

SUSTAINABLE DEVELOPMENT AND ENERGY POVERTY: CHALLENGES FOR THE GOVERNING INSTITUTIONS

This article presents the major challenges faced by the state for tackling energy poverty as one of the barriers to sustainable development not only of the energy sector but also of the society. The article presents the scope of energy poverty in Bulgaria, the underlying factors, the consequences, and the trends of development in the last three years until 2016. The article also provides a brief guide to tackling the challenges of combating energy poverty.

JEL: Q01; B41; B55; C18; D63; P36

1. Actuality of the problem

Energy poverty in Bulgaria is the highest in the European Union. In 2010 it is defined as covering 67% of the country's population². Since then, until the end of 2018, several things have changed. **Firstly, energy poverty in Bulgaria increases**, although the same Eurostat statistics report a sharp fall in population coverage – from 67% in 2010 to 46% in 2011 and a steady decline in the remaining few years to 36.5% in 2017, without any significant changes in the methodology of the study. At the same time, the energy poverty in Luxembourg and the EU countries that hit the lowest levels in 2010, doubles by 2017. With the change in the data reported by the statistics on income and living conditions, the differences in the levels of energy poverty among EU countries diminish. However, Bulgaria remains again with the highest level of energy poverty in the Union. Country data showing a deepening of energy poverty.

Secondly, electricity prices in Bulgaria mark an increase by 16% from 2010 to 2017 in Bulgaria and by 24% on average in the EU in the same period. Only for the period 2014-2016, the increase in electricity prices is 14.9% for Bulgaria and 0.7% for the EU. Per capita energy expenditure gradually rises from 579 BGN in 2014³ to 586 BGN in 2016

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² According to Eurostat's subjective measurement of the Survey on Incomes and Living Conditions (SILC) that takes place annually in the EU.

³ Anonymized data from the NSI Household Budget Surveys.

while the net total income per person drops slightly from 5,034 BGN per year in 2014 to 4,530 BGN in 2016 despite the increase in the nominal total income per person.

Third, there is no radical change in the policy of energy poverty in Bulgaria. The only existing policy remains the targeted heating allowances, which during the period increased from BGN 56.7 per month in the season 2010/2011, BGN 65 in 2011/2012 and BGN 72 in 2014/2015 and 75 for 2018/2019. The scope of the target group remains unchanged. In April 2016, the Ministry of Energy adopted a Mechanism for the Protection of Vulnerable Energy Users which implies the introduction of a social tariff for electricity, but this mechanism is still not implemented in December 2018. For the period 2015-2016, a total of 2,184 households in 155 buildings have received funding for the renovation of their homes from Operative Program for Regional Development (OPRD) 2007-2013, which represents less than 0.05% of all panel housing in the country. At the same time, 2,000 buildings have applied for the new National Energy Efficiency Program for multifamily buildings⁴, or nearly 10% of the panel housing in the country. Many of these buildings have not been renovated during the period, meaning that energy efficiency measures have not had a real effect on the level of energy poverty yet.

Within the European Union, several important things are happening: 1) energy poverty is set as the No. 7 objective in the 17 objectives for sustainable growth of the Union, measured by 2030, at the proposal of the United Nations⁵; 2) On November 30, 2016, the European Commission introduced the Clean Energy for All package in order to provide the necessary legal framework for meeting the objectives of the Paris Agreement. In December 2018, four of the eight dossier packages were formally adopted and political agreement was reached for the other four. In the packages, policies directly related to energy poverty. Are the energy efficiency requirements for buildings and the new energy market rules requiring Member States to measure and monitor energy poverty and to report to the Commission every two years; 4) An Energy Poverty Observatory is set up on 29 January 2018 in Brussels, and the website “Fuel poverty network”, which brings together energy poverty articles by researchers from all over the world, moves under the new Observatory website (<https://www.energypoverty.eu/>).

In Bulgaria, besides the aforementioned policy measures, the term energy poverty becomes more popular. Several discussion forums and round tables are organized on the topic, several reports are presented with proposals for measures by independent institutions. In general, there is a lack of political consensus on the term, a lack of understanding of the nature of the phenomenon, both among the population and experts, and unfortunately – there is no change in the legal framework introducing the new term and setting criteria for new target groups, nor of the statistical framework of the National Statistical Institute (NSI) to cover the phenomenon, not directly in the policies. There is a lack of awareness of the importance of introducing a methodology for measuring the required energy cost of

⁴ Adopted by Decree No 18 of the Council of Ministers of February 2, 2015, on the Terms and Procedures for the Grant of the Program and the Bodies responsible for its implementation (Prom. y) (Prom., SG 10/02 February 6, 2015)

⁵ Goal 7 for Sustainable Growth: Providing access to affordable, reliable, sustainable and modern energy for all.

households – the cost they have to make with their existing housing conditions (energy efficiency class), and energy consumption patterns to reach the heating comfort of 21⁰C for heated rooms and 18⁰C for unheated rooms, as set by the World Health Organization. This is the first step towards introducing a comprehensive management approach by defining energy poverty, defining the specific target groups and developing a strategy with measures, funding, and specific targets to reduce the number of the target groups.

2. Dimensions of energy poverty in Bulgaria

2.1. Methods of measuring energy poverty

There are three main approaches to measuring energy poverty: 1) an objective approach (based on the consequences of energy poverty – diseases and mortality), 2) a subjective approach (also called "conceptual") in Harriet Thompson (Thompson, 2016) and Trinomics (Rademaekers, 2016) articles based on the subjective perception of energy poor respondents), and 3) an expenditure approach (based on energy costs). Practical application of two or more of the above approaches uses the term “combined approach” (Rademaekers, 2016).

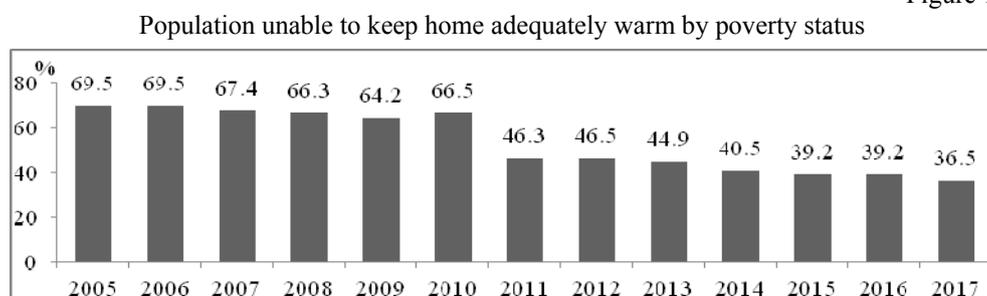
The objective approach monitors indicators such as mortality and illness as a result of energy poverty. EU-wide indicators have been used for the past few years, such as mortality from fine particles in the air, respiratory illness in the winter, etc. As a part of these statistics, it can be said that in Bulgaria the mortality rate from respiratory diseases has increased in recent years, from 48.3 per 100,000 population in 2013 (NSI, Health 2017) to 54.5 in 2014 , 56.4 in 2015, 62.1 in 2016 and 64.5 in 2017. Unfortunately, it is unclear what the severity of the various factors behind this trend and how much energy poverty has affected these outcomes.

The subjective approach provides information on the actual energy needs subjectively assessed by the households themselves through surveys. It includes indicators of the number or percentage of households who fail to keep their home adequately warm, have difficulty paying their energy bills in time and/or have serious difficulties paying their utility bills. These indicators are set out in the Survey of Incomes and Living Conditions (SILC) of Eurostat as part of the material deprivation indicators. They were officially approved and added to the set of indicators for social inclusion at EU level only after 2009.

According to the subjective approach most often cited in EU policy documents, energy poverty in Bulgaria has declined in the last few years since 2011, with no change in methodology.

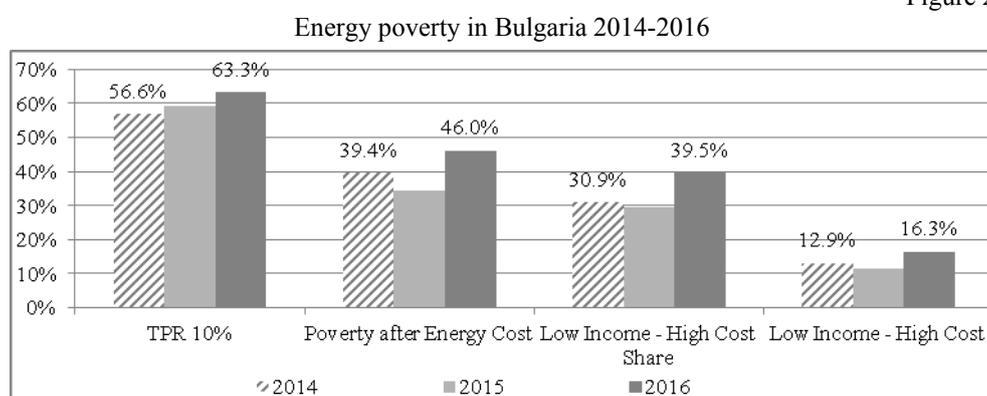
The expenditure approach is based on data on household incomes, their costs and in countries with available data, their housing characteristics. Within the expenditure approach, there are many options for defining energy poverty. According to the expenditure approach, regardless of which definition, energy poverty is growing in Bulgaria during the 2014-2016 period.

Figure 1



Source: Eurostat.

Figure 2



Source: NSI, own calculations. 1) 10% rule: Household is energy poor if its energy expenditure exceeds 10% of net income; 2) Poverty after energy consumption measures households with net income after energy cost under the official poverty line; 3) LI-HCS – households with a net total income below the poverty line and a share of energy cost above 10%; 4) LHHC – households with a net income below the poverty line and energy expenditure above the median for the country. The poverty line for the three definitions is according to the SILC for the respective year.

Although there is a slight decline in the energy poverty level in 2015, according to three of the definitions, this is due to the decline in the relative poverty line that is being used by these definitions. However, no matter which definition is applied, there is an increase in the percentage of energy-poor households in the country in 2016 compared to the previous two years. This is due to several reasons, discussed in more detail in the next section.

3. Factors Impacting Energy Poverty

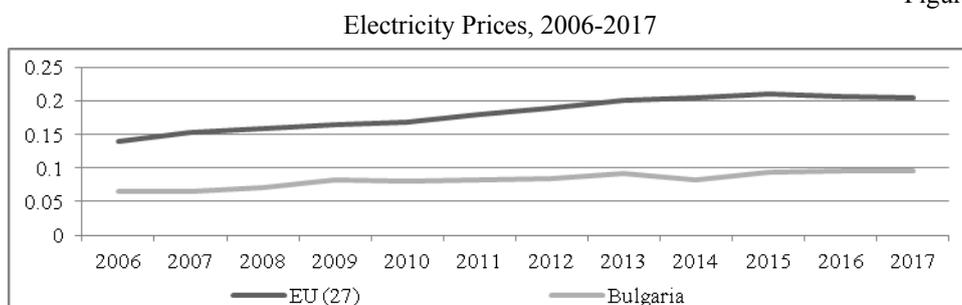
Energy poverty is a function of both household incomes and energy costs. Household incomes are flexible and depend mainly on the employment and economic activity of households themselves, and the economic situation in the country. Energy costs are not entirely flexible, excluding energy prices. They depend on the dwelling conditions and the

efficiency of the energy resources, appliances and heating systems used in it. Energy costs are expressed through quantity and price. The energy efficiency of the dwelling and the used electrical appliances and heating systems determine the quantity needed. Energy prices determine the value of energy costs. Between 2014 and 2017, electricity prices follow a steady upward trend in Bulgaria.

3.1. Energy cost increase

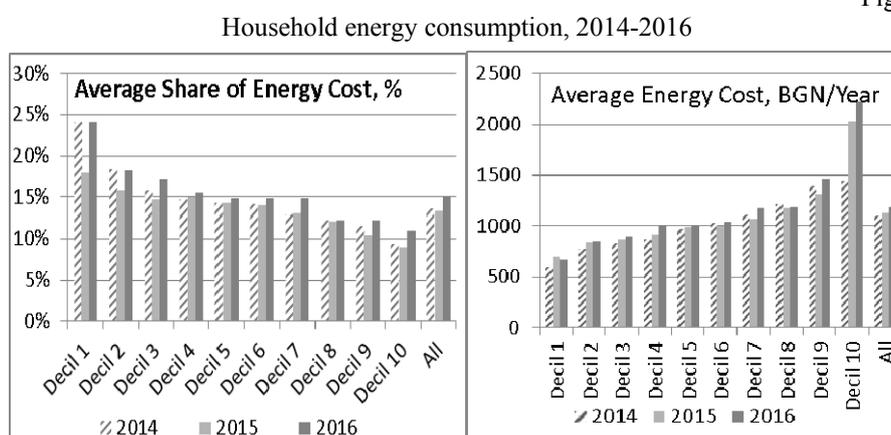
Electricity prices in Bulgaria increase by 16% from 2010 to 2017 in Bulgaria and 24% on average in the EU, with the price increase in Bulgaria more intense in the last years of the period under review. Only for the period 2014-2016, the increase in electricity prices is 14.9% for Bulgaria and 0.7% for the EU.

Figure 3



Source: Eurostat.

Figure 4



Source: NSI, own calculations

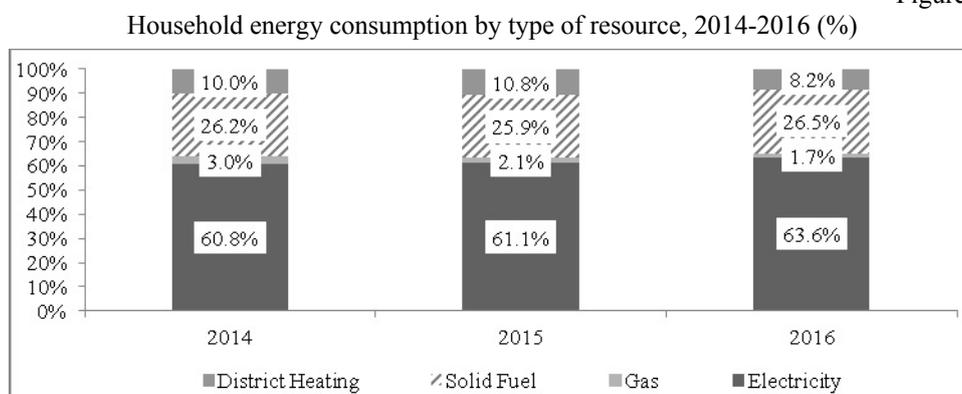
Since the bulk of household energy costs are generated by electricity consumption, the main energy resource in the sector, inevitably, and total energy consumption increases alongside electricity prices. It is important to note that if, in 2015, with the fall in the

poverty line, low-income and high-income three decile groups⁶ show a relative drop in the share of energy expenditure relative to 2014, then during the same period, the average decile groups increased in this share, which shows the impoverishment of the middle classes of society.

3.2. Changes in the structure of consumption

At the same time, the structure of consumption changes, with tendencies to reduce the use of district heating by heating companies and gas and an increase in the percentage of electricity and solid fuel consumption. It is also important to take into account trends in decile groups, indicating the conditionality of choice of energy resource by price.

Figure 5



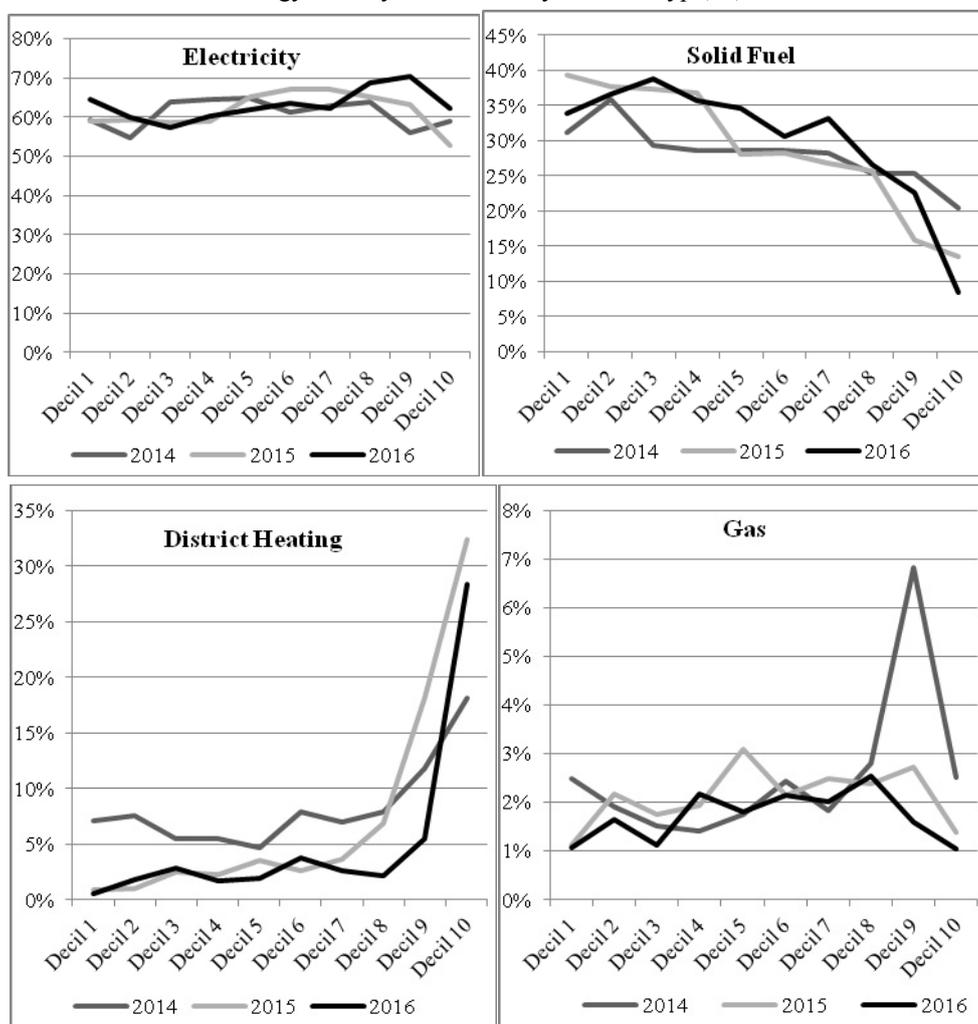
Source: NSI, own calculations.

The percentage of households using solid fuels from the first four low-yielding decile groups increases each year, while higher-income groups are more likely to move to electricity. The use of TPP falls below 2% for low-income 40% of the population, while 20% of households with the highest yield increase to 25%. In 2015, when the winter season recorded the lowest temperatures at the beginning of the year, the low-income groups with a solid fuel increased sharply by about 6-7% from an average of 31% in 2014 to 37-38% in 2015, and again slightly return to 36% in 2016. All this shows the strong link of incomes with the structure of consumption.

⁶ Lower and upper 30% of the population by income.

Figure 6

Share of energy used by households by resource type, %, 2014-2016



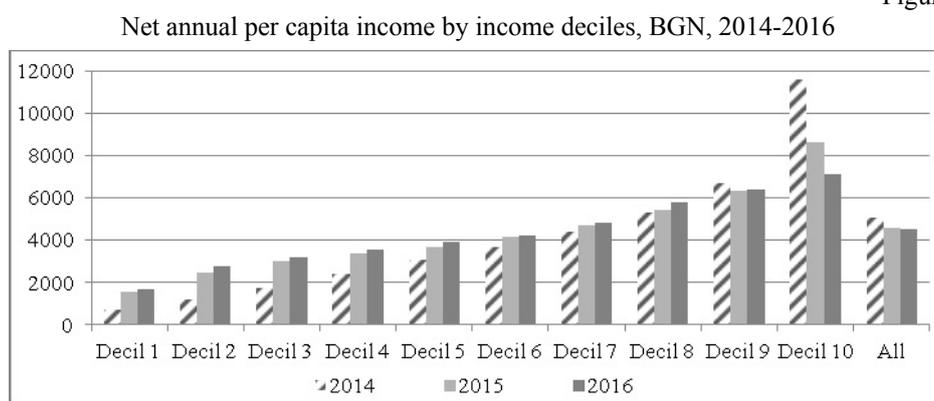
Source: NSI, own calculations

3.3. Per Capita Income Decline

The change in the structure of consumption in the high-income decile groups is much more dramatic than the rest, as they also suffer a drop in the per capita income during that period. Although the lower decile groups do not follow this trend, the country's total data shows a drop in the net per capita income. This is mainly due to a change in the demographic structure of households. The number of individuals per household falls by about 5% on

average for all households, from 2.42 persons in 2014 to 2.30 persons in 2017. This rate of decline is nearly twice as high in low decile groups. However, the rate of increase in the per capita income in the lower decile groups results in an increase in the per capita energy expenditure. Only in the highest-income 20% of the population, the income decline also reflects a decline in the energy expenditure, but also a growth in the share of expenditure in the household's total net income. There is an increase in the share of consumption in the middle classes of society, where the percentage of energy poor grows in 2014-2016.

Figure 7



Source: NSI, own calculations.

4. Problems for the governing institutions

The statistics above clearly show that there is no reason to believe that the subjective assessment of respondents in Eurostat's SILC reflects the real situation in the country. There is no decline in the energy poverty in Bulgaria during the 2014-2016 period. Unfortunately, this indicator is set to monitor the EU's sustainable development goals, the seventh goal of which is to provide affordable, reliable, sustainable and modern energy for all by 2030 (Goozee, 2017). An interesting fact is that among the indicators for monitoring the sustainable growth targets in Bulgaria, in the energy and climate part, this indicator is not set, nor is another indicator for energy poverty. There is no mechanism to monitor energy poverty. The need for such a mechanism is also enshrined in the new EU political documents of 2018.

Energy poverty is seen in the context of energy savings targets in buildings and the financing of a series of measures to renovate the building stock. The latest EU documents set a new EU energy efficiency target for 2030 from 32.5% with a revision clause up to 2023.

From the data in the article above, it is clear that in Bulgaria, low-income 70-80% of the population increase their energy expenditure in the presence of growth in net total income. Such behavior clearly indicates the existence of energy poverty, which is a hindrance to investment in energy efficiency measures. The EU's expectations for real energy savings

between 2021 and 2030 are challenged in our country, precisely because of the high levels of energy poverty and the widening trend.

In June 2018, Directive (EU) 2018/444 amending Directive 2012/27 / EU on energy efficiency and Directive 2010/31 / EU on the energy performance of buildings was adopted. The directive imposes greater data requirements, increased transparency of energy efficiency calculation methodologies for buildings, ensuring the use of information and communication technologies and supporting the renovation of buildings by linking policy and funding with results (Claudia Canevari 2018) . In a few countries in the EU and the UK, this policy is tied to the policy of reducing energy poverty by reducing the rate according to the energy class of the dwelling.

The development of a methodology for monitoring energy poverty requires a household housing database to be combined with data on the household structure and income, types of appliances, and energy consumption regime. It is necessary to implement regulatory expenditure on energy, to monitor energy poverty and not to use actual expenditure, which is often suppressed due to underconsumption or rarely also overconsumption, where households have a high income. These are important, unavoidable steps to achieve the above goals.

Each government should bind its energy efficiency policies with a clear policy of reducing energy poverty, with all the steps and phases of the governance cycle. First of all, this includes the setting of new indicators in statistical research, the development and adoption of a methodology for monitoring regulatory energy consumption, and the adoption of a definition of energy poverty. Only this will bring us closer to the goal of accessible and sustainable energy for all.

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