JRC 138969

European Commission

SCIENCE FOR POLICY BRIEF

The Persistency of Energy Poverty in the EU

HIGHLIGHTS

→ To comprehensively understand the dynamics of energy poverty and address this socio-economic inequality within the framework of the EU Green Deal, it's crucial to look beyond single-point-in-time indicators

→ A persistent energy poverty indicator is vital, as it captures the chronic and recurring nature of energy poverty, helping policy-makers tackle long-term structural problems rather than just short-term

→ There are substantial variations in the magnitude and trends of persistent energy poverty across the EU, with rates ranging from just under 1% to over 20% among various Member States

→ Higher public expenditure on social exclusion benefits, housing allowances, and improvements in energy efficiency reduce the risk of persistent energy poverty

Energy poverty has emerged as a significant policy challenge within the European Union (EU), intersecting with broader socioeconomic inequalities and influencing the health and well-being of millions of citizens. Defined recently in EU legislation ([1]) as the inability of households to secure essential energy services—such as heating, cooling, and electricity—energy poverty affects a substantial portion of the EU population, with pronounced regional disparities and varying degrees of severity across different socioeconomic groups. Despite various policy efforts, energy poverty has remained a persistent issue for years, underscoring the need for a deeper examination of its structural causes and long-term solutions.

The purpose of this brief is to suggest new social policy indicators for measuring persistence of energy poverty in the EU. Most indicators of energy poverty rely on cross-sectional data capturing a snapshot of the population on a specific moment ([2]). To examine the persistency of energy poverty in the EU, at the Joint Research Centre (JRC), we have developed a new

[1] Directive (EU) 2023/1791 of the European Parliament and of the Council of 13 September 2023 on energy efficiency and amending Regulation (EU) 2023/955 (recast).

[2] Cross-sectional data is a type of data collected by observing many subjects at a single point or period of time.

methodology drawing on panel data from the European Union Statistics on Income and Living Conditions (EU-SILC) ([3]).

The methodology and analysis is being presented in a recent JRC report (Ozdemir & Koukoufikis, 2024) that examines how long and severe energy poverty has been over time, and identifies the socioeconomic and demographic factors contributing to its persistence ([4]). This briefing draws from this work and aims to present our findings and inform targeted policy interventions that align with the EU's broader energy transition and social inclusion goals.

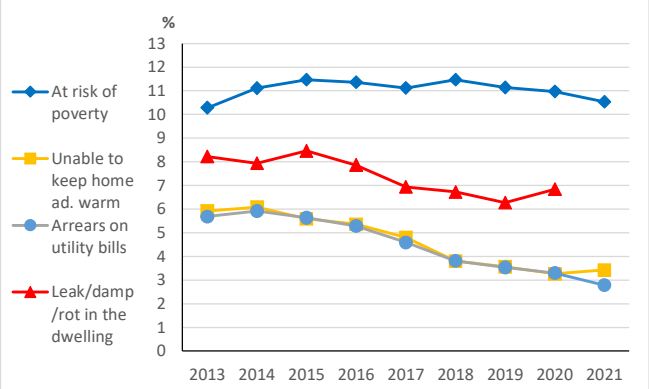
MAIN FINDINGS

Downward trends in the EU

Unlike the typical presentation of energy poverty indicators through cross-sectional data, our analysis focuses on the persistency of these indicators, revealing the long-term trends and deeper insights. Our analysis over EU-SILC longitudinal microdata indicate that in 2021, approximately 3.5% of individuals in the EU were unable to keep their homes adequately warm for at least three years within a four-year period, a notable decrease from around 6% in 2013 and 2014 (**Figure 1**). Similarly, the persistency rate of arrears on utility bills fell to just below 3% in 2021. On the other hand, the proportion of people persistently experiencing leaks, damp, or rot in their dwellings remained higher than other indicators, fluctuating over the years and showing a less marked decline.

Despite a two-percentage point decrease in unfavourable physical conditions for energy efficiency from 2013 to 2019, nearly 7% of individuals still faced persistent issues with leaks, damp, or rot in 2020. Meanwhile, the persistent at-risk-of-poverty rate remained relatively stagnant between 2013 and 2021, hovering around 10-11% each year. These findings highlight both progress and ongoing challenges in addressing energy poverty across the EU.

Figure 1 – Persistency rates for monetary poverty and energy poverty indicators, 2013-2021 (%)



Note: DE is excluded from the EU total because of the absence of the data in seven of the nine years in the given period. Values for SK in 2017 and PT in 2020 are estimates. For PT, the 2021 persistent at-risk-of-poverty rate is obtained from Eurostat. No leak/damp/rot in the dwelling data in 2021.

Source: Ozdemir & Koukoufikis, 2024

DEFINITION The persistent energy poverty rate for a given energy poverty indicator refers to ***the percentage of the population living in energy poor households for the current year and at least two out of the preceding three years.*** This methodology is based on Eurostat's persistent at risk of poverty definition ([5]).

A significant proportion of individuals experience energy poverty at least once in medium term

To fully grasp the dynamics of energy poverty and financial instability, we must examine more than just indicators that reflect data from a single moment. Between 2017 and 2020, 18% of individuals in the EU were unable to keep their home adequately warm for at least one year (**Figure 2**), a figure that exceeds the annual rate in 2020 (snapshot) by about 10 percentage points. Around 8% faced this issue for two years or more. Notably, in Lithuania and Cyprus, over 40% struggled with adequate heating for at least one year during this period. Greece, Portugal, Bulgaria and Italy also exceeding 30%. Similarly, from 2017 to 2020, 15.5% of individuals in the EU experienced arrears on utility bills for at least one year, with 7.5% facing this issue for two years or more. Greece recorded the highest rates, with 57% of the population missing utility bills payments at least once in four

[3] Panel data or longitudinal data are multi-dimensional data tracking the same sample at different points in time.

[4] The report titled "The persistence of energy poverty in the EU is available here at the JRC publications repository

[5] Eurostat: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:At-risk-of-poverty_rate

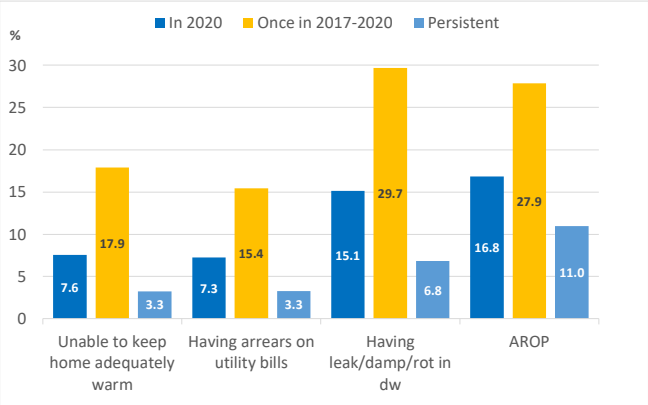
years. Similarly, in Bulgaria, over two fifths of the population had arrears for one year or more; the figure was around one third of the overall population in Croatia, and it exceeded 20% in Slovenia, Cyprus, Romania, Hungary and Ireland.

Regarding housing conditions, just below 30% of individuals in the EU experienced a leak, damp, or rot in their dwellings for at least one year between 2017 and 2020. In Cyprus, two-thirds of the population resided in dwellings with unfavourable physical conditions for energy efficiency for at least one year or more. This proportion was over 40% in Portugal, Latvia, Slovenia, and Italy, while only nine EU Member States had figures below 20%.

Relation between the persistence of three energy poverty indicators

The results of the correlation analysis for the selected monetary and energy poverty indicators demonstrate that the strongest relation is between arrears on utility bills and ability to keep the home warm (Pearsons's R=0.65). This finding corresponds to the link between these two indicators for the cross-sectional measurement of energy poverty. However, trends vary across countries regarding the persistence of being unable to keep the home warm or pay utility bills, reflecting different patterns affecting energy poverty in each EU Member State.

Figure 2 – Annual and persistency rates for monetary poverty and energy poverty indicators, 2020 (%)



Note: DE is excluded from the EU total Source: Ozdemir & Koukoufikis, 2024

The correlation coefficients indicate a moderate relationship between the persistent at-risk-of-poverty rates (0.56) and those for being unable to keep the home warm or pay utility bills (0.48), with a slightly stronger link for the former. Conversely, there is an extremely weak causal relationship (0.05) between the persistent at-risk-of-poverty rate and the persistency of having a leak, damp, or rot in the dwelling. There is a moderate link between persistently unfavourable housing conditions and the other two energy poverty indicators (around 0.30), but it is much weaker than the correlation between being unable to warm the home and having arrears on utility bills.

Box 1: What factors do determine the persistence of energy poverty?

To explore the factors affecting the persistence of energy poverty, random intercept multilevel mixed effects logistic regression models were implemented. The results suggest that gender does not have a significant influence, while the impacts of age and changes in household composition are relatively limited. However, the likelihood of being persistently energy poor increases with the number of years an individual spends below the at-risk-of-poverty threshold or faces a heavy financial burden due to housing costs.

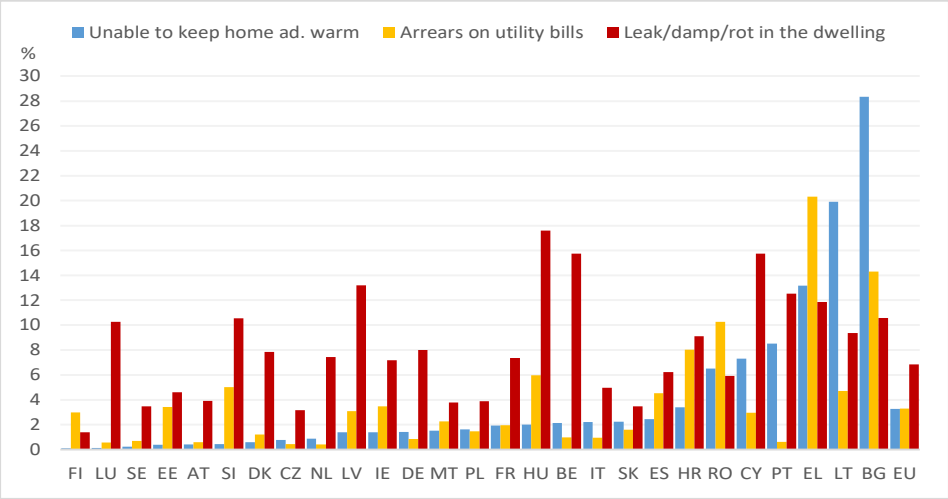
Additionally, individuals are less likely to experience persistent issues with keeping their homes warm or having leaks, damp, or rot in their dwellings if the total share of social protection expenditures on social exclusion benefits and housing allowances in the country's GDP increases. Furthermore, the findings indicate that higher average energy efficiency of dwellings in a country is associated with a lower probability of individuals being persistently energy poor.

Variation across EU Member States

The empirical findings indicate significant variation in the persistence of energy poverty across EU Member States. By 2020, Bulgaria had the highest proportion of individuals persistently unable to keep their homes adequately warm, at 28%, which is approximately 8.5 percentage points higher than Lithuania, the second highest. Greece also had a persistency rate over 10%. Although Portugal, Cyprus, and Romania had lower persistency rates for the 2017 to 2020 period, these rates were still well above the EU average (**Figure 3**).

In 2020, one in five people in Greece had persistent arrears on their utility bills. The figures were above 10% in Bulgaria and Romania, and exceeded 5% in Croatia and Hungary. The analysis results reveal that in the majority of Member States with available data, the proportion of people with some persistency in terms of having a leak, damp or rot in the dwelling was likely to be significantly higher than those who could not warm their home adequately or pay their bills. The rates were over 15% in Hungary, Cyprus and Belgium.

Figure 3 – Persistency rates for energy poverty indicators, 2020 (%)



Note: DE is excluded from the EU total. Source: Ozdemir & Koukoufikis, 2024

WHAT WE HAVE LEARNT?

The extensive analysis of energy poverty in the EU reveals a complex issue affecting a significant portion of the EU population. Our work highlights the magnitude and persistent nature of this pressing issue. The findings indicate that nearly half of the individuals classified as energy-poor in 2020 had been persistently so over the 2017-2020 period in the EU, according to the indicators used. At the same time, large parts of the population periodically faced energy poverty issues in the course of four years. Thus, the analyses results suggest that certain segments of the population are more vulnerable to energy poverty. In addition, longitudinal data analysis shows that the population exposed to the risk in a 4-year period is much bigger than the number of energy poor people given in a single year. This situation is exacerbated by socioeconomic disparities and inefficiencies in housing and energy consumption.

Our study has shown a strong connection between the length of time individuals experience energy poverty and their financial and housing stability. Individuals with prolonged periods of low income or excessive housing costs are more likely to experience persistent energy poverty, as are those living in homes with poor physical conditions for energy efficiency.

Based on the findings, it becomes clear that targeted interventions are necessary to break the cycle of energy poverty. Policy insights derived from our analysis include enhanced financial support for vulnerable groups, improvements in building energy efficiency (particularly via Social Climate Fund), integration of energy poverty into social policy, utilisation of an inclusive policymaking process, standardisation and disaggregation of indicators in the EU, adoption of tailored energy poverty indicators including persistency measurements, and promotion of sustainable energy access for all.

SUPPORTING PUBLICATIONS

Ozdemir, E. and Koukoufikis, G., *The persistence of energy poverty in the EU*, Publications Office of the European Union, Luxembourg, 2024, https://data.europa.eu/doi/10.2760/745025, JRC138409

Koukoufikis, G., Ozdemir, E. and Uihlein, A., *Shedding Light: Unveiling the Dynamics of Energy Poverty in the EU*, Publications Office of the European Union, Luxembourg, 2024 https://data.europa.eu/doi/10.2760/7432189, JRC138567

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