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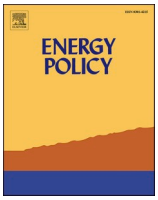

Energy poverty and emerging debates: Beyond the traditional triangle of energy poverty drivers

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ABSTRACT

This paper evaluates whether, how, and why policy documents in six diverse European countries (Spain, France, Portugal, the UK, North Macedonia, and Slovenia) link energy poverty to other related policy areas. Our exploratory study suggests that the most explicit links to energy poverty are made in energy efficiency policies rather than in energy price and income policies, due to the dominant techno-economic approach to addressing energy poverty. As countries with a long tradition of addressing energy poverty, France and the UK integrate energy poverty to a greater extent in linked policies. Policy integration is reflected in EU efforts to include energy poverty in climate and energy policies. Emerging debates linked to energy poverty include good governance, citizens' agency, new energy services, and new threats from the energy transition. We argue that the spatial divide of energy poverty across Europe is more than a physical (infrastructural) divide. It is a policy (political) divide embedded in the economic and political space co-shaped by national path dependencies, such as the social welfare system, the energy market, the level of experience of dealing with energy poverty, and the influence of EU policies. These conditions determine the national policy integration efforts linked to energy poverty.

1. Introduction

Energy poverty, defined as the inability to attain a socially and materially necessitated level of domestic energy services (Bouzarovski and Petrova, 2015), has received increased academic and policy attention in the past decade, with researchers continuing to add to the scope of and refine their understanding of this concept. Links between energy poverty and many other areas which impact, indicate, or result from energy poverty have been established in the literature, underlining the complex embeddedness of this condition in the current socio-economic system. For instance, the current neoliberal economic system, the ongoing energy transition, and policies to mitigate climate change can increase the risk of energy poverty (Bouzarovski and Tirado Herrero, 2017a; Chester, 2014; Ürge-Vorsatz and Tirado Herrero, 2012). While the academic literature explores how energy poverty is interrelated with a broad set of drivers, consequences, and indicators of different levels, ranging from social exclusion (Gillard et al., 2017) to air pollution (Frankowski, 2020), still the links between energy poverty and many policy areas with an impact on energy poverty remain largely under-researched (Stojilovska et al., 2020).

There is a lack of evidence and inter-country comparison examining existing or missing links between energy poverty and other policy areas influencing energy poverty in the EU. Moreover, due to the multidimensional nature of energy poverty (Guyet et al., 2018), criticism has been made of siloed approaches to the design of energy poverty policies (Barrella et al., 2021). Energy poverty varies spatially across Europe due

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to various systemic inequalities and path dependencies. Exploring the links between energy poverty and other relevant policies from different geographies is thus critical to establishing how public policies in different national European contexts address the multidimensional aspects of energy poverty. We explore whether and how energy poverty is linked to other related policy areas in policy documents by investigating explicit, implicit, or missing policy links. The aim is 1) to examine the level of integrated policy designs related to energy poverty in diverse national contexts in Europe and the factors influencing the policy integration of areas relevant to energy poverty, and 2) to map the emergence of new links to energy poverty, informing the understanding of the geography of energy poverty in Europe. We argue that the spatial divide of energy poverty across Europe is more complex than a physical (infrastructural) divide determined by the development of the built environment. It is a policy (political) divide embedded in the economic and political space co-shaped by national path dependencies, such as social welfare systems, the energy market, and the level of experience of dealing with energy poverty and EU policy influence. These diverse conditions influence the extent of national policy integration of energy poverty. As this research is exploratory, we focus on a small number of European countries Spain (ES), France (FR), Portugal (PT), the United Kingdom (UK), North Macedonia (MK), and Slovenia (SI). These countries display various social, economic, political, and institutional differences. Levels of energy poverty also vary. Our paper is structured as follows: 2) Literature review (Energy poverty: a spatially and structurally embedded phenomenon), 3) Methodology; 4) Results; 5) Discussion, and 6) Conclusion and policy implications.

2. Energy poverty: a spatially and structurally embedded phenomenon

We review the literature on the spatiality of energy poverty in Europe, including the scope, main features, and drivers of energy poverty, links between energy poverty and other policy areas, and energy poverty policies in practice. Our conceptual framework shown in Fig. 1, represents the approach taken in the policy analysis. The first step is a review of the policies which impact the three main drivers of energy poverty combined with a review of climate and energy policies that can also impact energy poverty. These impacts are recognized by the EU through the requirement to add energy poverty sections to National Energy and Climate Plans (NECP). By reviewing the three drivers and climate and energy policies, we investigate two types of links. We evaluate the explicit, implicit, and missing links to energy poverty in policies that impact this phenomenon. We also explore whether there are new policy areas with emerging links to energy poverty. We discuss the three drivers, the spatiality of energy poverty, and the new policy areas impacting energy poverty through the literature review.

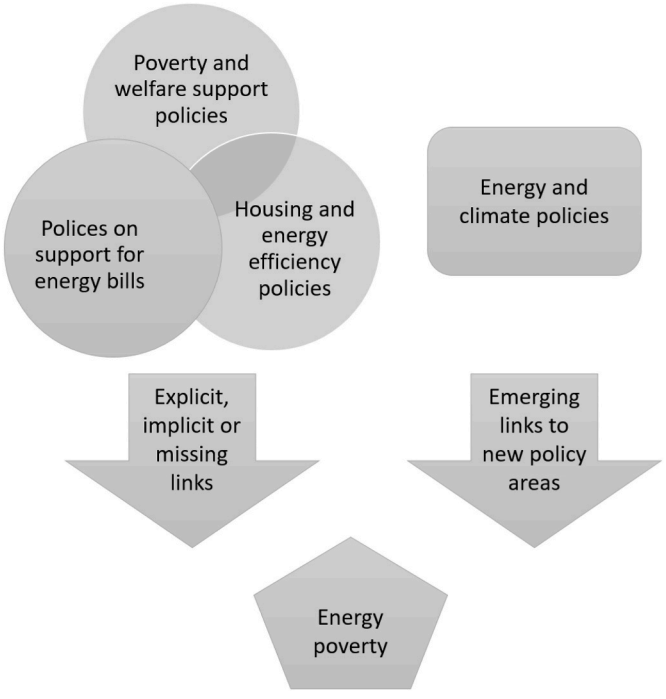

Fig. 1. Conceptual framework to study policy integration around energy poverty.

Energy poverty is a spatially manifested phenomenon unevenly distributed across Europe. Regions of Central Eastern Europe, the Mediterranean countries, Ireland, and the UK are more vulnerable to energy poverty, while the countries in the geographical core of Europe have lower shares of energy poverty (Bouzarovski, 2014; Bouzarovski and Tirado Herrero, 2017a). This distribution of spatial energy injustice is embedded in existing infrastructure, fuel, and dwelling features. This is shown by the dominant approaches to measuring the spatial differences in the manifestation of energy poverty. These are the triangle of energy poverty drivers - income levels, the energy efficiency of the housing stock, and energy prices (Boardman, 2010), or simply the 'poverty of infrastructure' referring to the lack of access to adequate infrastructure and the built environment (Bouzarovski, 2018; Robinson et al., 2018). However, these spatial inequalities are not merely physical and related to infrastructure and location. The infrastructural divide in Europe is linked to the path dependencies of the communist/socialist legacy singling out the 'east' from the 'west' (Bouzarovski, 2018). Thus, the spatial divide is also influenced by the national path dependencies.

The scope and understanding of energy poverty have expanded over time to bridge various policy areas and uncover hidden energy poverty drivers. Socio-demographic, housing, and infrastructure characteristics inherently linked to the "traditional drivers", including unemployment, housing tenure, age and size of the dwelling, and location, continue to be collected to measure the prevalence of energy poverty. However, today we also examine energy poverty through a more nuanced understanding of the vulnerable groups, including a reflection on social exclusion (Middlemiss et al., 2019); mental illnesses (Harris et al., 2010); gender (Feenstra and Özerol, 2021; Petrova and Simcock, 2019; Tirado Herrero, 2020); disability (Snell et al., 2015); and minority status (Bouzarovski and Tirado Herrero, 2017b; Tirado Herrero and Ürge-Vorsatz, 2010). In addition to understanding the features and conditions of these vulnerable groups, research has focused on widening the scope of energy services, which at first were focused on space heating only (Buzar, 2007), to incorporating transport (Mattioli et al., 2017) and cooling (Castaño-Rosa et al., 2021; Thomson et al., 2019). Academics have also presented energy poverty at complex multidimensional levels accounting for diverse variables, such as final energy demand and consumption, climate, health implications, and available support (Castaño-Rosa et al., 2019; Gouveia et al., 2019; Mahoney et al., 2020).

Further research pushes the discussions away from the energy-poor - onto the drivers of energy poverty. Recent discussions on the right to energy put pressure on utility companies and the role of the state, requiring enhanced protection of vulnerable consumers through bans on disconnections, and the introduction of social tariffs (EPSU, 2017). Removing access to energy from citizens in energy poverty may be a question of human rights (Hesselman et al., 2019). Lastly, the social welfare system and the market structure are also criticized for co-creating energy poverty (Stojilovska, 2021).

The current energy transition may bring new dangers for the vulnerable, increasing the spatial divide. There are fears that the low-carbon transition will negatively affect or exclude vulnerable households, similar to the transition from the socialist system (Bouzarovski and Tirado Herrero, 2017a). This could imply increased electricity prices due to incorporating carbon pricing or renewable energy subsidies (Ürge-Vorsatz and Tirado Herrero, 2012), displacement and segregation due to renovation efforts, and increased rent and property values

(Bouzarovski et al., 2018; Großmann et al., 2015). Existing studies on policies linked to energy poverty show that broader and multidisciplinary approaches to addressing energy poverty are considered more viable and effective (Bajomi et al., 2021; Feenstra et al., 2021; Gouveia et al., 2021; Kyprianou et al., 2019). Having recognized the need to synchronize climate and energy policies with energy poverty and to realize the just transition envisioned in the Green Deal, the EU has tasked its member and candidate states to define energy poverty and propose corresponding measures in the NECPs based on the Regulation on the Governance of the Energy Union and Climate Action (Official_Journal_of_the_European_Union, 2018). In a more global context, scholars suggest a link between energy use, energy prices, and achieving environmental sustainability (Abbasi and Adedoyin, 2021; Abbasi et al., 2021, 2022).

Our research fills a gap in the current literature regarding how the design of policies framing the three drivers and other related policies, directly and indirectly, consider the risk of energy poverty. Thus, our approach is to look beyond the 'traditional triangle' of energy poverty drivers and analyze policies in which energy poverty discussions emerge across various European countries.

3. Methodology

Our overall methodological approach for this exploratory research is a comparative case study investigating contemporary issues by comparing different case studies (Punch, 2005; Yin, 2003), in our case, six diverse European countries. Our case study is based on analytical generalization, additionally, the multiple-case sampling applied increases the generalizability and the confidence of the findings (Miles et al., 2014; Yin, 2003). We explain the methods, data sampling, collection, and analysis in section 3.1. Subsequently, we introduce the relevant national contexts of the selected countries and justify their selection (section 3.2).

3.1. Methods, data sampling, collection, and analysis

Our primary method is the analysis of policy documents and laws which can be utilized in case study research (Punch, 2005). These documents vary per country but include strategies, plans, programs, or regulations dealing with policies shaping income, energy efficiency, energy prices, and energy and climate topics influencing energy poverty. We collected relevant policy documents for the period 2010–2020 (including the beginning of 2021 but not considering COVID-19 measures) to understand the development of the policies. However, we do refer to key older documents if necessary to explain the context of the policy development. The comprehensive list of policy documents we analyzed is in the Appendix. As our research is exploratory, the list of selected documents is not exhaustive and is limited to policies that may influence the main drivers of energy poverty.

The data sampling and analysis follow a three-step procedure (Fig. 2). We developed a common thematic approach to study whether and how energy poverty is linked to other policies. Acknowledging that the general understanding of the drivers of energy poverty centers on income, energy efficiency, and energy prices, we depart from this triangle to study policy documents embodying policies influencing income (poverty and welfare support), energy prices (support for energy bills), and energy efficiency (housing and energy efficiency policies) regarding their links to energy poverty (first step in Fig. 2). Next, we investigate climate and energy policies (climate, sustainable development, renewables strategies or plans, legislation on energy or energy transition) regarding their links to energy poverty (second step in Fig. 2). The reason for choosing energy and climate policies is the political focus, particularly in the EU, on achieving greater social, energy, and climate policy integration and an inclusive energy transition. Based on the first two steps, we reveal which new emerging topics are linked to energy poverty (third step in Fig. 2).

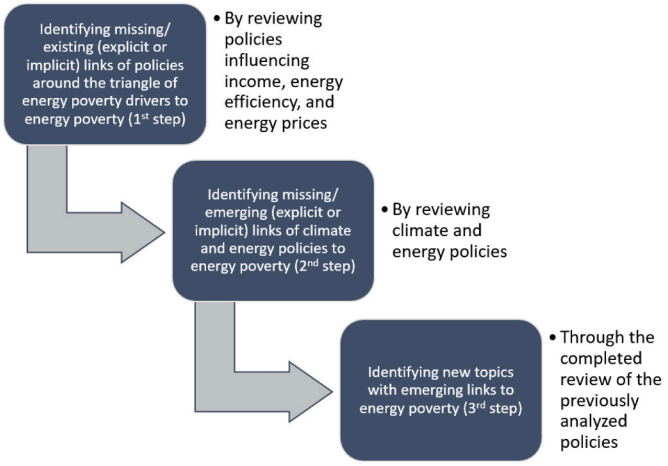

Fig. 2. Thematic data sampling and analysis.

After collecting the policy documents relevant to the three drivers and the climate and energy policies impacting energy poverty, we analyzed whether they have existing (explicit or implicit) or missing links to energy poverty. An explicit link to energy poverty means that energy poverty (or fuel poverty, energy precarity, or energy vulnerability) was explicitly mentioned in the policy document. An implicit link implies that the word 'energy poverty' or its synonyms have not been used, but this problem is indirectly acknowledged. Missing links refer to cases where there were no links to energy poverty at all. We used discourse analysis to study the embedded meanings of keywords related to energy poverty in policy documents (Gee, 2014; Miles et al., 2014). Discourse analysis is used to uncover ideas, issues, and themes as they are expressed in writing (Gee, 2014). Discourse analysis is a qualitative data analysis technique that can capture how narratives and rhetoric combined can bring meaning to systems, institutional practices, and power structures (Sovacool et al., 2018). We analyzed the selected policy documents by searching for keywords (Gee, 2014), such as energy poverty, fuel poverty, energy precarity, and energy vulnerability[1] (as primary keywords) and energy, households, consumer, vulnerable, and deprivation as secondary keywords to evaluate whether energy poverty was implicitly or explicitly mentioned. We qualitatively analyzed the material by following the steps of data condensation, data display, and conclusion drawing (Miles et al., 2014). Following a review of the policy documents and corresponding actions impacting energy poverty, we explored which new topics appear in these policy documents with emerging links to energy poverty. Our method of assessing policy integration of energy poverty and related policies is based on the explicit, implicit, or missing links approach, where explicit links in multiple areas indicate a greater policy integration. Following Candel and Biesbroek (2016) we define policy integration related to energy poverty as incorporating and prioritizing energy poverty in non-energy poverty domains to enhance energy poverty policy outcomes.

3.2. Country selection and characteristics

Our country selection consists of six European countries (Spain, France, Portugal, the UK, North Macedonia, and Slovenia). These countries represent a diverse sample of geographical locations, different socio-economic legacies, and political and institutional path dependencies as well as varying levels of energy poverty. These countries

[1] Energy poverty is referred to as fuel poverty in the UK and energy precarity in France, while energy vulnerability describes the dynamics of or the risk of falling into energy poverty. The EU uses the notion of (energy) vulnerable consumers.

also have distinctive experience in developing energy poverty policies.

In selecting these countries, we depart from the spatiality of energy poverty (Bouzarovski and Simcock, 2017) and the understanding of the geography of energy poverty in Europe (Bouzarovski, 2014; Bouzarovski and Tirado Herrero, 2017a) to inspect regions less (such as France) and more affected by energy poverty (using the remaining selected countries), to represent diverse geographical regions, and to indicate diversity in social welfare systems and energy market structures (Table 1). Overall, based on the information relevant to energy poverty and its drivers compiled in Table 1 and Fig. 3, (while there is no clear-cut answer), the data indicates that North Macedonia, followed by Portugal and Spain, are more affected by energy poverty, while France, Slovenia, and the UK are less affected.

According to Table 1, North Macedonia and Spain are at higher risk of income poverty, with over 20% at risk, the lowest risk is found in Slovenia and France. The UK and Slovenia have the lowest rates of housing deprivation, while, North Macedonia has the highest rate. In comparison, France, Slovenia, and the UK have the strongest welfare systems, and North Macedonia the weakest. The countries have liberalized electricity markets with regulated prices by the universal service supplier. Finally, three out of six countries have a definition of energy poverty, while Portugal has been waiting for the final approval of its draft energy poverty strategy since early 2020.

In Fig. 3, we aggregated the most commonly used three EU-SILC collected indicators: inability to keep home adequately warm; population living in a dwelling with a leaking roof, damp walls, floors, or foundation, or rot in window frames or floor; and arrears on utility bills for the period 2010–2020 (data is only available until 2018 for the UK). Fig. 3 shows the average share of energy poverty per indicator calculated for the relevant period, by listing countries with the highest to the lowest share. The arrows indicate whether energy poverty per indicator has increased or decreased in the studied period. Over the past 10 years, North Macedonia and Portugal present the worst scores regarding the inability to adequately heat their homes. In contrast, Slovenia and France experienced the lowest energy poverty rates. The indicator measuring experience of poor dwelling quality shows that the worst performers are Portugal and Slovenia, while the best performer is France. North Macedonia experiences the highest share of arrears on utility bills, followed by Slovenia. Importantly, Portugal has, on average, the least percentage of the population with arrears, mainly related to adaptive cultural practices, such as high usage of biomass in fireplaces. This data is not disclosed in expenditure statistics, and strategies to avoid increasing energy-related bills result in situations of underconsumption (Antepara et al., 2020; Palma et al., 2019). These indicators show an evolving situation in each country. Evolutions may depend on welfare, housing or energy reforms, or the introduction of new strategies.

4. Results

Following the conceptual approach in Fig. 1 and the methodological steps in Fig. 2, firstly, we explain the links between energy poverty and the policies shaping the main three drivers of energy poverty in the selected countries – income, energy efficiency, and energy prices, and discuss whether the links are explicit, implicit, or missing. Secondly, we explore the links between energy poverty and energy and climate policies due to the EU's requirement to include energy poverty within the NECPs, which may also impact energy poverty. Although it is hard to determine a clear-cut divide among our sample of countries, we highlight important differences between the countries. Lastly, through reviewing all the selected policies, we reveal which new policy areas show emerging links to energy poverty. The results section presents the findings of the policy integration assessment and the policies impacting the a) income as 4.1, b) energy efficiency as 4.2, c) energy prices as 4.3, d) climate and energy policies as 4.4, and e) new policies areas with emerging links to energy poverty as 4.5.

4.1. Links to policies on income - around vulnerable groups

Academics have strongly argued that energy poverty is a distinct phenomenon from income poverty (Boardman, 2010; Guyet et al., 2018) however 'classical' policies on income in the studied countries, such as strategies against income poverty and welfare policies do not necessarily mention energy poverty but do focus on specific vulnerable groups. We observed that France's and North Macedonia's policies on income had explicit links to energy poverty. North Macedonia explicitly mentions energy poverty as an identified form of poverty in its Antipoverty Strategy. Social welfare recipients in North Macedonia used to be eligible for a small monthly energy poverty subsidy, but this measure, with a bit of expansion, was rebranded for vulnerable consumers. In France's national Strategy for Preventing and Combating Poverty from 2018, the focus has been on children and young people. Energy has been explicitly mentioned as one of the many essential services that should be guaranteed to children.

Portugal, Spain, Slovenia, the UK, and some French policies have implicit links to energy poverty. In many of these, the link is through unemployment protection. In France, the Antipoverty Strategy aims at tackling passive and active employment policies relying both on reforming income support for disadvantaged groups (new Minimum Social Benefits Law in 2008), for the unemployed (unemployment

Table 1
General characteristics of relevance to energy poverty.

Country	Geographical diversity	Definition of energy poverty	At-risk-of-poverty rate (%, 2020, UK, 2018)	Impact of social transfers (excluding pensions) on poverty reduction (%, 2020, UK 2018)	Severe housing deprivation rate (%, 2020, UK, 2018)	Degree of electricity market liberalization for households
ES	South	yes	21	23.4	3.4	Deregulated prices except for the universal service supplier
FR	Center	yes	13.8	47	3.8	Residential consumers can choose their electricity and gas supplier since July 1, 2007. Since then, a combination of tariffs set by the market and regulated prices by the state. The end of regulated gas prices planned in 2023
PT	South	no	16.2	26	3.9	Liberalized market since 2006. There is still the option of maintaining the regulated universal service until 2025
UK	North	yes	18.6	36.1	1.9	Fully liberal and private since 1989, regulated through Ofgem (consumer protection organization)
MK	East	no	21.8	15.2	9.9	Deregulated retail prices except for the universal service supplier
SI	East	no	12.4	44.6	3.1	Fully liberalized

Source: authors, (Eurostat, 2022b, c, e)

Fig. 3. Energy poverty 2010–2020 in the selected countries (UK by 2018) based on three selected EU-SILC indicators. Source: authors based on (Eurostat, 2022a, d, f).

benefits), and those on support and strategies to help the unemployed get back to the labor market. Portugal's welfare policies include three types of unemployment benefits depending on the duration of the person's past employment or the household income. One of these is the social insertion income that protects recipients from extreme poverty to satisfy basic needs (Brito, 2019). One of the goals of the Spanish Antipoverty Strategy is to improve the income guarantee system and add to the coverage of unemployment benefits (e.g., the long-term unemployed or unemployed people aged over 52). The British Employment and Support Allowance is for persons with a disability or health condition and also provides support for living costs for those unable to work or to get back into work if capable, while Universal credit introduced in 2013 replaced past benefits for those on low incomes, the unemployed, or those who cannot work.

Furthermore, we have established an implicit link to energy poverty by protecting vulnerable groups. For example, children were mentioned as a vulnerable group in the antipoverty strategies of Spain, France, and North Macedonia and welfare subsidy support in Slovenia. A link between food poverty and energy poverty has been recognized in the UK. For instance, the Warm Home Discount Industry Initiative provides food bank-dependent customers with additional credit to top up pre-payment meters. Finally, the antipoverty strategies of the studied countries have a broad set of objectives to tackle various aspects of material deprivation and social exclusion. For example, the Portuguese, Slovenian, and North Macedonia's strategies aim at mitigating inequalities and supporting decent living conditions. The Slovenian welfare support includes two monetary support schemes that can be linked to tackling energy poverty. However, they are not explicitly designed as such: extraordinary financial social assistance for exceptional expenses related to subsistence (e.g. heating costs in winter) and a security supplement for costs of living incurred over a long period (e.g. change of heating boiler) are among the supports provided. The Antipoverty Strategy in North Macedonia links combating poverty to the topics of unemployment, gender equality, housing, health, protection of children, as well as social protection. The French Antipoverty Strategy explains that energy poverty is addressed mainly through an income support scheme called the Energy voucher (*Chèque énergie*) and renovation programs, tackling the energy deprivation risk of both parents and children. Last but not least, the Spanish Antipoverty Strategy aims to improve the performance of public bodies to enhance the institutions' effectiveness and efficiency in the overall coordination of services and policies.

4.2. Links to energy efficiency – about reduced energy consumption and improved housing

Energy efficiency policies generally fit into the bigger picture of improving housing conditions and reducing energy consumption. All countries have some policies on energy efficiency, which explicitly refer

to energy poverty. For instance, the Portuguese Long Term Renovation Strategy (2021) indicates that the renovation of buildings should focus on cost-effective measures that reduce energy poverty. Most of the Spanish regulations and plans around housing and energy efficiency refer to notions of wellbeing, such as the Regulation on Thermal Installations in Buildings; prioritizing buildings inhabited by the most vulnerable households in the Law on Rehabilitation, Regeneration, and Urban Renewal. The Royal Decree 737/2020 regulates the aid program for energy rehabilitation actions in existing buildings obliging each region to allocate support for the most vulnerable households in line with the National Energy Poverty Strategy. In Great Britain, support is provided to low-income, vulnerable, and fuel-poor households via Energy Company Obligations, which oblige large and medium-sized energy suppliers to deliver efficiency and heating measures to households. In France, the Law on the National Commitment to the Environment ("Grenelle 2 Law") introduced a definition of energy poverty. Since then, all the policies and legislation related to energy efficiency have explicitly aimed to mitigate energy poverty targeting low-income households and social housing (such as the French Law on Energy Transition for Green Growth 2015). North Macedonia's Energy Efficiency Plan focuses on reducing energy consumption and mentions vulnerable consumers who need to be assisted through the provision of efficient energy equipment, refurbishment, and efficient light bulbs.

Many energy efficiency policies in the studied countries aim to reduce energy consumption. In Slovenia, there are a set of energy efficiency acts and policies governing the housing sector where reducing energy consumption is the main aim. However, the Action Plan for Energy Efficiency highlights the prevention of energy poverty through renovation work. Additionally, the energy efficiency policies are the source of several practical programs for tackling energy poverty, run by the Slovenian Eco Fund. Some extraordinary measures include 100% co-financing of the replacement of individual old stoves and wood stoves for socially disadvantaged citizens; 100% co-financing of the replacement of old stoves and wood stoves in multi-apartment buildings; 100% co-financing of energy renovation of dwellings in multi-apartment buildings, and non-repayable financial incentives are available to reduce energy poverty in 500 households (ZERO500). In Portugal, some legal acts aim to improve thermal comfort through energy efficiency measures and reduce energy consumption costs. Portugal's State Housing Plan 2018–2021 proposes measures relevant to energy poverty as it aims to help mortgage holders meet their mortgage loan obligations, improve the building quality, facilitate access for young people to decent and adequate housing for rent, and facilitate the enjoyment of proper and adequate housing for older people and people with disabilities. In Spain, the Housing and Rehabilitation Plan 2018–2021 aims to improve thermal comfort, promote the use of renewables, and improve the efficiency of heating systems to reduce energy demand. Countries with a long tradition of the social welfare state and of having a legal definition of energy poverty, such as France and the UK, had much older housing policies that accounted for decent or substandard conditions of dwellings and the corresponding effects on citizens' wellbeing. In 2000, the UK Government set a target to ensure standards of decency in social housing through the Decent Homes Standard as a reaction to the 1997 Government estimate that 2.2 million homes could be considered "non-decent". In France, from 1977 to the Loi Grenelle 2 2010 introducing the definition of energy poverty, renovation policies were implemented to retrofit the built fabric and improve the comfort of the residents or to address the "substandard dwelling" and promote sustainable development in the housing sector, indirectly addressing the risk of energy deprivation due to low housing quality.

Lastly, we report on new interesting insights around justice, equity, and responsibility demands stemming from housing policies relevant to energy poverty. In Portugal, the Portuguese Long Term Renovation Strategy (2021) aims to promote renewable energy to reduce energy consumption costs and highlights the regulatory context that allows for equitable and just energy tariffs. Furthermore, the link between higher rates of energy poverty and poorer energy efficiency among private sector properties in the UK countries is addressed explicitly in a set of political commitments. This includes setting minimum standards for privately rented properties or support to increase energy efficiency for low-income owner-occupied households across the UK.

4.3. Links to energy prices policies – social tariffs and subsidized prices

We find that the studied countries according to the historical development of the respective energy markets, the present structure of the market, and the historical context of energy provision, differ in the support their governments or utilities provide. The most common form is social tariffs, social discounts, or price caps existing in all studied countries except Slovenia and North Macedonia. Slovenia has no support for energy prices, and energy prices in North Macedonia are regulated for the consumers of the universal supplier.

The UK and France have a long tradition of supporting households in paying their energy bills and have various mechanisms in place. In the UK, the energy price caps cap the price consumers pay per kWh of electricity (Ofgem, 2022). The cap was introduced in 2017 for households equipped with prepaid meters. The scope broadened in 2019 so that the caps deliver fair energy prices by ensuring these tariffs reflect the underlying costs to supply energy and no more (Ofgem, 2019). Even though energy costs are rarely the sole target of UK policies (Mahoney et al., 2020), there are several financial aids available towards heating costs for vulnerable consumers. The Winter Fuel Payment is an automatic payment of between £100–300 for those born before November 1953; the Cold Weather Payment is issued if the temperature is 0° or less for seven consecutive days, awarding £25 for every seven days between 1 November and 31st March. The Warm Homes Discount is a single payment of £140 issued via energy suppliers as a discount on the energy bill.

Action on energy prices in France also has a well-established history. In 1993 EDF, the leading French energy supplier created a task force called "integration – fight against exclusion," which aimed to support a "solidarity policy" towards vulnerable clients and help them pay their bills. The first fund directly addressing the energy costs of struggling households was officially introduced in 1984 under the name of "Housing Solidarity Fund" by the Besson Law in 1990, aiming to introduce a housing right. The Law No. 2000–108 on the modernization and development of the public service of electricity introduced specific domestic user rates that account for income below a threshold ceiling and household composition. This approach reflects a special "consideration of electricity as a product of first necessity" and presents the social electricity tariff as a way to promote social cohesion. Law No. 2006–1537, relating to the energy sector, introduces a social tariff on gas. At first, only the historical energy suppliers were supposed to grant these social tariffs. In 2013, the law known as the "Law Brottes" required all suppliers to grant a social tariff to eligible persons. The social tariffs were transformed into the "Chèque énergie" (Energy voucher) gradually introduced by the Energy Transition Law for Green Growth of 2015 and generalized in 2018. The voucher amount varies according to income and household composition (on average 150€ per household per year). Moreover, since law No. 2013–312 preparing for the transition to a lower consuming energy system (known as Law Brottes) France imposes a disconnection ban every winter (from November to March).

Social tariffs target vulnerable or low-income consumers. The social discount rate on electricity bills (*Bono social eléctrico*) for vulnerable consumers in Spain was updated in 2017 by including those groups whose individual or annual family income is below €11,279. Note that the electricity companies finance the *Bono social eléctrico* under the supervision of the National Markets and Competition Commission. In Portugal, the focus is on supporting low-income consumers. There is assistance available, through a social tariff, for payment of energy bills (natural gas and electricity) in Portugal, which since 2016 has been automatically awarded to households in receipt of certain benefits and

low-income homes. The previous version only targeted vulnerable energy consumers depending on the fulfillment of specific requirements such as economic vulnerability criteria. Concerning electricity, for example, although the distribution of this tariff varies from region to region, on average, 9.5% of the population in each area benefits from this tariff (DGEG, 2022).

The post-socialist countries in this study have a different experience and less protection from energy prices than the other countries. There are no social tariffs in Slovenia. This can be understood in the context of the milder political and socio-economic transition process in this country during the 1990s. Slovenia did not experience rapid privatization or market liberalization unlike other countries in the region. Energy prices rose along the way, but not as dramatically as in other countries, allowing Slovenian society a more gradual adjustment. Unlike Slovenia, electricity prices for households in North Macedonia from 2011 to 2020 increased by 69% (Energy_and_Water_Services_Regulatory_Commission, 2011, 2020). There is no social tariff in North Macedonia, but electricity is still considered a social category for households below the market level (Stojilovska, 2020). In North Macedonia, the electricity supply is under the control of a private monopoly, often criticized for abusing its position and disconnecting after only one unpaid electricity bill (Stojilovska, 2020).

4.4. EU-driven integration of climate, energy, and social goals

This section explores the inter-linkages between energy and climate policies and energy poverty. There are firm or developing links between climate/energy policies and energy poverty among the studied countries. A common reason for explicitly mentioning energy poverty in climate/energy policy documents is because of the EU-driven National Energy and Climate Plan (NECP) obligation, which requires the definition of energy poverty and corresponding alleviating measures. Thus, all studied countries mention energy poverty in their NECPs, though with different levels of depth. Despite no longer being an EU Member State, the UK strategy mentions the term fuel poverty 101 times in its current energy and climate plan. Reducing fuel poverty is a clear goal, and core plans include integration between energy poverty and areas such as air pollution and energy efficiency. The French Plan describes how energy poverty is already addressed by broader energy efficiency programs and income support schemes. Moreover, a national observatory of energy poverty measures the extent of the condition of energy poverty and assesses the policies in place. The proposed measures include mobility aspects, such as replacing old vehicles in low-income households.

Energy poverty is not defined in Slovenia's NECP, although it aims to reduce energy poverty through social and housing policy and energy efficiency measures targeting vulnerable groups. Some measures are to be included in the heating and cooling strategy. Portugal's Energy and Climate Plan set measures across several policy areas to address energy poverty, voicing the need for a just transition and active citizen participation and recognizing the impacts of energy poverty on wellbeing, comfort, health, mortality, educational attainment, professional performance, and social isolation. The document mentions the protection of vulnerable consumers and considers consumers as active agents in the market. Some measures include low-carbon, renewable technology, and the development of energy communities. Apart from the usual efficiency measures, the Spanish Plan also emphasizes the reduction of electricity costs through the use of renewable technologies, the role of local energy communities, and the right to access energy. It also refers to the National Strategy against Energy Poverty, which promotes collective consumption schemes as a possible tool for mitigating energy poverty and preventing supply suspension in extreme weather situations. North Macedonia's NECP addressed the protection of vulnerable consumers and proposed supporting them with renewable energy measures and subsidies. It also advocated the introduction of energy poverty in the relevant legislation and the protection of vulnerable consumers from energy suppliers.

If NECPs were disregarded, the remaining policies focused on the energy transition and climate change show a sharp distinction between France and the UK as countries with stronger links between climate and energy policies to energy poverty. This can be explained by the long tradition of these countries in dealing with energy poverty. North Macedonia with an explicit link to energy poverty in its climate and energy policies, and Slovenia in its Energy Act, are exceptions.

In 2009, the UK's Low Carbon Transition Plan referred to fuel poverty commitment targets, energy efficiency programs, and support for elderly and vulnerable households. It also referred to energy bill discounts and making low-carbon schemes such as the Renewable Heat Incentive accessible to fuel-poor households. The Clean Growth Strategy of 2017 explicitly mentions fuel poverty and working with Ofgem (Great Britain's independent energy regulator) to cap standard variables and default tariffs. It aims to make 2.5 million fuel-poor homes' Energy Performance Certificate (EPC) grade C or better by 2023 in England. In 2015, the Scottish Heat Policy Statement Towards Decarbonising Heat increased funding for energy efficiency programs, supported the increase of renewables, and aimed to decrease heating demand to reduce emissions. Protecting Scotland's Future sets 2040 as a deadline to tackle fuel poverty and envisages the creation of a public energy company by 2021. A Low Carbon Wales aims to tackle fuel poverty and emissions by improving homes. Northern Ireland does not currently have a long-term emissions target but is included within UK targets.

Energy poverty is increasingly embedded in France's climate and energy policy debates, especially since the Grenelle Law in 2009. Furthermore, article 1 of the Law on the Energy Transition for Green Growth (2015) explicitly defines the fight against energy poverty as one of the three main objectives of the national energy policy to reduce energy demand, improve the energy efficiency of the housing sector, and ensure access to energy services for the most disadvantaged households. The law even highlights that energy is considered a basic necessity. By targeting "thermal sieves" (energy consumption with a label F or G), the Law of the 8th of November 2019 on Energy and Climate is another legal framework addressing the energy burden of households living in low-quality housing, thus contributing to reducing both energy poverty and carbon emitted by the building sector.

Slovenia's and North Macedonia's energy policies refer to energy poverty, vulnerable consumers, or households in general. Slovenia's Energy Act mentions that the government will prepare legislation to provide vulnerable households funding for energy efficiency refurbishments. The Slovenian Action Plan for Renewable Energy Sources 2010–2020 identifies that renewable incentives will be available for all households, including those who produce their own electricity. North Macedonia's Energy Strategy and Energy Law explicitly mention energy poverty. The Energy Strategy of North Macedonia highlights reducing energy poverty and protecting vulnerable consumers. The Macedonian Renewable Energy Strategy mentions that some measures such as purchasing new efficient stoves should target vulnerable consumers. The Energy Law mentions energy poverty reduction as one of the country's energy policy goals. The new Program for Support of Domestic Renewables and Energy Efficiency Measures targets low-income households to support them in buying solar panels, pellet stoves, or efficient windows.

Most of Portugal's energy transition and climate change policies implicitly mention energy poverty, vulnerable groups, or consumers. The Carbon Neutrality Roadmap 2050, for example, refers to the challenges in mobilizing consumer investment potential in new technology, as markets work on short-term opportunities rather than for long-term gains. The Strategic Framework on Climate Policy 2015 promotes resilient terrestrial and economic systems reducing vulnerability. This framework looks for possible increases in demand for heating and cooling and discussed the improved adoption of society to climate change. However, some legal acts shift the direction towards the responsibility of utilities in times of crisis. For example, Law No. 7/2020 prohibits the suspension of water supply, electricity sales services,

natural gas supply services, or electronic communication services in light of the current pandemic. At the same time, Ministerial Decision No. 3547-A/2020 ensures the continuity of the provision of public energy services including electricity and natural gas, and fuels. In the case of Spain, climate strategies make an implicit link to energy poverty and vulnerability. Since 2007, the Spanish Sustainable Development Strategy has included a broad set of areas relevant to energy poverty, such as income poverty, social inclusion, clean energy, sustainable transport, and health. The National Climate Change Adaptation Plan 2021–2030 focuses on vulnerable groups and proposes identifying climate-vulnerable communities, and equitable measures to support them for their resilience and adaptation.

4.5. New topics with emerging links to energy poverty

After reviewing the income, energy efficiency, energy prices, energy, and climate policies regarding existing links to energy poverty, we report new policy areas with emerging links to energy poverty. In Table 2 we summarize the emerging links discussed in the previous sections.

These new policies with emerging links to energy poverty include a) strengthening the agency of the energy vulnerable by looking into vulnerable groups and their various features (gender, age, health, etc.) (1), emphasizing citizens' agency (3), and narratives of considering energy access as a human right (2); b) underlying the importance of good governance by institutions to develop and implement better policies for the energy vulnerable (4); c) expanding the area of energy poverty by considering education and health (5 and 6); and d) taking into account the new threats of the energy transition for energy poverty, such as cooling, transport, renewables, and air pollution (7–10). We can observe that these new topics establishing links to energy poverty are diverse and comprehensive. There is a focus on better recognizing the vulnerable groups, and their empowerment while addressing the socio-political conditions for improving their wellbeing, and integrating energy poverty in areas affected by climate change and energy transition.

5. Discussion

We addressed the gap in the literature regarding how energy poverty is linked to several public policies based on an analysis of policy documents in six diverse European countries exploring explicit, implicit, or missing links to energy poverty, and mapping new policy areas which showcase emerging links to energy poverty. In Table 3 we show the nature of links (missing, explicit, or implicit) per policy area (income, energy efficiency, energy prices, energy, and climate) per country and we attach the source/type of the specific policy. In Fig. 4, we summarize the factors impacting the policy integration of areas relevant to energy poverty. These are discussed in the subsequent paragraphs.

Table 2
New topics with emerging links to energy poverty found through the study of policies about income, energy efficiency, energy prices, climate, and energy policies.

1) Vulnerable groups (gender, elderly, children, social inclusion, social isolation, social welfare recipients, and disability)
2) Human rights (right to energy, decent living conditions, wellbeing, dignity, quality of life, minimum living needs, considering energy as a basic necessity, decent housing, dignified life, or explicit mention of human rights)
3) Citizens' agency (local energy communities, active citizen participation, prosumerism, and energy citizenship)
4) Good governance (effectiveness or efficiency of policies, disconnection prevention or protection, mitigation of inequalities, establishing a representative body, responsibility of institutions, narratives of justice, equality, just transition, and institutional support for energy-poor)
5) Education (educational attainment)
6) Health
7) Cooling
8) Transport
9) Renewables
10) Air pollution

The links between energy poverty and policies on income are structured around vulnerable groups, and can be explicit and implicit, but are less strong than the links to energy efficiency. This could be due to the approach of solving energy poverty through energy efficiency measures and not as part of social policies. An energy policy focus is more often taken by EU countries with higher levels of energy poverty (Primc and Slabe-Erker, 2020). The role of the welfare state is relevant but it does not explain the divide – as countries with more effective welfare systems, such as France, and the UK, and less effective systems, such as North Macedonia, have explicit links between policies on income and energy poverty. This is in line with the argument that addressing energy poverty should not only be the responsibility of the welfare system, even in countries with a strong social welfare system (Feenstra et al., 2021). We observed a generalized focus on the "deserving poor", subsidy cuts, and stricter rules to access income support. This may be explained by the dominant liberal narrative spreading across Europe. At the same time, we can argue that a better-designed welfare system and the labor market would ensure more decent living standards.

The links between energy poverty and energy efficiency policies focus on energy consumption and improved housing and express the most explicit links to energy poverty. This can be explained by the dominant (EU's) techno-economic approach (Baker et al., 2018; Jenkins et al., 2017) to alleviate energy poverty. However, some energy efficiency measures are geared toward general energy savings and do not establish a link to the energy vulnerable. Furthermore, overestimating energy efficiency measures as a tool to address energy poverty could circumvent energy vulnerable households as they under-spend on energy as a coping strategy (Barrella et al., 2022; Stojilovska et al., 2021), and are not eligible for energy-saving programs (Antepara et al., 2020). The side-effects of energy efficiency programs that may result in rent increases leading to segregation, gentrification, or "renovictions" should not be overlooked either (Grossmann, 2019).

The links to energy price policies are shaped by social tariffs and subsidized prices and have explicit, implicit, or missing links to energy poverty. This depends on the role of the market and the history of energy market liberalization. Even in the UK, a country that pioneered the liberalization of the energy market, actions on energy prices exist. At the same time, there is no explicit action on energy prices relevant to energy poverty in countries where liberalization came later or is yet to occur, such as post-socialist Slovenia and North Macedonia. The process of energy liberalization can increase the risk of energy poverty (Boardman, 2010). However, this depends on whether the market structure is monopolized or privatized (Stojilovska, 2021). It also depends on how it is regulated, and especially how vulnerable consumers are protected as stated in the EU Directives regarding the common rules on the internal market for electricity and gas from 2003 (Official_Journal_of_the_European_Union, 2003a, b).

We have identified several conditions that affect the integration of areas relevant to energy poverty in policy documents. The impact of the EU in creating synergies between energy, climate, and social policies is evident. The Renewable Energy, Energy Efficiency Directives, and the Governance of the Energy Union represent the relevant political agreement reached within the EU to include energy poverty-related provisions. Examples include obligations on energy poverty reporting when investments in infrastructure are made, ambitious energy efficiency targets, and energy poverty reduction goals in the NECP (Thomson and Bouzarovski, 2018). Due to the obligation to prepare NECPs, all studied countries, (as a result of NECP preparation) present increasingly explicit links between climate and energy policy and energy poverty. We note that this "trickling down" effect from the EU policy resulted in a level of consistency in the studied country's responses, despite some variations remaining.

France and the UK have explicit links to energy poverty in all the studied policy areas, which can be explained by the long tradition of

Table 3
Links between energy poverty and policies on income, energy efficiency, energy prices, and climate and energy policies.

Country/Nature and source of links to energy poverty	Policies on income	Policies on energy efficiency	Policies on energy prices	Climate and energy policies
Spain	Implicit (Antipoverty Strategy)	Explicit (energy efficiency), implicit (housing)	Explicit (Social discount on electricity bill)	Explicit (NECP), implicit (Spanish Sustainable Development Strategy, National Climate Change Adaptation Plan)
France	Explicit (child poverty), implicit (unemployment and welfare)	Explicit (housing, energy efficiency)	Explicit (Social tariff on gas, Energy voucher)	Explicit (NECP, Law on Energy Transition, Law on Energy and Climate)
Portugal	Implicit (unemployment support)	Explicit (housing, Long Term Renovation Strategy), implicit (energy efficiency)	Explicit (Social discount on electricity and gas bills)	Explicit (NECP, Energy Poverty Strategy), implicit (Strategic Framework on Climate Policy, Carbon Neutrality Roadmap)
United Kingdom	Explicit (pensioners/the elderly) implicit (social welfare, child poverty)	Explicit (energy efficiency), implicit (housing)	Explicit (energy price caps, multiple financial aid programs)	Explicit (NECP, Clean Growth Strategy, Protecting Scotland's Future, A Low Carbon Wales)
North Macedonia	Explicit (Antipoverty Strategy, Energy Poverty Subsidy)	Explicit (energy efficiency)	Implicit (subsidized electricity price for households)	Explicit (NECP, Energy Strategy, Energy Law, Renewable Energy Strategy, Household Support Program)
Slovenia	Implicit (welfare support)	Explicit (Action Plan for Energy Efficiency), implicit (energy efficiency)	Missing	Explicit (NECP, Energy Act), implicit (Action Plan for Renewable Energy)

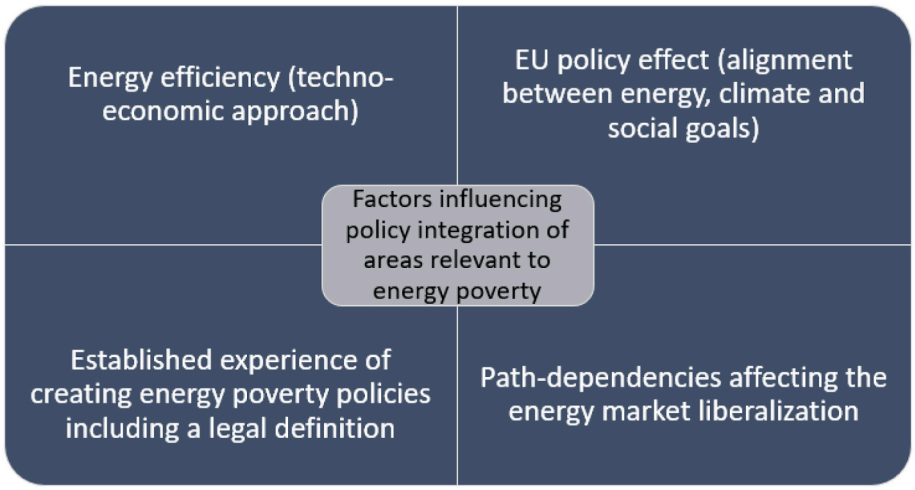

Fig. 4. Factors influencing policy integration of areas relevant to energy poverty.

dealing with energy poverty in these countries and the existence of legal definitions of energy poverty which helped introduce a greater integration between energy, climate, and social policies. Both have links to energy poverty in a few energy and climate policies beyond the NECPs. Social tariffs to protect the vulnerable from energy price increases, and more effective social welfare systems are also essential methods employed in these countries.

Portugal and Spain have shown encouraging engagement with energy poverty in the recent past but face challenges such as high income poverty with impacts on energy poverty. Spain has recently adopted an energy poverty definition and has a comprehensive set of measures to tackle energy poverty (Kyprianou et al., 2019). Portugal has made a moderate effort in fighting energy poverty (Kyprianou et al., 2019). For example, it has made good progress with its recent Renovation of Buildings Policy which should produce an annual progress report showing that legal obligation is an essential factor in developing integrative policies around energy poverty.

North Macedonia and Slovenia, as post-socialist countries, have little protection for the vulnerable from energy prices but differ in the number of explicit links. While North Macedonia has explicit links to all inspected policies except energy prices, Slovenia has the least number of explicit links to energy poverty. It does, however, have programs and measures to tackle energy poverty in practice. The difference between the current levels of energy poverty in these countries (Slovenia with low and North Macedonia with a high share of energy poverty) came from past path dependencies when Slovenia went through a much milder privatization process and a more steady increase in energy prices. North Macedonia still has regulated prices for households supplied by the universal service supplier and has been experiencing a continued rise in energy prices. In absence of suitable policies for energy, housing, and social welfare, the liberalization of the energy sector contributed to energy poverty in North Macedonia (Buzar, 2007).

Despite not deeply analyzing the emergence of new topics, we observe a general trend of considering energy poverty within broader issues such as air pollution, human rights, health, and similar. This is particularly interesting in countries that do not have a long history of combating energy poverty. The new topics we uncovered with emerging links to energy poverty are in line with ongoing academic discussions about furthering the perspective and the lived experience of the energy vulnerable by empowering them and changing the policies and conditions which entrap them in energy poverty (Hesselman et al., 2019; Lennon et al., 2019; Petrova, 2018; Stojilovska, 2021). Our findings are also consistent with research expanding the scope of energy services considered relevant for energy poverty (Mattioli et al., 2017; Thomson et al., 2019), and accounting for how the energy transition could affect the energy vulnerable (Bouzarovski and Tirado Herrero, 2017a; Castaño-Rosa et al., 2021; Stojilovska et al., 2020).

These findings show that the spatial divide in energy poverty

(Bouzarovski and Simcock, 2017; Bouzarovski and Tirado Herrero, 2017a; Chatterton et al., 2016; Gillard et al., 2017) is more than a physical space; but is also political. Somewhat paradoxically, countries with higher energy poverty rates do not necessarily have more developed energy poverty programs than those with lower rates (Sareen and Thomson, 2019). We argue that the spatial divide of energy poverty across Europe is more complex because it is more than a physical (infrastructural) divide determined by the development of the built environment. It is a policy (political) divide embedded in the economic and political space co-shaped by the national path dependencies, such as the social welfare, the energy market, and the tradition of dealing with energy poverty and EU policy influence. These diverse conditions factor in the extent of national policy integration efforts around energy poverty. We agree with the statement that local circumstances matter in the prevalence of energy poverty (Bouzarovski, 2014).

We acknowledge a set of limitations. First, we compare different policies (i.e. different contexts), providing only a narrative and qualitative assessment, not a quantitative comparison. Second, due to our ambitious goal, we could not explain each policy in detail and focus on the most relevant policies. However, we attempted to give sufficient information to explain the policies and links in question. Next, the UK is composed of four countries with different policies on energy poverty. Thus, we aimed to see the bigger picture of all these policies representing the UK as a whole, although we did provide some nuanced information where this was relevant. Lastly, as the data for this study was collected by the beginning of 2021, we do not include policies undertaken recently as a reaction to the energy and pandemic crises.

6. Conclusion and policy implications

Based on studying policy documents, we add to the limited research on links between energy poverty and other policy areas. We analyzed a set of policy documents to explore explicit, implicit, or missing links to energy poverty and establish new policy areas that showcase emerging links to energy poverty. We examined whether and how energy poverty is linked to other policy areas to 1) examine the level of integrated policy designs surrounding energy poverty in diverse country contexts in Europe and the factors influencing it, and 2) map the emergence of new links to energy poverty. We studied the reasons behind the level of policy integration surrounding energy poverty and how this informs the understanding of the geography of energy poverty in Europe.

Energy efficiency had the most explicit links to energy poverty compared to energy prices and income due to the dominant techno-economic approach to addressing energy poverty. We see less explicit references to the social aspects of energy poverty and this is comparatively under-valued in our study sample which presents a barrier to resolving energy poverty. The EU, through its NECP, has contributed to increased policy integration efforts around social, energy, and climate policies. Countries with a long tradition of addressing energy poverty, and earlier introduction of legal definitions, such as France, and the UK, have greater integration of policies around energy poverty. Post-socialist countries in our sample, Slovenia and North Macedonia have no explicit link to energy poverty in the policies affecting energy prices but differ in the level of energy poverty due to different starting points and processes of energy liberalization and varied energy market structures. Portugal and Spain have shown good progress in working towards energy poverty definitions, and more policy coherence around energy poverty.

Our exploratory study has shown that energy poverty has been increasingly linked to various public policies. The new topics with emerging links to energy poverty focus on the institutional drivers of energy poverty putting more responsibility on the institutions to perform and empowering the energy vulnerable by recognizing their agency. Energy poverty is expanding beyond the triangle of energy poverty drivers (Barrella et al., 2021; Guyet et al., 2018) to include the new risks resulting from climate change and the energy transition, and an increase in the scope of domestic energy services. The comparatively recent topics of vulnerable groups and good governance indicate a recognition of the government's responsibility in helping these groups and reflect some of the faults in the current system. For example, disconnection is not a fair or just method of dealing with those unable to pay their energy bills however this remains a common problem in many European countries.

We argue that the spatial divide of energy poverty across Europe is complex because it is more than a physical (infrastructural) divide, it is a policy (political) divide determined by various national inequalities and EU policies which all co-shape the extent of policy integration around energy poverty. However, we highlight that the existence of a policy does not mean it has been implemented and does not guarantee a reduction of energy poverty. Conversely, having no clear policy does not mean there are no practical measures taken to reduce energy poverty, as the case of Slovenia shows. Hence, a lack of policies does not necessarily mean there is no effort taken to abate energy poverty, but it does represent a challenge. In the sense that a lack of clear policies and regulations can result in energy poverty programs being vulnerable to political manipulations.

By studying how energy poverty is linked to several policy areas, we have just started to uncover the potential emerging links between energy poverty and a more extensive set of various policies. This signals for further research to uncover more emerging links. A multidimensional and policy coherent approach to dealing with energy poverty can have additional benefits across other policy areas, such as health, employment, air quality, climate data, technologies, and the just transition (Antepara et al., 2020; Bajomi et al., 2021; Feenstra et al., 2021; Gouveia et al., 2021; Mahoney et al., 2020). Energy poverty gains increasing attention in times of crises such as the COVID-19 pandemic when government responses recognize that access to energy services is essential for basic human wellbeing (Hesselman et al., 2021). Thus, the war in Ukraine driving further energy price increases may accelerate recognition and action on energy poverty as there is a trend of mitigating the effects of the price hike, accelerating energy transitions towards renewable energy, and promoting the quicker and broader deployment of building renovation and decarbonization of transport to save energy. The costs and benefits of such policies should be equitably shared and not leave vulnerable citizens behind. Energy poverty should not be considered an issue solvable only by improving technology or only through the social welfare system. The increasing implicit and explicit links between energy poverty and many other policy areas show that siloed approaches are not sufficient to address the full scope of energy poverty. As energy poverty is a complex multidimensional challenge, multi-stakeholder bodies are needed to design energy poverty measures (Guyet et al., 2018) by focusing on mitigating the structural drivers of energy poverty. At the same time, the impact of various policies, such as climate, labor, tax, and others on energy poverty needs to be further assessed (Guyet et al., 2018). Therefore, we call for a greater collaboration between academia and decision-makers to develop and implement integrative policies around energy poverty that consider the multiple scales and dimensions of energy poverty to address it effectively.

CRediT authorship contribution statement

Ana Stojilovska: Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Visualization. **Rachel Guyet:** Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing. **Katherine Mahoney:** Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing. **João Pedro Gouveia:** Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing. **Raúl Castaño-Rosa:** Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing. **Lidija Živčič:** Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing. **Ricardo Barbosa:**

Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing. **Tomislav Tkalec:** Investigation, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.enpol.2022.113181.

Appendix

List of policy documents analyzed

Country	Policy documents
Spain	Government of Spain, (2020), Integrated National Energy and Climate Plan 2021–2030, https://www.miteco.gob.es/es/cambio-climatico/temas/impactos-vulnerabilidad-y-adaptacion/pnacc-2021-2030_tcm30-512163.pdf Government of Spain, (2020), Sustainable Development Strategy 2030, https://www.mdsocialesa2030.gob.es/agenda2030/documentos/eds2030-english.pdf Government of Spain, (2018), Housing Plan in Spain for 2018–2021, https://ec.europa.eu/social/BlobServlet?docId=19993&langId=en#:~:text=In%20March%202018%2C%20the%20Spanish,employment%20in%20the%20construction%20sector Government of Spain, (2019), National Strategy to Prevent and Combat Poverty and Social Exclusion 2019–2023, https://ec.europa.eu/social/BlobServlet?docId=21554&langId=en Government of Spain, (2018), Royal Decree 106/2018 National Housing Plan 2018–2021, https://www.boe.es/buscar/act.php?id=BOE-A-2018-3358&p=20220119&tn=1 Government of Spain, (2007), Royal Decree 1027/2007 Regulation on Thermal Installations in Buildings, https://www.boe.es/buscar/doc.php?id=BOE-A-2007-15820 Government of Spain, (2020), Royal Decree 737/2020 regulates the aid program for energy rehabilitation actions in existing buildings, https://static.eurofound.europa.eu/covid19db/cases/ES-2020-32_1301.html Government of Spain, (2018), Social discount rate on electricity bills (bono social eléctrico), https://ec.europa.eu/social/BlobServlet?docId=19205&langId=en Government of Spain, (2013), Law 8/2013, 26 June, Urban Rehabilitation, Regeneration and Renewal, https://www.boe.es/buscar/act.php?id=BOE-A-2013-12886
France	Integrated National Energy and Climate Plan for France, (2020) https://ec.europa.eu/energy/sites/default/files/documents/fr_final_necp_main_en.pdf National strategy preventing and combating poverty (2018 and following) https://solidarites-sante.gouv.fr/IMG/pdf/strategie_pauvrete_vfhd.pdf Law n° 90–449 of May 31, 1990 aiming to introduce a housing right (Besson law) https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000159413/ Loi Grenelle 1 2009–967 of August 2, 2009 on housing sector and climate change https://www.legifrance.gouv.fr/loda/id/JORFTEXT000020949548/ The law of July 12, 2010, on national commitment to the environment (definition of energy poverty) https://www.legifrance.gouv.fr/loda/id/JORFTEXT000022470434/ Program Habiter Mieux (living better) launched in 2010 https://www.ccomptes.fr/sites/default/files/2018-04/20180404-rapport-programme-habiter-mieux.pdf; https://www.senat.fr/rap/r17-399/r17-3992.html Plan of energy renovation of housing 2013 https://expertises.ademe.fr/batiment/elements-contexte/politiques-vigueur/plan-renovation-energetique-lhabitat-preh ALUR law 2014 (law on housing access and renovated urbanism) https://www.legifrance.gouv.fr/loda/id/JORFTEXT000028772256/ The law n° 2000–108 of February 10, 2000, on the modernization and development of the public service of electricity (introduction of social tariffs for electricity) https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000750321/ The law No. 2006–1537 of December 7, 2006 relating to the energy sector (introduction of social tariffs for gas) https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000462914/ Decree n° 2008–780 of August 13, 2008 regarding the procedures to be followed in case of bill arrears (electricity, gas, heating and water) (disconnection ban) https://www.legifrance.gouv.fr/loda/id/JORFTEXT000019325694/ "Law Brottes" (2013) law No. 2013–312 of April 15, 2013 aiming at preparing the transition to a sober energy system (all suppliers must grant social tariffs) https://www.legifrance.gouv.fr/loda/id/JORFTEXT000027310001/ Law n°2015–992 of 17 August 17, 2015 on energy Transition Law for Green Growth (introduction of the chèque énergie) https://www.legifrance.gouv.fr/loda/id/JORFTEXT000031044385/ Law n° 2019–1147 of November 8, 2019 on energy and climate (insists on the energy efficiency of "thermal sieves") Indoor Environmental Medical Advisors (CIAM)/National environment health plan 2009/2019 https://solidarites-sante.gouv.fr/sante-et-environnement/les-plans-nationaux-sante-environnement/article/plan-national-sante-environnement-pnse3-2015-2019 National Energy and Climate Plan (NECP) of France 2021–2030 https://energy.ec.europa.eu/system/files/2020-09/fr_final_necp_main_en_0.pdf
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