Measuring energy poverty in Poland with the Multidimensional Energy Poverty Index

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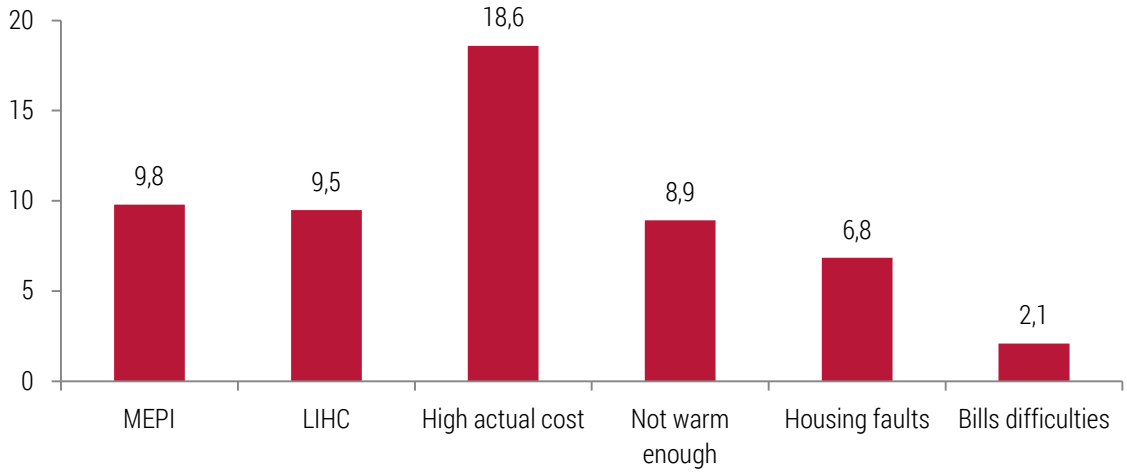
Energy poverty occurs when a household is unable to afford the energy needed to provide its members with adequate warmth, cooling, lighting, and appliance use. It generally results from three factors: a low household income, high energy costs, and the low energy efficiency of a dwelling. The measurement of energy poverty has two main aims. First, the identification of energy-poor households should enable the efficient implementation of support measures. Second, the measurement should capture the relevant features of deprivation. Ideally, energy poverty metrics would include both quantitative and qualitative components that ensure comprehensive coverage while minimizing biases in the representations of outcomes.

This article contributes to the improvement of the measurement of energy poverty by assessing not only the degree, but the incidence of multiple energy poverty dimensions in a given household. To achieve this goal, we propose a multidimensional index that accounts for the multi-faceted nature of energy poverty, and results in a single indicator that can be used for poverty mapping and policy planning. We combine objective and subjective indicators (five in total), and assign an equal weight to each indicator. We address the key drawback of using single indicators only: namely, that conflicting interpretations and results inevitably arise. We provide a single index of multidimensional poverty at the household level for which the interpretation is clear: i.e., a household is considered energy-poor if it experiences at least two forms of deprivation. We base our approach on the concept of the multidimensional poverty index developed by Alkire and Foster (2008). We apply our methodology to Poland, taking advantage of data from the Polish Household Budget Survey.

The most important conclusions from our analysis are as follows:

- In 2017, 1.3 million out of 13.5 million households (9.8%) in Poland are energy-poor in the multidimensional sense. In population terms, 3.3 million people out of the 38 million people living in Poland (8.8%) are affected.

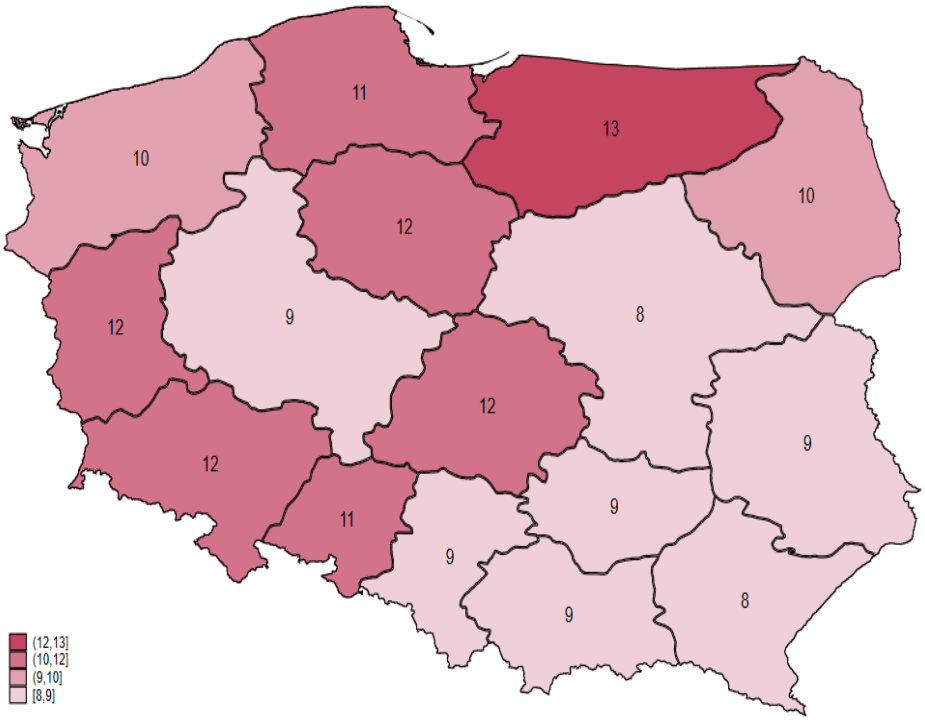
Figure 1. Energy poverty rate according to the multi-dimensional and single indicators (percent of households)



Source: Own calculations based on the Household Budget Survey data, 2017.

- More than 1 million (7.8% of households) of households identified as poor in the multidimensional sense are affected by exactly two forms of deprivation. The number of households affected by three of more forms of deprivation is much lower (314 thousand, or 2% of households)
- One in four households in Poland are deprived in exactly one dimension, while two in three households are not affected by energy poverty at all.
- Among the energy-poor households, the combination of the "low income, high costs" and "high actual cost" forms of deprivation is the most common (31% of poor households, according to the multidimensional index), followed by the combination of "leaks, damp, or rot" and "not warm enough" (16%).
- The 48% of households identified as energy-poor in a multidimensional sense exhibited some objective and some subjective forms of deprivation. The ability to identify households that are affected by both expenditure-based and subjective indicators of energy poverty is a desirable feature of the multidimensional approach.
- The equivalised incomes of energy-poor households are relatively low in comparison to the overall equivalised income distribution in Poland. Slightly more than a half (53%) of the households identified as energy-poor according to the MEPI are also income-poor.
- The multidimensional energy poverty rate is much higher among households living on non-earned sources of income than it is among any other socioeconomic group. Farmers, retirees, and pensioners also experience high rates of multidimensional poverty.
- Retirees and pensioners, recipients of non-earned income sources, and blue-collar workers constitute the three most numerous groups among the energy-poor, according to the MEPI, with 78% of all energy-poor households belonging to one of these three groups.
- The risk of energy poverty in Poland is strongly related to the characteristics of dwellings. According to the MEPI, energy poverty is more common among households living in detached houses than among households living in multifamily buildings.
- The older the building the household lives in is, the higher the household's risk of multidimensional energy poverty is. This is found to be the case for both detached and multifamily buildings, but the relationship between the age of the building and the risk of multidimensional poverty is stronger among households living in multifamily buildings.
- Taking into account the size of place of residence, the multidimensional energy poverty rate is the highest among households living in rural areas.

Map 1. Multidimensional energy poverty rate by NUTS2 regions in Poland (percent of households)



Source: Own calculations based on the Household Budget Survey data, 2017.

- The rate of multidimensional energy poverty is highest in the northern and western regions of Poland, and is lowest in the eastern part of the country. This pattern may seem counterintuitive, as the eastern regions are less urbanized and have lower average incomes than the central or western regions. However, the homes in the eastern regions are, on average, newer, and the incidence of subjective energy poverty, and in particular of "not being warm enough", is lower in the eastern regions than in the central or western regions.

The complete results of our research are published in the working paper:

Sokołowski J., Lewandowski P., Kiełczewska A. & Bouzarovski S. (2019), Measuring energy poverty in Poland with the Multidimensional Energy Poverty Index, IBS Working Paper 07/2019,
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