

Exploring Multi-dimensional Nature of Poverty in Slovakia: Access to Energy and Concept of Energy Poverty¹

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Abstract

Poverty is a multi-dimensional phenomenon, with a complicated nature, roots and multiple impacts. Although generally missing in the mainstream definitions, access to energy has become an increasingly important aspect of this poverty. In modern societies access to energy is a basic condition for full participation. In this context, even short-term deprivation results in serious difficulties for the people affected. In the article we discuss the concept of energy poverty (its origin and problems with definitions), and analyse empirical data indicating the scope and impacts of the problem in the Slovak Republic. We suggest possible approach to defining energy poverty and offer first empirical findings. In conclusion we discuss methodological problems with the conceptualization of energy poverty and possible definitions, and outline challenges and further research needs.

Keywords: *energy/fuel poverty, housing costs, ability to pay for energy, financial burdens*

JEL Classification: D63, I32

Introduction

An elementary academic standpoint is that poverty is a complex issue which is not solely related to (very) low income. The multidimensional nature of poverty has been studied in relation to such phenomena as deprivation, health, and

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participation in standard social activities, etc. An important aspect in studying this multidimensionality is access to energy, being a basic resource for life and participation in modern societies. This is of special importance for countries like Slovakia where economic transformation has resulted in significantly increased energy prices (through privatization and liberalization) and the purchasing power of large social groups (single mothers, unemployed, pensioners) has diminished. These trends are reinforced by increasing labour market instability, the deepening of marginalization of certain population categories and decrease in the capacity of the welfare state and relevant actors to intervene in social problems.

The consequences of high fuel bills and difficulties with paying for energy services in Slovakia have mainly been the object of social research carried out as a part of a general review of living conditions. In policy discourse, the emphasis has been put predominantly on the regulation of energy prices, while other aspects of vulnerability (i.e., households' indebtedness, low quality of housing conditions, and a combination of disadvantages) have usually been neglected. Nevertheless, there have been attempts by NGOs such as the Slovak Anti-poverty Network, to draw public attention to these issues. The aim of this paper is accordingly to map the present situation in this field, contribute to discussion on potential directions in analysing energy poverty and to stimulate broader approaches to research on context and consequences of housing costs in Slovakia.

The paper has three parts. First we provide a review of approaches to the conceptualization of energy poverty and vulnerability to energy costs. Within this, available definitions and methodological aspects in energy poverty research are discussed. In the second part we focus on whether the question of paying for energy is a real problem in Slovakia and if so, to whom. We offer empirical evidence based on the latest available data from the EU Survey on Income and Living Conditions (EU SILC) and the Household Budget Survey (HBS). Based on the analyses of potential approaches and data available we suggest possible approach to defining energy poverty. Finally we focus on the key methodological aspects in defining and measuring energy poverty in the country and explore the need for further research.

Towards Conceptualization of Energy Poverty

Energy poverty² research originally began in the UK, where studies of the market liberalization of energy prices and growing social inequalities resulted in the inability of households to cope with increasing energy costs and subsequent social and health impacts (Boardman, 1991; Clinch and Healy, 2000; Alyin et al., 2001; Healy, 2001; 2002a; 2003). The long history of this research in the

UK, with a distinguished academic background³ and growing policy interest (e.g. *The UK Fuel Poverty Strategy 2001*) has provided important examples of approaches to energy/fuel poverty and policy practice.

Isherwood and Hancock (1979) provided one of the first definitions of fuel poverty, known as a twice-median concept. Related to the share of households' fuel spending, the authors defined households with high fuel expenditure as those spending more than twice the median on fuel, light and power (Walker, Thomson and Lidell, 2012, p. 9). The twice-median concept was driven primarily by empirical considerations on spending patterns from the Family Expenditure Survey 1978. Brenda Boardman's work (1991) is another key contribution to energy poverty research, which leads to the current understanding of energy/fuel poverty. Boardman set the 10% threshold, which later became the basis for an official definition of fuel poverty in the UK; according to her analyses, fuel poverty occurred when a household couldn't purchase adequate energy services (particularly warmth) with 10% of its income (Boardman, 2010, p. 22). In setting the threshold, Boardman took into account the situation of households in the lowest three income deciles (using data from the Family Expenditure Survey 1988). Their average spending on energy represented 10% of their weekly budget, compared to 5% for the whole population. The threshold was in line with the former findings of Isherwood and Hancock, because according to their definition, disproportionate fuel expenditures (twice the median) were confirmed among the households in the lowest three deciles (ibid.). Boardman's conceptualization of fuel poverty was not however a matter of pure empirical calculation. It relies on theoretical and methodological considerations involving defined elements of fuel poverty, which influenced progress in the following periods.

The official definition of fuel poverty in the UK, adopted by the government and applied by relevant actors, represents a basis for regularly published fuel poverty statistics and fuel poverty reports. The definition is the subject of a recent discussion and critical review (Hills, 2012) and we will come to this point later. Fuel poverty is presently defined in terms of Boardman's approach and expressed through comparing the ratio between fuel costs (usage of fuel multiplied by price) and income against a fixed threshold. In these terms, a "household is said to be in fuel poverty if it needs to spend more than 10% of its income on fuel to maintain an adequate level of warmth"⁴ (DECC, 2013, p. 2). It is

² *Fuel poverty* is the term used predominantly in the UK, while other scholars have adopted the term *energy poverty*. We use the latter term, and understand energy here to be broadly defined as all commercially paid energy inputs needed for heating, cooking and lighting houses.

³ Energy (fuel) poverty in the UK is surveyed by leading academic institutions (e.g. The Townsend Centre for International Poverty Research, and The Centre for Analysis of Social Exclusion).

important to note, that fuel costs are based on the modelling of fuel requirements (needs) of the households taking into account factors such as size of the dwelling, number of people living in the dwelling, energy efficiency of the household, and the energy mix usage of each household. The modelled fuel needs are preferred to actual spending because the modelling ensures that the adequate level of warmth is achieved (DECC, 2013, p. 3).

As mentioned above, discussion on fuel poverty definition continues. Hills (2012) published results of an independent review commissioned by the UK government. This brought about a series of considerations and recommendations, including suggestions for an alternative definition of fuel poverty. According to Hills (2012, p. 30), the main strength of the official indicator is that it is based on models of fuel costs rather than actual expenditure. Thus it avoids possible misclassification. Further, Hills highlights the fuel poverty ratio's sensitivity to more than one parameter (it relies on three parameters – energy needs, energy costs and income).

The principal objections to the indicator were targeted at the way it was calculated. First of all, a fixed threshold value of 10% (which relies on the twice median concept applied on data from 1988 when median household spent 5% of its income on fuel), is seen as an arbitrary choice. It may lead to problems with the classification of some groups of households. Further, the form of the indicator is very sensitive to fuel prices and may threaten the nature of trends in fuel poverty figures. As Hills argued, “any headline indicator of fuel poverty must be sensitive to fuel prices. The degree of sensitivity under the 10% indicator would, however, appear to be excessive, thus distorting trends” (Hills, 2012, p. 30). Taking into considerations these (and other) weaknesses, Hills suggested an alternative definition of fuel poverty based on a Low Income and High Costs indicator (LIHC indicator hereafter). As the title indicates, focus is on households, which have both a lower income and higher required costs (i.e. above “reasonable” level). According to Hills (2012, p. 33), these households should be counted as fuel poor if:

- they have required fuel costs that are above the median level, and
- were they to spend that amount they would be left with a residual income below the official poverty line.

The LIHC indicator overcomes some difficulties connected to the official definition and offers a relatively simple and understandable (transparent) method of calculation. Additionally, it not only determines the number of fuel poor households, but also expresses the depth of their difficulties through a fuel poverty gap

⁴ Adequate warmth is defined as 21 degrees for the main living area and 18 degrees for other occupied rooms.

indicator. The fuel poverty gap refers here to the extent to which fuel costs of the fuel poor rise above the median level (i.e. above reasonable level of fuel costs). Inspired by the income poverty gap, it improves understanding of the issue and provides a useful guideline for public policies.

Another interesting approach can be found in the 2008 European *Fuel Poverty and Energy Efficiency Poverty Project* (EPEE, 2008). This project, co-financed by the European Commission, aimed to increase understanding of the causes and effects of fuel poverty and to devise effective operational mechanisms to tackle them. The survey of fuel poverty involved France, Belgium, Spain, UK and Italy. Fuel poverty was defined as a household's difficulty, sometimes even inability, to adequately heat its dwelling at a fair, income indexed price (EPEE, 2008, p. 3). Broadness of the definition resulted from an effort to incorporate specific characteristics of the countries as well as an ability to capture it empirically. Several indicators and their availability for cross-country comparison were examined in the project. It seems the following three variables from the EU SILC are the most relevant:

- the ability to pay to keep the home adequately warm;
- leaking roofs, damp walls/floors/foundation, or rot on window frames/floors;
- arrears in utility bills (electricity, water, gas).

It is clear that the variables cover very significant dimensions of fuel poverty while ignoring some others. Experts involved in the project adopted the view that the EU SILC data are limited in scope and coverage for analysing fuel poverty and that in order to properly analyse fuel poverty at the national level, national data should be used. On the other hand, the EU SILC data are seen as very useful from a comparative perspective (EPEE, 2008, p. 6). They allow the comparison of forms and incidence of fuel poverty in the EU member states. Data gathered at the national level, reflecting specific institutional settings and regulations, have limited value for cross-country comparisons. Yet, it is the comparative approach, which provides crucial insights into drivers and causes of fuel poverty.

Based on analysing the three variables the EPEE study estimated incidence of fuel poverty in given countries. In each of them the survey found strong correlation between life cycle and fuel poverty. Unemployed, single-parent families, and the retired are among the most vulnerable groups in analysed societies. The survey concluded that low income, poor heating and insulation standards, together with high energy prices, were among main factors contributing to fuel poverty.

Only a limited number of studies have been conducted on this topic in Central and Eastern Europe (CEE), but they indicate that the scope of the problem is significant and increasing. The pioneering work of Buzar (2007) is built on

comparative analyses of Macedonia and the Czech Republic and his conclusion is that energy poverty is a current and serious problem, especially for lower income households in both countries. The EU-wide survey by Morgan (2008) has covered all the CEE Member States. Comprehensive surveys and analyses at the nation-state level were carried out in Hungary in a research project lead by Herero and Urge-Vorsatz (2010).

As far as the authors of this article are aware, there is only scattered theoretical thinking and empirical evidence on this topic in Slovakia. Theoretical approaches to studying energy poverty in the Czech Republic and Slovakia were explored by Richard Filčák (2010), indicating that access to energy is a problem especially for people at risk of poverty and has strong social and environmental impacts. Zuzana Kusá (2011) recently published overview of housing policy and analysed affordability of housing in Slovakia. Kusá concluded that inadequate housing policy has resulted in the reduction of the public/social housing sector, persistent inability to pay energy bills, high risk of disconnection from energy sources and enforced evictions for the most vulnerable groups. In addition, policy measures potentially contributing to an improvement of the situation (housing allowance) have been weakened and marginalized within the social protections system.

Additional empirical evidence is provided by the United Nations Development Programme (UNDP) research on living conditions of marginalised Roma households (UNDP, 2006; 2011). Outcomes confirmed that many households living at the margins of society face great difficulties in covering their utility bills, such as water, electricity, and gas; they accumulate unpaid bills for several months. Moreover, a significant proportion of households in segregated and separated settlements have to cope with unacceptable unprecedented housing conditions (lack of water, sources of energy). We will analyse this in the next section.

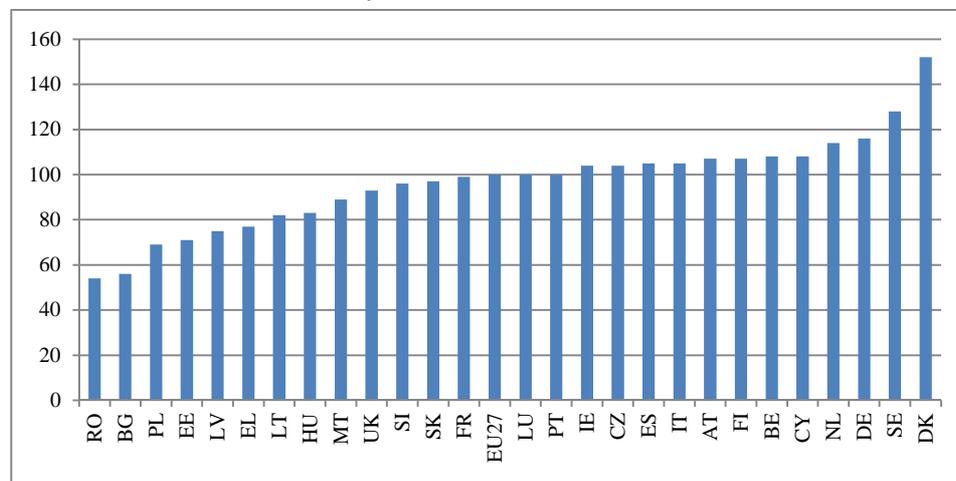
Indicators of Energy Poverty in Slovakia: Empirical Evidence

Indicating forms and incidence of energy poverty requires various data sources. In this section we rely mainly on data from two statistical surveys, which are carried out regularly – the Household Budget Survey (HBS), and the EU Survey on Income and Living Condition (EU SILC). Both surveys offer information useful for the analysis of living conditions. While the HBS focuses on consumption and expenditures (and income) of households, the EU SILC concentrates on income and its structure, deprivation and other aspects of living conditions. The survey data are supplemented by information on development of energy prices and information from other relevant sources. Lack of other relevant information is discussed in the final section of the paper.

Energy prices in Slovakia have been steadily growing for the last decade. In the second half of 2013 were average electricity price for household 16.8 euro per 100 kWh, or 20% below the EU average (Eurostat, 2014). The average gas price for households represented 5.2 euro per 100 kWh in 2013, which was lower than the EU-28 average of 7.1 euro.⁵ While electricity price between years 2012 and 2013 decreased by 2.6%, the gas price increased by 1%. Taking into account different costs of energy among the countries and expressing electricity price in Purchasing Power Parities, we see, that Slovakia ranks above the EU average. It has the sixth highest electricity price and the thirteenth highest price for gas in the EU-28 (Eurostat, 2014). In a more general cross-country comparison of all energy prices, based on the price level index,⁶ was the price level for electricity, gas and other fuels in Slovakia very close to the EU average (Eurostat, 2012, p. 3). The situation in Slovakia was similar to countries like France or Slovenia. Comparing to the Visegrad countries, the lowest prices for energy are reported in Poland, while Slovakia has the second highest price level. The average position in terms of price level for energy thus sharply contrasts with the fact that Slovakia belongs among the EU countries with lower income level.

Figure 1

Price Level Index for Electricity, Gas and other Fuels in 2011 (EU-27 = 100)



Source: Eurostat (2012), p. 3.

⁵ Electricity prices refer to a household with an annual consumption of between 2 500 and 5 000 kWh, gas prices refer to annual consumption of between 5 600 and 56 000 kWh. Both figures include taxes.

⁶ Price level indices provide a comparison of countries' price levels with respect to the EU average. If the price level index for given group of products is higher than 100, the price level of the group of products in the country is higher than the EU average (Eurostat, 2012, p. 1).

The extent to which energy represents a burden for the household budget is indicated by the ratio of a household's expenditure on energy to its total expenditure. In Slovakia, there is a significant variation among the households. According to the Household Budget Survey data, old-age pensioners' households have to cope with the highest proportion of energy expenditure. In 2012, households with an old-age pensioner at its head paid approximately 19% of total net monetary expenditure (expressed per capita)⁷ on electricity, gas and other fuels. This was disproportionately higher than the average across the total population of 13.4%. It was also seven percentage points higher than the share of expenditure on energy in households where the head was an employee or self-employed.

Unemployment is another substantial factor contributing to energy poverty of households. This has long been the case: the old-age pensioner households and households where the head of the family is unemployed consistently spend above average proportions on electricity, gas and other fuels, while the expenditure of households of employees and those who are self-employed have been below the population average. Looking at the economic status of all adult household members, it is clear that the presence of economically active persons in a household reduces the proportion of expenditure spent on energy (although not linearly). Households without economically active members spent as much as 20% of total net monetary expenditure on energy in 2012, while households with one, or more economically active member spent significantly less. As Table 1 shows, the proportion of expenditure on energy also decreases with increasing income of household.

Table 1

Expenditure on Energy as Share of Total Net Money Expenditure (% , 2012)

Economic status of the head of the household		Level of income (per capita)	
Household's head – old-age pensioner	18.7	First quartile	15.1
Household's head – unemployed	18.0	Second quartile	14.5
Household's head – self-employed	11.9	Third quartile	13.8
Household's head – employed	11.7	Fourth quartile	10.2
Number of economically active persons in households		Number of dependent children	
No person	20.4	No children	15.8
One person	12.4	One children	11.3
Two persons	11.7	Two children	11.4
Three and more persons	12.8	Three and more children	11.4
Total population			13.4

Note: Expenditure per capita. Energy includes electricity, gas and other fuels.

Source: Own calculations based on Statistical Office of the Slovak Republic (2013).

⁷ We focus on net monetary expenditures (excluding in kind expenditures) – it provides straightforward information on a burden which energy costs represent in the household budget.

Comparison with data from 2009 (not shown in Table 1) suggests positive trend in terms of households share of financial expenditure spent on energy. The exemption is in the category of Household's head – unemployed, where we see a significant increase in share of financial expenditures spent on energy. Three years after the first effects of the crisis appeared, a households led by unemployed person spend on energy 18% of the income. It is far above the average, and very close to spending pattern of old-age pensioner households. Since share of persons living in households with very low work intensity rose by 1.2 percentage point, a possible explanation could be in the increasing concentration of unemployment within these household.

If we applied the UK approach (the 10% threshold) on the HBS data we could obtain a very interesting perspective on the situation in Slovakia. The 10% threshold, based on the ratio of real expenditure on fuels to real net money expenditures would be very stringent for Slovakia. Households here spent in 2012 (on average) 13% of net expenditures on energy. Using this approach, majority of households in Slovakia would fall into the category of energy poverty. However, there are serious limitations, which prohibit such a simple application. As previously discussed, the UK definition is built on the modelling of fuel costs, while data from Slovakia represents actual expenditure. In addition, identification of the income component in the UK definition is based on a number of presumptions, some of which are rather specific to the UK.

The EU SILC offers other types of indicators that are collected regularly and which can be useful in analysing energy poverty. Unlike the HBS, they lack a detailed overview of expenditure, but concentrate more on income as well as broadly defined living conditions (including such aspects as labour market status, material deprivation, housing conditions, indebtedness, subjective perception of financial commitments, etc.). We have already mentioned the EPEE study, which used the EU SILC variables in order to capture a nature of fuel poverty risk (EPEE, 2008). Here we use three indicators with the potential to cover non-trivial aspects of energy poverty. Firstly, we focus on the ability of households to keep their home adequately warm. Secondly, we give credence to presence of arrears on utility bills. Utilities are defined here in relation to the main dwelling and include heating, electricity, gas and water. Thirdly, we pay attention to inadequate level of housing costs in relation to disposable household income. We use here EU SILC-based indicator “housing costs overburden rate” which refers to the population living in households where total housing costs (net of housing allowance) represent 40% or more of their disposable income. We consider this as a better indicator of energy poverty than presence of leaking roofs, damp walls/floors/foundation (or rot on window frames/floors). Incidence of problems, covered by the indicators, is shown in Table 2. The values refer to

the percentage of people in a given category who live in households, which are unable to keep their home adequately warm, have arrears on utility bills and housing costs above 40% of the equivalent disposable income. We start with description of distribution of energy poverty-related problems among the population (in order to see the most vulnerable groups, and identify drivers behind). Secondly, estimation of energy poverty based on various combinations of the three indicators is provided.

The first conclusion could be that only small proportion of the population of Slovakia lives in households, which were in 2012 unable to stay warm. Similar holds true for arrears on utility bills. Their incidence is not as high as one would expect when looking at the expenditure on energy. Yet the picture is different if we take a closer look at various population categories. As far as inadequate warmth is concerned, old-age pensioners are at the highest risk, especially those who live alone. In 2012, 11% of them couldn't afford to keep their homes adequately warm. On the other hand, old-age pensioners have a very low frequency of arrears on energy bills. Two facts may account for this. Old-age pensioners often live in large houses. Living (often alone) in a large dwelling may lead to difficulties in heating it sufficiently. According to the 2012 EU SILC data, 37% of single adults aged 65 and over lived in homes with three rooms and 14% lived in four-room dwellings. Similar situation can be found among households with two adults, with at least one aged 65 or over. High energy costs, expressed as a percentage of total expenditure however, don't necessarily lead to indebtedness. It seems that older people behave very cautiously as regards their financial commitments and this supports Buzar's (2007) argument that not paying for energy bills is often stigmatised in Eastern Europe and people prefer to save money elsewhere (e.g., heating only fraction of their dwellings).

Quite a different situation can be found among lone parents and large families (households with three or more dependent children). Here, arrears on utility bills are more frequent than in other households, especially in comparison to those headed by old-age pensioners or those without children. It is remarkable that households with dependent children spend on average proportionately less of their income on energy than households without dependent children (11% compared to 16% of total net expenditure in 2012). Both, the lone parents and large families belong to the most vulnerable groups in terms of income poverty. In 2012, 27.5% of people from lone parent households and 35% of people from large families were below the poverty line, compared to 14.7% of single adults aged 65 and over or 9% of people from households consisting of two adults younger than 65. High incidence of economic vulnerability makes the risk of arrears very real. The changing incidence of problems with warmth and arrears according to the poverty threshold confirm this claim (see Table 2).

Table 2

Incidence of Vulnerability in Relation to Energy (% of persons, 2012)

	Unable to keep home adequately warm	Arrears on utility bills ⁸	Housing costs 40% or more of income
Total population	5.5	5.8	8.4
Type of household			
Single adult	12.7	5.3	22.8
Single adult aged 65 and over	14.3	1.8	21.1
2 adults without children, at least one aged 65 and over	5.7	2.1	6.4
Lone parent with dependent children	10.3	10.8	15.7
2 adults with one dependent child	3.8	4.6	10.8
2 adults with two dependent children	3.0	5.5	10.9
2 adults with three and more dependent children	5.4	6.7	14.8
Age (in years)			
0 – 17	4.7	8.4	10.9
18 – 24	5.4	6.2	6.9
25 – 64	5.2	5.9	7.4
65+	8.0	2.3	10.3
Tenure status			
Owner	5.3	5.5	7.7
Tenant, rent at market price	6.3	7.8	15.1
Tenant, rent reduced price or free	12.6	13.7	8.7
Poverty status			
Below 60% of median equivalised disposable income	13.6	18.3	36.3
Above 60% of median equivalised disposable income	4.3	3.8	4.1

Source: Own calculations from the EU SILC 2012.

There is a strong effect of the so-called “housing costs overburdening”. This concept, developed by Eurostat, reflects the extent to which housing costs represents a serious problem. It refers to households where the total housing costs represent more than 40% of disposable income.⁹ In 2012 there were 8.4% of persons living in households with such a high proportion of housing costs. They were more often exposed to the consequences of insufficient heating (13%) than the rest of the population (5%), and they were similarly susceptible to arrears on utility bills (14% to 5%). Disproportionally high housing costs represent serious problem for lonely people (older persons, single parents, and single adults in general) as well as for larger families. A high incidence of housing costs overburdening among lone parents (15.7%), single adults (23%) and families with a large number of children (14.8%) partly explains the higher prevalence of problems with adequate warmth at home in these households. To be clear, economic

⁸ Share of people with arrears on utility bills includes people with a single incidence of arrears as well as those with multiple incidences.

⁹ Housing allowances are not included in housing costs and disposable income.

vulnerability (high incidence of income poverty) of these groups represents one of the key factors; there is a strong relationship between incidence of housing costs overburdening and level of income. There were 27% of persons living in the overburdened households in the first quintile of income distribution, while in the second quintile we find there only 8%. Stronger evidence is visible in comparison of housing cost overburden rate among poor, and non-poor population. Proportion of poor people living in households with very high housing costs (in relation to household income) is approximately nine times higher than proportion of non-poor persons.

Tenure status is also identified among differentiating factors. Here, “standard” tenants who live in dwellings rented at market prices face the highest incidence of disproportionately high housing costs (well above the average for total population). It seems, that ownership is a strong factor in protection against the risk of being overburdened by housing costs. This factor is significant also because as many as 90% of households in Slovakia (in 2012) own dwelling they live in. In the situation, where only 10.1 % of flats constructed in 2012 were general rental apartments,¹⁰ the most vulnerable group are people dependent on renting apartment at the market prices.

In summary, economic status of household members (including household’s head) and the resulting income situation, family composition and phase of life cycle, impact on the probability of difficulties related to energy poverty. Of course, size of dwelling and level of housing costs play a crucial role, but we suggest that their impact is mediated by household type and its socio-economic status. It is clear that when talking about energy poverty, energy prices alone don’t represent sufficient information; they don’t have a uniform impact on (various) forms of energy poverty. Therefore, a more detailed picture must be obtained, including various contexts and conditions.

The three above mentioned indicators were explored as a point of departure for discussion about definition of energy poverty and for first estimations on scope of the problem. Each of the indicators has its own pros and cons, yet together they provide substantial data and information on various aspects of the energy poverty and we may combine them in numerous ways. We decided to follow the approach applied in the case of the indicator “at risk of poverty rate or social exclusion” – the headline indicator to monitor poverty target within the Europa 2020. Referring to persons rather than households, it reflects the share of the population, which is either at risk of poverty, and/or severely materially deprived, and/or lives in a household with very low work intensity. This combination

¹⁰ *Information on Housing Construction in the Slovak Republic for the Year 2012*. Published by the Ministry of Transport, Construction and Regional Development of the Slovak Republic.

of three partial indicators is very useful, as it includes persons facing at least one social risk. In other words, it includes all potential combinations of three disadvantages. Our indicator of “at risk of energy poverty”¹¹ is therefore built on a similar principle. It refers to persons who are unable to keep home adequately warmth and/or have arrears in utility bills more than one time and/or their housing costs represent 40% or more of disposable household income. We include into definition of energy poverty indicator “arrears in utility bills” in its stricter form and only repeated arrears are taken into account. Based on this logic, we eliminate people who have got only one arrear, as this could lead to overestimation of the problems in Slovakia. On the other hand, repeated occurrence of arrears has strong consequences for household’s living conditions. According to this definition, there is 14.8% of population at risk of energy poverty. It hits half of people living below the income poverty threshold set at 60% of national median equalised disposable income. The number is rather indicative with aim to open discussion on the extent and depth of energy poverty in Slovakia.

Table 3

Estimation of Energy Poverty in Slovakia (% , 2012)

	Problems with warmth and/or problems with arrears in utility bills and/or problems with very high housing costs
Total population	14.8
Income poor	50.2
Income non-poor	9.4

Source: Own calculations from EU SILC 2012.

Statistical surveys are sometimes blamed for an insufficient coverage of the most vulnerable groups that live at the margins of the society. Marginalized Roma households represent one such example. In order to capture their living conditions and provide a comprehensive overview for policy makers, NGOs and academics, the UNDP conducted *Survey on living conditions of Roma households in Slovakia* in 2010.¹² The survey provided data on a broad range of issues, including income and expenditure, labour market activities, health, education and housing conditions. The study (UNDP, 2012) based on the survey shows that there are big differences between Roma households and the neighbouring majority in many respects. Many Roma households are socially excluded in the

¹¹ Expression „risk“ reflects the fact that the indicator captures rather potentiality of real energy poverty. Chosen aspects are not the only areas related to energy poverty.

¹² It was the second wave of the survey; the first one was carried out in 2005. The UNDP Survey (UNDP, 2012) employed a specific methodological approach. The sample consisted of three categories of Roma households defined by the extent of their integration with the majority (segregated, separated, mixed) and control groups, which included households from a majority living in proximity of Roma households.

strictest sense of the term. Taking into account that they live in the same locality, search for jobs at the same labour markets as their Non-Roma neighbours, it indicates that Roma households have to face serious structural disadvantages which limit their future prospects to a significant extent.

Access to energy and energy poverty is part of the complex situation. Roma households have to cope with deep and frequent problems with housing in general and energy use in particular. The UNDP study reports a high incidence of overcrowding (26% of Roma households live in dwellings with maximum of 5m² per person), inadequate access to drinking water (6% of Roma households don't have access to drinking water), non-standard conditions for personal hygiene, etc. Almost every fifth Roma household surveyed reported an interrupted connection to electricity supplier during the previous year; 38% of these households remained without access to energy for three or more months (UNDP, 2012, p. 71). The most frequent reason for disconnection from the electricity supply was lack of financial resources (68%). Disconnection as a result of technical difficulties was rare (12%). This reveals a very deep exclusion of a significant part of the population from a standard way of life. The evidence that majority of Roma households use non-standard tools for heating of their dwellings supports these findings. Central heating is uncommon (7% of households, compared to 48% of households belonging to the control group who live in proximity). Wood/coal stoves represent the most common method of heating in Roma households.

There are also big differences within Roma households. Those living in segregated and separated settlements show deeper and more frequent social exclusion than those integrated with the majority. We find a similar situation in housing conditions and access to energy; the further the distance from majority, the poorer the access to electricity and other energy sources.

Unlike the EU SILC, the UNDP survey has indicators, which relate more directly to energy poverty. This approach was employed in the UNDP survey to help test the hypotheses on exclusion from standard use of energy and its consequences. This approach also provides deeper insight into the access to energy for the general population. Along with regularly repeated questions (so-called "core" variables"), each year the EU SILC includes an ad-hoc module exploring selected specific area of living conditions and social inclusion. In 2007, the module on housing conditions was added,¹³ containing several variables relevant to different aspects of energy poverty. These help us supplement the information on number of households that have arrears on energy bills and can't afford to

¹³ Among other thematic issues there are intergenerational transmission of poverty, social participation, material deprivation, intra-household sharing of resources, over-indebtedness and financial exclusion.

heat their home adequately. At the same time it is important to pay attention to the limits of these data. They are not collected on a regular basis, therefore they don't provide up-to-date information and don't facilitate the tracing of development of disadvantages in time. For the purpose of this paper we use the four indicators shown in Table 4. As we can see, they cover "material" aspects of energy poverty i.e. lack of equipment necessary for keeping the home at an adequate temperature. The four indicators represent a useful extension of the concept lying behind the ability to keep a home warm.

Table 4

Inadequacy of Energy Equipment in the Home (% of persons, 2007)

	Population	Non-poor	Poor
Inadequate electrical installation	5.1	4.7	8.2
Inadequate plumbing/water installations	5.2	4.7	9.0
Dwelling not equipped with heating facilities	0.2	0.1	0.9
Dwelling not comfortably warm during winter time	13.0	11.7	24.0

Note: Lack of heating facilities means no fixed heating facility in household.

Source: Eurostat, based on EU SILC.

According to the 2007 data, dwellings without heating facilities were very rare in Slovakia. When we compare this to the UNDP data collected only three years later, we may conclude that there is a weak coverage of the most vulnerable groups in the statistical survey.

Table 4 shows that high prevalence of heating facilities at the level of total population didn't lead to sufficient outcomes in terms of maintaining adequate warmth in houses. Comfortable¹⁴ warmth during wintertime was inaccessible for 13% of the population. However, it was poor people who suffered more frequently from restricted access to energy equipment and related outcomes in terms of warmth. Almost every fourth poor person in Slovakia thus lived in a dwelling which was not comfortably warm during winter time. The relationship between income poverty and symptoms of energy poverty is beyond reasonable doubt.

Discussion on Energy Poverty in the Slovak Republic: Preliminary Assessment and Challenges for Future Research

The study of energy poverty in the Slovak Republic is a rather challenging and complicated task. Our aim is not to find answers to all of the problems but to provide a valuable review of important questions for future research, based

¹⁴ We put aside the problems arising from the use of the term „comfortably“ instead of the term „adequately“.

on theoretical considerations and empirical analyses. Probably the most urgent challenge is to conceptualize energy poverty in our context and conditions.

Discussion about the concept should take place prior to looking for an exact definition (i.e., definition set forth by the authors in this article serves only as an example of one of the several possible approaches – based on the three details explored sub-indicators). Analogous to the poverty debate, the concept of energy poverty should be discussed in terms of the (share of) expenditure on energy, income situation of household, deprivation in living standard, and interventions of relevant actors (eligibility for given public support, problems with distribution companies), etc. Each choice has its own logic and consequences for the further development of the exact definition (e.g. certain threshold of the proportion of expenditure on energy, inability to keep the home adequately warm combined with another disadvantage, etc.).

The energy poverty concept based on a household's expenditure is straightforward, understandable and relatively easy to calculate. It reflects the real burden of energy costs on a household budget. The idea of a disposable household budget, after paying for energy, also has useful public policy connotations. Moreover, it could rely on permanently collected information about consumption patterns. Of course, there are many more "technical" questions, which remain unanswered, as illustrated by the UK approach, which works with modelled inputs, rather than real expenditure. Building and validating such models requires detailed data on characteristics of dwellings. For example, energy efficiency is one of the key inputs of such models. By efficiency we mean accomplishing the same task, such as heating or lighting a building of certain size, by using less energy. This lowers costs and reduces emissions. Energy efficiency of a household is determined by design and quality of the dwelling as well as by the efficiency of the heating and lighting systems. In order to model "energy needs", all such information must be available. It should also be accompanied by institutional support of long-term research in methodological and theoretical issues.

Another strategy may rely on actual expenditure patterns although this approach also brings problems. Thresholds used to be calculated on the basis of average consumption patterns of the most vulnerable groups (let's say 10% of total expenditure on energy in the first tenth income percentile). In such a case, the threshold may reflect specific strategies of poor households, which have to cope with very limited income, and thus have to choose among several consumption priorities (preferring to spend in areas which are more pressing than energy-such as food or health care). As result, the threshold may represent pure empiricism without any normative dimension.

The concept of energy poverty may also be saturated by deprivation items (inability to keep home adequately warm, arrears in utility bills). The advantage of this approach is that we would work with real outcomes, not inputs (expenditure, income) and the concept is based on deprivation that refers directly to a lack of necessities. Availability of permanently updated datasets (the EU SILC) is also of great importance. The choice of single indicator may be rather voluntary, from both methodological and theoretical point of view. Instead, we support the combination of several variables that seems to be more appropriate. Disconnection from an energy supplier represents one of the most extreme manifestations of energy poverty. It would be useful if relevant authorities publish such data about their population. It would help to evaluate the scope of the problem and analyse its dynamics at country level. There are however, two potential problems associated with this. Firstly, it is very difficult to obtain such data from mostly private or semi-private energy distribution companies. Secondly, disconnected households may represent only the tip of the iceberg. Buzar (2007) suggests that people in Central and Eastern Europe put great emphasis on paying energy bills on time and that energy debts in the region are associated with a negative social stigma. This means that people may pay their household bills instead of other important expenditures.

Last but not least we recommend focusing on subjective assessments of housing conditions and burdens represented by various housing-related costs. Objections to subjective social indicators are successfully dealt with in recent literature (Valentová, 2003; Van den Bosch, 2001; Veenhoven, 2002), which find they are routinely used in analyses of poverty, well-being, and quality of life. A subjective perspective may enrich the concept of energy poverty¹⁵ because personal experiences often differ from objectively observed behaviour patterns.

Taking into account available data and their nature, we suggest to measure energy poverty as a combination of three partial indicators, which cover deprivation (inability to keep home adequately warm), financial difficulties (arrears on utility bills) and relationship between expenditures and income (housing costs overburdening). According to this definition, as many as 14.8% of people is at risk of energy poverty. These and other findings discussed in the article confirm, that energy poverty is a serious problem and it needs to be addressed. There are first attempts to open the policy discourse and put this problem on the agenda. Regulatory Office for Network Industries in Slovakia published in 2013 *Concept of the Consumers Protection Falling into the Category of Energy Poverty*. Their approach to defining energy poverty is based on the three main aspects: (i) Calculation of the cost for providing minimum energy needs for a households

¹⁵ For use of subjective indicators in relation to income poverty in Slovakia see Gerbery (2009).

(depending on the number of household members, current energy prices, the type and use of the energy and the corresponding tariffs for the supply and distribution of electricity and gas); (ii) Set up a threshold of minimum net monthly household income (minimum monthly disposable household income) as a multiplication of the minimum energy needs of the household as determined in point 1; and (iii) Household can be categorized as energy poor if it satisfies the condition that the monthly disposable income of the household at the time of its assessment is less than the minimal monthly disposable household income as determined in point 2. The Concept is step into the right direction, yet the proposed definition is according to our opinion too narrow and should take into account broader context of the energy poverty problem. In addition, there is still lack of definition on minimum living standard in Slovakia. It would be a good starting point for addressing energy poverty problems.

In modern societies access to energy is a basic condition for full participation. In this context, even short-term deprivation results in serious difficulties for the people affected. We suppose that, irrespective of the chosen concept, energy poverty should be understood in terms of exclusion from the normal standard of living, which has damaging effects on human dignity of people and their participation in social activities.

Concept of energy poverty and its definition should have clear implications in terms of enhancing public policies to intervene, and address deprived living conditions. Until now, little effort has been made in this direction. For instance, housing allowances are provided only to the people living in the material need. Yet because of conditions (often ignoring difficult and complicated situation of the poor), many of those who should be eligible for the allowances do not qualify for them.¹⁶ More measures for inclusion are needed, taking also into account access to energy in a broader sense.

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¹⁶ See for example Slovak Anti-Poverty Network (2014).

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