, a multidimensional issue at the intersection of ecological and social challenges, and thus the object of both social and energy policies (Primc & Slabe-Erker, 2020). To examine different approaches to energy poverty, the problematisation of energy poverty and related planned measures are evaluated comparatively for four countries, Austria, Denmark, Poland and Italy. Methodologically, the approach draws on a qualitative content analysis of the National Energy and Climate Plans.

The article is structured as follows. Section two presents the theoretical and analytical framework combining energy justice and energy poverty, followed by the methodology in section three. In section four, the results are discussed and laid out. The article concludes with a reflection on which dimensions of energy poverty, conceptualised as energy injustice, are missing in the plans. Integrating these dimensions in the revised National Energy and Climate Plans, planned for 2023–2024, could strengthen the pursuit of social justice in energy policy and the development of eco-social policies.

2. Energy poverty

Energy poverty is a concept within the wider energy system studied by energy justice. In 2021, 34 million households in the EU were estimated to be affected by energy poverty (Energy Poverty Advisory Hub, 2021). Central concepts to understanding the issue are (specific) energy needs and utilisation practices. Energy poverty has been defined as the "inability of a household to secure a socially and materially necessitated level of energy services in the home" (Bouzarovski & Tirado Herrero, 2017, 1), but also other definitions are used in light of the multiple drivers and impacts of energy poverty. The European Energy Poverty Observatory (EPOV), a project of the European Commission from 2018 to 2021, successively replaced by the Energy Poverty Advisory Hub, was created to harmonise the definition of energy poverty and to improve its monitoring and contrast throughout the EU.

People in energy poverty might face a trade-off between their energy needs and other basic needs (Walker & Day, 2012). Choices such as "heat or eat" (Walker & Day, 2012, 70) or self-imposed reduction of energy consumption due to unbearable costs (Betto et al., 2020) are described as hidden energy poverty. The latter might be unrelated to income poverty but rather arising from high housing costs, as Karpinska and Śmiech (2020) find in their analysis of households in Central and Eastern Europe characterised by energy under-consumption. A similar analysis was conducted for Italy. The authors advise considering climatic heterogeneity and better linking policy measures to (hidden) energy poverty evaluations rather than income to ensure an adequate reach (Betto et al., 2020). Another hindrance that

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requires consideration to address energy poverty is the landlord/tenant dilemma. It captures the contrast between landlords, who have agency over investments in refurbishments and bear the related costs, while improvements in living conditions and in energy bills benefit tenants (Ástmarsson et al., 2013; Seebauer et al., 2019).

Overall, the main causal factors of energy poverty are low income, high energy prices and low energy efficiency of housing (Ürge-Vorsatz & Tirado Herrero, 2012), as well as specific energy needs arising, for instance, from health conditions (EU Energy Poverty Observatory, 2017). These factors interact with dynamics on the micro and macro levels, from unemployment to economic crises (Oliveras et al., 2021). Socio-economic structures, institutions and policy approaches may act towards or against situations of energy poverty. For instance, insufficient social protection has been identified as a factor in increasing energy poverty in Post-Communist EU countries in the past two decades (Bouzarovski & Tirado Herrero, 2017). Energy poverty's effects are varied and range from worsened health and wellbeing to broader socio-economic impacts (Bouzarovski & Thomson, 2019; Thomson et al., 2017).

Focusing on climate change mitigation and energy poverty reduction policies in developed and transition economies, Ürge-Vorsatz and Tirado Herrero (2012) identify a taxonomy of synergies and trade-offs between social, environmental, and climate goals. They highlight increases in energy prices from policy measures to mitigate climate change, such as carbon pricing, as the main trade-off, potentially exacerbating energy poverty. In the other direction, reducing energy poverty might cause rebound effects. Great synergic potential and long-term benefits are, in turn, attributed to energy efficiency improvement in the building stocks.

Setting these policies in the broader political-economic context, the effects on energy poverty of diverse approaches to energy transitions, from decentralisation to liberalisation, are yet to be further examined (Axon & Morrissey, 2020; Bouzarovski & Tirado Herrero, 2017; Newell & Mulvaney, 2013). However, examining poverty rates, energy prices, energy poverty and transition policies in the EU for the period from 2007 to 2013, Bouzarovski and Tirado Herrero (2017) found limited improvements in energy poverty. Instead, they pointed out that transitional policies can potentially exacerbate the existing energy poverty by interlacing with existing regional inequalities policies**.**

In the last decades, the EU has been working to reconcile the environmental, climate, social and economic objectives, progressing towards an eco-social agenda, especially through the European Green Deal (Sabato et al., 2022). Indeed, eco-social policies, or socio-ecological policies, bear a great potential for integration across policy fields (Mandelli, 2022). Energy poverty is an object of eco-social policies, and it is currently addressed via energy policy, social policy or a mix of instruments at the EU level (European Parliament, 2022). Addressing energy poverty is also claimed as a crucial dimension in the European Green Deal: "the risk of energy

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poverty must be addressed for households that cannot afford key energy services to ensure a basic standard of living" (European Commission, 2019, 6). However, no binding definition or policy instruments to directly address energy poverty among European citizens exist yet on the EU level (European Parliament, 2022). Instead, "the Commission will produce guidance to assist Member States in addressing the issue of energy poverty" (ibid.). In the above-mentioned National Energy and Climate Plans, the member states lay out their national energy and climate goals, policies and measures to reach the EU targets for 2030 for tackling climate change. Mandated by the EU 2018/1999 Regulation (European Parliament & Council of the European Union, 2018), the plans encompass strategies for the five dimensions of the Energy Union, i.e. decarbonisation, energy efficiency, energy security, internal energy market, as well as research, innovation and competitiveness, for the period from 2020 to 2030. The 2018 Regulation introduced the novelty of requiring member states to assess and consider energy poverty in their NECPs, which hence provide a very fertile database for analysing different national strategies towards energy poverty. At the same time, the NECPs set a suitable frame for cross-country comparison since they reflect the nationally diverse socio-economic situations in the face of the common challenge of energy restructuring (Bouzarovski & Tirado Herrero, 2017). Finally, a revision of the NECPs by each member state is planned for 2023–2024. While a monitoring of the plans was planned since the beginning, the revision seems necessary because, since the plans' mandate in 2018 and drafting in 2019, the EU's commitments to contrast climate change and environmental degradation have risen, with the EGD, the European Climate Law and the Fit for 55 package (European Commission, 2019b). So, while the NECPs still set the frame for the newer goals and instruments (European Commission, 2020), the planned strategies need to be aligned and efforts increased (PlanUp, 2021). In light of the planned revision and the necessity for eco-social synergies, the present article aims to analyse NECPs from different EU member states to unravel different public approaches towards energy poverty, starting from its conceptualisation as energy injustice – as the following section will outline.

3. Energy poverty as energy injustice: an analytical framework

To examine how transitional policies address energy poverty, as presented in the NECPs, the analytical framework builds on the conceptualisation of energy poverty as energy injustice, adopting an energy justice perspective (Heffron & McCauley, 2018; Jenkins et al., 2016, 2018; Sovacool et al., 2016, 2017).

As outlined in section 2, successful policy interventions against energy poverty need to integrate social justice and climate goals, by developing synergies and diminishing trade-offs both amongst policies (Ürge-Vorsatz & Tirado Herrero, 2012), and with existing socio-economic inequalities of the "spatial and institutional systems" of the EU (Bouzarovski & Tirado Herrero, 2017). Recognising the embeddedness

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of energy poverty in the socio-political and economic context and in injustices characterising the larger energy system is the starting point to see energy poverty as not simply a situation resulting from unequal distribution, but as a socio-political injustice (Gillard et al., 2017).

Energy justice is an analytical concept to assess justice dynamics and situations traversing the energy system, and thus also energy transitions. It explores what constitutes energy injustices and how they arise (Walker & Day, 2012). First used by NGOs in the 1990s, then by some scholars limitedly linked to the sustainable development discourse (Guruswamy, 2010), its conceptualisation was further elaborated from 2013 (Heffron & McCauley, 2017). The "emerging critical concept" rapidly developed, in less than a decade, into "a framework for decision making" and an academic subject (Castán Broto et al., 2018) defined as "a new cross-cutting social science research agenda" (Jenkins et al., 2016, 175). An overall goal underlined in the energy justice scholarship is to support the decision-making of energy and policy practitioners through a policy approach (Jenkins et al., 2017). Indeed, energy justice results from the aspiration to bridge theoretical justice debates with policy decisions having justice implications. Thereby, the literature encompasses both normative and descriptive approaches (Jenkins et al., 2016). Some scholars point to energy justice as a way to discuss what is envisioned as a just energy transition, and hence to replace "so called objective and normatively 'neutral' rational choice cum behavioural and technological expert decision approaches" (Healy and Barry, 2017, 14).

The energy poverty literature lends itself well for integration into energy justice research (Healy & Barry, 2017; Jenkins et al., 2016) since it is at the intersection of social justice and environmental justice (Walker & Day, 2012), and has drawn from disability, vulnerability and economic inequality studies (Gillard et al., 2017; Bouzarovski & Tirado Herrero, 2017). Similarly, energy justice is an academic concept sharing the "philosophical groundings" (Jenkins et al., 2018, 67) with climate and environmental justice and focusing on the goal of "minimising the environmental externalities and unequal burdens of energy extraction, provision and consumption" (Newell & Mulvaney, 2013, 135).

Two main analytical approaches to energy justice can be distinguished in the literature: energy justice principles (Sovacool et al., 2016) and three tenets of energy justice (McCauley et al., 2013). While the former comprises ten principles, i.e. rationales, to assess and argue what is just, the latter is chosen for the analytical framework of this paper since its three-legged structure is well-suited for a cross-country comparison, allowing for a broad "umbrella" structure to gather specificities of each case. Deriving from both the environmental and the social justice literatures (McCauley et al., 2013; Schlosberg, 2007), the energy justice perspective is developed along the recognition, distribution, and procedural justice

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tenets. Table 1 presents the tenets, which can be examined through descriptive and normative accounts, as delineated in Jenkins et al. (2016).

Table 1: Energy justice tenets and approaches

EJ tenets	EJ approach	
	Descriptive	**Normative**
Recognition justice	Who is ignored?	How should we recognise?
Distributional justice	Where are the injustices?	How should we solve them?
Procedural justice	Is there a fair process?	Which new processes?

Source: Jenkins et al. (2016).

While distinct, each of the three dimensions requires the other two to be realised. Schlosberg (2007) reviews several arguments asserting that only an integrated approach to all three dimensions allows examining injustices comprehensively and pursuing justice.

This article thus looks at energy poverty from an energy justice perspective along the three justice tenets. In doing so, it extends to energy poverty arguments developed by Walker and Day (2012) and Gillard et al. (2017) for fuel poverty to be considered an energy injustice. Figure 1, adapted from Walker and Day (2012, 74), characterises energy poverty as injustice in energy consumption along the three interrelated dimensions of energy justice – recognition, procedure and distribution – which must be considered altogether to pursue justice. This understanding of energy poverty hence goes beyond the prevalent association of energy poverty with distributional injustices in the past (Jenkins et al., 2016).

Recognition sheds light on individuals and/or groups affected by energy poverty but ignored in decisional processes and remedies of transitional policies. Adequately tackling energy poverty entails understanding and valuing energy rights, needs and vulnerabilities "of all groups, whilst understanding potential diversity in those needs" (Moniruzzaman & Day, 2020, 2), as well as different burdens and vulnerabilities when it is not possible to satisfy these needs (Gillard et al., 2017; G. Walker & Day, 2012). Differences in energy needs and vulnerability to energy poverty arise along social and personal characteristics and living situations, like health problems, disability, old age and infants (Gillard et al., 2017; Hills, 2012). Further, recognition justice entails also acknowledging different knowledge, livelihoods, histories and cultures (Bennett et al., 2019). However, in promoting group differentiation (Fraser, 1995), processes to ensure recognition justice need to be careful to avert "setting up a deserving/ undeserving dynamic" (Walker & Day, 2012, 74). To avoid this, energy needs should be recognised and "defined with reference to the society that they operate in" (Walker & Day, 2012, 74) and by giving space to "voices, knowledges and interests" of vulnerable and marginalised groups (Samarakoon, 2019, 8).

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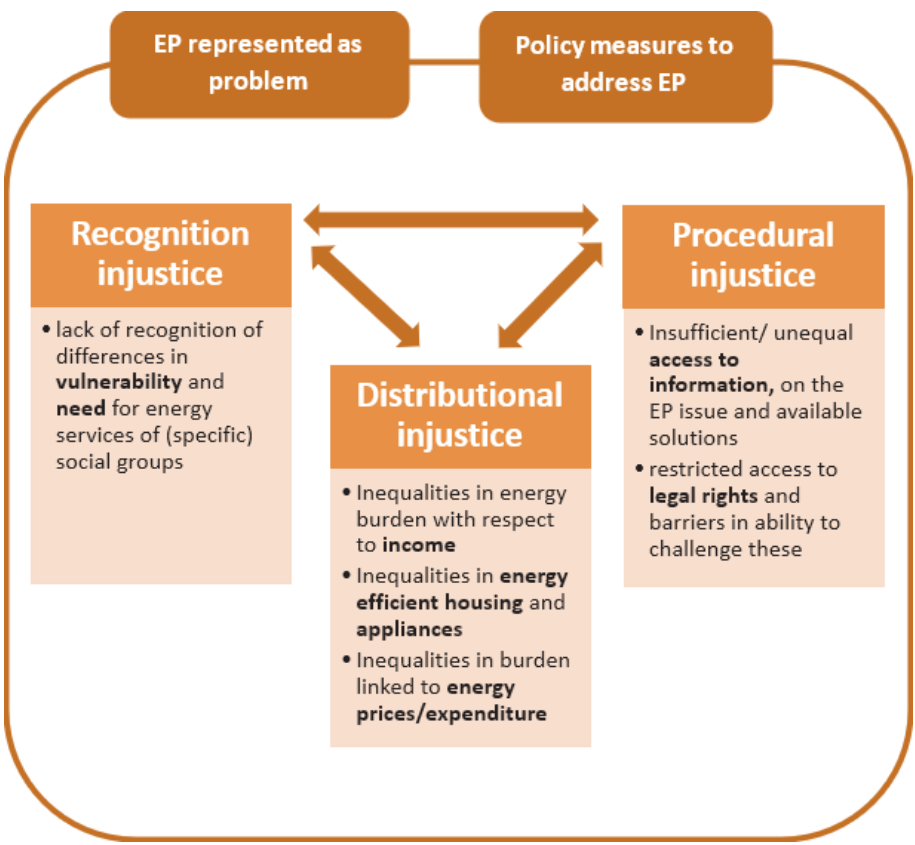
Instead, distributional justice has been defined "as fairness in the distribution of benefits and harms of decisions and actions to different groups across space and time" (Bennett et al., 2019, 5). Beyond general socio-economic inequalities and injustices (Bouzarovski & Tirado Herrero, 2017; Fraser, 1995), distributional injustices characterising energy poverty can be traced back to three main causal interlacing drivers: energy inefficiency, energy expenditure and low income (Kerr et al., 2019). When these factors interlace, lock-in situations may arise (Ürge-Vorsatz & Tirado Herrero, 2012). Policy measures tackling energy poverty prevalently and traditionally aim to influence distributive dimensions. For example, fuel poverty policy in the UK has changed from directive redistributive instruments, like grants to improve buildings and heating systems, to more "trickle down" approaches (Walker & Day, 2012, 74), focusing on energy efficiency renovations of housing, rather than tackling the other two drivers of incomes and pricing.

Figure 1: Energy poverty as injustice



Source: Own adaptation based on Walker & Day (2012, 74).

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Finally, procedural justice evaluates whether there are "fair and equitable institutional processes" (Schlosberg, 2007, 25) and strategies for remediation (Jenkins et al., 2016) in planning and implementing energy projects. Realising social justice requires that decision-making procedures occur democratically, providing adequate information and ensuring the participation of all affected parties (Galvin, 2020; Young, 1990). To rectify injustices, access to legal processes and adequate information further contribute to procedural justice (Walker & Day, 2012).

Research combining energy poverty and energy justice has been increasing in the last decade (Bouzarovski et al., 2021; Moniruzzaman & Day, 2020; Samarakoon, 2019). This combined approach exposes the multiple facets of energy poverty and thus makes explicit that political interventions also need to be multifaceted: integrated eco-social policies are required (Mandelli, 2022; Seebauer et al., 2019), and the analytical lens presented here can support their development.

The energy justice framework has been chosen to evaluate the NECPs because several scholars (Heffron et al., 2015; Jenkins et al., 2016, 2018; Sovacool & Dworkin, 2014) highlighted that energy justice is intended and a suitable tool to inform and support policymaking. De Geus et al. (2020, 141) suggest reflecting and integrating social justice in energy transitions throughout all stages from development to implementation of energy policy rather than only "in 'isolated' initiatives related to participation or acceptance" – to truly enable socially just processes. So, while the actual implementation will clearly differ from the plans, it remains crucial to analyse and discuss the planning stage captured by the NECPs, to adapt strategies and potentially address lacking aspects of energy justice. Hence, the main question guiding this research is: how is energy poverty addressed in four NECPs?

The comparison is conducted through two main sub-questions, each examining the energy and climate plans along the three energy justice dimensions. Thus, the sub-questions are:

1. How energy just is the problematisation of energy poverty?
   a. Who is recognised as affected by energy poverty?
   b. Which distributional energy poverty injustices are described?
   c. Which procedural injustices are described?
2. How energy just are the planned energy poverty measures?
   a. Who is recognised and addressed by the energy poverty measures?
   b. Which distributional energy poverty injustices are addressed through the measures?
   c. Which information on energy poverty and legal processes are made available and accessible through the measures?

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There have been few analyses of the NECPs focusing on justice dimensions. Gündüzyeli and Moore (2020) look at the production side, while Bouzarovski et al. (2021) and EU Energy Poverty Observatory (2020b) look at the consumption side and thus at energy poverty. The current work distinguishes itself from these last two contributions through a more focused and detailed analysis by applying the qualitative content analysis to four countries, whereas the other two studies look at all the NECPs. Moreover, the energy justice dimensions of energy poverty in the plans are investigated using a different categorisation than Bouzarovski et al. (2021). The latter evaluates energy poverty in the NECPs distinguishing access to justice, comprising recognition and procedural dimensions, and access to resources, a combination of distributional and spatial justice. These are respectively based on criteria that differ from those used here to a certain degree. Hence, starting from the broader picture drawn by Bouzarovski et al. (2021) and EU's EPOV (2020b), this paper adds more detailed findings, organising them along the analytical framework outlined in table 2.

Table 2: Analytical framework

Research (sub-)questions	Main categories: EJ dimensions	Sub-categories: EP aspects
How energy just is the problematisation of energy poverty in the NECPs?		
Who is recognised as affected by EP?	**Recognition**	Groups affected by energy poverty and groups' specific characteristics and needs
Which distributional energy poverty injustices are described?	**Distribution**	Main energy poverty drivers and material outcomes: energy inefficiency, energy expenditure, low income & limited/no capital
Which procedural injustices are described?	**Procedural**	Access to information on energy poverty issues, existing measures, and legal processes
How energy just are the planned energy poverty measures?		
Who is recognised in energy poverty measures?	**Recognition**	Groups targeted by energy poverty measures and groups' specific characteristics and needs
Which unequal outcomes and causes of energy poverty are addressed by the measures?	**Distribution**	Main energy poverty drivers and material outcomes: energy (in)efficiency, energy expenditure, low-income & limited/no capital
Which information on energy poverty is made available and accessible in the measures?	**Procedural**	Access to information on energy poverty issue, energy supply and use, measures, and legal processes

Source: own elaboration

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Thus, this study investigates the NECPs with respect to who is recognised as affected in the problematisation and who is targeted in the policy measures. Secondly, it examines which distributional inequalities of energy poverty situations are problematised and which distributional justice measures are suggested. Thirdly, procedural justice is investigated with respect to access to information on energy poverty and its drivers and access to legal processes to ensure a correct development of decision-making. These two elements and a third, access to the decision-making process, were outlined in the Aarhus convention (United Nations Economic Commission for Europe, 2008) and linked by Walker and Day (2012) to fuel poverty. An evaluation of the third element, i.e. public participatory processes in the elaboration of the NECPs, required by the EU, was beyond the scope of this work. Procedural inequalities in accessing information are considered in the problematisation of energy poverty. In the policy measures, it is inquired which and how much information and legal processes specific to energy poverty situations are planned.

4. Methodology

To compare approaches towards energy justice in different European member states, the final NECPs – which were compiled and submitted in 2019 – are analysed. Each country had to present a draft and a final strategy towards the EU 2030 climate and energy targets. The NECPs are suitable documents for comparison since they are compiled based on the EU 2018/1999 Regulation and on EU guidelines (European Parliament & Council of the European Union, 2018), which specified the same plan structure for all EU member states. Thus, there is a common framework for the comparison, while each plan then is the domestic response.

Out of the 27 member states, the English versions of the NECPs of Austria, Denmark, Italy, and Poland were analysed. The four countries were selected based on their categorisation into different welfare regimes or worlds (Esping-Andersen, 1990) and their diverse energy poverty rates. Contemporary welfare states differ in their institutional designs and their political orientations, as well as in their approaches to social justice and in what their populations envision as just (Sachweh, 2016), all characteristics along which welfare regimes are distinguished. Considering countries of different welfare regimes thus informs a structural perspective on energy poverty, i.e. to consider the socio-economic and institutional context. Recognising that groupings of welfare models are debated (Arts & Gelissen, 2010), the current work builds on Castles and Obinger (2008). They classify Austria as a continental welfare state with solid bargaining rights and labour movements and workers' representation. Italy instead would belong to the Southern European regime, Poland to the post-Communist welfare regime, and Denmark to the Scandinavian one.

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Regarding energy poverty incidence, Italy and Poland belong to the Mediterranean and Central East European regions, experiencing the highest energy poverty in the EU in the last three decades (Bouzarovski & Tirado Herrero, 2017). The causes of this peculiarity can be traced back to energy inefficiency of housing and heating systems common in Mediterranean countries; and to energy prices and thermo-inefficient buildings following the past centrally planned economy in CEE countries. Differently, the energy poverty problem is encountered less in Austria and Denmark. There the phenomenon is endured by specific demographic groups and prevalently as in difficulty to afford heating (Bouzarovski & Tirado Herrero, 2017).

Besides belonging to different welfare systems and showing different energy poverty incidences, the four countries under study also differ with regard to their position in EU economic and power hierarchies. Italy and Poland somehow belong to an "EU-periphery" comprising the European regions with the highest incidences of energy poverty and high regional inequality levels. In contrast, the opposite holds for the other two countries belonging to the core (Bouzarovski & Tirado Herrero, 2017). This dual characterisation of energy-poor periphery and core countries and their diverse approaches laid out in the NECPs support the reflections of Heidenreich and Preunkert (2019) on the winners and losers of Europeanization and the strengthening of centre-periphery structures in Europe.

For all four countries, the NECPS were analysed by deploying an inductively and deductively developed framework structured along the research questions outlined above. The main and sub-categories were derived from the policy analyses mentioned above and the literature on energy poverty and energy justice. Coding the plans subsequently, confirmed and/or modified the sub-categories. This allowed evaluating the differentiation, complexity, and system perspective underlying the plans' recognition of inequalities and injustices tied in the energy poverty phenomenon. At the same time, considering how the energy poverty issue is presented in the NECPs, delineates which dimensions of the problem are not set on the agenda (Bacchi, 2009). Hence, the framework enables us to inquire about the presence of energy justice elements, their disaggregation and scope in relation to energy poverty approaches. Its two main analytical parts are the problematisation of energy poverty and the policy measures, advancing solutions to the issue (Bacchi, 2009; Kerr et al., 2019). Each part comprises the three energy justice dimensions, along which energy poverty factors are deductively and inductively arranged. Table 3 depicts the analytical framework.

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Table 3: The analytical framework

Problematisation	
Justice dimension	**Corresponding energy poverty components**
Recognition	**Definition used**
	Groups affected
	Consumer, customers
	Households
	Social groups
	Families
	Group-specific characteristics and needs
	Age
	Vulnerability
	Place of residence
Distribution	**Main EP drivers and/or outcomes**
	Energy inefficiency
	Energy expenditure
	Low-income & limited / no capital
Procedural	Access to existing measures tackling EP
	Access to information on EP issue
Policy measures	
Justice dimension	**Corresponding energy poverty components**
Recognition	**Target groups**
	Consumer, customers
	Households
	Energy communities and self-consumption systems
	Families
	Social benefit beneficiaries and potential energy poverty-benefit beneficiaries
	Group-specific characteristics and needs
	Age
	Type of energy source used
	Vulnerability
	Substantial and unforeseen deterioration of living conditions
	Health
	Place of residence (remote, climatic zone)
	Air pollution

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	Energy poverty areas targeted
Distribution	Energy inefficiency
	Energy expenditure
	Income & capital
Procedural	Access to information on energy poverty
	Access to information on energy use & supply
	Access to (information on) measures tackling energy poverty
	Laws and regulations (obligation to supply, protection from disconnection)

Source: own elaboration

The methods employed are qualitative content analysis, based on Mayring (2014), and policy analysis, leaning on Bacchi's problem representation (2009) and on Kerr and others' policy evaluation (2019). The assessment is conducted exclusively on the NECPs' sections principally addressing energy poverty (a detailed overview of the analysed sections is provided in Appendix A). The qualitative content analysis is applied through thematic analysis and a mixed deductive and inductive approach. An analytical framework was developed based on themes from the literature and then revised upon coding the plans. The final category system is itself a core result, and it provides intersubjectivity to the method and allows replication (Mayring, 2014).

Methodological limitations comprise the different lengths of the plans, at national discretion, which might influence the scope of energy justice dimensions that could be found. The analysis of the plans is on the national level. Thus, local and international situations and perspectives on energy poverty are not contemplated, despite a systemic perspective being constitutive of energy justice. Finally, the NECPs contain both existing and new planned measures. These were analysed altogether since a clear distinction was not always possible throughout the plans.

5. Empirical findings: Energy justice across Europe

Energy poverty in the four countries under study differs. To put the analysis of the four NECPs into context, figures 2 and 3 give an overview of the energy poverty situation in Austria, Italy, Denmark and Poland. They display energy poverty indicators identified by the European Energy Poverty Observatory, EPOV. The EPOV distinguishes four primary energy poverty indicators. They comprise self-reported or indirect measurements of arrears on utility bills and inability to keep the home adequately warm, as well as expenditure-based and thus direct measurements of low absolute energy expenditure and a high share of energy expenditure in income (EU Energy Poverty Observatory, 2018). Historical trends are presented only for arrears

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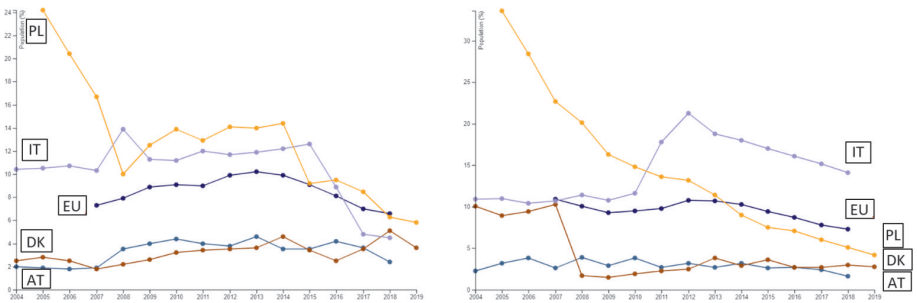
on utility bills and the inability to keep the home adequately warm, since this data is available for a longer time span (Thema & Vondung, 2020).

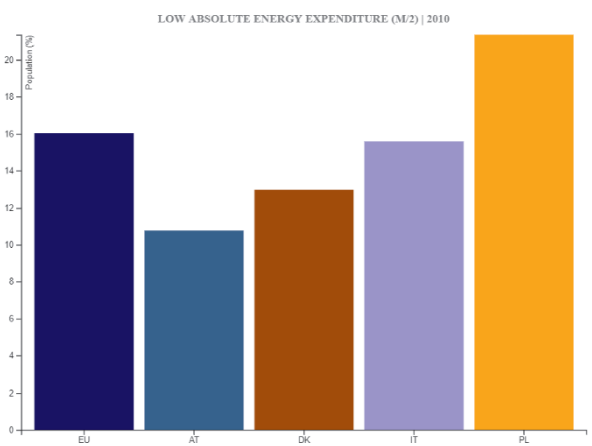
Figure 2: Energy poverty trends for the four countries, between 2004–2019 a) Arrears on utility bills. b) Inability to keep home adequately warm.



Source: EOVP

Figure 3 portrays another indicator selected by the EPOV, energy poverty as indicated by low absolute energy expenditure. The situation is differentiated in the core-periphery direction, with lower shares of population affected in Austria and Denmark.

Figure 3: Share of population in energy poverty by low absolute energy expenditure 2010



Source: EPOV

As the figures show, the four countries under study depart from different problem settings regarding energy poverty. Households' energy liabilities have decreased for all countries, moving below the EU average. A downward trend is also seen for

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the inability to keep the home warm (except for Italy). However, as shown by both depictions, Italy and Poland fare worse than the other two countries (also historically), confirming the core-periphery division identified by Bouzarovski and Tirado Herrero (2017).

To analyse how the four different EU member states approach energy poverty within their national contexts and in light of diverging problem pressure, the NECP of each country was examined along the analytical framework, consisting of two main parts: 1) problematisation and 2) policy measures. Each part then delves into the three energy justice dimensions (recognition, distribution, and procedural justice), to which energy poverty aspects are traced back. This structure will also guide the following subsection, which presents the empirical results from a cross-country comparative perspective.

5.1 Problematisation

Recognition

None of the four member states under study had an official definition of energy poverty at the end of 2019, when the plans were published. Hence, the plans employ unofficial or provisional ones or refer to Eurostat. Denmark describes energy poverty as the inability to heat. At the same time, Italy refers to the inability to purchase energy services or on the grounds of diversion of resources to ensure energy services. Conversely, the Austrian definition is based on energy poverty drivers, specifically low-income and high energy costs. The Polish plan does not clearly define it but refers to a high share of energy costs in household disposable income.

Denmark considers energy poverty a social problem and thus pertaining to social policy. Its plan states that "therefore, in the Danish energy policy no specific national objectives exist for the limitation of energy poverty" (p.74). It then points out that the plan contains some "social policy instruments related to energy consumption" (p.74). Specific characteristics of groups in energy poverty are vulnerability in the Danish and Polish plans, while Italy problematises energy poverty with respect to age – whereby households with at least one member younger than 65 years are likely to be more vulnerable – and to place of residence, since energy poverty rates are unequally distributed across the country, to the disadvantage of the South.

Distribution

Energy poverty is associated with energy-inefficient buildings, report Austria and Poland. However, for Austria, this occurs (also) with buildings inhabited by the homeowner, while the second points out municipal buildings. Energy inefficiency is characteristic of single-family houses, according to both plans. Austria specifies that,

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in general, this inefficiency is driven by oil and natural gas used for heating, while Italy points to energy type consumed without specifying.

High energy costs are recognised as a cause in the Austrian and Italian plans. Italy problematises their rise disproportionately affecting people in deprivation, and that energy expenditures are a higher share out of total expenditure for the households in the lowest energy consumption decile. Instead, from an inefficiency perspective, Austria points out that energy-poor households consume 140 % more energy for residential services than average households.

Household size matters in Italy, but while one-person households are less vulnerable to energy poverty, the opposite holds for Austria, according to the plan. Both countries associate energy poverty with poverty, highlighting the difficulty or inability that energy-poor households face to finance investments needed to improve their living conditions. Similarly, Poland mentions their specific obstacle of the lack of creditworthiness. Low income correlates with energy poverty and characterises Poland's primary inhabitants of energy-inefficient municipal buildings.

Procedure

The plans and absence of official energy poverty definitions hint to a lack of monitoring of the issue overall and specific objectives to tackle it in the Danish case. Further, Italy estimates that only a third of potential beneficiaries of energy bonuses are reached and hypothesises lacking awareness and administrative complexities in access as causes. In the Polish NECP, lacking creditworthiness is instead identified as an obstacle to supporting measures.

5.2 Measures

Recognition

All plans except Austria target people receiving social benefits, thus linking energy poverty recognition with situations of deprivation or need for social assistance, such as the "citizenship income" in Italy or unemployment or illness benefits in Denmark, but also high costs for housing or a large family. Italy also addresses families and accounts for their size and number of children, while Denmark mentions energy poverty measures tailored for "the weakest (…) pensioners" (Danish NECP, 2019, 121).

All four plans identify specific needs linked to low income and limited or no capital. Italy considers several exposures and needs, characterising people in energy poverty. For instance, measures shall account for the energy needs of people relying on life-saving medical equipment, living in remote areas or the impacts of exceptional events such as earthquakes or climatic zones. Similarly, Poland mentions support for municipalities characterised by poor air quality.

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Distribution

The most prominent focus throughout the plans is on energy efficiency measures, where housing and heating play a role in all four NECPs. Denmark plans to subsidise these improvements not specifically for people in energy poverty but horizontally to improve the energy performances of buildings via financial aid for specific renovations and informational campaigns on energy savings and to target building owners. Instead, recognising that long-term investments in building stocks are difficult to withstand for energy-poor households, Austria points to the alternative of "relatively modest investments (which) can often also have a significant impact" (Danish NECP, 2019, 187). Differently, Italy mentions tax deductions – green social bonus – on energy refurbishment of buildings, loans to energy-poor families, and a programme for energy-efficient refurbishment of social housing. Finally, Poland mentions the broadening of the thermo-modernisation bonus to municipal buildings, as well as subsidies, loans and direct replacements for people in energy poverty to upgrade their heating, cooling or residential energy infrastructures. Efficient cooling systems are fostered in the Polish and Italian plans. Latter also envisages the provision of energy-efficient appliances for low-income households, while Poland accounts for the connection to and expansion of the energy network.

Regarding energy expenditure, Austria presents the regulation and limitation of ancillary late payment costs that network operators can collect. Italy and Poland foresee a reduction of costs through energy efficiency improvements and mention several instruments to alleviate expenditures of energy poor. Instead, looking at measures acting on income and capital, Austria and Denmark mention existing provisions which exempt or compensate low-income households for higher costs or taxes due to climate measures. Both countries also report social policy instruments (indirectly) alleviating energy poverty, such as minimum income instruments and housing subsidies in Austria. And cash support, in addition to any social benefits, in case of unforeseen (energy) expenses, illness or unemployment in Denmark. In a similar direction, Italy aims at ameliorating its existing electricity and gas bonuses by linking them to indicators of the economic situation and energy utility. The Polish plan presents measures acting directly and indirectly on the income and capital of people in energy poverty. Lastly, Italy prospects measures to tackle energy poverty while supporting the expansion of renewable energy, such as an "energy income" for low-income families, to entirely finance PV for residential use.

Procedure

Poland and Italy outline their efforts to define and monitor the issue. Italy envisages instituting a national Observatory on energy poverty by 2020, which would also coordinate specific measures. Concerning access to information on energy prices, use and supply options, all four plans outline initiatives targeting generic energy

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consumers, among which the energy poor, like tools to check personal energy consumption, bills and contracts or compare suppliers. More targeted, Austria mandates large energy suppliers to establish contact and advice centres also covering issues related to energy poverty. Poland, instead, sees initiatives favouring broader participation in the energy market, such as prosumers and dynamic price contracts, as means to ameliorate the position of vulnerable consumers through a more active role.

Regarding accessibility to information on existing measures to eradicate energy poverty, Austria and Italy mention vague intentions, for instance, to develop informal and organisational-legal measures to complement financial support and decrease administrative or organisational barriers of energy poverty specific measures. Finally, with the exception of Italy, countries have or plan obligations to contract and supply, despite poor credit ratings, arrears in payments or debts. Austria also mandates reminders before energy is cut off, and Poland envisages protection against supply suspension. Finally, both included in the plan measures on dispute settlements, although not specifically for the energy poor.

6. Discussion

Overall, the problematisation of energy poverty and the measures outlined in the four NECPs are only a starting point towards realising energy justice since they both consider structural components and dynamics of energy poverty to a limited extent. Measures are often vague and only partially coherent with problematisation, leaving identified problematic aspects unaddressed. The absence of official definitions and the variety of those employed in the NECPs hinders cross-country comparison and sufficient coverage of the issue.

The three tenets of energy justice (recognitions, distribution and procedure) are cinstituted by several elements, as outlined in figure 1. However, their consideration is limited in the NECPs. In terms of recognition, all four plans mention a few social groups, characteristics, and structural inequalities. Several dimensions associated with higher vulnerability to energy poverty, such as gender and education (Gillard et al., 2017; Hills, 2012), are absent in the plans. This confirms the observations by Feenstra and Clancy (2020) that, while there are gender inequalities tied to energy poverty in the EU, this gendered injustice, along with an intersectional perspective on it, is often overlooked. Limited data availability is an issue for recognitional justice (Feenstra & Clancy, 2020). However, when data is available, such as for age, gender, family composition and locations associated with higher energy poverty (Bouzarovski et al., 2021), it is only partially considered in the NECPs. Qualitative inquiries into daily practices (Xu & Chen, 2019), for instance, to uncover gender roles and thus unbalanced burdens in coping with energy poverty (Petrova & Simcock, 2021), are also absent in the NECPs, weakening recognition of energy poverty injustices. Specific energy consumption needs are considered only by Italy.

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Old age, disability, illness, or infant children are absent in the other plans, despite these situations causing higher vulnerability to inadequate housing temperature or insufficient electricity (Gillard et al., 2017; Hills, 2012).

With respect to distributional justice, problematic energy inefficiency and high expenditures and related measures are mentioned in all plans. Housing retrofitting is central, specifically for public housing in Italy and Poland. These interventions offer substantial synergy between climate goals and energy poverty eradication (Ürge-Vorsatz & Tirado Herrero, 2012). However, the required investments are a hindrance for energy-poor households, recognised by Austria, but left mostly unaddressed by measures across the four plans. Further, the multidimensionality of energy poverty requires more comprehensive approaches, with non-monetary, self-assessed, and monetary indicators, to grasp living conditions and effects on capabilities (Sokołowski et al., 2020).

Moreover, building on this, adequate energy poverty benefits should be linked to energy dimensions rather than general poverty (Kyprianou et al., 2019), an approach partially present in the Italian plan. Unequal distribution of outcomes is assessed only by Austria and Italy, where the latter has the only plan stating spatial distribution inequalities. Also, temporality is moderately considered, as well as whether causalities arise at the household or socio-economic level (Oliveras et al., 2021). Italy and Denmark mention rising energy costs during the 2008 economic crisis and unemployment, pointing to the structural energy poverty perspective. This perspective needs, however, to be expanded in all plans to include the impacts of transitional policies on energy poverty. The Austrian and Danish plans briefly mention measures to alleviate such impacts.

Finally, procedural justice is deficient, with Italy estimating one third of potential beneficiaries not being reached and Austria aiming to eliminate similar administrative difficulties in access. This tenet seems, however, more addressed than the other two through interventions, with a focus on transparency and supply comparison tools, however generic to any energy consumers and probably a result of compliance with EU directives. Some measures are mentioned to ensure information, participation, and legal support of energy poor citizens. Although access to decision-making processes was per se not investigated, it is part of procedural justice. No plan mentions it concerning energy poverty, despite the tenant-landlord dilemma capturing barriers to performing energy improvements in buildings when agency and benefits are split between actors (Ástmarsson et al., 2013; Seebauer et al., 2019).

Different problematisation across the NECPs may be explained through the national context. Denmark's striking case, assigning energy poverty alleviation to social policy and excluding it from energy and climate goals and policies, may be understood through the country's Scandinavian welfare regime and low-energy poverty rates (Bouzarovski et al., 2021). By considering energy poverty a secondary effect of poverty, a common perspective in countries with the highest median incomes

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(Prime & Slabe-Erker, 2020), Denmark can rely on an existing strong étatism and generous social benefits (Arts & Gelissen, 2010) to address energy poverty, at the risk of neglecting its specific effects on climate, environment, and health (Prime & Slabe-Erker, 2020). Differently, countries with high energy poverty, Italy and Poland, provide a more detailed problematisation of the issue in the NECPs, but Bouzarovski et al. (2021) stress that more ambition is needed.

7. Conclusions

Alternative energy transition strategies have different impacts on inequalities and injustices. This study takes an energy justice perspective and compares four NECPs to examine how their approaches to energy poverty entail (in)justices in recognition, distribution and procedure. The investigation finds the Italian plan to be the most detailed in problematising energy poverty. At the same time, Denmark describes the issue the least, since it assigns energy poverty to the social policy domain beyond the NECP. This choice highlights the relevance of considering the socio-economic institutions and resources on which a country can draw to address energy poverty, as well as the fact that sectorial policy separation is also common. However, the multidimensional challenge of energy poverty requires integration across policy fields. Some steps in this direction are happening, for instance with energy poverty benefits being linked to unemployment subsidies; but efforts in all four plans could increase to develop integrated eco-social policies (Mandelli, 2022; Seebauer et al., 2019). The disaggregation of energy poverty along all three energy justice tenets is limited as, in particular, gender is disregarded by all plans. Age, illness, and other vulnerabilities to energy poverty, as well as spatial injustices, are barely mentioned, too. The focus on economic indicators prevails over that on needs, wellbeing, and justice aspects, confirming the results of other analyses (Bouzarovski et al., 2021; Sovacool et al., 2016). All plans identify energy efficient buildings as a promising area of intervention, endorsing previous suggestions for strong synergies between social and energy policies in the literature (Ürge-Vorsatz & Tirado Herrero, 2012). The plans acknowledge that the necessary investments are hindrances for people in energy poverty. However, pertaining support measures are vague and other problems, such as the tenant-landlord dilemma, eco-gentrification or interactions with broader housing market dynamics, remain unaddressed (Grossmann et al., 2021; Grossmann, 2019; Seebauer et al., 2019). A broader recognition of structural injustices associated with energy poverty is needed to ground more concrete policies, integrate social and energy goals, and reach a "*justice-aware*" energy policy (Sovacool et al., 2017).

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Appendix A

NECP sections' titles		**Countries**	**Selection criteria**
1.2 Current policy and administrative structures – Dimension 4: market integration – Measures to overcome energy poverty		AT	AT added a focus on energy poverty
2.4.4 National objectives to prevent energy poverty (including a time frame for implementation), where applicable		AT, DK, IT, PL	EU guidelines
3.2 Dimension Energy efficiency		DK	Danish Section 3.4.3 on energy poverty measures refers to section 3.2 for other measures relevant for energy poverty
3. Policies and measures – 3.4.3. Market integration – iv.	*Where applicable, measures to protect consumers, especially against energy poverty*	AT	Energy poor consumers are mentioned in the EU guidelines title. (only the paragraphs explicitly concerning energy poor consumers – as far as this distinction is possible)
	Policies and measures to protect consumers, especially vulnerable and, where applicable, energy poor consumers, and to improve the competitiveness and contestability of the retail energy market	DK, IT, PL	
3. Policies and measures – 3.4.4.Energy poverty – i. Where applicable, policies and measures to achieve the objectives set out in point 2.4.4.		AT, IT, PL Absent for DK, plan refers to 3.4.3.iv	EU guidelines

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Appendix B. Findings: classification of energy poverty (EP) problematisation along the three energy justice (EJ) tenets

Justice dimension	Corresponding components in EP	Addressed in each NECP			
Recognition	**Groups affected**	**AT**	**DK**	**IT**	**PL**
	Consumer, customers	n/a	vulnerable customers	n/a	vulnerable (electricity / fuel gaseous / energy) consumers
	Households	Yes	Yes	yes	n/a
	Social groups	n/a	n/a	n/a	vulnerable social groups
	Families	Family houses	n/a	n/a	""single-family dwellings"
"	**Group-specific characteristics and needs**				
	Age	n/a	n/a	EP is lower for HH with at least one member aged above 65 years old. These HH are expected to increase.	n/a
	Vulnerability	n/a	vulnerable customers	n/a	Vulnerability as a characteristic of social groups and energy consumers
	Place of residence	n/a	n/a	EP increases from the North to the South of the country.	n/a
Distribution	**Main EP drivers and/or outcomes**	**AT**	**DK**	**IT**	**PL**
	Energy inefficiency	**Housing characteristics (*driver*):** Built before 1960, one or two-family houses, inhabited by the homeowner, larger heated living area; **Heating systems (*drivers*):** Oil and natural gas **HH size (*driver*):** Single member households tend to be more in EP. **Higher energy consumption (*effect*)** (heating, hot water, cooking, electrical energy and other energy uses for the building) by 140 % for energy poor	n/a	**HH size (*driver*):** with one member less likely in EP. Smaller HH are expected to increase. **Consumption type (*driver*)** Residential energy consumption and mix of sources. Forecasted increase of electricity, decrease of oil and gas;	**Housing characteristics (*driver*):** single family buildings and municipal buildings, with poor energy standards. **(distribution)** People with lowest income live in energy inefficient municipal buildings.

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		HH than an average HH. Their yearly energy use for living is 28 % higher than average and reaches 49 % for heating.			
	Energy expenditure	**High energy expenditure as share of income (effect)** EP HH spend 22.8 % of their income on energy, against 4.5 % for average HHs. Out of all energy costs, heating oil has the highest share, corresponding to 21 % for EP HH and 14 % for non-EP HH. Average annual energy costs of EP HH are 39 % higher than the average for all HH. **Energy inefficiency (driver)** poor thermal quality of the building. **Costly energy heating sources** **Energy prices (driver of EP)** Volatile heating prices cause uncertain future costs. **(distribution):** High energy costs put low-income households in particular at risk of poverty.	n/a	**Unequal distribution (effect): higher energy expenditure for most deprived and for lowest consumption levels:** Increase in energy costs weighs more on deprived HH, who experienced the largest increase in energy costs, along with the 2008 economic crisis and decrease in overall HH expenditure. Increasing HH expenditure on heating and electricity, in the last two decades. In 2016, the energy expenditure of the 10 % HH with lowest consumption was 4.5 % of total spending, against this being 1 % for the 10 % HH with highest consumption levels. **Overall HH expenditure (driver of EP)** Expected to increase. **Energy prices (driver of EP)** Expected to increase.	**Energy inefficiency in building (driver)** Poor energy standards in municipal buildings lead to high costs for people with the lowest income.
	Low-income & limited / no capital	**Poverty (distribution)** EP are 20.3 % of the people at risk of poverty. **(driver)** HH in or near poverty face **difficulties to finance** substantial ""long-term effective investments""in buildings and heating and hot water systems.	n/a	**Poverty (distribution)** Slightly increasing trend in EP corresponds to that of HH in relative **poverty**. **(driver):** Energy efficiency incentives are not accessible for EP HH. HH in poverty **cannot make necessary investments** in measures to counter EP	A considerable proportion of energy poor people have **no creditworthiness.**

		Income (distribution) EP is characteristic of low-income HH and associated to incomes below at-risk-of-poverty.			
Procedural	**Access to existing measures tackling EP**	organisational barriers (e.g. liabilities for renovation loans) for EP HH	n/a	About one third of potential beneficiaries requested access to electricity and gas bonuses. Probably due to **lack of awareness** and administrative **complexity** of the access requirements.	Exclusion from support.programmes due to **no creditworthiness**, for many people in EP
	Access to information on EP issue	n/a	Issue not independently analysed. Rather indirectly, through social policy	No official definition yet	No official definition yet

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Appendix C. Findings: classification of policy instruments to tackle EP along the three EJ tenets

Justice dimension	Corresponding components in EP	Addressed in each NECP			
Recognition	***Target groups***	**AT**	**DK**	**IT**	**PL**
	Generic	HH (main subject); all sections of the population (shall meet their basic energy requirements) Energy poor HH	HH	HH	HH
	Consumers, customers	n/a	customers, consumers	n/a	vulnerable electricity and gaseous fuel consumers, EP consumers
	Energy communities and self-consumption systems	n/a	n/a	Promotion of energy communities and self-consumption systems to reduce energy consumption	n/a
	Family	n/a	n/a	families, accounting for children and number of family members	n/a
	Social benefit beneficiaries and potential EP-benefit beneficiaries	n/a	People receiving social assistance (social incident leading to inability to fulfil needs of oneself/ family; people with high housing costs or large families) can receive supplementary housing benefit	People benefitting of the "citizenship income" can automatically access social energy bonuses. People qualifying, but not yet getting EP benefits.	Vulnerable consumers defined on the requirement of receiving housing benefit (electricity) or fuel allowance (gas)
	Specific target group characteristics and needs	**AT**	**DK**	**IT**	**PL**
	Age	n/a	Heating supplement for ""he weakest part of pensioners""and ""old age pensioners and persons who have taken early retirement"	"n/a	n/a

Type of energy source used	n/a	n/a	Policy measures improving access should account for specific needs of people heating with alternatives to methane or lacking a heating system; gas social bonus varies also as a function of the type of use.	n/a
Vulnerability	n/a	Vulnerable customers (mentioned once and not defined)	Vulnerable HH or families	Vulnerable consumers, i.e. the poorest HH
Substantial and unforeseen deterioration of living conditions	n/a	Support when an unforeseen and substantial change in conditions (sickness, unemployment…) hinders covering important energy expenses or with any crucial impact on life or future care	n/a	n/a
Health	n/a	n/a	people reliant on life-saving medical equipment, granted irrespective of income	n/a
Living in remote areas	n/a	n/a	energy tax reductions for people in Sardinia, mountainous areas or small islands	n/a
Extreme natural event	n/a	n/a	people affected by exceptional events such as earthquakes	n/a
Climatic zone	n/a	n/a	gas social bonus varies also as a function of the climatic zone	n/a
Air pollution	n/a	n/a	n/a	Support targetting municipalities with poor air quality (i.e. concentrations of air pollutants exceeding EU standards.)

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	Income & capital	People in or near poverty people with poor credit ratings or old debts low-income HHs people unable to or in difficulties with energy bills	Persons with a relatively low income	poverty conditions; HH living in conditions of "financial/physical hardship" "disadvantaged""and "deprived sections of the population" "families in living in economic or physical hardship" "domestic users living in disadvantaged socio-economic conditions" "individuals with insufficient funds low-income families and HHs	energy poor people "areas at risk of EP"" Account for ""needs of the poor" "creditworthy entities people with the lowest incomes
Distribution	**EP area targeted by measures**	**AT**	**DK**	**IT**	**PL**
	energy efficiency	(*) incentives to suppliers to increase energy efficiency of low-income HH **Housing & heating:** long-term effective investment is needed to overcome EP, targeting both building envelopes and heating and hot water systems. But when EP such investments are difficult with own resources. Measures involving relatively modest investments can often also have a significant impact. Such measures should offer households sufficient information which is easy to put into practice and financial support.	Not targeting EP, but recognised as relevant for EP, are specific subsidies targeting energy efficiency, particularly in buildings **Housing:** (not in EP section) subsidies for energy efficiency buildings: – Financial aid will be given to owners of buildings who have renovated their buildings in accordance with a specific list of energy savings & using energy label for buildings – campaigns to support realising the potential for energy savings	– Subsidies, regulations, tax breaks, energy supply certification schemes, energy tutors; – reduction of energy consumption via energy communities and self-consumption systems; – (*) adapting the existing thermal energy account subsidy **Housing:** – tax deduction (green social bonus) on energy refurbishment of buildings, with loans to EP families, then extended to social housing institutes; – large programme for energy efficient and renovated social housing; – thermomodernisation bonus and renovation bonus for creditworthy entities	subsidy programs for energy poor people to carry out the most expensive investment projects (e.g. thermal upgrading) **Housing:** – support for construction and renovation, accounting for difficulties or impossibility of investments; – using EU funding and loan programmes targetting EP, comprehensive building; – thermomodernisation bonus, adding municipal buildings **Heating & cooling:** – Subsidies and preferential loans to support replacement of heating for energy poor in single-dwellings; Construction, expansion and upgrading of district heat-

		Transport: ""efforts must be made to ensure that all sections of the population can meet their basic energy and mobility requirements" But no transport specific measures mentioned, and figures on EP exclude transport	For existing buildings: – requirements to the renovation of buildings in the building codes – information campaigns on technological opportunities and financial measures for building owners. **Heating**: – Heating supplement for old age pensioners and persons choosing early retirement. – (not in EP section): Subsidy scheme to replace oil burners with heat pumps in buildings located in areas without access to district heating or the gas grid.	**Heating & cooling:** Benefit will be, at most, equivalent to three months energy costs to cover heating costs (during the winter) or air-conditioning costs (during the summer) **HH appliances:** Linked to the bonuses for physical hardship, households with very low ISEE* scores will be directly provided with highly technologically efficient equipment to make the application of the bonus more functional and concrete **Renewable energy:** ""energy income""is a revolving fund to grant capital contributions covering 100 % investments in domestic PV, for low-income HH; To increase renewable use and help disadvantaged HH, public bodies and regions managing subsidised public housing can conditionally use net metering electricity produced in their owned plants (i.e. exemption from the obligation to same generation and consumption place)	ing, cooling, electricity or gas network (Stop Smog); – New Anti-smog tariff: to encourage household owners to replace outdated furnaces and heat their homes at night with electricity (via reduction of electricity and over-night rates) **Connection to /expansion of the energy network** *connection to the district heating, electricity or gas network (Stop Smog); protection against suspension of supplies;*	
	energy expenditure	ancillary late payment costs collected by the network operators are standardised, limited and regulated	n/a	– reduce energy bills for EP people via energy efficiency and electricity and gas bonuses, scaled to poverty conditions, and via tax deductions on electricity and heating fuel; – standardised interventions to reduce energy costs for populations affected by exceptional	– (*) flat-rate energy allowance for vulnerable electricity consumer; – reduction in the share of energy costs in household budgets resulting from energy efficiency investments;	

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				events (suspension of bills after earthquakes); – increase the efficiency of existing measures in support of energy expenditure Consumer protection measures to accompany the liberalisation of energy retail markets	subsidies to low-income families: improving their access by reviewing energy social bonuses: add link to income (ISEE), automated identification of who is entitled – benefits to be granted using methods other than cost compensation, identifying a potential joint payment of support measures for the cost of electricity and natural gas supply	– prepayment metering and billing system; – option to terminate contracts without extra charge, option to change the vendor of electricity or gaseous fuels;
	income & capital	-(*) Green Electricity Act relieved low-income households of additional costs for green electricity production. -Protect (EP) consumers via right to monthly billing	(*) green check to compensate low-income people for higher green taxes – EP addressed via social policy, which is not specifically targeted to energy; – Income transfer system is structured around costs of living, including energy costs and taxes; – Cash support (in addition to social benefits) in case of a substantial change in the living conditions (illness, sickness, discontinuance of cohabitation…) along with unforeseen and significant expenses, or with high costs for housing or large family			minimum income instruments The Energy Law defining vulnerable energy consumers is "to protect the poorest people"

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Procedure	**Access to information on EP problem**	n/a	n/a	Establish an official measure of EP; Setting up national Observatory of Energy Poverty: by 2020, to monitor EP, and identify and coordinate relevant measures	Definition of EP adapted to Polish conditions; monitoring EP to assess phenomenon and see effects of proposed solutions
	Access to information on energy use and prices, on supply options	– Protect (EP) consumers via smart metering; – transparency via easy and fast access to information and further training. Should be guaranteed to increase social acceptance: (*) tariff calculator by the regulatory authority for the transparent and non-discriminatory publication of price data and conditions, making it easy to switch supplier; – Large energy suppliers are obliged to set up contact and advice centres, which also cover problems relating to EP; – Electricity labelling system for end customers to assess the energy sources in the mix supplied;	– Retail price formation is fully competitive. Market development is closely monitored in order to ensure an appropriate price level for all consumers. – (*) Law on clear distinction btw vertically integrated monopoly and retail companies, clearly distinguishing the monopoly company in any customer contact; – (*) supplier centric model to ensure suppliers have the primary customer contact, and all costs related to electricity are summed up in one bill sent to the customer by their supplier. – (*) Regulation to ensure that electricity bills are more easily understandable, setting a minimum standard on the content of electricity bills. – (*) Datahub to manage all retail and whole-	(*) since 2019: IT system informing on own energy consumption and supply contract – data management tools will be added. Allows easier switching and changing supply "including in cases of overdue payment" Self-consumption portal for "prosumers" for a personalised economic evaluation of photovoltaic projects – No specifics for EP mentioned Planned: enhancing tools for comparing offers (already made available by ARERA and Acquirente Unico), and information campaigns	access to the collection of consumer rights; Information Centre for electricity and gas consumers; online energy price calculator: to be improved for easier and broader access to info about offers and switching possibilities, both for electricity and for gas (planned in connection with the timeframe for deregulating gaseous fuel prices in the household sector set out in statutory regulations) Active forms of participation in the electricity market (aggregation services or prosumers or dynamic price contracts) becoming more common – ""intended to enhance the position of vulnerable consumers and encourage them to take on a more active role in the electricity market" " Goal 2030: raising awareness among consumers with respect to the rules of operation of the energy and gaseous fuel markets

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	– Ensure easy comprehension of green finance instruments for consumers; – Guidelines have been developed for consumers, electricity traders and suppliers by the regulatory authority to explain more clearly the complex legal bases and correlations	sale market transactions through one central system operated and owned by the TSO – for more transparency and equal access to data – (*) Online price, products and suppliers comparison tool, trustworthy cause operated by Danish Utility Regulator – improve information to customers and ease customers: the competition and consumer authority has published behavioural principles in consumer-oriented regulation that shall be applied on the electricity market as well: Consumer-oriented regulation should support as simple and action-oriented consumer information as possible			information campaigns to make consumers aware of their rights in their relations with energy companies
	Access to (information on) measures tackling EP	– informal and organisation-legal measures are needed to improve access to independent and public information and advice, and to reduce organisational barriers (e.g. liabilities for reno-	– n/a	Measures: Reviewing existing measures, remove administrative barriers, introduce automated tools to grant financial support and coordinate between energy mechanisms and other social policy measures: automatic access to the social bonuses for electricity and gas, when benefitting from citizenship income	n/a	

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	vation loans) for HH in EP		or citizenship pension. And access based on ISEE (equivalent economic situation indicator), integrating the related database with the databases at the company Acquirente Unico (Integrated Information System) This means replacing the current electricity and gas social bonuses with a new energy social bonus		
Laws and regulations (right to energy): obligation to supply, disconnection protection	(*) improve conditions of people in payment difficulties: reminders before energy is cut off to look for solutions; Contracting obligation: basic supply for household customers is mandatory. Obligation to contract to ensure that people with poor credit ratings or old debts can also purchase electricity and gas, provided they pay a monthly instalment of their electricity costs in advance. They cannot be charged a tariff more expensive than the standard one; Arbitration body to help energy consumers with difficulties with grid operators or suppliers;	(*) Suppliers of last resort are phased out and replaced with a general obligation to supply: Electricity suppliers are thus obliged to supply any household customer, upon the customer s request, in a reas where the supplier offers its products. It is not allowed to enter into time-limited supply agreements with household customers. If there is a particular reason to expect a lack of payment ability or willingness to pay, that is if the customer is or has been in arrears with payments, the supplier can request a guarantee from the customer. Only if the request for a guarantee is not fulfilled, the supplier is allowed to cancel the agreement.	Several non-price protections: code of conduct, contractual conditions, and monitoring will be carried out to identify over time any price increases not linked to market fundamentals as well as wrongful conduct of operators Register of suppliers: will be established by Decree. Register will impose technical, financial and reputational requirements on suppliers. These will be monitored and assessed, especially in their activities with immediate repercussions on customers regulation of services of last resort: safeguarding service for customers who are currently entitled to the Increased Protection service and the potential review of the other last resort services that currently exist; other measures planned: checks and sanctions regarding wrongful conduct, measures of protection for the weakest consumers (also in view of the room for manoeuvre provided by the Clean Energy Package in this regard). Mak-	alternative dispute resolution methods

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					ing suppliers more responsible, for ex. automatically compensating service supply failures to protect consumers in the event of a violation of their rights

* ISEE = equivalent economic situation indicator.

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