Energy poverty among households living in the detached houses in Poland

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In 2016, 12% of the Polish population were affected by energy poverty according to the Low Income – High Costs (LIHC) measure. 65% of all energy poor households, and 75% of all energy poor individuals, lived in detached houses. Among approximately 6 million households living in detached houses (hereinafter referred to as "HDH" – households in detached houses), 14% experienced energy poverty.

Regional variation in energy poverty is significant, but voivodships with the highest shares of energy poor HDHs are not necessarily those with the largest number of energy poor HDHs. The highest risk occurs in the less developed voivodships such as Warmińsko-Mazurskie, Opolskie and Podkarpackie. However, the largest number of energy poor HDHs live in populous voivodships with a significant number of detached houses, namely in Wielkopolskie, Mazowieckie, Podkarpackie, Małopolskie and Lubelskie. The Wielkopolskie and Podkarpackie voivodships are characterised by high risk of energy poverty as well as a large absolute number of energy poor HDHs.

Among the HDHs, energy poverty affects mainly inhabitants of villages and small towns (Table 1). This is a consequence of lower incomes than in larger cities, as well as the characteristics of housing stock (older houses and larger floor area).

Table 1. Energy poverty in households living in detached houses, by the size of place of residence (2016)

	Energy poverty (%)	Number of energy poor HDHs
City with more than 100 thousand inhabitants	7.8	61 891
City with 20-100 thousand inhabitants	7.1	50 509
City with less than 20 thousand inhabitants	12.4	91 476
Rural area	17.2	649 364
Overall	**14.1**	**853 240**

Source: Own calculations based on Polish Household Budget Survey 2016.

The income of people living in the energy poor HDHs is noticeably lower than the income of the total population. In 2016, the average income per person in energy poor HDHs stood at 63% of the average income per capita in Poland, and the median – at the level of 50% of the median in general population. Employment in blue-collar jobs (27%), retirement pension (25%) and subsistence farming (20%) were the most frequent main sources of income among the energy poor HDHs.

Buildings inhabited by the energy poor HDHs are generally older than the total stock of detached houses in Poland. Over 1/5 of the buildings inhabited by energy poor HDHs are pre-war buildings, and 1/3 of them were built in the period from 1961 to 1980.

Energy poor HDHs live in larger houses (average floor area – 126 m^2) than the average HDHs (111 m^2), see Table 2. However, in terms of floor area per person, there are no significant differences between all HDHs and energy poor HDHs. At the same time, energy poor pensioners, retirees and people living on unearned sources (together representing almost 40% of the energy poor HDHs) inhabit houses with the floor area per person by, on average, 10m^2 larger than the whole population of HDHs.

Table 2. Average floor area of the house (m^2) for energy poor HDHs, by the main source of income

	Total area	Area per person	Number of energy poor HDHs
Overall	**126**	**42**	**853 240**
Employment at blue-collar job	125	30	230 966
Employment at white-collar job	140	38	78 629
Farming	157	38	170 847
Self-employment	136	39	38 451
Retirement pension	106	52	209 674
Pension	110	57	79 129
Other unearned source	104	55	45 544

Source: Own calculations based on Polish Household Budget Survey 2016.

2/3 of energy poor HDHs use the combination of coal and wood for heating. Almost 1/5 of energy poor HDHs use solid fuel stoves, while among of all HDHs this source of heating is very rarely used (3% of households). This means that many energy poor HDHs would face higher heating costs if their stoves were replaced with less polluting, modern boilers which require the use of certified, more expensive fuel.

80% of energy poor HDHs have central heating (85% in the total population). Unfortunately, the Household Budget Survey data does not allow to distinguish between households obtaining heat from a supply grid and from individual central heating.

1/4 of all energy poor HDHs have access to the gas network. This share is significantly higher in large and medium-sized cities (60%) than in small towns (37%) and in rural areas (18%). Regional diversification is significant: in a number of voivodships (Kujawsko-Pomorskie, Lubuskie, Łódzkie, Opolskie, Podlaskie, Świętokrzyskie, Warmińsko-Mazurskie) only about 10% of energy HDHs have access to the gas network while in Podkarpackie, Małopolskie and Zachodniopomorskie voivodships this share is about 50%.

The following implications for public policy stem from our findings:

Income criteria are crucial for addressing any support for the energy poor HDHs. That is because energy poor HDHs have significantly lower incomes than general population in Poland. At the same time, because many of the income poor households are not energy poor, additional criteria related to the condition of the building should be used.

Among the energy poor HDHs who use stoves or boilers for heating, the vast majority use coal as the main fuel and wood as an additional fuel. Presumably, these households do it in order to limit the running costs of heating. As much as 20% of poor HDHs use wood as the main fuel. This means that replacing heating sources with modern coal boilers, gas boilers or electric heating would imply an increase in heating cost which could be a significant burden for these households. There would be a need for public policy instruments to counteract this problem, for example by improving the energy efficiency of houses or reducing the financial burden, e.g. by financial transfers.

Pensioners living in energy poor HDHs deserve special attention. They live in the houses with relatively large floor area per person, often in oversized houses. As a result, the cost-effectiveness of investing in building retrofit and thermo-modernisation of houses inhabited by pensioners will on average be lower than among other groups. In our opinion, any targeting of public funds for building retrofit programs should take into account the expected further duration of house use.

20% of energy poor HDHs live in houses built before 1946. An exceptionally high share (over 70%) of such houses among energy poor HDHs occurs in the Western part of Poland (Dolnośląskie, Lubuskie and Opolskie voivodships). Investing in thermo-modernisation of these houses can be technically difficult and/or economically inefficient, especially in the case of households inhabited by older people whose children decided to live elsewhere or already have their own houses. In this case, financial transfers may prove to be an important policy instrument to raise the standard of living or to reduce heating costs related to the replacement of heating source.

The complete results of our research are published in Polish in the report:

Lewandowski, P., Kiełczewska, A., Ziółkowska, K. (2018). Zjawisko ubóstwa energetycznego w Polsce, w tym ze szczególnym uwzględnieniem zamieszkujących w domach jednorodzinnych. *IBS Research Report 02/2018*.

http://ibs.org.pl/publications/zjawisko-ubostwa-energetycznego-w-polsce-w-tym-ze-szczegolnym-uwzglednieniem-zamieszkujacych-w-domach-jednorodzinnych/