A review of measures and policies for the European Union energy poverty fighting

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Abstract*. The European Union is among the regions with important climatic ambitions, especially through well-defined legislation. Targeting climatic neutrality by 2050 can prove extremely difficult and with multiple challenges and often difficult to carry on. The European Union (EU) energy system requires a sustainable approach, with economic, political, social and cultural implications. The consequences of this transition require special measures, so that the energy transition is distributed as fair as possible between the various social categories, so that the prosperity is not affected, especially of the households with low incomes, often generating energy poverty. Energy poverty is a relatively young concept, appearing at the end of the last century and focusing on defining and exploring fuel poverty. Currently, there is a variety of identified energy poverty. According to the EU, energy poverty (EP) is the phenomenon that harms the well-being and security of households as a result of the need to reduce energy consumption. More recent studies include aspects considering EP, poverty being seen in classic and hidden sense, urban and rural energy poverty, poverty related to accessibility and financial possibilities, income. The crisis triggered in 2008-2009, and with powerful EU reverberations, the 2012 sovereign debt crisis, but especially the Covid-19 crisis, based on home insulation, has led to the inability of an increasing number of households to not be able to keep their homes comfortable, either against work background, or against the access to technology and the impossibility of teleworking (especially in the case of Covid-19 crisis), creating low living comfort and real difficulties in time and integral energy invoices. In this framework, beyond defining and outlining the problem of energy poverty, the article has the* ***objective*** *to identify measures and policies to combat energy poverty at the EU level, including by taking into account the changes generated by climate change, but also by fair ecological transition. The* ***method*** *of study takes into account an exploratory approach to the specialized literature through a comparative investigation of the various case studies on measures to combat energy poverty. The* ***results*** *indicate, on the one hand, that where the problems are relatively correct identified public policy measures are well targeted and efficient. Energy poverty, fair transition, climate problems and energy infrastructure if they are viewed together as integrated as possible, they can lead, through correct policies, to a higher level of simultaneous solving and can be potentiate on each other in solving these problems. On the other hand, a longer experience in combating energy poverty makes some states do better than others in combating energy poverty. The theme of energy poverty is new and original and its control is relatively fresh and slightly superficially addressed today. Although there is a huge opening against the increasingly visible climatic changes and of energy infrastructure problems, on the grounds of reduced public funds, especially regarding the social funds, aspects such as energy poverty are usually not observed, analysed and taken into account in public policies.*

Keywords*: energy poverty, social inequity, climate change, fair transition, public policies*
JEL classification*: I31, I32, R28*

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1. Introduction

The well-being of the population is a subject of interest for citizens, non-governmental organizations, businesses and states. In general, the governing regimes, through their representatives, the government and the parliament manage the public apparatus and the country's budget, building a framework for a prosperous economic future for citizens. Economic instruments, but also classical fiscal instruments, are generally led by monetary policy (in the prerogative of national central banks - having as a dominant objective the management of inflation, interest rates, exchange rates) and by fiscal-budgetary policy (the Government having an overwhelming role in the development of public policies, managing revenues and expenditures and the establishment of taxes and duties, etc.). Classical fiscal and non-fiscal instruments refer to: income tax, profit tax, tax on wealth, social assistance, child allowances, social pensions, subsidies (e.g. for heating), and other taxes, as well as important investments in education, health, infrastructure etc. While some of these instruments influence rather indirectly the level of population well-being, others directly and systematically influence the level of citizens' well-being (income tax, wealth tax, social contributions and social transfers). In this context, it should be noted that not only the level of taxation matters, but especially the efficiency of administration and the manner and degree of redistribution of public revenues. Social models certainly matter, for example, France is a true welfare state with significant social spending, on the background of high tax revenues, and the Nordic countries have a high level of taxation relative to GDP, but also generous social transfers and high-quality public services, substantially raising the well-being of citizens.

In this context, a particular aspect of well-being is energy well-being, with its negative valence captured by the literature and still defined extremely differently – energy poverty. Energy poverty is defined according to European authorities as a dramatic deprivation of energy services including for washing, heating, lighting and powering appliances against the background of high energy costs, a modest income, but also against the background of poor housing efficiency.

Thus, the article addresses the energy poverty problem through the lens of measures and policies to combat it, reviewing the main bibliographical elements that can outline the possible solutions at European level. The study is not necessarily a pure research but rather a review paper.

The structure of the paper includes a brief introduction, which rather presents the general framework and what energy poverty means, followed by a brief literature review, small methodological presentation, research results section and a conclusions section.

2. Literature review

Although the problem of energy poverty is increasingly occurring worldwide, and especially in areas such as Africa, Asia and South America, over the last 10-20 years, energy poverty has increasingly become an element of interest at the EU level (Salman, Zha and Wang, 2022; Nguyen and Su, 2022). Thus, many studies have focused on defining EP, beyond other forms of deprivation and social inequalities (Sovacool, 2012; Okushima, 2017). Therefore, the variety of definitions can create some shortcomings both for the measurement methods, but also for the public and private policies that need to be implemented to combat energy poverty (De Vidovich, 2024).

Thus, the European Commission (2020) mentioned that there is a need for household energy poverty observation and monitoring according to transparent criteria, while also requiring a fully functional, publicly accessible definition of the concept. Thus, although there are numerous national definitions, determined by specific conditions, the concept of energy poverty is still described according to Electricity Directive and Regulation (EU) 2018/1999 as “a situation in which a household cannot afford the essential energy services necessary for a decent standard of living” (European Parliament, 1999). Energy poverty generally involves challenges related to the quality of the housing structure, energy supply and cost issues, income stability, poor health, and rental and social relationships (Middlemiss & Gillard, 2015).

Although there are some works that address the issue of energy poverty through individual, singular indicators (Boardman, 1991; DECC, 2016), due to the complexity of the problem and the numerous debatable aspects (e.g. the needs of households taken into account, the distinction between

real and necessary domestic energy expenditures, the establishment of energy poverty thresholds and limits; the equivalence of household incomes and energy expenditures, the subjective nature of questionnaire responses, etc, Herrero, 2017) multiple indicators are often proposed (Healy and Clinch, 2002; Nussbaumer et al., 2012; Herrero, 2017; Eurostat, 2024) and even composite indices (Bouzarovski & Herrero, 2015; Gouveia et al., 2019; Palma et al., 2022; Hosan et al., 2023; Al Kez et al., 2024).

Regarding economic and fiscal policy measures, numerous studies at global and EU level emphasize the capture of multifaceted aspects but also the role of an adequate calibration of public policies. For example, Xia et al. (2022) note that, in China's case for the period 2005Q1-2019Q4, increasing country risk and fiscal decentralization lead to aggravation of energy poverty, while economic growth, increasing innovation and renewable energy, reduces energy poverty in the long term. This brings into discussion the need to integrate the issues captured by the SDGs correlated with the macroeconomic framework, but especially with economic policies, including fiscal policies of a specific country or region.

Considering measures at the EU level, in the Action Plan proposed by the European Commission (2025a), it is considered to reduce energy prices, strengthen the Energy Union, absorb investments in energy infrastructure, and combat crises in the field. Thus, the project (European Commission, 2025b) provides assistance in favour of reducing bills for citizens but also for companies producing substantial savings in the period 2025-2030. The project is based on the revision of climate and energy legislation, on the reorganization of the energy market (European Commission, 2022) but also on sectoral projects in various areas of renewable energy. Thus, recent EU legislation recommended that member states reduce national electricity taxes to support consumers and the economy.

3. Methodology and data

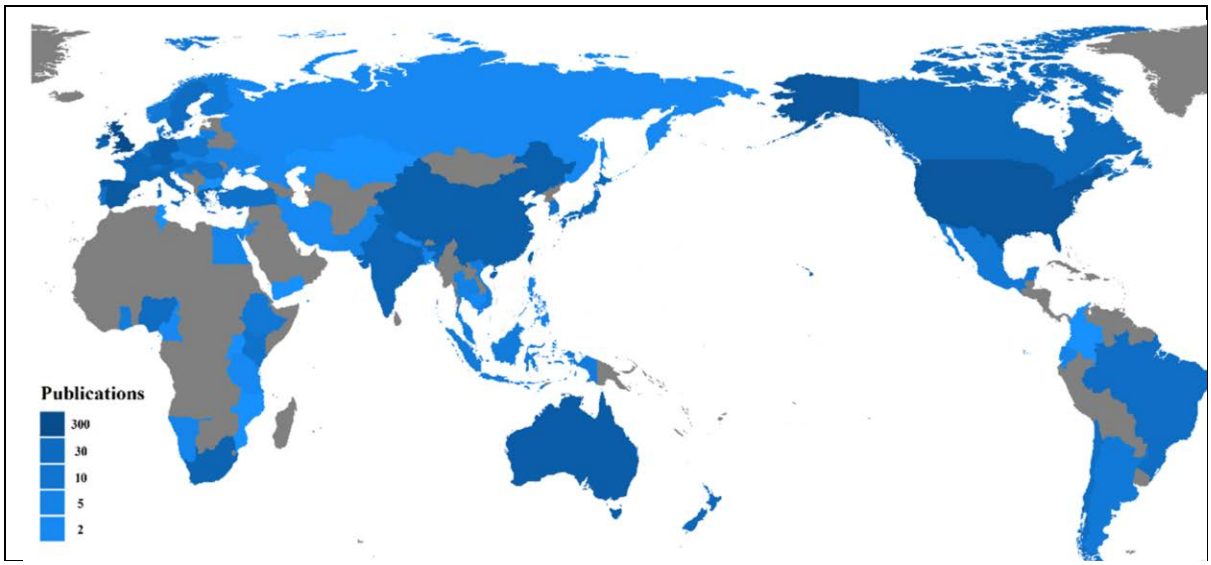
This paper critically analyses, by studying available literature, the role of economic and in particular fiscal instruments in addressing the problem of energy poverty. The results are obtained by analysing papers available on various professional scientific platforms, especially Elsevier, Science Direct, MDPI, etc. The study of methods for alleviating energy poverty may outline the best solutions to address the problem. Although there are no perfect methods in which both the state and the population and companies can benefit substantially from these methods, there are still a number of more direct, more targeted methods that can be recommended in the interests of others. Although studies from other parts of the world have also been taken into account, the paper had concentrated on Europe. The aim is to expand as much as possible the knowledge gaps and equally discover opportunities for investigating the most appropriate measures to combat energy poverty.

4. Research results and comments

Although at the global level studies abound in dealing with EP, on European continent, studies are focusing mainly on the England and Ireland cases or on Central-Southern Europe cases, but also on an overall, global picture at EU level (Buzar, 2007; Healy and Clinch, 2002; Boardman, 2010; Dubois, 2012; Thomson & Snell, 2013; Bouzarovski, 2014; Middlemiss & Gillard, 2015; Thomson, Snell & Bouzarovski, 2017; Kyprianou et al., 2019; Bouzarovski, Thomson & Cornelis, 2021).

From a quantitative, bibliometric perspective, based on 1018 research papers from the Web of Science, for the period 1999-2019, Xiao et al. (2021) highlight that over 982 research institutions from over 80 regions of the world have been concerned with the study of energy poverty, revealing that the Anglo-Saxon world dominates the scientific cooperation network. Thus, as Figure 1 (worldwide rendering of the situation) and Table 1 show, according to Xiao et al. (2021), it is noted that in addition to Great Britain, Spain, Deutschland, Greece, Italy, French Republic, Austria, Denmark and the Netherlands dominate the top 20 countries in the European Union with important scientific concerns in the study of energy poverty. In terms of policies, the study notes that in general, in Europe, energy poverty is well analysed in studies and targeted in public policies (Gilbertson and others, 2006; Santamouris et al., 2014; Liddell and Morris, 2010; Sovacool, 2015).

Figure 1. Distribution of publications in the field of energy poverty, by country



Source: Xiao et al. (2021), Figure 4, pp.7.

Table 1. The 20 leading countries that dominate the rankings of publications on energy poverty

Grade	State	Percentage	Papers	H-index	Citations
20	Denmark	1.6	16	10	655
19	Nigeria	1.8	18	9	206
18	Netherlands	2.0	20	10	542
17	Japan	2.0	20	8	384
16	Sweden	2.1	21	12	425
15	Canada	2.1	21	12	436
14	Ireland	2.2	22	11	968
13	New Zeeland	2.4	24	12	420
12	Austria	2.8	28	16	785
11	France	2.8	29	13	550
10	Italy	3.2	33	12	522
9	India	3.2	33	12	450
8	Greece	3.5	36	15	929
7	South Africa	4.0	41	12	449
6	China	4.0	41	12	541
5	Germany	4.9	50	20	681
4	Australia	7.6	77	20	1033
3	Spain	7.8	79	16	1126
2	US	13.2	134	34	3528
1	GB	32.9	335	46	7750

Source: Xiao et al. (2021), Figure 4, pp.7.

Bouzarovski, Petrova and Sarlamanov (2012), based on semi-structured interviews and workshops with experts, decision-makers and activists from Bulgaria and at the level of European institutions, analyse EP targeting policies at the level of organizations, noting that de jure the energy

poverty directives are relatively properly implemented, but not de facto, with decision-makers having too little understanding of what they have to do at the national level.

For Pye and Dobbins (2015), the problems associated with EP in European countries are noted and a series of solutions are proposed, such as: energy efficiency investments in buildings; financing of energy efficiency investments through public financing schemes; -regulatory support mechanisms; financial savings to households and raising awareness of energy poverty; smart meters; renovation and retrofitting of old buildings; new building performance requirements incorporating renewable energy systems; funding mechanisms; better targeting vulnerable customers; energy savings check and insulation; improving legislative framework and definition; a consistent diagnosis; supporting household energy needs through better infrastructure; address energy services through policies.

Clancy et al. (2017) recommend that: government authorities should centralize the energy efficiency of buildings in a database, starting with those with the lowest energy efficiency, aggregate information on PE by sex to take into account the gender perspective, expand the definition of PE to obtain a consensus-based indicator, and define the term energy poverty to capture the wide range of household energy needs.

Mandelli and Jaewook (2025), based on a qualitative analysis of the way energy poverty is addressed at Member State level, highlights the policy mixes, starting from strategies to types of instruments. The study attempts to fill the gaps in the literature on environmental and social policies, pursuing the cross-cutting subject in all EU countries, comparing the information with other related works. The results of the study indicate that most EU countries have implemented at least one form of combating energy poverty, except for Slovenia and Hungary, and others, such as countries in the South of the continent, have formulated well-targeted policies and strategies, addressing innovative and integrative policies to energy poverty reduction.

Marco-Lajara et al. (2023) analyse the link between renewable energies and sustainable development targets, and propose a series of measures such as: an appropriate regulatory framework to encourage investments in renewable energy; ensuring reliable market access and guaranteeing long-term income for investors in renewable sources; fiscal incentives, tax reductions and financial incentives (low-interest loans) for investors in renewable energy; compensation mechanisms (including refunds and price reductions); ways to support the implementation of renewable energy in economy (e.g. renewable energy funds, green investment funds); encouraging partnerships to support renewable energy between governments, industry and civil society; and educational programs. Although not only renewable energy should be taken into account, but also increasing energy efficiency (Patterson, 1996; IEA, 2012), reducing energy consumption (Sorrell, 2015) and increasing the degree of energy autonomy, renewable energy, through its growing proportion in the overall energy supply at the European Union level, represents a catalytic element for the structural change in the perception of a strong and independent energy system and overcoming the problems related to energy poverty. For example, in 2023, according to the European Council and the Council of the European Union, renewable energy share in EU energy supply increased significantly, exceeding 45% of total electricity production, and for the construction sector, an indicative target of at least 49% renewable energy in buildings by 2030 is designed, with gradual evolutions of the targets for heating and cooling.

Therefore, based on the relevant literature, these policies and measures presented above are briefly transposed in the form of tables to show on the one hand what can be improved at the general economic level (see Table 2), and on the other hand, specifically, what can be improved at the level of fiscal-budgetary policies (see Table 3).

Table 2. A series of economic instruments to manage energy poverty

Economic instrument	Description	EU's example	Impact on well-being
Energy price regulation (price caps & regulated social tariffs)	The state can impose an energy price cap for vulnerable consumers	The Agency for Energy Regulators Cooperation at EU level, in Romania, ANRE	National or European electricity regulatory agencies can regulate tariffs for certain categories of consumers, including pensioners or low-income families, and can make legislative proposals to ameliorate the impact of energy price distortions on consumers, etc.
Support for renewable energy and self-consumption	Financing photovoltaic panels for vulnerable households (without direct fiscal involvement).	Programs like "Photovoltaic Green House" (Romania)	It offers co-financing for the installation of solar panels.
Creating accessible financing schemes (microcredits, green leasing)	Providing low-interest loans or leasing for energy-efficient equipment	LIFE BIO-BALANCE project, there were four local pilot projects in Bulgaria, Hungary, and Romania – implemented, aiming to test practical small-scale interventions that best fit the identified needs of firewood-dependent, low-income communities	Pilot projects in some regions financed by European funds or public-private partnerships
Creating and supporting energy communities	Local entities and groups of citizens that produce and consume energy jointly (collective self-producers).	In Czech Republic local distribution can be operated by energy communities (Source: Frieden et al., 2020)	Reducing costs by sharing locally produced energy, including in rural or isolated areas
Stimulating employment in the green energy sector	Vocational training and retraining in energy-related professions (installers, solar technicians, energy auditors).	E.g. RESkill4NetZero project founded by European Union through the Erasmus+ programme	Improving critical and comprehensive skills in the renewable energy sector, these programs will enhance worker mobility and employability. This can lead to increased family incomes and a reduction in energy poverty in the long term.
Education and counselling for efficient consumption	Public campaigns and individual counselling on reducing energy consumption	Programs aimed at increasing energy efficiency in schools and public buildings. (Source: Pietrapertosa, 2021).	Educational programs run by public and regional institutions, NGOs or local authorities to teach the population how to save energy.

Source: Author's systematization, ChatGPT assistance.

Based on the analysed literature, a series of fiscal and budgetary policies and measures can be identified (see Table 3).

Table 3. A series of fiscal and budgetary instruments to manage energy poverty

Fiscal or budgetary instrument	Description	EU's example	Impact on well-being
Direct subsidies for invoices	Financial aid or vouchers for energy payments	Romania – Energy Card (2023). Source: Romania Insider (2023)	It directly supports vulnerable consumers, aims to reduce the risk of disconnection and reduces thermal discomfort
VAT reductions on energy	Temporary or permanent reduced VAT on electricity and gas	Spain – VAT reduced from 21% to 5% in 2022, and 2025 EU Action Plan for Affordable Energy. Source: Enerdata (2022)	Reduces bill cost; beneficial for a wide range of consumers, but less targeted
Tax exemptions/reductions for vulnerable consumers	Elimination of network fees, excise duties, etc. for vulnerable categories	Belgium – Automatic social tariff for electricity and gas Source: The Brussels Times (2022)	Targeted and effective in protecting poor categories
Tax deductions for energy efficiency	Tax breaks or tax credits for thermal renovations	France – "MaPrimeRénov" for poor households Source: Service Public (2026)	Reduces long-term costs by reducing energy consumption
Public funds for thermal rehabilitation	Investments from the national or EU public budget for the modernization of energy-inefficient homes	Romania – PNRR funds for the rehabilitation of apartment buildings Source: Proidea (2023)	Improves energy efficiency and reduces structural energy poverty
Ecological taxes and social compensations or "climate bonus"	Carbon/CO_2 taxes with income redistribution to vulnerable households	Germany – CO_2 tax with "climate bonus" for low-income households Source: Clean Energy Wire (2024)	Encourages green transition without penalizing poor households
Taxing excessive energy profits	Special taxes applied to companies with large profits from energy crises	Numerous EU states, among which the following stand out with high rates: Italy, Spain, Hungary – taxes on excessive profits of energy suppliers (only a few states still apply it). Source: Woelfing, N. (2023)	It finances social measures without directly affecting the citizen's budget, it can have an adverse effect by introducing additional taxation in various forms back onto the consumer 's bill and may encourage tax arbitrage for those firms.

Source: Author's systematization, ChatGPT assistance.

Based on the information previously captured, several valuable conclusions and proposals can be drawn for the next stages of research or for future research.

5. Conclusion

By reviewing the main studies, this paper analysed measures to combat and improve energy poverty. Thus, efforts to combat energy poverty were analysed at the strategic and legislative level across the European Union as a whole, but also at the level of individual countries or groups of countries.

The findings refer to the fact that remarkable progress has been recorded on energy poverty, starting with the definition and measurement of the phenomenon and ending with a comprehensive, global assessment, with the observation of the impact and with specific policies targeting the identified shortcomings.

On the other hand, it is also worth noting that there is a contradiction between the monetary, economic and fiscal aspiration for stability and sustainability and social and environmental sustainability, at the macroeconomic level within public policies. But this aspiration for a secure macroeconomic future often translates into austerity at the level of social policies and the protection of vulnerable groups, implicitly on groups with energy vulnerabilities.

At the same time, the findings also highlight differences in vision and strategy, with structural heterogeneity between countries, both in terms of awareness of the situation and policy approaches. Where climate change has hit harder and where the phenomenon of energy poverty has been more deeply recorded, national policies have managed to better focus efforts and an integrated vision of the varied and sometimes contradictory aspects of energy poverty (e.g. the southern flank of the European Union).

In terms of fiscal public policies, long-term actions are needed, such as supporting energy efficiency and the renovation process, and in the short and medium term, subsidies and VAT reductions. Special attention must be directed to vulnerable citizens, so that the just transition does not leave behind, especially those who may have already been affected by various forms of poverty.

Not only financing can prove to be a bottleneck, through the relatively limited funds at EU or national level, but especially all the cooperation structures between private-state-citizens-non-governmental organizations, including at local-national-regional levels. Therefore, an increase in innovative participatory mechanisms at the level of national policies is necessary to involve especially vulnerable citizens in the design and implementation of relevant measures and programs.

Studies note the vulnerabilities and failures of policies to combat energy poverty, and that there is an even more acute need to expand investigations, to reformulate theoretical frameworks in order to truly capture the causes of energy poverty and propose the best methods to combat the phenomenon.

The results of the study show heterogeneity in decision-making based on heterogeneity of definitions but also of particular situations existing at the EU27 level regarding energy poverty. In general, the EU-27 countries that are more advanced in terms of policies to combat energy poverty also show a greater sophistication of policies, strategies, means and instruments. At the same time, they can better integrate, in a broader framework, in various combinations, a more relevant number of instruments and with better effectiveness of each one and of the overall mix of specific policies to combat energy poverty. The subject is extremely vast, and beyond the literature analysis it will be continued in extensive specific analyses. In this regard, the study will be developed into other analyses emphasizing the capacities of various fiscal instruments to combat energy poverty, including impact studies at the EU27 level.

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