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Energy poverty in Bulgaria. Policy measures for alleviating it.

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ABSTRACT OF THESIS submitted by:
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The current study examines the energy poverty problem in Bulgaria from an energy and environmental justice perspectives. It aims to contribute to the efforts for alleviating the energy poverty in the country by proposing "how a holistic and inclusive approach against energy poverty should look like in the Bulgarian context". During literature review and in-depth interviews with Bulgarian experts in related fields are evaluated the present state, good practices, problems and solutions within three Bulgarian policy measures. The discussion on measures, address directly the energy poor citizens or have such potential (Social Tariff, Winter Supplement Program, Program for Energy Efficiency in Multifamily Residential Buildings) is followed by country-relevant recommendations and on the usage of the Bulgarian experience abroad. A holistic approach in Bulgaria should integrate a wide information campaign on the benefits of energy saving and smart energy use, short-term measures like environmentally friendly energy benefits (only for the people living in worst housing and receiving the lowest incomes with differentiated amounts in accordance with fuel type and individual needs) with long-term energy efficiency investments on renovation of the buildings and on efficient heating units and appliances (with a minimal self-contribution for energy poor households for bigger interest in the process and care afterwards). A special fund for support of energy poor people could be created to help them cover their co-financing. The proposed improvements are financially durable solutions, which could bring the highest positive effect on the living conditions of the target group and society in general.

Keywords: Bulgaria, energy poverty, energy justice, energy benefits, energy efficiency, social tariff, policy measures, problems, solutions, recommendations.

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Table of Contents

List of Tables

List of Abbreviations

ANRE - Romanian Energy Regulatory Authority
BPIE - Buildings Performance Institute Europe
CEE - Central and Eastern Europe
CO2 - carbon dioxide
DG – Directorate General
DH – district heating
DHS - district heating system
DMI - differentiated minimum income
DTI - Department of Trade and Industry
EA - Environmental Association
EERSF - Energy Efficiency and Renewable Sources Fund
EESC - European Economic and Social Committee
EMI - Institute for Energy Management
EPEE - European fuel Poverty and Energy Efficiency
ESCO - energy savings company
EU – European Union
EU-ETS
EU-ETS – European Union emissions trading system
EWRC - Energy and Water Regulatory Commission
EWRC - Energy and Water Regulatory Commission
GHG - greenhouse gas
GMI - guaranteed minimum income
IEA - International Energy Agency
IME - Institute for Market Economics
IMF – International Monetary Fund
ISSR - Institute for Social and Syndicate Research
KNSB – Konfederaciya na nezavisimite sindikati v Bulgaria
[Confederation of Independent Trade Unions of Bulgaria]
KSH - Központi Statisztikai Hivatal
[Hungarian Central Statistical Office]
ME - Ministry of Energy
Ministry of Regional Development and Public Works.
MLSP - Ministry of Labour and Social Policy
MRDPA - Ministry of Regional Development and Public Affairs
NEC - National Electric Company
NGO – non-governmental organization
NSI – Nasional Statistical Institute
OPRR – Operational Program “Regions in Growth”
PM - particulate matters
REACH – Reduce Energy Consumption and Change Habits
REECL - Residential Energy Efficiency Credit Line
RES – renewable energy sources
SAA - Social Assistance Agency
SEDA - Sustainable Energy Development Agency
SEE - South East Europe
SILC - statistics on income and living conditions
VCWG - working group on vulnerable consumers

1. Introduction

1.1. Background

Energy poverty is most often defined as "*a situation where individuals or households are not able to adequately heat or provide other required energy services in their homes at affordable cost"* (Rye *et al.* 2015). Various studies have identified that the low levels of energy efficiency in buildings, low income levels and high energy prices are the main contributing factors to energy poverty (Bouzarovski 2011, Grevisse and Brynart 2011, Thomson and Snell 2013, Atanasiu *et al*. 2014).

Until the middle of 2016, Bulgaria has been undergoing a transition to fully liberalized energy market, expected by 2022 at latest. The electricity prices have been rising since the end of 90s almost on an annual base (Bouzarovski *et al.* 2012), and will continue to rise till 2022. Bulgaria has a legacy of inefficient buildings, a product of low standards and poor materials. They are combined with outdated supply system and heating units/appliances and mass energy wasting behavior of the population. Despite gradually improving, the socio-economic situation in the country is still primary characterized with low to medium incomes like around 22% of the population is estimated to be under the national poverty line (NSI SILC 2015).

The energy poverty is an emerging research field in Bulgaria. After recent reports with alarming statistical figures on energy poverty indicators of EU SILC (Eurostat 2016a), it has been recognized as a policy problem for the whole European Union, which also offers possibilities for gaining multiple benefits. The Bulgarian situation has been briefly discussed in EU-level reports like Rye *et al.* (2015), "State of the Energy Union" (EC 2015b), as the latter declared Bulgaria "the most vulnerable country in EU".

1.2. Added value within the field

Despite the seriousness of the problem, the energy poverty did not receive much political attention. There is a limited number of studies by Bulgarian scholars (Kisyov 2014, Peneva 2014, 2015, Tomov and Nikolov 2015) and international ones (Buzar 2007, Bouzarovski *et al.* 2012, Bouzarovski 2014, Bouzarovski and Tirado Herrero 2015). Now, with the recent interest on the issue by EU, the Bulgarian government, as well as, all affected Member States are required to take protective actions towards this segment of the population (Rye *et al.* 2015). Solutions for this already harsh problem in Bulgaria, which will be further accelerated with the forthcoming full energy market liberalization, should be sought. Some measures with limited scale and effectiveness have been taking place, which have the potential to make real improvements of the situation of energy poor households, if effectively using the available funds and attracting new ones. Thus, in order to have an adequate policy against energy poverty, an assessment of the positive and negative features of the current and proposed policy solutions, should be executed. The current study wants to contribute to these efforts by giving recommendations on improvements in the measures in terms of energy justice, sustainability and effective spending of public money. The study is also aiming to contribute to the discussions on the topic, initiated with the announcement of Bulgarian definition on vulnerable energy consumers in May 2016 (ME 2016b).

1.3. Aims and objectives

1.3.1. Aim

Find answer of the research question: "How a holistic policy approach against energy poverty in Bulgaria should look like?".

1.3.2. Objectives

1. Identify problems and propose solutions through an assessment of the current state, positive and negative features of current and proposed policy tools for addressing energy poverty in Bulgaria.
   - **1.1** What kind of prospective problems the social tariff could bring and how to be addressed?
   - **1.2** How the identified problems within the Winter Supplement Program could be improved?
   - **1.3** How can the energy poor people in Bulgaria be integrated in Energy Efficiency programs for multifamily and individual buildings?
2. Provide recommendations on improvements in the Bulgarian energy poverty policy mix.
3. Provide recommendations on how the Bulgarian experience could be used abroad.

1.4. Structure of the thesis

The followed structure was first to explore the current state of existing and forthcoming policy solutions in order to identify their positive features, which usage should continue in the future fight against energy poverty. Then problems and deficiencies were detected in order to come up with recommendations. During interviews with relevant experts from governmental and non-governmental sector were debated the problems in current measures and the applicability of prospective changes. After providing country-relevant recommendations on improvements in the measures will be discussed how the Bulgarian experience could be used abroad - presumably in countries with similar socio-economic conditions and history, in EU and beyond.

1.5. Overview of the used methodology approach

To fulfil the aim and answer the research question "How an improved mix of policy solutions against energy poverty in Bulgaria should look like?" the author used peer-reviewed and policy literature on anti-energy poverty measures on EU and national level, as well as empirical data from face-to-face interviews with Bulgarian experts in energy, housing, social protection, energy efficiencies, eco-financing, from the governmental and non-governmental sector.

2. Academic literature review

2.1. Introduction

The following text is a review of the discussions in the field of fuel and energy poverty since the emergence of the notions to the present moment and how relevant to the Bulgarian context the debates are. It tackles questions on what the aspects of the domestic energy deprivation (Bouzarovski 2014) and the contributing factors in countries of various development level are. The classical definition and the proposed amendments are examined, which make it a more inclusive and well-targeting measurement tool are examined. Special attention is given on the matter how the notion can be enriched through the energy vulnerability, capabilities and injustices perspectives.

2.2. Early history and classical definition of energy poverty

In 2012 "Energy Policy" Journal released a Special Issue, commemorating 21 years of research and policy on fuel poverty, showing the high degree of recognition and importance of the fuel poverty issue. The problem of "fuel poverty" was recognized in UK and Ireland for the first time in the academic literature. In their local context, researchers like Boardman (1991, 2010), Campbell (1993), Healy and Clinch (2004), Liddell (2009) were studying cold and inefficient homes and their associated effects on health and wellbeing. Liddell (2012) pointed out in an Introduction article within the Special Issue, that Boardman was not the first one to talk about the fuel poverty issue, but her work made it recognizable and worth public and political attention. Liddell calls Boardman's first book "a masterclass on fuel poverty", as Boardman has combined the roles of "pioneer researcher, strategic thinker, campaigner and mentor to a new generation".

According to the original definition by Boardman (1991) fuel poverty occurs when a household could not "*have adequate energy services for 10 per cent of income".* She explains that the "emphasis on capital expenditures is what differentiates fuel poverty from poverty. Raising incomes can lift a household out of poverty, but rarely out of fuel poverty." Boardman identified an energy inefficient house as the root cause of fuel poverty. Her initial intention was to improve the thermal efficiency of the English homes in order to enhance the quality of life, while keeping warmth affordable (Liddell 2012).

A series of critiques of this initial definition followed, mainly on the technical side of determining the income thresholds, including a re-definition by Boardman herself ((Healy 1999), Boardman (2010), Hills (2011), Moore (2012), Liddell *et al*. (2012)). In her second book Boardman suggested using twice the median of the income instead 10% of incomes, as it is a more appropriate tool in regards to floating inflation and is better suited for monitoring purposes. Hills' approach (2011) measures the fuel poverty through a "Low Income-High Costs" indicator (LIHC), according to which fuel poor are households below the conventional 60% of the median residual income poverty line and whose fuel costs are above the median level. Moore's paper (2012) compared different measurement approaches towards the 10% UK definition and concluded that "the size of the problem depends on the definition and chosen threshold". Legendre and Ricci (2015) also stated that the proportion and characteristics of fuel poor depend on the chosen measurement method. Moore's results are quite intriguing, clearly showing different numbers and even affected groups when a slightly changed income composition and threshold are used. The expression "adequate energy services" is also disputed (Clinch and Healy 1999), as the adequacy depends on factors such as climatic conditions, dwellings characteristics, health status of the residents. For instance when talking about a

"satisfactory heating regime" most often the recommendations of World Health Organization are followed – "21 degrees C in the living room and 18 degrees C in the other occupied rooms", as below that level there is an increased risk of respiratory and cardiovascular illnesses stated in seniors and asthma in children (Boardman 2010). The Scottish Local Housing Guidance Strategy (2014) recognizes the needs of "elderly and infirm households", who should be able to heat their living rooms 2 degrees higher.

2.3. Energy poverty from developing countries' perspective

In the developed countries the affordability of energy and the insufficient thermal comfort seem to be the main concerns, usually framed as "fuel poverty". In less developed countries access to energy is still an alarming issue and the supply-side deficiencies and inequalities are regarded as "energy poverty" (Lee *et al*. 1999). Energy access, as defined by International Energy Agency (IEA 2016), is "about providing modern energy services to everyone around the world". These services include "access to electricity and clean cooking facilities (e.g. fuels and stoves that do not cause air pollution in houses)". Currently 1.2 billion people lack access to electricity, whereas more than 2.7 billion people cannot use clean cooking facilities, according to IEA.

Authors like Li *et al*. (2014) consider fuel and energy poverty as distinct notions. According to Li's team, fuel poverty is inherent in "wealthy countries with cold climates", while both accessibility and affordability problems might be experienced only by people in rural China, Nepal, India or homeless people in wealthy countries. Bouzarovski *et al*. (2014) do not agree with Li and his colleagues that the two notions of poverty are so different in their essence. They argue that "*all forms of household-scale energy deprivation share the same consequence: A lack of adequate energy services in the home, with its associated discomfort and difficulty."*

2.4. Energy poverty from energy vulnerability perspective

Bouzarovski *et al.* (2014) use the conceptual framework of "energy service poverty" to integrate all kind of factors leading to domestic energy deprivation or "energy vulnerability". Such factors are, as expected, affordability and accessibility concerns, but also efficiency and flexibility (for example, when a mismatch between the personal energy service needs and the available heating or cooling options in the dwelling is present). The broader "energy vulnerability" perspective justifies why recently the use of "energy poverty" notion has been preferred, although the fuel and energy poverty notions have been used interchangeably in different European countries. When talking about the Central and Eastern Europe, the energy poverty notion is probably preferred as a more appropriate connotation of the multi-dimensional energy challenges in the region. Another possible reason, which will be discussed in the forthcoming Policy Review Chapter, seems to be the associated with European Energy Union newly prioritized aim towards energy security after the Russia-Ukraine Gas Disputes (LaBelle 2016b), particularly damaging for CEE countries.

2.5. Energy poverty from capabilities perspective

Despite the fact that a definition of "good, sufficient and just life" is still contested, the access to energy resources remains fundamental, because there is an enduring positive correlation between energy consumption and wellbeing, according to Day *et al.* (2016). Day and her colleagues offered one of the most recent and comprehensive definitions of energy poverty, based on the capabilities perspective of Amartya Sen and Martha Nussbaum (Sen 1999; Nussbaum 2011):

Energy poverty is the "inability to realise essential capabilities as a direct or indirect result of insufficient access to affordable, reliable and safe energy services, and taking into account available reasonable alternative means of realising these capabilities".

One particular strength of the study (and the definition) is that the capabilities perspective can be positioned in all well-known energy poverty approaches (focusing on the access to modern energy (or its lack), affordability or the energy inefficient buildings and infrastructures). Furthermore, they are talking about "safe" energy services as for them "the combination of fuel, appliance and usage", not the fuel itself, contributes to both cleanliness and safety.

2.6. Energy poverty from energy justice perspective

Fuel poverty advocacy groups in the UK and increasingly in other countries have been campaigning for "the right of (affordable) warmth" (Walker and Day 2012). Boardman (2010) also contributed to the debate on energy as a social human right/welfare right, saying that "everyone needs to purchase fuel to provide essential energy services, such as warmth, hot water and lightning. These are not discretionary purchases but absolute necessities". In their common study, Walker and Day (2012) also explored the fuel poverty in the context of injustice forms. Fuel poverty is most often regarded as distributive injustice - "unequal distribution of access to essential energy services", caused by a combination of factors like shortage of income, rising energy price, insufficient efficiency of the dwelling. Meantime, they argue that the fuel poverty possesses the features of the other forms of injustice– injustice in recognition (lack of equal respect accorded to their wellbeing) and procedural injustice (lack of involvement and influence in decision-making (Day 2010)), which also need to be addressed for proper tackling of the problem (Walker and Day 2012).

LaBelle (2016a) offers another definition of energy justice, interlinked with energy poverty and more specifically with the unaffordability aspect. It says that in a "just, well-functioning and

financially sustainable" energy system, "justice is being served on the part of consumers, but also for companies".

2.7. Energy poverty in the CEE region

Tirado Herrero and Ürge-Vorsatz (2012) reminded in their study that around ten years ago the fuel poverty phenomenon in CEE was "virtually unknown" in both academic and policy literature. The first studies on the topic were conducted by Kovačević (2004), Fankhauser and Tepic (2005) and Buzar (2007). The latter author uses the notion "hidden geography" to describe the political and physical invisibility of the energy poverty situation in the region. In his overview of the region, he offers a new definition for energy poverty - "the inability to heat the home up to a socially- and materially- necessitated level". Accordingly, the energy poor people do not have the amount of warmth, allowing them to participate in the "lifestyles, customs and activities which define membership of society" (Folwell 1998). Buzar (2007) also explored the historical context for the emergence of the phenomenon and Tirado Herrero and Ürge-Vorsatz (2012) agreed with him that the liberalization, privatization and unbundling have contributed to the emergence of fuel poverty in CEE. They assume that the full cost of electricity and other energy sources will become unbearable for CEE countries which are still having ineffective heating facilities and inadequate insulation of their building stock. The situation will be triggered even further, as until recently the citizens have become accustomed to plenty of warmth at a negligible cost, due to the heavy subsidization of the energy sector in socialist times.

2.8. Energy poverty in the Bulgarian context

Buzar's analysis (2007) showed that all countries in the former Eastern bloc have experienced a rise in income inequality. That could be explained through inadequate social support-schemes, disproportional to the restructuring of the energy systems, fall of real incomes and increases of

prices. The unaffordability of energy in CEE is even more burdening and alarming issue than in Western Europe, but there is one more aspect, shared to a certain degree between the underdeveloped countries and also in the CEE countries – the lack of access to clean energy sources. The most popular heating method in Bulgaria for example is through stoves/heaters using wood-fuel and/or coal, which is considered the cheapest option. They are preferred by around 90% of the citizens, eligible for energy benefits under the Winter Supplement Program (WSP) (Agency for Social Assistance Bulgaria 2016). In this case, while the Bulgarian state is helping the most vulnerable groups to survive the winter, it is also contributing to their deteriorating health by funding purchases of low-quality coal, burnt in inefficient heaters (Robić *et al.* 2016). This issue will be examined in details in the following sections.

The Bulgarian energy system does not fit into LaBelle's definition of "just energy system", but can be characterized with "*financial burden of corruption, mismanagement and long-term bad planning resulting in users incurring higher costs" (*Sovacool and Dworkin 2015). It seems that the price increases for households, associated with the energy market liberalization process (LaBelle 2016a), have been more painful in the Bulgarian case because of the political (mis) representation. Since socialist times till the current moment (July 2016) the electricity prices have been kept artificially low as a support scheme, valid for everyone. It looks as this populistic move and other mismanagement practices in the energy sector create injustices in a longer term for both companies and households and thus are contributing to the rising energy poverty rates in the country. A tariff deficit accounting of 767 million EUR in 2014 of the National Electric Company (NEC) (LaBelle and Georgiev 2016) was addressed with the establishment of a Fund "Security for the electricity system" (Bulgarian State Gazette 2015). Its contributors are relevant companies in the electricity and gas sectors with 5% of their annual profits. Furthermore the

companies have to pay again for repaying the deficit in the form of tax "contribution to society", which was later reflected in the final electricity bills for both household and industries.

Another typical situation, important from energy justice perspective and connected with the energy vulnerability, is when a low-income Bulgarian household has only one heating option, which even if regarded as clean (district heating systems using natural gas), could become unaffordable, as Tirado Herrero and Ürge-Vorsatz (2012) observed in Hungary. They explored for the first time a new aspect of the fuel poverty, which was prevalent in prefabricated (panel) blocks in post-socialist countries, using district heating. They found that the buildings were adequately heated, but with disproportionally high energy costs, caused by various inefficiencies in the physical and institutional settings of the inhabited building stock and the DH systems. This example of energy overconsumption is simultaneously a challenge and an opportunity for the CEE region, as the big inefficiencies in the residential building stock hide a huge potential for energy savings at a relatively low price. The overconsumption in panel blocks also showed that the fuel poverty is not only a social injustice, but also an environmental one. Fuel poverty energy underconsumption is occurring within an overall climate of energy overconsumption. That justifies the recommendations of researchers (Boardman 2010, Walker and Day 2012, Ürge-Vorsatz and Tirado Herrero 2012), the two energy challenges to be addressed in an interconnected way in order to obtain maximum benefits from the synergies.

According to Boardman (2010) energy poverty is unlikely to occur just because of low incomes. Her observations can be confirmed in Bulgaria, where the incomes are the lowest in EU (Eurostat 2016) and have been rather low in a retrospective plan. A few years ago, many people did not have problems paying their energy bills, despite living in inefficient dwellings and using inefficient appliances. With the recent price increases of electricity and other heating sources

such as DHS, gas and wood, while the income level stayed almost the same (Eurostat 2010-2016), the locals started to have significant problems in terms of affordability. As energy inefficient housing was identified as the energy poverty root cause (Boardman 1991, Liddell 2012); by improving it, the warmth in the dwelling will become affordable and the wellbeing of the household will be increased (Boardman 1991). Furthermore, as Boardman assumes, the fuel poor are living in inefficient dwellings, which are also the most polluting. Actions for lifting them out of fuel poverty will be actions on climate change too, as for both energy efficiency is the best solution (Boardman 2010).

Energy efficiency improvements in low-income households will prevent the occurrence of a rebound effect. Sorrel (2007) understands the rebound effect in the reduction of the benefits from energy savings. He claims that the money saved after implementation of energy efficiency measures and subsequent reduction of energy consumption and energy bill, would be spend on other energy-related expenditures. At the same time, the English EE "Warm Front Program" found out that the coldest homes benefited more from increased temperatures inside, than from bills reduction, as they did not consume much energy in the first place (Boardman 2010). From this point of view prioritizing low-income households for energy efficiency measures would be a wise energy economics solution, but also a cost effective-one. According to Stern (2006) the early actions are less costly than the delays on the route to a carbon-neutral world.

Energy efficiency measures and improvements seem to be a solution for Bulgaria, as the current artificially low price of electricity cannot be kept at the same level for long. It is a matter of time before a liberalization model will be adopted and consequently prices will reflect the real market costs for generation, transmission and delivery of electricity. Assumingly fuel prices will continue to rise in the context of fossil depletion, while the green/clean energy is becoming more

competitive and affordable, but is still at a rather high price (Šefčovič 2016). Whatever happens in the future, if the home is efficient, when the price becomes high, the increase will not adversely affect the household budget.

2.9. Conclusion

It seems that for the Bulgarian context are applicable all "Western" dimensions of energy poverty like unaffordability, inefficient housing and low incomes. Still, similarly to developing countries, Bulgaria lacks access to clean and safe cooking and heating facilities for all its citizens at an affordable cost, described as "safe energy services" by Day *et al.* (2016). Bouzarovski *et al.* (2014) summarized as "energy vulnerability" all applicable to Bulgaria dimensions (affordability, accessibility, efficiency and flexibility). The lack of heating alternatives, another typical for Bulgaria situation is a form of distributive energy injustice (Walker and Day 2016). Other present injustices are the low political recognition (Walker and Day 2016) (resulted in limited support measures), political misrepresentation (LaBelle 2016a) (resulted in energy injustices for both citizens and energy companies) and the lack of public involvement in defining vulnerable consumers' term (to be discussed later). On the other hand, the stimulated woodfuel burning is an environmental injustice not only for the energy poor citizens, but for all other community members and the society in general.

3. Policy literature review

3.1. Introduction

Energy poverty is a national problem, but still it is not recognized by some national governments, despite the startling EU-SILC figures (Bouzarovski *et al.* 2012). Within the European Union the member states are required to ensure adequate protection mechanisms towards the vulnerable energy consumers (Rye *et al.* 2015), but it depends on the political will of the local governors what route they would choose, if any. Some countries like the UK, Ireland, and France have been collecting comprehensive monitoring data on the state of the issue and their anti-energy poverty policies have undergone several adjustments. Their policies are discussed as they have navigated the development of the energy poverty concept and policy across the whole Union. Bulgaria can learn from their experience, but also from practices in countries with similar history and socio-economic conditions like Romania, Hungary, Czech Republic.

3.2. Historical review

As it was discussed in the previous part of the literature review, Boardman's first book (1991) made the fuel/energy poverty an issue worth public attention firstly in the UK and Ireland. Since 2001, the UK has a strategy on Fuel Poverty (the first ever) (DTI 2001). The real seriousness of the issue for the whole European Union was realized after EU wide Statistics on Income and Living conditions were collected for the first time in 2005 (Eurostat 2016a). Self-reported indicators were measured: inadequate thermal comfort at home, difficulties with payment of utility bills/ having arrears and condition of the housing (faults like presence of mould, damp, rot, roof leakages). A report (EPEE 2009) analyzed the gathered data and made important insights on who were the most financially disadvantaged households – *older households, low-income households with dependent children, single parent families, tenants rather than home-*

owners. Similarly looking vulnerable groups (retired people, people living alone; tenants; who use an individual boiler for heating; cook with butane or propane and have poor roof insulation) could be found in Legendre and Ricci's study (2015) on fuel poverty in France. By using Hill's identification approach they concluded that fuel poor are people who have become poor because of their domestic fuel costs.

Results, relevant for Bulgaria, came after 2006, when the country initiated the EU-SILC data gathering (Eurostat 2016a). In 2012, 10.8% of the EU population or around 54 million people could not receive heat at an affordable cost (Rye *et al.* 2015). Bulgaria had the highest rate of population at risk of being unable to keep the home adequately warm (70%) and the third highest rate after Hungary and Greece of the indicator "risk of arrears on utility bills" - 51%.

3.3. Role of EU policies in Bulgaria

Bouzarovski *et al*. (2012) pointed out the fundamental role the EU accession process and international financial institutions like World Bank had for the slow, but steady adoption of anti-energy poverty measures in Bulgaria. Indeed, the liberalization and structural reforms in the energy sector started after 1997, when a Stand-By Arrangement with IMF was signed, followed by currency board and inverted block tariff between 2002 and 2006 (Phillips *et al.* 2003, LaBelle and Georgiev 2016). The start of phasing out of subsidies led to welfare loss and consequent energy degradation – switch to less sustainable and technologically advanced heating options like woodfuel, visible from 2002-2009 figures in Bouzarovski *et al.*'s paper (2012). Thus, in 1996/7 was launched the first Bulgarian targeted support mechanism for vulnerable consumers, a heating assistance program called "Winter Supplement Program" (WSP) (Phillips *et al.* 2003). Another good example of the proactive approach of the EU institutions was the launch of Energy Community Treaty, joined by Bulgaria in 2006 (Bouzarovski *et al*. 2012). The regional energy

initiative had an important role in the process of preparing and harmonizing the local national policies and legislations with the European ones. Within the Treaty, the liberalization and the price increases associated with it were recognized as a prospective treat to the low and middle-income groups.

After EU accession in 2007, Bulgaria had to abide by numerous requirements within EU policy documents. Such requirement is the establishment of European Energy Union integrated in Directives 2009/72/EC and 2009/73/EC of the European Parliament and of the Council, 'concerning common rules for the internal market in electricity and natural gas supply' (European Parliament and Council 2009a, 2009b). The main aim of the European Energy Union, as set out in the Framework Strategy (EC 2015a) is to provide "secure, sustainable, competitive and affordable energy" to the European consumers. A direct consequence of the Union is the liberalization of energy prices and increased competition, as liberalization benefits consumers through increased competition and transparency of the price setting mechanisms. Key gains are lower energy prices and guaranteed supply, improved service quality, and greater choice (EESC 2010).

At the same time, while researchers like Bouzarovski *et al*. (2012) claimed that the energy poverty concerns were rather creeping in EU policy documents., their requirements for Bulgaria did create a momentum. In the autumn of 2010, it became clear through the interviews held by the team of Bouzarovski that Bulgarian officials were not aware of the presence of direct EU-level policies for targeting energy poverty. The lack of administrative capacity was a serious problem, especially in regards to creation and coordination of cross-sectoral policies and measures as in the energy poverty case, and up to a point it still is.

In the context of the above mentioned Directives concerning the Energy Union (Directives 2009/72/EC and 2009/73/EC) each Member State is expected to define concept and criteria of energy poverty and vulnerable consumers and to ensure "the necessary energy supply for vulnerable customers". The affected Member States are required to take appropriate actions for mitigating the problem, preferably through an integrated approach combining social support policies and energy efficiency improvements for housing. Possible solutions are prohibition of disconnection of electricity to vulnerable customers in critical times; solidarity tariffs or reductions of the energy bills, but which do not hamper the energy liberalization process.

Under another Directive (Directive 2012/27/EU on Energy Efficiency) all EU states are obliged to set up an energy efficiency obligation scheme. That means the companies from the energy sector need to achieve energy savings of 1.5% of their annual sales to final consumers, by helping clients make their homes more energy efficient. Article 7(7)(a) of the Directive recommends giving priority to implementing energy efficiency measures for low-income groups, but the realization of such measure depends on the political will of national governments.

Between 1996 and 2016 the Bulgarian decision-makers preferred to heal the symptoms of energy poverty through direct payments to the most vulnerable (Phillips *et al.* 2003). Nevertheless, the Bulgarian administration has undergone a long, but fruitful way of following the EU requirements. In May 2016, the Bulgarian energy poverty definition and criteria were announced, created with the support of EC and World Bank experts (ME 2016). Officials from relevant ministries and agencies demonstrated willingness to cooperate against the energy poverty problem in Bulgaria. The drawbacks and benefits within the proposed Bulgarian definition will be presented in following chapter.

3.4. Tackling the energy poverty in a holistic approach

Commissioner Maroš Šefčovič, vice-President on the Energy Union (2016) believes that citizens should be put the heart of the Energy Union, which makes the efforts against energy poverty are a very relevant topic. While waiting for the energy and natural gas markets to adjust in the process of pan-European liberalization, support mechanisms for vulnerable consumers are essential. A working group on vulnerable consumers (VCWG 2013) was created in early 2012 by the European Commission in the context of the Energy Union - one more proof of the high political awareness on the issue. Among the tasks of the working group in addition to spreading good practices will be to produce a set of indicators for measurement and comparison of the energy poverty situation across EU (one of the recommendations of European Economic and Social Committee (EESC 2010)). VCWG also supports the recommendations of energy poverty pioneer Boardman (1991, 2010), that tackling energy poverty requires a combination of policies, addressing both the causes (long-term energy efficiency measures) and the symptoms of energy poverty (targeted short-term financial support).

The energy efficiency is a highly valued and recognized solution in European context, the "best long-term solution to energy poverty" according to the Citizens' Energy Forum (2015). Within the strategy for optimizing the heating and cooling of residences and industries, the European Commission will publish a toolbox of measures, easing the renovation of multi-apartment buildings (EC 2016). The strategy is part of a new energy security package of the Energy Union, citing estimates that decarbonization of the building stock, combined with energy efficiency measures could reduce the energy costs of households (for heating and cooling) up to 70% till 2050.

In Boardman's opinion, EE improvements can bring numerous benefits such as GHG cuts, improved living conditions, lower energy bills, lifting out of fuel poverty, more jobs and increased purchasing power. Because of them, it is essential in the upcoming review procedure of the European 2030 Energy Efficiency target (currently 27%), a more ambitious target to be adopted in the discussed range of 30-40% (Riley 2016). In this regard interesting debates are happening in the European Parliament. According to MEP Theresa Griffin (UK) (2016) "*for every 1% improvement in energy efficiency, 3 million more homes can be properly renovated, 7 million people lifted out of energy poverty".* In a report on "Delivering a new deal for energy consumers," she is also calling for considering the energy as a basic social right, not just a commodity (Committee on Industry, Research and Energy 2016). Commissioner Maroš Šefčovič (2016), stressed that dedicated EU funding for tackling energy poverty should be provided, because upfront investment costs for energy efficiency improvements and smart energy solutions (for example self-generation, smart meters, heat pumps) are falling down, but are still unaffordable.

The current supply and demand model in the Bulgarian energy sector (energy degradation stemming from loss of welfare) is unsustainable and cannot last longer in the light of climate change and increasing targets for reductions of GHG emissions. EU is preparing a quick ratification process for the Paris climate agreement (EC 2016b), after which new targets for EE savings will be distributed among the Member States in areas, previously not covered under the Emissions Trading System such as building, transport and agriculture. These targets for the building's sector are a good sign for the embarked direction by EU politicians, recognizing the important role of residential, administration and industry buildings in GHG emissions. Boardman (2010) also acknowledged the "greater cost-effective potential to reduce energy

consumption and greenhouse emissions by households than by transport, industry or other sector of the economy ", visible from the estimations of UK's National Audit Office (NAO 2008) - "Programmes to reduce household energy consumption".

3.5. Energy poverty definition debates

Many researchers and officials are participating in an ongoing debate "for" and "against" EU-level definition. The proponents like EESC (2010) since 2010 are calling for a common general definition that should be adapted by each member state. In order to identify, tackle appropriately and prevent the energy poverty they requested the adoption of European energy poverty indicators and harmonization of statistics. The opponents, such as EURELECTRIC (2016) are against "a broad, common but non-quantitative" definition due to the high level of diversity across the European Union.

Bouzarovski and Tirado Herrero (2015) divided the EU over core and periphery after measuring the reginal differences through an Energy Poverty Index. They used Eurostat data (EU-SILC) for calculating the Index for EU countries, and compared their results with existing monetary indicator - at-risk-of-poverty-rate. Bulgaria was placed in the periphery comprising of Southern and Central and Eastern European (CEE) countries, characterized with high level of domestic energy deprivation ("high and increasing poverty rates, and high and increasing domestic gas and electricity prices"). That justifies why for Bulgaria it makes more sense to learn from the experience of similar looking-countries such as Romania and Hungary when talking about the adoption of a country specific definition. For that reason in the upcoming text there would be several comparisons with these two countries and how they are dealing with the energy poverty issue.

In 2012 Tirado and Ürge-Vorsatz listed many characteristics of the Hungarian energy poverty situation in a prefabricated block, also valid for Bulgaria, such as limited options for management of the individual consumption or change of supplier, or for implementing EE measures (for which a consent of the whole condominium is required). In this respect the two countries have one small, but very important difference. In Hungary, in the panel blocks live people with higher than the median income (Household Budget Survey (Központi Statisztikai Hivatal (KSH) 2006). Such level of income matches socioeconomic characteristics of vulnerable consumers like good education, younger, less likely to have a pensioner as head of the household, fewer children. Their traits are very different from the ones of the typical EU-level vulnerable groups (EPEE 2009, Legendre and Ricci 2015). For Bulgaria, information on the income level of residents in prefabricated blocks is not available, but it is commonly accepted that in such dwellings currently live middle and lower – income representatives. It is also believed that the mix of residents is not heterogeneous and there are representatives of all income, age and education groups. When talking about the financial situation of the Bulgarian households, which are in general the poorest in EU (Eurostat 2016b), that makes the energy/fuel poverty problem in panel blocks even more clearly expressed and alarming.

3.5.1. Energy poverty definition for SEE region

REACH project, exploring the energy poverty in South and Eastern European countries (SEE) region also argues that tailor-made structural solutions are needed (Robić *et al.* 2016). Their report proposed a good approach for national definitions in respect to the SEE countries – "calculating the share of income which household would need to spend on energy costs if it would be using adequate energy services". Their estimates showed that over 30% of the households are under threat of energy poverty. Their team of researchers observed a notably long

history of subsidized energy prices (followed by switch to market based prices), and poor insulation properties of the building stock (materials, insulation, maintenance) - both legacies from socialist times. A high share of home ownership (between 80-96%) is also something typical for the region, but not so often encountered in Western Europe. The team of researchers noticed low or no political interest in the matter and consequently very limited support, primary in the form of funds granted for purchase of low-quality coal, burnt in inefficient heaters. All these statements seem to be valid for Bulgaria, but even within the region, there are discrepancies, stemming from the individual characteristics of the states. The study found out that in CEE often people who are not poor, also cannot afford adequate energy services. This might be true for the middle-income Bulgarians, although experts believe that the general poverty is the main reason for energy poverty (Tomov and Nikolov 2015).

3.6. Conclusion

In the policy literature review the main emphasis was given on the policy of the European Union, why, how and when the liberalization process in Bulgaria was initiated. The implications associated with the Energy Union and the need of providing protection mechanisms for the most vulnerable citizens were also discussed in relation to Bulgaria. As a member state the country has been immensely and mainly positively influenced by the energy policy of the European Union, for example by the adoption of Bulgarian vulnerable consumers' definition and criteria (ME 2016b). It seems that the main traits of vulnerable groups across the Union are similar in all affected countries, although there are regional and national differences. For the SEE region, it will be more important is to estimate the energy quantity and its cost according to the actual needs of the household, not the current energy expenditures (Robić *et al.* 2016). The VCWG

(2013) also confirmed the conclusions of Boardman (2010) that a holistic approach can tackle the energy poverty with a combination of short and long term policy solutions.

4. Methodology

4.1. Introduction

In order to answer my research question – "How a holistic policy approach against energy poverty should look like in the Bulgarian context?" two methodological tools were used. The first one was literature review and the second – interviews with experts. The literature review was divided into two chapters. I structured an Academic Literature review, which I used to explain the origin and different relevant dimensions of the terms energy poverty to the country, object of my study. Then, in a Policy literature review I used Eurostat and country specific statistical data, reports, assessments, strategies and action plans by Bulgarian and international scholars and experts. My aim was to present the European energy poverty policy and how it influences the Bulgarian decision-making process on energy poverty. In a combined chapter Discussion of results, the current situation of energy poverty and the measures against it in Bulgaria were outlined using historical and up-to-date data. Though the second methodological tool – interviews, I collected empirical qualitative data from experts from governmental and non-governmental sector, as I was discussing with them the problems in the policy measures and the applicability of different solutions and prospective changes. In the following Analysis section, I also used information from media and governmental reports and press releases as a basis of trends and future directions of the government towards the issue. The results stemming from the two interpreting techniques complemented each other and allowed me to get a fuller picture of the energy poverty situation in Bulgaria and how it can be improved though a mix of policy measures. The recommendations are based on my understanding of the deficiencies in the

relevant measures, after reviewing academic and policy literature, empirical data and other relevant received materials from the interviewees.

I conducted 16 open-ended, semi-structured interviews with NGO experts, dealing with energy efficiency, housing policy issues like Environmental Association "Za Zemiata", Center for Energy Efficiency EnEffect, Habitat for Humanity Bulgaria, Institute for Energy Management (EMI), Institute for Market Economics (IME), "Utilities" magazine. I met government officials from Ministry of Regional Development and Public Affairs (MRDPA), Ministry of Labour and Social Policy (MLSP), Ministry of Energy (ME), Energy and Water Regulatory Commission (EWRC), regional office of Social Assistance (SAA), Sustainable Energy Development Agency (SEDA), Energy Efficiency and Renewable Sources Fund (EERSF).

4.2. Why an interviewing method was preferred?

I chose interviewing as my main methodology tool as it seemed the most relevant tool for fulfilling my social research goals, as it is "in the heart of social research" (Esterberg 2002). The aim of my research was to explore three topics or three policy solutions against energy poverty and interviewing experts appeared most suitable for the task. According to Janesick (1998) the goal and main result of an interview is a "joint construction of meaning about a particular topic" and I was looking for new "meanings" or solutions of old (and emerging within the social tariff) problems.

I preferred semi-structured or in-depth interviews, which allow exploring a topic altogether in an open manner as respondents use their own words (Esterberg 2002) and tend to produce "rich and valuable data" (Punch 1994). If I had used a structured interviewing method and had full control over the direction of the conversation there was a risk to overlook new topics, which are of

particular interest of the interviewee (Punch 1994, Esterberg 2002) and which could have constituted as a basis for my following recommendations.

4.3. Interviewing techniques:

I had few informal talks with few energy poor, which helped me get an understanding of the issue and structure my questions towards experts. I followed Foddy's (1993) guidance on how to construct questions. I also tried to avoid leading questions and asked both general and specific questions, thus making my questions open-ended in order to get as much information as possible on the studied topics, as recommended by - Esterberg (2002). No table with sample questions will be provided as despite trying to ask questions from the three topics in my research, the questions were personalized in accordance with the interviewee's expertise, - another characteristic of the in-depth interview.

The length of the interviews was about 1 hour. All interviews were conducted in person, except for one phone talk, explaining why my invitation was rejected. The initial response rate of the cold contacts, was rather high but unsatisfactory, because many prospective interviewees were explaining in written form why they are not appropriate for an interview and only few were referring to their colleagues.

A purposive sampling method and more specifically expert sampling method was used, aiming to find particular traits, perspectives and expertise in the interviewees, required for answering my research question (Esterberg 2002). The method is associated with areas of high uncertainty and lack of sufficient empirical data (Meyer and Booker 2001), both valid for the emerging energy poverty research field in Bulgaria. The list of invited interviewees was based on my work experience on energy efficiency in buildings, combined with online research. The list was made due to my judgements on the insights they might have on the topics concerned based on their

current positions, job description or background. The use of this sampling method, associated with qualitative research, potentially makes my study prone to a researcher's bias and thus non-representative. On the other hand, the received benefits seem to outweigh the negatives, as the open-ended interviews with experts allowed me to identify new subtopics of interest (potential problems not considered before) and also to reach other relevant interviewees by using the chain/snowball sampling method (Biernacki and Waldorf 1981, Meyer and Booker 2001). A snowball sampling approach was used at the first interviews, which resulted in a higher than expected final number of conducted interviews, enriching my analysis. Due to the diverse set of topics and expertise, the "saturation" point was reached and concurred with my two last days for interviews (Schoenberger 1991).

Eventually I managed to conduct sixteen 16 open-ended, semi-structured interviews with NGO experts, dealing with energy efficiency, housing policy issues like Environmental Association "Za Zemiata", EnEffect, Habitat for Humanity Bulgaria, Institute for Energy Management, Institute for Market Economics, "Utilities" magazine. I met government officials from Ministry of Regional Development, Social Ministry, Energy Ministry, Energy regulator (SEWR), the regional office of the Social Assistance Agency (SAA/ASP), Sustainable Energy Development Agency (SEDA), EE and RE Fund.

4.4. Limitations:

4.4.1. Insufficient peer-reviewed literature

The energy poverty is simultaneously a new and an old topic in Bulgaria. It is old, because as a problem, it existed for a long time and was partly addressed through the creation of the Winter Supplement Program (WSP) in 1996 and with the inverted social tariff between 2002 and 2006. Furthermore, the energy debates continued throughout the following years. At the same time, it

can be considered a new problem, associated with the start of the liberalization process in the energy sector in 2007. Since then, its scale has increased and reached 60% of the Bulgarian population, according to subjectively collected household data of EU-SILC (Rye *et al.* 2015).

As it is a rather new issue, only a limited number of peer reviewed articles is available on Bulgaria. The topic was discussed by Bouzarovski and colleagues (Buzar 2007, Bouzarovski *et al.* 2012, Bouzarovski 2014, Bouzarovski and Tirado Herrero 2015). After the EU accession in 2007, reports on the whole union have devoted few pages on Bulgaria (like EC 2015b, Rye *et al.* 2015). An additional hurdle was the limited literature on Bulgaria, available online during my preliminary research, which contributed to my initial decision to visit Bulgaria for face-to-face interviews. Indeed, in the course of interviews I received relevant reports and materials, created by the interviewees' organizations or their partners, which I did not encounter online.

4.4.2. Sampling method

An appropriate question towards my chosen methodology would be why I used only interviews with experts, but did not reach for energy poor people to hear about their experience at first hand. In this case, I would have had additional limitations in identifying and approaching the study group of the energy poor. Identification is the main challenge, even if information on their main traits or in which social status groups they belong is available. Even if I had found such people, due to the delicacy of the problem of energy poverty, they might feel ashamed and unwilling to talk about the deprivations they are experiencing. On the other hand, within the public registers of the National energy efficiency program, only contact details of the home-owners' association managers are available. In this case I would have interviewed only the managers and perhaps recommended by them neighbours, as the approach might have led to "one-sided" perspective.

Another reason why I did not conduct interviews with them was the relatively high number of beneficiaries, which would have required significant time and labour resources. The same argument applies for my decision not to meet and talk with social workers, who are in close contact with energy poor people and visit their homes regularly. Neither did I meet with company representatives, who are an interesting research object from energy justice point of view. For example to I could have explored how they are dealing with the variations in electricity price and how they see their role in the fight against energy poverty. The limited time for conducting my research was the main constrain, which made me chose only one target group of interviewees, in order to keep my work focused. I was more interested in the policy aspects of the energy poverty issue, the perceptions of decision-makers of the seriousness and the applicable measures/solutions, not just describing in detail what the situation in Bulgaria is.

Thus, I chose to interview experts, working with and on behalf of disadvantaged people and having expertise on housing, energy efficiency and sustainability issues. Indeed, they had a good understanding of how the energy poor could be involved in energy efficiency and other schemes for helping them step out the energy poverty state.

I faced various obstacles during the purposeful sampling and interviewing periods. The abovementioned time constrained also applied to the period allocated for conducting interviews face to face.

In addition, a limited pool of interviewees from the governmental sector was working on the issue. Several of the contacted officials referred to other colleagues due to insufficient expertise or unavailability. Other officials declined my invitation for an interview stating that they cannot provide me with additional information beyond what is available online. I had a similar situation

with NGO experts who preferred to send me the materials they have used for writing their positions and declined the interview invitation.

On a later phase, during the interviews with government officials, I encountered a confidentiality barrier. They did not have the authority to release information from the negotiations within the working group on energy poverty, before the official announcement of the results.

Eventually, more NGO experts were interviewed. From one side they had a broader understanding and expertise, but were also more willing to talk "outside the box". The personal factor also played a role for arranging meetings with them, as I knew some of them from common projects and events.

4.4.3. Personal biases:

I have chosen this topic after reflecting back on my short working experience in environmental NGO and consultancy firm, dealing with EE in the residential sector. My environmental education also helped me identify harmful to the environment and common good practices and to elaborate on solutions. The unsustainability of the Winter Supplement program and the mass heating with electricity, were such practices, which needed urgent reconsideration and changes in my opinion. Providing ideas on low cost / affordable heating alternatives for the poorest households, is the basis of my research. My environmental point of view might stay behind any possible biases, giving emphasis on more expensive solutions. The proposed improvements might not be the most cost-effective solutions, but could simultaneously bring big positive effects on the living conditions of the target group and to the society.

4.4.4. Positionality of the interviewees:

The NGO experts will be probably more critical towards the problems in the measures, while the governmental official will refer to them with caution, as if the ongoing schemes are the only

possible solutions for the moment. I expect all of them to be talking about their topics as the ones deserving most of the public attention and funds.

A full list of interviewees could be found in Table 1. And Table 2., containing their organizations, current and previous positions and fields of expertise.

Table 1. List of interviewees from Bulgarian governmental sector.

Interviewee's names:	*Expertise in:*	*Current position*	*Previous positions:*	*Comments:*
Ivanka DilovskaEnergy Management Institute (EMI)	Energy policy, energy strategy, energy markets, energy economics, energy regulation	Chairman of the Management Board since it was established in 2010	Deputy Minister of Energy (1996, 2005-2006), Director of directions for energy strategy, projects, markets and state governance, Chairman of NEC, worked for Economic and Investment Bank.	EMI is a fully-fletched member of EURELECTRIC; Extended professional experience in the Bulgarian energy sector; an active participant in all changes in the energy sector since 1990.
Todor Todorov EA "Za Zemiata" (Friends of the Earth Bulgaria	Energy poverty, clean energy, climate change, coal	Public funds for sustainable development	European funds and clean energy	Currently writes a report on the unsustainability of WSP
Genady Kondarev EA "Za Zemiata" (Friends of the Earth Bulgaria	Retrofitting programs, EE, RES, clean energy, European funds, citizen's participation, coal	Energy and Climate Coordinator		Participated in retrofitting projects like STACCATO and together with EnEffect and BPIE worked on recommendations on the National EE Program
Zdravko Gentchev Center for Energy Efficiency EnEffect	EE, energy savings, residential buildings, housing policy	Executive Director since 1993, architect	Head of the Housing Policy Department at the Ministry of Regional Development, Housing Policy and Construction, Director General of the National Centre for Regional Development and Housing Policy	Worked on recommendations on the National EE Program. Vice-Chairman of the Steering Committee of the UN/ECE Project 'Energy Efficiency 21".
Assya Dobrudjalieva Habitat for Humanity Bulgaria	housing, retrofitting programs, EE, condominium lawm vulnerable groups	Project Manager; Chair of Association of Municipal Environmentalists in Bulgaria	-	During the campaign Solid Ground Habitat will work on amendments to the national legislation for ensuring access to land for housing and public infrastructure for vulnerable groups.
Atanas Georgiev Industrial Economics and Management Department at Sofia University "St. Kliment Ohridski"	Energy, infrastructure and utilities, energy regulation, energy market liberalization	Scientific Secretary of the department and managing editor of Publics.bg since 2010.	Has worked as consultant in energy sector restructuring	Introduced me to Teodora Peneva, a Phd. student from Sofia University, currently writing on the same topic
Kaloyan Staykov Institute for market Economics (IME)	Poverty, Energy poverty, Economic Regulation in the Electricity Sector, Public Finance, Economic Development	Economist	Researcher in Finance in Center for Economic Development, Editor of BusinessWeek Bulgaria	Since recently has been writing articles on energy poverty in Bulgaria.
Evelina Stoykova Energy Center Sofia (SEC)	EE, Res, energy poverty, EE building refurbishment, energy user behaviour, clean fossil fuel technologies	Manager; architect	-	SEC is an energy consultancy company; Implemented a project on energy poverty in Bulgaria, called "Energy Ambassadors"

Table 2. List of interviewees from Bulgarian non-governmental sector.

Interviewee's names:	*Expertise in:*	*Current position*	*Previous positions:*	*Comments:*
Annonymous expert Ministry of Labour and Social Policy	Social assistance and protection, energy and social benefits	Department "Social benefits", Directorate "Social Protection and Social integration"	-	-
Rosen Simitchiev Ministry of Energy	Energy policy, Renewable energy, Sustainable energy	Advisor to the Minister of Energy	Head of Energy Strategy Department; Worked for Bulgarian Energy Holding EAD, Bulgartransgaz EAD, Bulgarian Energy Holding (BEH)	Part of the working group on energy poverty between ME, MTSP, EC and World Bank
Gergana Blagieva Directorate "Housing policy", Ministry of Regional Development and Public Works.	EE, Housing, retrofitting programs	Director	Director of the Regional Inspectorate of Environment and Water - Sofia	Head of project "Energy renovation of Bulgarian homes" under OPRG 2007-2014
Dimitar Doukov Energy Efficiency and Renewable Sources Fund (EERSF)	EE, RES, investments for sustainable development	Executive Director; Works in EnEffect since 1998	-	Has participated in projects with The American Development Agency and World Resource Institute
Svetla Todorova Energy and Water Regulatory Commission (EWRC)	Energy regulation, electricity market, energy price, energy market liberalization	Commissioner	Has worked in Ministry of Energy and EWRC as a director of pricing and Commissioner, Chair of the Prices and Tariffs Standing Committee of the Regional Association of the Energy Regulatory Authorities of the CEE countries and the CIS (ERRA)	Regulatory consultant with a long standing experience in the energy area for more than 25 years
Tsvetomira Kulevska Sustainable Energy Development Agency (SEDA)	EE, RES, energy policy, energy savings, energy consumption, EE policy measures	Director of General Directorate "Coordination and management of energy efficiency and renewable energy sources", SEDA	-	Chief Expert since 2007; Prepares the annual reports on the implementation of National Energy Efficiency Action Plan (NEEAP)
Annonymous expert Regional office of the Social Assistance Agency	Social assistance and protection, energy and social benefits	Social expert	-	Municipality above 35 000 population; long experience in the social protection sphere
Annonymous expert Small town municipality	Retrofitting programs	Chief expert "Municipal Properties"	-	Currently implementing the National EE program and 2 retrofitting schemes under OPRG 2014-2020

4.5. Analysis approach

In order to explore the logic and to get better understanding of where the problems in the measures are coming from I made a microanalysis (called also comparative analysis) over the taken interviews, using the open coding method, described by Strauss and Corbin (1998). I examined comparatively the energy poverty concept from developed and developing countries perspective, vulnerability, capabilities, regional differences while trying to find out how they related to each other and to how applicable they were for the Bulgarian situation.

I started by identifying and developing concepts derived from interviews, examining their properties and dimensions. By describing and breaking down events, happenings, objects, actions, interactions during open coding, I was able to find similarities in their nature, new meaning and differentiate/group them into relevant categories (my so called "abstract generalized concepts").

Further analysis included axial and selective coding. Led by the guidelines of Strauss and Corbin (1998), I examined the relationship among categories in order to detect patterns and to create the logical basis for my assumptions, that later grew into policy recommendations.

5. Analysis over the proposed social tariff

5.1. Comparison between Bulgarian and Romanian social tariffs

A working group, consisting of experts from the Bulgarian Energy Ministry, Ministry of Labour and Social Policy, EWRC, consultants from the European Commission, Directorate-General for Energy (DG Energy) and the World Bank worked for a period of 7 months on the Bulgarian definition of "vulnerable consumers", criteria and social protection measures. Their results were announced on 26th May 2016 in Sofia by the Bulgarian Minister of Energy, Temenuzhka Petrova in the presence of the researcher. She admitted that the expert group has worked in close cooperation with the **Romanian Energy Regulatory Authority (ANRE).** Indeed**, the two** definitions look identical and it seems that a process of transfer of good practices has taken place. Given the multiple similarities between the two countries, such transfer seems reasonable and even praiseworthy. Still, the national derived differences should be taken into consideration too.

The Romanian definition says that a **vulnerable customer is** "*the final customer being a residential customer in a category of customers who, for* ***reasons of age, health or low income****, are at risk of social exclusion, and to prevent this risk, benefits from social protection measures, including financial protection"* (Electricity and Gas Law 2012).

The Bulgarian draft definition defines vulnerable consumers as *"households that are supplied with electricity and are inhabited by people who for* ***reasons of age, health or low income*** *are at risk of social exclusion regarding electricity supply and consumption and benefit from social protection measures needed to provide them with the necessary supply of electricity"* (ME 2016b).

The new social tariff has adopted the set of eligibility criteria, used under the Bulgarian Winter Supplement Program (WSP), differentiating 17 groups of vulnerable citizens. This means that all people who are presently receiving energy allowances under the Social Protection Act (2016) will be covered under the social tariff. The current group will be expanded through **additional criteria**, which will double the beneficiaries from 237 207 for winter 2015/16 to almost 500 000 families and individual (ME 2016).

1. **Elderly over 70 years of age, living alone, with income only from pension that is up to the defined poverty line in the country for the respective year;**
2. **Persons with over 90% reduced ability, with attendant;**
3. **Families with disabled children, with attendant;**

The aim of Bulgarian social tariff is to cover basic energy services, calculated by the Energy Ministry. It will have a duration of 5 years, starting from 2017 until the full liberalization, expected by 2022. The guaranteed consumption at a lower price **is under 150 kWh for consumers using electric boilers for heating water and 100 kWh for users of DHS.** 70% of the electricity price alone will be covered under the social tariff. After taxes on network services and obligation to the society are added to the price, the monthly support will comprise of 1/3 of the final electricity bill or only between 6 and 10 levs[1] (3 and 5 euro) (ME 2016b).

- For 150 kW/h will cover 9.53 lv from 30.75 lv (annual support of 114.36 lv)
- For 100 kW/h will cover 6.35 lv from 20.5 lv (annual support of 76.20 lv)

Romania introduced its tariff in 2005 with a support level of 110 kWh, progressive to the energy consumption and paid by the state budget (Inchauste 2016). Eligible are Romanian citizens with

[1] EUR =1.95583 BGN Source: Bulgarian National Bank. URL: http://www.bnb.bg/ Accessed 31 July 2016.

income per capita below or equal to the national minimum wage or 12% of the population (14% in 2006 (Diaconu *et al.* 2007)). In Bulgaria the tariff will cover similar percentage of the population - 14% (ME 2016b).

Before 2005, Romania had another tariff, cross-subsidized by the domestic consumers, who were consuming bigger energy quantities, in the same way a Bulgarian inverted block tariff was operating between2002-2006 (Dilovska). On the other hand, cross subsidization between Industrial and Residential sector in Romania was removed between 1999 and 2004 (Gugu 2004). Such subsidization is still in practice in Bulgaria, but EWRC expects by the middle of 2017 their share on the regulated market to be reduced to 20% (from 70% in 2007), while Dilovska's colleagues from EMI anticipate only domestic consumers to remain on the regulated market by the end of the year (EMI 2016b).

The Romanian Electricity Act from 2007 stops the cross-subsidizations and social tariffs should have been replaced with social transfers from the State budget (Diaconu *et al.* 2007). (Electricity Law 2007). However, in the years following 2007, Romania was leading a political battle not to remove the tariff (Inchauste 2016). According to an agreement with the International Monetary Fund (IMF) between 2013 and 2015, Romania should cancel the tariff in three stages and vulnerable consumers should receive financial support (Inchauste 2016).

The approach they used most probably will be adopted be EWRC (Todorova). Gradually, they were introducing an increasing mandatory quota at open market price within the final regulated electricity price. This method could bring energy justice for the energy companies too. The suppliers will face lower financial risk, as the quota at market price will be revised every quarter in order to prevent rapid price increases for the domestic consumers. A mechanism was provided

for suspending and even reverting the price increasing process, if the prices become unaffordable (Romania Insider 2012). Similar reversion option was granted to Bulgarian companies from the services sector, when they massively joined the liberalized market in 2014 (EMI 2016b).

5.2. Roles within the social tariff in Bulgaria

EWRC will determine a cost-reflective price of electricity, on which the social tariff will be based until the full liberalization. The energy regulator will be the body which will develop the implementation rules and will be a guarantor of the efficient functioning of the social tariff system, including executing control on e*nergy suppliers* to perform their duties (Simitchiev and Todorova). For awareness raising reasons, EWRC will create *A Notebook of the energy consumer*, explaining the conditions and the simplified procedure of change of supplier (Ivanov 2016). MLSP will probably be the Ministry with a leading role in the process, responsible for the eligibility under the tariff and all payments. Its Social Assistance Agency (SAA) will be responsible for the administration of the social tariff, as it is currently operating WSP and has a vast network of regional offices (Simitchiev). Apart from the institutions, the social tariff will create additional work for the energy suppliers' administration of the scheme like detecting frauds (Staykov, Georgiev). What will be the implications for the companies from energy justice point of view will be discussed later in the text – in the "Who will pay?" section.

5.3. Expected problems within the Bulgarian social tariff:

5.3.1. Identification and coverage problems.

EWRC should determine such a price, which could fit into the estimated costs and budget for the social tariff, announced to be 60 million levs per year (ME 2016b). But what approach did the Energy Ministry use for calculating this budget? It seems as they first determined the vulnerable

groups with the help of Social Ministry experts and then estimated what the costs will be, which seems an appropriate approach. But then the costs could have seemed too big and therefore they have added new restrictive criteria, as in the case of pensioners the criterion "living alone" might have been introduced. It seems as the Social Ministry has used identical approaches for defining energy poor in WSP and now with the social tariff - trying to adjust the total number of beneficiaries according to the available budget. In this way, many people in actual need of energy support might stay outside the scheme, because they slightly exceed the reduced threshold. I agree that the state has limited financial capabilities, but thus it should not be the only source of financial support for vulnerable groups. A number of interviewees, including energy experts from SEDA and EMI recommended that after all vulnerable groups are identified objectively, the government should start looking for money from preferably flexible and innovative financial instruments and other applicable market support mechanisms.

5.3.2. Extending the coverage of WSP – Where the increase could come from?

According to the State Ombudsman (2016), the definition of vulnerable consumers should be extended as much as possible. Despite the nearly 50% increase of the coverage in comparison with WSP, only 14% of the population will be covered. With small fluctuation, around 21-22% of the Bulgarians are living under the poverty line (NSI SILC 2015) (Table 3) and would also be adversely affected by the transition to real prices. From them, as IME (2015) pointed out, pensioners were the most numerous group (around 440 000).

If we compare the minimal pension with the poverty line, despite the recent increases of the former one (Table 3), it could fit twice in the poverty line amount. On the other hand, many pensioners live with a monthly social pension of 118 levs for 2016. These are people who did not have the required work experience, but have turned the age threshold for getting a pension. Their

number is unknown, as NSI estimates only a cumulative figure for all social non-labour pensions including all kinds of pensions for disabilities. Thus, the probable number of citizens with disabilities who will be covered under the tariff remains publicly unknown.

At the end of 2015 there were 969 166 pensioners above 70 years old, which comprised of 13.5% of the Bulgarian population (NSI 2016a). From them, 37% lived in villages, where the income is traditionally lower and thus people are often engaged in additional agriculture/farming. There is no publicly available data on the income of this group and how many of them are below the poverty line or if they are living alone. Such data should exist and probably has been used by the Energy Ministry for determining the budget of the scheme to 60 million levs.

Table 3. Main energy poverty related indicators in levs, used in the text.

Indicators / Periods	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	Source
Monthly energy allowance amount	56.5	55.23	56.86	65.72	65.72	65.72	72.2	SAA 2015, cited in Peneva (2015)
Yearly energy allowances amount	282.5	276.15	284.3	328.6	328.6	328.6		Same source
Number of Beneficiaries	256763	259395	206452	219760	210711	251876	254998	Same source
Number of Rejections	54954	51558	72746	48788	55743	55002	44969	Same source
Rejections in %	18	17	26	18	21	17	15	Same source
Annual WSP budget	72 535 548	71 631 929	58 694 304	72 213 136	69 239 635	82 766 454		Same source
Poverty line	295	295	285	279.8	286	323.75	295	NSI SILC 2015
Individuals under the poverty line		1 564 200	1 671 900	1 558 800	1 527 500	1 578 300		NSI SILC 2014
Covered as a %		20.7	22.2	21.2	21	21.8		NSI SILC 2014
Minimum pension	130	136	136	145	150	152	157	NSSI 2016
Social pension			101	101	110	113	115	NSSI 2016
Guaranteed minimum income (GMI)	65	65	65	65	65	65	65	Social Assistance Act 2016

Energy expenditures as % of income per household	14.3	14.1	15.3	14.2	13.4	14.3	NSI 2015a
Energy expenditure as % of income per individual	14.7	14.4	15.6	14.4	13.6	14.4	NSI 2015a
Number of Bulgarians in risk of poverty and social exclusion	3 718 700	3 693 200	3 621 100	3 493 400	2 908 600		NSI - SILC 2015
% of Bulgarians in risk of poverty and social exclusion	49.2	49.1	49.3	48	40.1		NSI - SILC 2015
% Bulgarians experiencing material deprivation	45.7	43.6	44.1	43	33.1		NSI - SILC 2015

Source: Cumulative sources, gathered by the author.

On the other hand, a research done by scholars from the University of Sofia working on poverty, representative for the whole country (Peneva 2015), indicated that seniors over 70 years were usually not living alone, but with a partner or other members of the family, for which they were still taking care, including financially. The average personal income of that group representatives was 449 levs, but after being divided by 3.5 (the number of household members), it becomes 299 levs which falls or raises above the poverty line depending on its yearly variations (Table 3). In general, as they were not living alone, they would be excluded from WSP under both criteria. The study proved that not too many seniors were living alone and had an income below the poverty line in 2014. On the other hand, this study's target group were only working people, as working seniors above 70 represented only 7.1% of the sample.

Still, there is an additional income criterion only for the group of pensioners, which seems as an attempt to fit the number of prospective beneficiaries in the designated budget, despite the fact that they seem to be the most vulnerable group. The lack of financial criteria for the other newly added groups probably means that they are not significant in numbers and will not be a big

burden to the budget of the scheme. Probably pensioners will be the subgroup, which will have biggest numbers in the new enlargement procedure under the social tariff, but still it will not cover all seniors in need of energy support, unless the "living alone" criterion is removed. Thus, the energy justice principle will require additional payments for pensioners staying outside the tariff to be provided, for example. The financial source could be a specialized fund for support of energy poor households.

5.3.3. The tariff does not corresponds with the competitiveness principle.

During some of my interviews, which preceded the announcement of the social tariff, experts doubted that such a tariff could be a solution, mainly because it is against the competitiveness rules of the EU (Todorova, Dilovska, Staykov). A social tariff is mixing market traits and politics while the state is transferring its obligations to redistribute the benefits, associated with social policy, to the private sector (Staykov). Borchardt (2016) from DG Energy, during his speech on the announcement event, also expressed the position that the Commission does not like social tariffs and prefers social measures. However, after reviewing the situation in Bulgaria, the Commission realized that there was no other alternative for the liberalization transition period. Social tariff was the most targeted approach, used in Romania, Ireland and other countries in order to prevent new cases of energy poor people, and it looked appropriate for Bulgaria too. Commissioner Cañete, during the same event, called it the most economically feasible way of energy poverty fight during the liberalization process, although he thinks the energy efficiency is the most important measure for its eradication.

An interesting observation in relation to the social tariffs was shared by a member of the Bulgarian energy regulator EWRC. Although social tariffs are in general against EU competitiveness principles, after EU accession, the requirements towards the Member States

have become less strict than for Candidates. For example, Bulgaria had to terminate its block tariff in order to join the Union (EWRC 2006), while Hungary, 1 year after its accession, adopted identical progressive social tariff (Budapest Business Journal 2005). Now the Commission also supports the adoption of the tariff.

5.3.4. The tariff is hard to phase out

My respondent from the Bulgarian energy regulator, who was most familiar with the situation in Romania, disliked the tariff, partly because it was hard to be terminated, even if it was set for a certain period. The reason is that the electricity price is in general sensitive for the society and politically important (Todorova). It is notable that Bulgaria already has a history of government resigned due to protests initiated because of high electricity costs in 2013 (Cage and Tsolova 2013). The political battle for keeping the tariff, despite the Act on its termination in 2007, was among the problems of the tariff, pointed out by World Bank expert Gabriela Inchauste during the Announcement event. Ten years later the Romanian social tariff is still in practice, but is expected to be phased out until 2018 and to be replaced by a new social assistance program called Minimum social insurance program (Inchauste 2016).

5.3.5. "Who to pay?" options

In principle, the tariff can be compensated either by the energy consumers or through targeted support for energy suppliers, from the state budget or other financial source like a specialized fund for support of energy poor households. The US approach of solidarity - other energy consumers to cover the lower cost for vulnerable groups, is not applicable for Bulgarian context (Dilovska). It is a form of cross-subsidization and there is no logic in using one type of subsidies for phasing out other. Furthermore, by calculating the expenses on the tariff in the electricity price for everyone, it will consequently increase and could lead to new energy poor and thus

more people in need of from the tariff. The latter has a potential for causing financial destabilization of the whole residential electricity sector. Still, creating more energy poor citizens is a clear contradiction with the aim of the social tariff – to help vulnerable groups face easier the challenges stemming from the liberalization process. Introducing a new tax on energy suppliers or forcing them to grant revenues to a specialized fund for covering the costs of the tariff, are also not good approaches, as all end consumers will be paying at the end.

Since 2015, the Bulgarian energy companies are already forced to contribute to NEC's (National Electric Company) deficit reduction with annual instalments consisting of 5% of their revenues under the "Security for the electricity system" Fund (Bulgarian State Gazette 2015). They also have annual 1.5% energy saving obligation. Introducing an additional obligation on them will mean calculating the costs in the price, as they have already too many obligations. On the other hand, part of the collected funds within the newly established fund was recently used to prevent a price increase from 1st of July 2016 (Todorova). This is another example of the high determination of Bulgarian officials to keep prices low and prevent sharp increases. During the announcement event Bulgarian governmental officials indicated that most probably the state budget will cover the expenses of the social tariff in order to prevent prices increases following Romanian experience (Simitchiev, Todorova). Providing money from the budget (and from everyone's taxes, including energy poor), seems the fairer option than burdening companies.

Energy experts and economists (Atanasov, Staykov, Todorova, Dilovska) favour a market approach, where the full prices of electricity are applicable to all consumers and only the vulnerable receive targeted support for heating and meeting other basic needs. The real prices are especially important for phasing out dirty energy sources, as the consumers would reject to pay more for them. (Dilovska). Experts require the support on energy poor to be in the form of

social policy like energy payments, not through prices. The energy allowances should come from the state budget, as currently, while money for EE investments could come from many sources, including partly from the budget.

5.4. Positive features of the Bulgarian social tariff

5.4.1. Covers more vulnerable citizens than WSP

The definition on vulnerable consumers emphasizes on additional for WSP criteria - age, health status or low income criterion, eventually expanding the scope of supported twice. The tariff is not using previously applied in WSP restrictive criteria such as possessing land, having a firm registered on your name or not traveling abroad on your expenses. This is due to administrative burden considerations, but still it is not denying access to prospective beneficiaries. Governmental energy official (Simitchiev) even said that in case expenditures on monitoring and control reach too big share, it would be better to allow some non-eligible to benefit from the scheme, than to spend the designated fund on control activities. On one side, this way of thinking might lead to inefficient spending of scarce public funds, but on the other, the current threshold in WSP, determining the group of vulnerable people is too low and even if someone who is a bit better-off receives such support, it still will be of help to his family budget, eventually releasing disposable income to be used in the real economy.

Still, it could and should be further expanded, as requested by the State Ombudsman (2016).

5.4.2. Good targeting

The tariff is applicable only for certain groups of consumers, fulfilling a set of criteria, which makes it a well-targeted tool with good effectiveness of the measure expected. The energy expert from the ministry (Simitchiev) was very proud with the targeting mechanism chosen from the working group. The mechanism uses another good targeting approach – a transfer of money

directly to the energy supplier, which could prevent spending them on anything else by the beneficiary. If a voucher system has been used, as previously for supporting woodfuel and coal under WSP, an illegal trade scheme will be stimulated, and again money will not be spent on heating. A very likely consequence will be that the beneficiaries would get woodfuel illegally from the nearby forest or would remain under-heated in the winter.

The social tariff will be paid over a registered energy meter, which is a substantial improvement of the previous model of social assistance, which was allowing families to benefit multiple times from the fact that several families live in one household (Simitchiev). This is another example of the importance of unified definitions and measurement criteria, as the mixture of notions – family, individual and household - is creating a total statistical mess and in practice no one can say who are the vulnerable people and what percentage of them has received aid from the state.

Another aspect of the good targeting within the social tariff is its timely manner – coming when new increases in the electricity price are expected. It also provides the guaranteed provision of basic energy services, to which everyone should have access at an affordable price. The amount of the guaranteed energy consumption with or without electricity boiler represents the energy consumption of typical appliances, which matches the main aim of the tariff: affordable basic energy services for the vulnerable consumers. The positive side of the tariff is the fact that it is a year-long protection measure, which supplements the WSP, aimed to cover only the heating needs.

5.4.3. Promoting energy saving behaviour

According to the same expert from Ministry of Energy, the social tariff could be regarded as an environmental measure, encouraging energy saving behavior. This view seems justified if one considers how people with low income already have this “saving” way of thinking and probably

will make sure not to exceed the threshold. How the energy saving behavior can be incentivized further will be discussed later in the text.

5.4.4. Provides energy justice for the companies and consumers

The energy companies will be benefitting from the lower financial risk during the gradual introduction of market price quantities in the regulated price. Previously, with the constant changes in the sector and increases in taxes like obligations to the society, they did not have the financial stability and security that they will be able to sale their production (Todorov). If they have such security, they could be considered contributors to the fight against energy poverty.

Meanwhile, the vulnerable consumers will receive financial support for ensuring their basic energy needs all year long, funded by the taxes of all Bulgarians, including them. By not manipulating the price, soon they could benefit from the low bills associated with competitive market prices of the Energy Union, while the financial situation and profitability of energy companies will not be artificially manipulated by political forces, but will depend on themselves and their business skills.

6. Analysis over the Winter Supplement Program (WSP)

6.1. History and positives of the program

The energy benefits are not a new measure for Bulgaria. They have been in practice for over 20 years and have undergone several variations.

The Winter Supplement Program was created as a protection measure under the supervision of the IMF and the World Bank during the first serious price variations in 1996, often on monthly basis (Aleksova 1996). One of the positive features of the program is its timely manner – and one of the energy experts I met has participated in the development of this first measure as a governmental official in 1996 (Dilovska). Unfortunately, not much information or data is available online for the initial period of the program, therefore my initial section of WSP is based on memories and assessments of experts.

The first Bulgarian anti-energy poverty protection measure used a similar to the currently applied English identification approach. A household was regarded energy poor if, after paying its energy expenses, it fell under the poverty line and needed support to exceed it. In the Bulgarian version of WSP beneficiaries received the difference between the "left over" of income and the poverty line, after paying particular energy expenses, estimated to cover basic energy need (Dilovska). For example, if someone's income is 200 levs above the poverty line before paying 300 levs for energy he or she is eligible to receive 100 levs in order not to fall into poverty.

In 1996, Dilovska and her colleagues in the Energy Ministry made the first calculations, determining the minimal guaranteed level of support ("X" kWh enough for heating one room with certain m2, to reach 20 degrees C, while securing cooking for 2 hours daily, television). They also estimated different allowance amounts in accordance with the three main energy/heating sources – electricity, DHS and solid fuels. Today the program uses unified money

equivalent of 385 kWh of electricity use for the three main energy sources: woodfuel, electricity and coal, according to SAA data (2016). For example, the current allowance level of 361 levs is covering around 5 m3 woodfuel.

Because of the individual approach used, not accompanied by a direct transfer of money, which could be spend on anything but energy, from today's point of view and after observing the progress of WSP, Dilovska describes the first scheme as the best and most effective protection system. Various problems with voucher frauds and non-targeted use have been reported during the years. The regional social protection expert remembered cases of vouchers being sold on half price, wood companies providing 2 not 3 m3 of woodfuel, fake orders for beneficiaries of energy allowances/vouchers. These problems were observed before 2008, when the current ordinance on energy allowances was enforced. In case of frauds under WSP now, the beneficiaries are being excluded from the energy allowances beneficiaries list for the next heating season (regional social expert).

Still, it seems that the non-targeted spending in WSP was not as significant as in other countries' programs. In reports by the World Bank (2007, 2009) the country has been praised for its effective targeting approach. Energy allowances have reached 66.8% of the poorest 20% in 2009. But the adequacy of the allowances or their effect on the material conditions and consumption of the households is small, due to the relatively low amount of the allowances. The criteria and characteristics of the program have not changed since 2009, which makes these conclusions still valid (Nikolova *et al.* 2016). For example, GMI was frozen at its 2009 level because of the financial crisis, but is still on the same level. For adjusting the amount of benefits in accordance with electricity price increases and inflation raise, the government is using a higher differentiation coefficient (Todorova, EWRC). This coefficient contributes to the better

targeting and consequently to the big number of rejected applications – usually between 16-18%, although shortly after the financial crisis have been much higher - 26% for 2010/11 winter season (Table 3) (SAA 2015). Having a slightly higher income is the main reason for 2/3 of the rejected applications (SAA 2015).

As visible from Table 3, the amount of the energy allowances is gradually increasing (Peneva 2015). Regional social expert pointed out that the amount of the energy benefit is identical to the amount of one additional minimal salary and is a great contribution to the budget of poor people**,** even if the funds are not spend on the designated function. He also considered heating one room in many cases as a rational, efficient and wise decision. This is a good solution, especially for people living alone, who are a big percentage of the beneficiaries in his municipality.

6.2. Problems within the program

6.2.1. Measuring and identification approach.

An important problem in measuring was detected during my research, confirmed by some experts and not realized by others. There is an inconsistency between the used indicators by the Social Ministry and ASP (individuals and families cumulatively), NSI and EU SILC (households), and the poverty line, estimated for individuals. For example, according to the Social Assistance Act (2016), if a family has children above 18, who are not students or disabled, it is considered that in this household, which is occupying a common dwelling and sharing a budget, live two families and both could receive energy allowance. Thus, no one can be certain about the exact number of people receiving energy benefits. Some of my interviewees were also not differentiating between individuals, families and households, when explaining the seriousness of Bulgarian energy poverty. The distribution within the 17 vulnerable groups under

WSP is also unknown. After requesting such data through the Access to Public Information Act, SAA replied that they do not have such data.

The poverty line is a monetary (cash) indicator, determining the poorest people in a society. The poverty line represents 60% of the average total disposable net income per equivalent unit. It has been calculated following Eurostat's methodology as a median income since 2007, when it was set at 152 levs level (NSI SILC 2009, Bogdanov and Zahariev 2009). Its size must be sufficient to ensure meeting the so-called "minimum living needs", which represent the monetary equivalent of the actual cost of food products that meet the recommended daily limit of 2700 kilocalories (Bogdanov and Zahariev 2009). By adopting an official poverty line as a basis for the social protection system, the government has fulfilled its commitment within the tripartite "Pact for economic and social development of Bulgaria by 2009". However, it seems that it is an indicator just on paper, created to fulfill international requirements, with no other implications for the Bulgarian citizens, but to show the big inequality and gap between poor and wealthy strata.

Meanwhile the Social Assistance Act (2016) uses the notion "guaranteed minimum income" (GMI), as a base for various social transfers, including energy allowances to families and individuals. GMI represents a "legally appropriate amount used as a basis for social assistance in order to ensure a minimum income to meet basic living needs of individuals according their *age, marital status, health and property status".* Although since 2009 the GMI has been staying at the same level (65 levs) (Table 3) the government had the right to change the coefficient, determining the differentiated minimum income (DMI) for the different categories of vulnerable people. Their income will be guaranteed at that specific DMI level and they will receive whatever amount of benefit is required to exceed that income. While the purpose of the poverty

line indicator is to determine the minimum resources necessary to meet the most basic needs, only the much lower DMI, based on GMI, is secured under the Social Assistance Act (2016).

6.2.2. Inadequate number of supported people.

Recent data from the Social Assistance Agency (SAA) from 2007 till 2016 showed levels of support between 210 000 and 300 000 people, while on average 50 000 applications were rejected annually (SAA 2016) (Table 3). Meanwhile in the Institute for Energy Management (EMI), the current workplace of Dilovska, her team observed the general worsening of the poverty situation in Bulgaria, while the number of beneficiaries of energy allowances stayed permanent around 200 000 households.

Dukov, an expert on financing EE and RE, remembered that the program has been launched with a relatively big number of beneficiaries, 650 000 (probably families and individuals). This number corresponds with a number of expected 530 000 beneficiaries for the winter season of 1996/1997, found in online media (Aleksova 1996). Since then the number of supported energy poor, has followed descending trends associated with a decreasing number of income threshold, restrictive administrative criteria, but also with an increasing amount of the energy allowances (Table 3), which will be discussed in following chapter.

Various restricting criteria have been used during the operation of the program such as possessing land, having a firm registered on your name, traveling abroad on your expenses, some of which are still in use:

- *No contract to provide property for sustentation or care-giving (except when the care-givers are pensioners, disabled, students or unemployed).*
- *Not having sold real estate over the past 5 years.*
- *Have not traveled abroad at their own expense over the past 12 months.*

- *If having savings, they do not exceed 500 levs per family member.*

Meanwhile NSI data (SILC 2014) on the share of the poor (below the poverty line) showed that the poor in Bulgaria in recent years (between 2006 and 2014) were moving in a narrow range of 20.7% and 22.2%, being about 1.5 million Bulgarians in 2014 (Table 3). Half of them are in deep poverty state, according to IME (2015). That means they are living with less than 40% of the median income of an average household and are experiencing long term and self-revolving poverty state.

The rate of individuals at risk of poverty and social exclusion did not show much dynamics between 2006 and 2014 (Table 3). A comparison with figures from ASP makes it clear that only about 38.8% of the individuals under the poverty line have received heating support (estimating with 2.4 members per household from total of 3 006 376 households (NSI Census 2011) and the number of families and individuals (not households) who have received energy allowances for 2014/2015 - 254 998). Meanwhile the poverty line has been increased almost twice (Table 3) (NSI SILC 2009). However, the higher level of poverty line is not the desired good sign of improved financial condition of Bulgarians. The stable percentage of the population at risk of poverty means that probably the same people are still in poverty state, but now have to face higher prices of basic food products.

At the same time, a study on consumer prices and cost of living by KNSB's Institute for Social and Syndicate Research (ISSR 2016) estimated that towards the end of 2015, a family member needs a personal income of 561 levs in order to live a normal life (food, healthcare, education, home maintenance). At first sight, this sum might seem higher for lonely seniors, as they do not have educational or other children-related expenses, but at the same time, they are spending a significant share of their monthly budget on medicines, so the sum seems adequate and

appropriate for all vulnerable groups. ISSR estimations showed that 78% of all Bulgarians live with personal income below that threshold, while only 1.5 million Bulgarians received money above this threshold. At the same time their calculations of the number of people below the poverty line seems relatively higher in comparison with the NSI data for the previous year, as data for 2015 is still not available (2.2 million people or 30% of all households versus 1.5 million people or 21.8%) (Table 3).

6.2.2.1. Who are the vulnerable groups?

Unemployed

People with low education who are staying out of the job market were identified as a group with a high risk of social exclusion by a number of studies (Bogdanov and Zahariev 2009, 2015; IME 2016). Other studies are talking about the high risk, associated with being inactive on the job market (IME 2015, Nikolova *et al*. 2016), which is usually caused by low education and qualification.

Employed

In April 2016, KNSB announced that nearly 20% of all employed are poor (economic.bg 2016a). People with low education continue to be at risk of poverty after starting a low-paid job, their only option due to the absent qualification. Despite working, members of households prone to poverty could be found in families with a senior over 65, families with three or more children and families of a single parent (Bogdanov and Zahariev 2009, 2015). IME's team of Nikolova *et al*. (2016) considered the working poor a challenging problem, but at the same time far less risky group and not in a deep poverty state.

Meanwhile Peneva's study (2015) using the English definition of more than 10% of income spent on energy, indicated that 89% of low-income workers in Bulgaria are energy poor. The average cost of heating was 11.8%, while many households spent more than 20%, some were

even reaching 80%. Her results are slightly lower than the official NSI data of 14% share of energy expenditures (electricity, heating and water). Still, the share of heating alone is unknown, as well as the level of thermal comfort, that stays behind the NSI number (Peneva 2015). Further research is needed on this matter.

Groups at highest risk

IME (2015) considered economically inactive or unemployed and their children as the vulnerable groups in greatest risk of deep poverty. These findings highlighted issues within the educational sector and the labor market, as the most vulnerable are in working age. Other groups in high risk of exclusion are pensioners living alone (more specifically women above 65 living alone, people with disabilities, parents with three or more children, including such living in segregated areas and single parents (Nikolova *et al.* 2016). In addition to labour market and education, contributing factors seem to be demographic and connected to the pension system, ethnic and purely social, result of failures of the social policy.

Probably the situation of poor woman seniors needs more explanations. IME (2015) pointed out that pensioners are the most numerous group under the poverty line (around 440 000 or 1/3 of all people in the group. In the gender structure in the group of seniors above 53 years, the number of women (NSI 2016b), who are generally receiving lower pensions than men prevails (NSI SILC 2014). One of three women above 65 is in high risk of poverty as the reasons for that are the longer life length in comparison with men, but more importantly the inequalities in the pension system, which are detrimental to women (Nikolova *et al.* 2016). This problem seems not to be reflected in the state policies by now, but should be taken into consideration when defining the criteria for energy allowances or support. The social policy experts in the Ministry seem to be familiar with these findings, as they have granted the highest differentiation coefficients within WSP and under the proposed social tariff to members of the above mentioned groups: a person

aged 75 or above living alone; but also for a person aged 65 or above living alone; a person with disability of more than 90%; person with disability of 50% or above living alone; single parent.

The vulnerable groups which are most widely spread within the beneficiaries in the small municipality, where two interviews were made are: unemployed, pensioners, people living alone, big Roma families, but also individuals. There might be working poor with incomes under the threshold, but their number is unknown.

All these highly vulnerable groups require specific measures, which would need to include education and qualification, but also better targeting and effectiveness of the social programs aimed at them, according to the researchers from IME (2016).

If a small increase of the threshold is executed, it will have significant effect on the number of beneficiaries. IME's research (2015) evaluated the effects of an increase of the guaranteed minimum income, which is the basis of the majority of social payments, including energy benefits and was frozen to 65 levs since 2009. They calculated 2 scenarios – increase with 10 levs and increase of 30 levs. An increase to 95 levs (65+30) would be identical to the growth in the minimum salary and poverty line between 2009-2015 (Table 3). Their aim was to show the expected growth of eligible beneficiaries, as well as what the growth of administrative costs of the programs will be. When in winter season 2013/14 there was a nominal growth of 15 levs after adjustment of the differentiation coefficient that increased the number of beneficiaries with 44 300, while the number of rejected also remained high – 45 000.

Similarly, IME estimated that an increase of GMI with 10 levs would lead to a growth of beneficiaries with at least 30 000 and would cost between 10.5 and 12.5 million levs. An increase of 30 levs will cause an increase between 18 and 31 levs of the differentiated minimal income (DMI) of the different vulnerable groups, which will result in much higher

administrative costs for the program - between 21.7 и 36.1 million levs and new beneficiaries in the range of 60 000 and 100 000. Taking into consideration the big share of the "grey" sector of the economy, an update of the GMI needs to ensure additional money for visit checks by social workers of the real welfare of the beneficiaries.

The most often referred question – "Where the money could come from?" could be answered through the means of energy efficiency. If part of the current WSP budget is spent on energy efficiency measures (EE), as proposed by a financial expert on EE and RES, financial resources will be released, which could be used for increasing the threshold and reaching new beneficiaries. The proposition of the financial specialist is the following: the amount of energy allowances for several heating seasons/years to be paid to families (or to an institution on their behalf), so that an investment is made, which would help them escape energy poverty – through EE – renovation/insulation of the façade, windows change or installation of a new and more effective heating units. The justification for such approach is that this sum will be paid in installments for the following years, as even if receiving salaries, the most vulnerable are unlikely to escape the energy poverty trap without measures on their buildings/dwellings.

The needed amount of money would be unbearable for the social ministry budget alone, which justifies the creation of specialized Fund for support of energy poor, discussed later in the text.

6.3. Insufficient / inadequate support

Researchers like Bogdanov and Zahariev (2015) argue that the basic GMI is too low, insufficient and inadequate in the support level it ensures. Currently, the amount of energy allowances is determined annually by the Social Minister; as for 2016, the monthly amount is 72.20 levs and a total of 361 levs for the five winter months. Its amount is slightly related to the individual energy needs of the households, due to the used DMI approach, while the housing conditions or winter

temperatures in the 9 climatic zones are not reflected (Peneva 2015). A future analysis on these two indicators might highlight the need for additional payments or increased ones for vulnerable citizens in the coldest areas or living in highly inefficient dwellings.

Peneva's study from 2015 estimated that the average monthly energy costs with the cheapest energy source – woodfuel were 100 levs; with electricity it was almost double – 180 levs, while the energy allowance was 72.20 levs per month. KNSB (ISSR 2016) estimated that the monthly necessary sum per capita is 561 levs. After receiving the 72.2 levs allowance, the beneficiaries will be much below that sum. Actually, the lonely seniors above 75, who have the highest differentiated income, will be with 24 levs under the poverty line of 300. With 120 lesa under the poverty line will remain the representatives of the group with the lowest DMI (married couples). The energy allowance might ensure the survival of the household, but it is extremely insufficient to secure the acceptable heat level of 21 degrees C., defined by the World Health Organization (Peneva 2015)

According to reference tables calculations by electricity suppliers, cited in Peneva (2015), one-bedroom apartment of 60 m2, using inverter air conditioner with a capacity of 12,000 Btu / h and working 240 hours for heating or cooling would need another 144 kWh or 23 levs per month, as this is the minimum for initial or final month of the heating season. Rough estimates indicated that for an average home of about 60 m2 with the necessary insulation, double-triple glazing and other energy efficiency measures in the Bulgarian climatic conditions in a winter month would pay 80 levs for electricity.

All interviewed experts united around the position that the amount of the energy allowances is insufficient and should be increased. The bureaucratic requirements should be reduced in order for more people to benefit from the program. Energy expert Dilovska supported the idea of an

increased number of energy allowance beneficiaries, achieved through more humane and flexible criteria.

Some of the experts like the regional social expert, supported the increase of energy allowance amount in the light of the expected electricity price increases associated with the liberalization process. On the other hand, he perceived the cost of heating as high – for solid fuels, natural gas, but also electricity, because of green energy and other additives. The regional social expert demonstrated poor understanding of the electricity price setting mechanisms and the role of taxes for transmission, green energy, obligations to the society. This corresponds with the general impression within the society that the electricity price is higher solely because of the green energy subsidization. Still, he is right to require normal and affordable prices for the Bulgarian income situation and not to care for the different additives which comprise the electricity price. If the natural gas price was comparable with the income level he would have chosen gas for heating his home, but it is an economically unreasonable choice right now. According to recent data on gas price, which has reached the low levels from 10 years ago (Dilovska), the gas might become a solution for him, as his town is connected to the gas network. This is a privilege many other settlements where poor people reside do not have. Still, he would need a big sum for covering the upfront investment for connecting to the grid and buying gas appliances, and currently there are limited low-interest credit options.

Economists, also agreed that an increase of the financial terms of the benefit is needed. IME (2015) reviewed the WSP as a good targeting example as indicated in Word Bank evaluation reports on safety nets around the world (2007, 2009). They reached the same conclusions that despite the good targeting (66% of the funds reaching the 20% most vulnerable/poor segment of

the population), the program was not adequate in regards to its effect on the allowances on the families' budgets –only 6%, and that is due to the too low amount of the allowances.

The adequacy of the support has few more dimensions, not mentioned by the World Bank. As it was pointed out by Dilovska, the costs for the different fuel types are not identical in practice, but are unified within the program. Their separation and differentiated levels are a good practice from the initial stage of the program, which should be brought back. This proposition was also supported by a social expert, having wide knowledge on the problems of the social assistance schemes, including WSP.

Given the abovementioned state of affairs, it makes sense the amount of energy benefit to correspond to the energy source, despite the additional administrative burdens and costs. If the negative environmental externalities are calculated in the energy price of dirty energy sources, the consumers will be incentivized to use more environmentally, but also human friendly heating options like burning biomass (pellets, not woodfuel) or natural gas. The so called "payments on savings" or the more energy you save the bigger grant you will receive, could serve as a stimulus for further energy saving behavior for middle class citizens, but also for poor ones. The scheme could work particularly well for the poorest families, who have a practice of saving energy in order to control their expenditures. This time, by saving, they would gain additional funds that could be used for a more nutritional diet or other immediate needs. The scheme should be accompanied by a vast information campaign as it is widely known that the vulnerable groups have limited capacity to deal with various administrative procedures, and might even not be aware that they are eligible for support. This justifies additional funding to be provided for capacity building in relevant institutional bodies – for example, the social workers from SAA (Stoykova). Furthermore, the social workers are the ones who can apply a real individual

approach towards the poor citizens – to give them specific for their dwelling energy saving advice and recommendations and help them identify low-cost alternatives to their current heating method. The increased demand for social workers could serve as a job market opportunity for currently unemployed or discouraged citizens, which are suitable for the work as they are the ones who know best the situation of energy poor and would be trusted by the target groups. This "payments on savings" approach could be used for institutions on public budgets too, according to Dilovska. Currently, they do not have any incentives to save energy. They need to spend more if they want a bigger budget next year. An example of a possible incentive scheme could be marketed to the potential recipients in the following way: "if you reduce the bill with 10% we will take only 5% from you and the other 5 will be bonus".

Another aspect of the inadequacy of the support stems from the adopted payment method. There are two payments in early autumn or November the latest and then by the end of January (MLSP 2016). If the vulnerable consumers want to be prepared for the winter in advance, they need to pay for woodfuel with their own money, as the received half allowance amount will be insufficient. This highlights another ongoing problem in the program - the identification of the "right moment" when control over the targeted use of money should be executed. No one can force the beneficiaries to buy solid fuels right after receiving the money from the allowance. They might want to spend this money on something else and later buy fuel with their own money. The regional social expert noted that the amount of the energy allowance is identical to the amount of one additional minimal salary and is a great contribution to the budget of poor people, even if the funds are not spent on the designated function.

The two instalments approach might have been conceived as a good targeting argument – not giving the beneficiaries the option of spending the whole sum on something else or as a way to

ease the burden on the state budget, which is reasonable, but creates a trade-off between the budget ease and environmental and health harms. Buying woodfuel in January is not only more expensive, which is also crucial for poor people (90-100 levs, not 65 levs in small municipalities), but leaves insufficient time for the woodfuel to be dried and forces people to burn it wet. Burning of wet woodfuel is a usual practice in Bulgaria, although it has many drawbacks. It is less efficient than burning dry woodfuel, consumes more material and emits 40% more particulate matters (PM) in the air (Boykova and Tonchev 2015). It also contributes greatly to the inner air pollution, which is destroying the health of the family members, leading to enhanced premature death rate and chronic lung diseases. The burning of solid fuels itself is increasing the greenhouse gas emissions in the atmosphere and contributing to temperature rise and extreme weather events, associated with climate change. A solution could be a prohibition of selling (and burning) wet woodfuel on national or local level or an incentives' scheme for drying. The most eco-friendly option would be drying the woodfuel for a year, although significantly less harmful effects will be caused if wood cutting is allowed only till May and till be dried by November/December (Boykova and Tonchev 2015).

6.4. Solutions for lifting citizens out of energy poverty

During the interviews, three complementary solutions were discussed:

- Employment
- EE – insulation and appliances
- Providing alternatives / Green options

6.4.1. Employability and qualification

Employability is an appropriate solution for lifting out of poverty (and energy poverty), as in Bulgaria the poor are energy poor too and simultaneously receive social and energy allowances.

Staykov and his colleagues at IME are supporters of a modern social assistance system, which requires leaving the social program as fast as possible (Nikolova *et al.* 2016). Staykov is questioning if energy benefits should be received life-long or should be limited in time. The chronically ill and disabled people will not be discussed here, but unemployed people in working age. For example, in case of a discouraged person who is unemployed, but not looking for a job, the question is how long should he/she receive energy allowances. This question was based on IME's recent findings on contributing factors for social mobility between quintiles for the years 2010-2013, which showed that employment was the main reason for lifting out of poverty people in the lowest quintiles (IME 2016).

Their results showed that the poverty in Bulgaria is dynamic, with both positive and negative tendencies. 41% of the people in the first quintile (with lowest incomes till the level of poverty line 295 levs) have moved to a higher income quintile and did not return to poverty state in the middle term. IME's observations conclude that the positive change for these unprivileged people is due to employability and thus increased incomes (valid for 2/3 of the studied sample). Another optimistic observation is the finding that 1/3 of the escaped from poverty went to third and fourth quintile, which means that they have increased their income substantially.

The study identified negative tendencies too. 14% of the sample individuals have escaped poverty only temporary. 45% of the people in the first quintile of their sample have remained there in a state of persistent poverty, which accounts for 10% of the Bulgarian population.

6.4.2. Energy efficient appliances

Both energy efficient appliances and EE in buildings as crucial means for lifting out of energy poverty. The buildings' dimension will be discussed in the chapter on the National EE Program.

The head of the EE and RES Fund Dukov pointed out that energy efficient appliances are becoming more and more accessible. There is no point in buying a lower class appliance, as there is no big cash difference – about 20%. On the other hand, there is a quality compromise when buying new and efficient appliances, which have a shorter life than the old ones and probably will need replacement in five years. Quality differences even within the same class appliances, but in different brands could be observed.

The launch of a scheme, successor of the Residential Energy Efficiency Credit Line (REECL 2016), whose financial resources were depleted in the end of 2015, is expected soon (Dukov). Often the 20% grant was "eaten" by the bank interest, thus for the next phase, the energy poor should be better protected (Todorov). This credit line alone would not be enough for taking care of the energy poor. However, a centralized scheme under the fund for support of energy poor households, targeted at changing with more efficient heaters and possessing grant elements, might be a possible complementary solution. Similar targeted schemes are successfully working in other countries like Hungary (a scheme for change of refrigerators). The Bulgarian scheme could be funded by the prospective Fund for support of the energy poor citizens. Money for capitalization of the fund could come from trading CO2 emissions as well as from future European funds for actions on climate change.

A financial specialists (Dukov), economist (Georgiev) and Environmentalist (Todorov) were in favour of the idea that state money from WSP budget on allowances are allocated not only on current consumption, but also on buying more efficient stoves/heaters, while being accompanied by control actions on the targeted use of the money. Dukov proposed the energy allowances for several years (3-5) to be paid in once for efficient heater as an upfront payment. These money will be spend by the state for the following years if energy efficiency measures are not

implemented for paying the regular energy allowances. By doing this, the beneficiaries will leave the program, as recommended in the modern social assistance schemes. Such a scheme, according to the interviewed regional social expert, should be better separated from the current WSP, as it did not look applicable for the current structure of the SAA. The specialized fund for support of energy poor will probably be a better option, allowing the energy efficiency measures for poor people to be gathered under one cap organization.

6.4.3. Providing heating alternatives

A comprehensive analysis over households' structure of income/consumption and the energy sources they use should be made, but not only about the present beneficiaries of energy allowances, but also for the prospective ones not covered by WSP and the social tariff. Then, the government should start thinking how to better shape its current energy support policy. For example, if the data has shown that the biggest use is electricity, which price will be rising due to phasing out of cross subsidies and increasing the share of green energy, probably an alternative heating method should be sought for these households. The solution should not only be cheaper, or at an affordable price, but also more efficient and not harmful for the environment or human health. An overview of the greening alternatives within WSP follows.

6.4.3.1. Why heating with electricity is not a good alternative?

The energy dependence of Bulgaria in 2015 (including nuclear energy, regarded as domestic energy source, although the uranium fuel is imported from Russia) is 35.6% (NSI 2015b). There is a clear decrease since 2008 when its value was 52.5%, but the country is still quite vulnerable, especially in terms of gas imports. Meanwhile, almost half of the Bulgarian electricity is generated by highly polluting coal - 44.3% is from domestic lignite coal, having low caloricity and 1.6% from imported coal with higher caloric value. Additional problem are the inevitable

energy transmission and distribution losses. Indirect effect of the solid fuels combustion is the mortality rate attributed to air pollution (household and outdoor). This indicator for Bulgaria for 2012 was the fourth highest in the world – 175 deaths of 100 000 people, while the leader Georgia had 290 – deaths (World Energy Outlook 2016).

According to data, cited by the World Bank representative in Bulgaria, Tony Thompson (Thompson 2016), the average electricity expenditures of the total households' expenditures in energy of the Bulgarian families accounted for over 60%, compared to about 40% in Hungary, Lithuania, Latvia, and Poland. This is a proof of the high dependence on electricity Bulgarians have. Meanwhile, data, provided by the energy suppliers Cez (2016), indicated that 73% of the consumed electricity of an average household goes to heating of the dwelling and water heating. If heating use is added, the consumption goes to 81%, but the data does not make clear if cooling is related only to use of refrigerators or also fans and air-conditioners in the summer.

Using electricity for heating is becoming a social problem, according to Staykov, as people do not have alternatives. In big cities, people can switch off the DHS if it becomes unaffordable and replace it with an air conditioner or a pellet stove. At the same time, these people have big chances of becoming energy poor with the upcoming electricity price increases. In the countryside, the solid fuels stoves or boilers are often the only alternative. Gas infrastructure is present only in bigger municipalities, but requires a high upfront investment for connecting to the gas network and purchasing of gas appliances (Georgiev, Dukov).

Another Bulgarian absurd, mentioned by the economist Staykov, is the raised electricity consumption of households after the financial crisis between 2008 and 2011 (NSI 2015b). The period is associated with job and incomes losses, but households were using more and more energy; their consumption started to decrease in 2011, but in 2014 was still above the 2008 level.

Meanwhile industries were decreasing their consumption because of the crisis, but also due to gaining efficiencies in an attempt to gain a competitive advantage (data from the last National EE action plan (ME 2016b and NSI (2015b) data on sectors consumption for 2014). During that period and beforehand the price of electricity has been rising (NSI 2015c) and the normal economic reaction would be the household's consumption to decrease as in the case of the business sector. The reason for the opposite is probably rooted in the lack of culture of energy use and conservation, but also the lack of alternatives. Thus, Staykov recommended the government to create/facilitate favorable conditions and business environment for affordable diversification.

In conclusion, energy, environmental, economists and social experts united around the proposition for state support over renewable or other than the highly polluting coal and woodfuel energy sources. This will be a huge step for WSP, as for the last heating season 2015/2016 more than 90% of the funds from the program has gone to solid fuels, paid in cash and in-kind.

The challenges and opportunities in front of the supply with wet woodfuel and the related two-instalment payment method, were already discussed. Another indirect problem, to which the inadequate amount and number of energy allowances is contributing is the illegal logging, mentioned by Dilovska and the representative of regional SAA office. Contributing factors for the logging problems are the restrictive criteria within WSP on one side, and the non-targeted use of the allowances on the other. If support is received through direct transfer of money, part of the beneficiaries can spend them on anything and cut illegally trees from the nearby forest, causing harms to the next generations. If received in-kind, the beneficiaries could again sell the wood material and get illegally one for personal use from the wood. A resistance approach could comprise of increased control on the targeted expenditures by social workers, stricter sanctions

such as a 10 year ban on applying energy benefits, fines, increased control over illegal logging, combined with broadening of the social support schemes in areas with high risk and a history of such bad practices.

6.4.3.2. The natural gas alternative

The home gasification market hides a huge potential, according to a number of experts (energy experts – Dilovska, Kulevska, economists like Staykov and Georgiev. The environmentalists (Kondarev. Todorov) and social assistance experts are still considering it a rather expensive option, not appropriate for energy poor citizens. Everyone agrees it is a much more eco-friendly and efficient option, because there are no losses in comparison with electricity generation and transmission, much less particulate matters and significantly less CO2 emissions emitted in comparison with other fossil fuels. Still, from environmental point the EE and RES are better alternatives (Todorov).

The main problem for the home gasification market expansion is the lack of gas network in many settlements, which could be explained also by the low interest in households to connect and a lack of incentives. At the same time, a network expansion is not so expensive, but requires targeted funds and project management (Georgiev). For example, Bulgargas, the public natural gas supplier, should be obliged to build the connecting infrastructure to the big gas ring (connecting gas pipelines and intermediate network), according to Dilovska. On the other hand, the gas companies have already made big investments, but only 3% from the 10% of households who had this opportunity to connect to the gas network did it due to the high price (Georgiev, Staykov). Another dis-incentive is the non-stable gas tariff or higher marginal cost. Currently the price of new connections to the gas network is covered in solidarity by all existing customers, but Staykov asks, if one is already connected, is it fair to pay a higher bill because of the

connections of other clients. Without infrastructure as in the current situation, the marginal cost is higher for all customers and probably part of the capital costs could be paid by grants or other support mechanism (Staykov).

Still, the upfront investment is high for houses (Staykov). Homeowners need to buy a gas boiler, gas stove, convectors and should also calculate in the final investment the costs for design and projection of the private gas network as well as the price for connecting to the main network, amounting to a total cost of around several thousand levs.

For multi-family buildings there are hurdles in addition to the price– the consent of the majority of neighbours and the consequent division of the costs for connection fee, connecting heat pipelines, substation and others. Overgas, the supplier, who owns 2/3 of the market, is providing leasing schemes (Georgiev), which might not be applicable for energy poor citizens, but the specialized fund for support of energy poor could take care of their financial difficulties.

Dilovska suggested that even an information campaign on the recently significantly reduced gas tariffs (EMI 2016a), could serve as a good incentive for choosing gas over electricity. In the light of expected electricity price increases, the gas supply might become cheaper. It is also in a transition period to become more secure energy source with the progress of building gas interconnectors with neighbouring countries and potentially ruining the monopoly situation of the Russian Gazprom. The government should create financial and other incentives in order to promote a more efficient, eco-friendly, but also affordable energy source like the natural gas.

6.4.3.3. RES - Solar collectors and Pellets

In 2015 pellets were 30% more expensive than woodfuel and coal per m3 (Boykova and Tonchev 2015), but on the other hand they are more efficient during combustion and less material is needed. During heating with pellets no smoke is exhaled. There is more dust and labour in

comparison with gas heating, but less in quantity and frequency if compared with solid fuels (Dukov). According to observations of the financial expert Dukov, the pellets stoves are becoming increasingly accessible, through leasing schemes from retailers. There are already many Bulgarian producers (Dukov, Todorov). Pellet stoves could be found between 1350-1500 levs with 6 kW/h capacity, which would be enough for heating two rooms (Dukov).

A renewable solution for the energy poor could come from energy suppliers, while fulfilling their energy saving obligations, proposed Dukov. The company could replace the highly inefficient fan heater or woodfuel stove of an energy poor household with a pellet stove. The beneficiaries could be left alone to take care of the pellets or a subscription scheme could be organized on a regional or national level. Storage houses could also have certain quotas for energy poor people, who would know that they can find pellets there whenever they need. Todorov paid attention to the possibilities of using locally available pellets (for example in regions having logging and woodworking industries to use woodchips or straw, corn and other residues in agricultural areas). When talking about energy poor people, a challenge would be how to persuade them not to sell the new efficient stove they have been granted. Another issue is how to incentivize them to buy a more efficient one stove/heating unit, and not to spend the money from the energy benefit on something else. A possible approach could be to help them realize what the effect of their own actions will have for the local and global climate. But as supposedly people in difficult social situation are less inclined to take climate change into consideration the poor do not care about climate, another solution should be sought. They need to find a meaning for themselves, which is usually the reduced fuel costs and bills. The "payments on savings" approach also looks applicable for them, as they already are accustomed to energy saving behavior, but this time they will be stimulated to go further and benefit. An ESCO scheme might also be considered

(Georgiev) - someone to guarantee them a better thermal comfort, while they are paying the same amount of money, while consuming two times less energy, which will soon pay off the investment. For environmentalists, the energy poor should contribute with a small percent for purchasing efficient heaters, after getting familiar with the numerous benefits.

7. Analysis over the National Program for Energy Efficiency in Multifamily Buildings

7.1. Introduction / Summary

54% of all Bulgarians live in multifamily buildings (ME 2016b). This type of residential building stock is known with its poor maintenance, but despite the accelerated amortization, most of them are still subject to renovation. According to expert estimates, cited in the National Program for renovation of residential buildings in Bulgaria 2006 – 2020, the group of buildings with three or more floors which needs renovation presently contains about 680 000 dwellings, half of which or about 360 000 are prefabricated constructions, 150 000 reinforced and 170 000 solid (MRDPA 2005).

A National Program for energy efficiency of multifamily buildings was initiated by the Bulgarian government in February 2015 (MRDPA 2016). The first two years of the program will be free for the participating home-owners' associations; after that a percentage of co-financing will be required. During the first year, only prefabricated/panel buildings with more than 35 apartments could participate, while in its second year, (from the beginning of 2016) participation was extended to all kind of buildings having more than 6 apartments or 3 floors. According to preliminary estimates, the number of buildings rehabilitated under this program with the financial resource of 1 billion levs in the best case will be between 4000 and 6000 from a total of 70 259 prefabricated units across the country, or around 7% (Leshtarska 2015).

Despite the initial low interest, till December 2015 over 2000 buildings were approved to participate in the program. Due to deficiencies of various kind, it turned out that the available funding of 1 billion levs will cover only the renovation of these most initiative buildings. Up to the present moment (July 2016), 3800 homeowners associations have been registered for

participation in the program (Economic.bg 2016b), but probably the second half of them will be contributing to the program with a certain percent and many buildings might give up if flexible financial sources are not provided. In 2015, only 5 buildings were finished (National EE Action Plan 2016 (ME 2016a)), while until the end of 2016, the expected number of renovated buildings is 750, according to the reginal development Minister Pavlova (Economic.bg 2016b).

The guidelines of the program say that priority would be given to the oldest or biggest buildings or the ones with construction problems. An interviewed official from the Regional development Ministry noted that 2-3% of the multi-family buildings have life-threatening constructive problems. Presumably, these buildings are inhabited by the most vulnerable citizens, although no data is available on the income distribution in multi-family buildings. The available funds of the program are allocated on the "first come, first served" basis. A renovation till energy class C will be reached in order to get the best ratio of money invested/energy savings.

This energy class will allow a greater number of buildings to be renovated, but is considered too low by all interviewed experts. How accessible the current "free" phase of the program has been to vulnerable citizens, and why a priority should have been given to them are some of the problems that will be discussed further in the text.

7.2. Problems in the National Program

7.2.1. Problems stemming from renovation till energy Class C

EE and housing experts (Dobrudjalieva, Kondarev, Genchev) observed that by heating only one room the consumed energy of the building fits into energy class C. Looking at the energy consumption it seems as the building is efficient, but in reality the temperature inside is 17 degrees or below health norms. Looking at the housing conditions and characteristics reveals the real class of the buildings being D or even E. This means that if energy efficiency measures for

reaching class C are applied, they will not bring a consumption reduction and consequently lower energy bills, but will improve primary the thermal comfort in the property. A recent research on low-income working force also confirmed their observations (Peneva 2015). They found out that the energy efficiency factor can influence the level of comfort, but not the cost of heating, which will continue to increase along with income level until it reaches its optimal point. BPIE and EnEffect research (Manchev *et al.* 2016) argued that the improvement of comfort levels in the many previously under-heated dwellings should be considered a real benefit, and should be valued in the economic appraisal, together with other benefits like improved health and better air quality.

The targeted energy class C, could cause serious trust problems for the National program, which is promising significant reductions of the energy bills in the range of 50-70% (Genchev, Dobrev 2015). According to Genchev, 60-70% energy savings are impossible to reach with such low class of EE (Genchev). Energy consumption reduction and paying less than before could be achieved if again only one radiator is working in the dwelling, but this is not the aim of the renovation. The normal reaction after experiencing material deprivations is to improve the heat comfort in the dwelling after being able to afford it.

The energy experts from SEDA also supported the idea of more ambitious renovations and energy savings under the national program. Their reasons not to favour the current class C are the considerations for the future rising EE and CO2 targets for Bulgaria and that the renovated class C buildings will be again under the norms in 5-6 years. Furthermore, they pointed out that under the energy obligations, class C measures are not allowed and recognized as they are examples of business-as-usual or market average EE measures. This explains why the national program is not a contributor towards the national EE target, but only the obliged entities are.

7.2.2. Financing problems

An important reason behind the low maintenance of the building stock are the financial difficulties, experienced by a big share of the Bulgarian population. Currently easily accessible low interest credit schemes which could be used for repair works, EE, RES are not available in Bulgaria (Dobrudjalieva). There are some options with not very favourable conditions, which have been used by the more initiative citizens, after realizing the need for improving the thermal comfort at home (Dobrudjalieva). But in general, neither the citizens, nor the state possess the money needed for an up-front investment in renovation of a higher energy class.

The current national program is funded by a state loan, which is an unsustainable financing source and no one knows how long the program could last in this way or how many buildings could be financed (Dobrudjalieva). Thus, a co-financing percent is considered after the current 1 billion is spent, although the main source will most probably be another state loan (Blagieva). Dilovska gave an example for revolving financing option from Germany, where after 1989, the government payed for renovation of all homes, but received back its money through increased rents. However, this approach seems inapplicable in Bulgaria, because of the high ownership percent, more than 90% (Eurostat 2014). Nonetheless, tax on the transactions with the renovated flats (renting or selling) could be introduced (Alan Watt, pers. communication). An increased property tax could also bring revenues to the state budget to be used for renovations. The increase of the tax is reasonable, as a better living standard will be provided in private properties by public money.

7.2.3. Arguments For and Against co-financing, including for energy poor citizens

Against 100% grant for everyone. All experts disliked the current 100% grant for everyone under the program. Since 2016, all kind of buildings with more than 6 flats with big, small or absent percent of energy poor could participate in the national program including buildings at central

locations, built in accordance with better standards. In general, the multi-family buildings have very different ratios of poor/wealthy owners and tenants. Furthermore, Dobrudjalieva, Genchev thought that EE should be supported by low interest loans, not grants, as EE and RES are feasible investments with a reasonable payback period (thus considered voluntary and recommendable measures in the technical and energy audit under the national program). Furthermore, the co-financing might actually lead to the desired high energy class renovations, as indicated by Minister Pavlova (Economic.bg 2016b) and the interviewed Regional Ministry expert Blagieva.

Thinking of the kind of self-contribution applicable for the program, Dilovska and Staykov were in favor of bigger co-financing (50%), as this will bring the change of behavior, so essential for certain groups of energy users. After all, the investment in improving one's own dwelling will have numerous benefits and even the smallest grant percent should be motivational for the home-owners. Georgiev and Dukov proposed 20%, while Genchev and Kulevska favoured 25% (as in Romania (Dobrudjalieva)), which will brings a bigger value, interest and control in the renovation work process to the homeowners than now. Still, lower co-financing percentage seem more applicable as a starting point, remembering the low participation rate before providing 100% grant.

7.2.3.1. For 100% grant for poor

Dukov, the head of the Bulgarian EE and RES Fund (EERSF), agrees that EE is a profitable investment but for middle or higher class citizens. Dukov and the economist Staykov could not think of low enough, but still affordable own contribution for energy poor people. Thus, for the next phase of the program, a 100% grant should be given only to vulnerable, while all other neighbours should cover a certain part of the investment (Dukov, Dilovska, Staykov). Dukov

proposed three possible ways of covering their contribution. The first source could be the program budget, as he assumed that the overall number of energy poor participants will not be bigger than 10%. The second option is from their energy allowances for 3-5 years, paid in once as an upfront payment. Third alternative could be the specialized fund for support of energy poor households, aimed to fund measures, lifting people out of energy poverty (supported by Georgiev, Dilovska). The program could also work with banks for providing zero-interest or mild loans, as proposed by SEDA experts. Most probably there will be a mixture of grant plus low interest loans for the low-income groups, as indicated by Blagieva from MRRB.

7.2.3.2. *Against 100% for poor*

Housing, EE experts and environmentalists (Dobrudjalieva, Kondarev, Todorov, Genchev), who used to work closely with people implementing renovations, support the idea of energy poor citizens having a small contribution to the program (as 10% for example), as this will have educational and motivational effect to save energy further and take care for the property and installations.

The differentiated percentage of self-contribution is likely to arise new problems for the program like reduced interest of participants, stemming from feeling of injustice that some people have to pay and others not. In this case, as Dobrudjalieva proposed, only homeowners who value their thermal comfort and will do further steps to maintain and increase it will participate in the program, which is not a bad prospect for the program from energy saving point of view.

7.2.4. Problem – too many aims. Recommendations.

The main aim of the National Program for Energy Efficiency in multifamily residential buildings is to contribute to greater energy efficiency and reduced energy costs, to improve the characteristics and to provide living conditions

in accordance with sustainability criteria and to extend the life span of buildings by renovating them (MRDPA 2016).

In 2015, only big buildings with over 36 apartments, which are considered the most inefficient type of buildings, and where presumably the poorest segment of the population lives were allowed to participate in the program (MRDPA 2016). While this seems as an example of good prioritization, the approval since 2016 of buildings with less owners and with a supposedly higher percentage of wealthier citizens could have ruined its positive effect. The smaller and wealthier buildings have more initiative residents, who could have fast depleted the available finances, if these were not depleted by the higher costs for constructive problems and artificially high tender prices. The government was expecting 2-3 fold more buildings to be covered with the initial 1 billion levs.

While an additional priority on buildings with constructive problems was recommendable only on paper and no mechanism for its implementation was developed under the main "first come, first served" approach, indeed detected constructive shortcomings were removed under the program (Dobrudjalieva). This is a good starting point, as constructive problems are consequence of bad care, often due to financial reasons. Nevertheless, much more could be done through further prioritization of energy poor and even partly budget spending (Stoykova, Todorov).

Blagieva, an expert from the Regional Ministry stated that they are also thinking of setting priorities for the next phase as the financial resource is limited. Setting criteria for prioritizing energy poor households is possible and could be enforced within the ongoing program, too, if there were available funds. The main challenge remains the localization of the energy poor

households, as the multifamily buildings have very different ratios of poor/wealthy owners and tenants.

Dobrudjalieva, a housing and EE expert, reflected on what the aims of the program should have been or could be in its next phase, as the level of support depends on the aim of the program. The current program approach looks chaotic as if having too many aims. It seems to be a channel of social policy, as it is giving 100% subsidy, but at the same time there is no income criteria for targeting energy poor or poor in general. She admits the importance of the initiation of massive EE measures, but the current 1 billion levs could be spent much more wisely and economically feasibly. The already mentioned poor maintenance of multifamily buildings is a result of low condominium culture and very low care for the common property. Currently the program requires a minimal involvement of condominiums, as they just need to fill in the application documents and provide access to the builders. According to Dobrudjalieva, if the country wanted to educate in care for the common property, it could have set it as an aim and involved condominiums. A justification for such an aim is the fact that after the renovation the building will need constant maintenance in order to keep, but also to increase the level of energy saving. The implementation of this aim could be based on eligibility criteria, giving priority to or allowing participation only of Homeowners Associations having fund "Repairs and Renovation", who have changed their windows, issued a technical passport, an energy audit or showed in any way their reliability and good care.

On the other hand, if EE was the aim, as indicated in the name of the program, then co-financing will be mandatory, because the EE investment will pay-off in 2-3 years (Dukov). Then, a better than class C renovation would have been implemented, although for fewer buildings. This would have notably reduced the energy bills and would have a high demonstrational effect on the

benefits of EE measures. In this case eligible might have been only buildings in good constructive state or buildings indicated interest in further renovations as in the previous example. From this point of view, the program should have provided support for measures, which are hard and complex to organize such as insulation of the entire building envelope, for which everyone needs to consent and provide access to flats. Furthermore, as the 100% grant is socially unfair, the Social Ministry should have developed a threshold above which not to support renovation or to a lower extent.

To sum up, all experts agreed that the program should be free only for the vulnerable in order to have an effective targeting and spending of public money. The national program should target the vulnerable in order to solve the energy poverty in this segment. Experts want to see in the next phase of the program new eligibility criteria and subsidized measures, as at least part of the money is devoted to energy poor.

7.3. Recommendations on financing options

7.3.1. Gradual renovation

Genchev's NGO, together with Buildings Performance Institute Europe (BPIE) developed a renovation method "step by step", applicable for the National program (Manchev *et al.* 2016). Three to four main measures are covered: insulation, change of windows, ventilation with heat recovery, and RES. If the combination of measures costs 1000 levs/m2 for class A and 300 levs/m2 for class C, presumably the second option will be affordable. So, instead of implementing all measures for 300 leva/m2 with compromised quality, they proposed to spend 300 levs/m2 now only on better insulation (class A). By applying a class A insulation, the whole building will become class C. The cost for class A (from 6-8 cm. (class C) to above 18 cm. (class

A)) is only 30%. In few years, when an appropriate financial source appears, the next measure from the set will be applied, again to class A.

The step by step renovation keeps the potential of the building for upgrades. The building could reach class A from combinations with other class A measures, while after class C renovation, it will be locked-in for future EE improvements. The life of measures is 30 years and it will be economically unwise to change it earlier.

BPIE and EnEffect's study (Manchev *et al.* 2016) suggested a reduction of the grant 100: 75: 50: 25, while accompanied with simultaneous introduction of financial and non-financial incentives for covering the co-financing like low-interest loans / loans with a grant component. With initial 25% grant, the funding could reach many more citizens, improving their homes and increasing their quality of life.

Experts familiar with the approach liked the propositions (Dukov, Kondarev, Dobrujalieva). Dukov commentary was that the distance between the implementation of the different measures shouldn't be too long in order to prevent a mismatch in their economic life and double expenditure. Kondarev and Dobrujdalieva supported the idea of subsidizing hard measures like insulation, while change of windows, RES, could be obtained through other schemes. RES like solar collectors and pellet stoves are becoming increasingly affordable, despite not applicable for all kinds of buildings. Hurdles for their further expansions are the still limited flexible financing options, the need of keeping costly cold reserve for balancing the RES, although the demonstrational effect of already implemented measures is growing fast.

7.3.2. Specialized fund for support of energy poor households

Companies have two options for fulfilling their energy obligations – through their own subsidiary or through revenues towards intermediary fund for EE measures, which could be a

specialized fund for support of energy poor citizens. They are free to decide for themselves when and which option to choose. For example, the electricity supplier EVN has a subsidiary, performing energy audits, whose mandate could be extended to perform EE measures or to be given to a new subsidiary (Georgiev). In countries like Holland, Denmark energy suppliers have been offering EE measures and higher class appliances for a long time (Georgiev), from which they have a double benefit. On one side, they are fulfilling their obligations, while on the other, they are buying less energy from producers. It is an example of simple economic logic - the cheapest electricity runs out first, then the more expensive energy sources remain.

Connecting obliged parties and energy poor people is a good idea, as they have obligations to perform and will be happy to target vulnerable households, if offered a bonus or higher percentage of recognized saving, as currently companies are experiencing problems in identification of beneficiaries for their energy saving obligations (Dukov, SEDA). For that prioritization, amendments of laws are required and it is a matter of political will (Georgiev, SEDA). The Ombudsman of Bulgaria, Maya Manolova, also agrees that a specialized fund is needed. There the financial resources for energy poor citizens could be concentrated and used in accordance with priorities. Every energy poor should be able to apply, which means that additional measures for ensuring access to information and support with all documentation need to be taken care of (Georgiev).

A big portion of the fund's liquidity could come from the state budget (if the monthly allowances for several years are paid at once and in advance, as proposed by Dukov). Other significant contributors could be the obliged entities, especially if being granted with favorable conditions. Currently, because of lobbying, the state has not started to demand from them to perform their duties (Genchev, Dilovska). They already have a huge debt to the state, while at the same time,

the state is borrowing money for funding the national program – a clear example of unwise spending of public money, which should be changed soon. A third contributor to the fund could be the sale of CO2 emissions, which should be dedicated to "green investments" and again it is a matter of political will to use them for public buildings as currently or on energy poor people.

Royalties from the fund should be used for targeted support – for energy efficiency measures in buildings and purchase of efficient appliances and heating/cooling bodies andRES, when applicable. They could also be used as a warrant for consumer credits and special schemes like REECL, when the purpose is the change of old appliance/heaters with new EE ones. The fund could finance the participation of low-income households in future renovation programs by co-financing both multi- and individual houses (Dukov, Dilovska, Georgiev).

Many experts argue that a new targeted fund is not needed, as there is an existing one with the task of funding EE – EERSF, headed by Dukov. This position is endorsed by Dukov himself, that they are the most suitable existing fund, which could take responsibility for energy poor people too. A new fund created from scratch will require higher upfront costs for administration and capacity building. EERSF currently has the required expertise, but if it receives additional mandate for support on energy poor, it will need additional funds for hiring new people in accordance with the new functions. Actually EERSF's administration has discussed it with the Social Ministry. Their experts were concerned about the fast changing list of eligible people, which could lead to subsidizing non- eligible ones. The fund could take care for this risk, as losses in the range of 10% are negligible and even beneficial in comparison with providing state support in the form of 100% grant (Dukov).

Dilovska and SEDA see EERSF's role as a facilitator between companies and vulnerable consumers. It could provide flexible financing solutions from different donors and banks. As

ESCO companies find it hard to work in buildings with low-income owners, EERSF could work as a guarantor for them, providing them bigger security (Genchev). The latter was one of the conclusions of EnEffect's common study with BPIE, which also identified the increased need for new financing tools. For example in Germany there is a Development Bank, providing bigger sums for bigger energy savings (Genchev). Such scheme looks applicable for energy poor people in Bulgaria too.

7.4. Support for individual house. Recommendations.

The state funding, even through debt, is providing more options for targeting individual homes. Kondarev, a specialist in EU funds, EE and clean energy in an environmental NGO was surprised by the launch of a support scheme on the private homes of energy poor citizens, partly funded by EU under the new Operational Programme "Regions in Growth" 2014-2020 (2014). The use of EU money on EE in Bulgaria, including for energy poor, is justified by all new climate policies and ambitions, according to Kondarev. For him, it is clear that the buildings in Eastern Europe are perhaps the cheapest energy saving option, as for Western Europe much more money would be needed to reach such level of savings (EE saving per 1 euro invested).

Following the European policy prioritizing the EE measures, the Bulgarian government is developing its capacity for implementation of EE programs – long-term solution to energy poverty, contributing to the decline of energy consumption and thus reducing energy costs. Such programs are the ongoing National program for EE for multi-family buildings and a similar scheme under the new Operational Program "Regions in Growth" (2014) – "Priority axis 2 "Support for Energy Efficiency in support centers in peripheral areas" offering free renovation of single houses, owned by citizens, receiving social allowances.

In this scheme, the bodies, judging who will be eligible based on the submitted documents are the 28 small municipalities (Blagieva). MRRB's role is to draw up instructions and guidelines of the program, but they do not participate in its implementation phase. On the other hand, the support for energy poor in Operational Program "Regions in Growth" (2014) is too weak, especially in terms of available financial resources. The total budget of the scheme is 207 million levs; eligible activities are insulation of public buildings, multifamily ones with less than 35 flats (with more than 35 are covered in the national program) and individual houses of energy poor homeowners. Despite the initial requirement that half of the money delegated to each municipality was to be spent on residential buildings (MRDPW 2015), some municipalities declared that they will not fund such buildings (Dobrudjalieva). This situation raises the question how free were the citizens to apply for free renovation of private buildings, as they were direct competitors of the municipality for the same funds. If the governors have already decided on which of their public buildings they will spend the money, they could have implemented a very weak information campaign.

On the website of the small municipality I visited, there were two announcements about the launching of the scheme. Yet, there was an apparent problem of miscommunication or deficit of communication between local officials of different departments about opportunities for their target groups. The social expert was not aware of the existing possibility that energy poor owners of individual houses could apply for free renovation under an operational program. If the officials did not have such information, how to expect interest from the eligible poor people, who in general suffer from a limited access to information. Not surprisingly, the town did not have a single application for renovation of individual houses (anonymous municipality official). This is revealing evidence that the relatively good coordination on national level is not followed on

regional and local level, and should be improved. It also highlights the need for further capacity building in municipalities and a more decentralized management (Todorov).

Attention should be paid to individual houses simultaneously to multifamily building, according to Kondarev and Stoykova. The environmentalist stated that many opportunities were missed and continue to be missed out for targeting individual houses like the money from emissions' trade, which the Czech Republic used for funding within their national program both multifamily and single family buildings (Kondarev).

Comparing the renovation costs of individual houses and flats, the price for a flat is much lower. The potential for energy savings in houses is bigger, but is expected to be costlier (Genchev). No one has made such cost calculations, but hopefully after the implementation of the scheme, it will become clearer. The scheme is a good indication of thinking in that direction. As Kondarev recommended, a co-financing is required, as the grant could be as low as 25%. Further support for individual houses could be granted through the specialized fund for support of energy poor households in the forms of mild credits.

7.4.1. Newly proposed measures on vulnerable consumers from 26th May 2016

7.4.1.1. Energy Efficiency

Experts united around the position that EE is the most important and purposeful tool for lifting vulnerable people out of energy poverty. Thus, the Energy Minister, proposed *the rules of the National Program for EE of multifamily residential buildings to be updated by giving priority to multifamily buildings, where more than 30% of the residents are energy vulnerable* (ME 2016b). An energy expert from the Ministry admitted that this percent is rather tentative and could be adjusted later. According to Dukov, the number is too high, while finding buildings with more than 10% looked more realistic. He doubted that such buildings are present in Sofia, while

assuming that probably in segregated areas, blocks with as much as 100% could be found. Furthermore, such blocks would be in a very miserable state and would require significant funds to be renovated, which could not be paid by the future energy savings. Calculations should be made if it would not be more feasible instead of renovating the buildings, to move the residents in newly built rentable blocks, planned in the new Operational Program. As the budget of the program is depleted, this prioritization will be implemented during the co-financing phase. Simitchiev from the Energy Ministry indicated that the share of the energy poor could be covered by the program itself. This could increase the tension between neighbours, if clear financial criteria for differentiation of the required co-financing is not adopted, as proposed by Genchev and Staykov. A parallel information campaign on the benefits for everyone from the renovation of the whole building and on how to save energy should be executed.

7.4.1.2. Non-Financial measures

- **Establishment of a register of vulnerable consumers,** who are protected from disconnections due to health – for people on life-support equipment in their homes (ME 2016b). The regime on forbidden disconnections of ill people with life-supporting machines would not have an expensive cost, as experts from the Energy Ministry expect not to cover many vulnerable people.
- **Prohibition to suspend electricity supply during winter months for a period** of 30 days after the deadline for payment for persons with over 90% reduced ability, with an attendant (ME 2016b).. The current extension period of 10 days will become 30 days (Simitchiev). On the other hand, the State Ombudsman (2016) supports the idea that the termination of electricity during the winter months for all vulnerable consumers, not only the ones using machines should be forbidden.

- **Possibility for debt restructuring** (ME 2016b);
- **Information campaigns** (ME 2016b) **should be** emphasized on both national and local level and special attention should be given to the role of social workers, who are institution representatives in closest contact with the target groups and who could be ambassadors of the whole energy saving idea and process.
- **Objective and reliable online platforms and other instruments** to compare among the prices of different suppliers (ME 2016b) for a better access to information.
- **Code of ethics** (ME 2016b) – the rules of conduct in relation to utilities. EWRC will be the body responsible to ensure that the vulnerable consumers can exercise their rights.

8. Recommendations

General recommendations for the identification approach and the functioning of modern social protection system and recommendations on improvements in the policy measures in Bulgaria are provided after the analysis of Bulgarian energy poverty situation. The general recommendations will be applicable for countries in similar to Bulgarian socio-economic state and with identical historical legacies (SEE / CEE countries).

8.1. General recommendations

- For monitoring purposes and taking adequate actions against energy poverty an integrated information system is necessary, connecting the three dimensions of energy poverty – incomes, housing conditions, used type of energy source, but also additional criteria like health status and age. In the long term, it could be the flexible mechanism for identification of prospective people in need of support by monitoring risk groups – applying the "prevention before healing" principle and performing early actions at a lower cost.
- After having information on "Who are the energy poor?", a road map, accompanied by an action plan, time frame, targets on addressing energy poverty, as well as strategies on EE and climate change will be the requirements for applying a holistic approach.
- Unifying/synchronizing or giving preference to definitions (household, family, individuals) and measuring approaches (indicators) within EU and Bulgaria is a must.
- A modern social assistance scheme needs to provide cost efficient and targeted support to the vulnerable groups for meeting basic energy needs in the form of heating payments, including additional payments in case of extreme temperatures, while keeping the beneficiaries within the schemes for as little as possible.

- Taking into account the shrinking population, 22% of the population, including thousands of pensioners under the poverty line, the main priorities for addressing them should be education, qualification and employment. They are especially important for energy poor people in working age (unemployed and inactive), who should be contributors to the social support system, not beneficiaries. They should be incentivized to spend minimal periods receiving any allowances, as in the case of energy allowance, WSP could be bound to schemes like "payments for savings".
- Increased financial support for capacity building of social workers is worth considering. They can implement an individual approach toward energy poor people. Furthermore, a possible scheme for qualification of unemployed or inactive energy poor citizens on how to become social workers and energy ambassadors, as they know best the situation of energy deprivation and could give personalized advice on low-cost measures of housing improvements and the kind of RES suitable for the household's location and needs.
- A culture of smart energy use and conservation should be developed through awareness raising and demonstrational measures, but also through financial incentives such as "payments on savings", with special attention to energy poor citizens.
- First the energy poor people should be identified, then the cost of the protection measures should be estimated and finally, the money should be sought.
- The lack of money is the essence of inadequate support for energy poor, not only in Bulgaria. Thus innovative and flexible solutions should be considered such as credit lines with/without grant elements, "paying on savings", investing the allowances for several years on EE and financing targeted EE measures for lifting out of poverty by the obliged parties.

- Differentiated approach for allocation of allowances (amount corresponding to used fuel type), in addition to applying individual approach towards energy poor (necessary fuel needed for an optimal heating of vulnerable groups), should be emphasized. The higher administration costs will be compensated by the better results and beneficiaries leaving the programs quickly and freeing financial resources for expanding the scheme.
- EERSF rather than ASP or other existing / new fund should acquire functions of Fund for support of energy poor and administer schemes for support of energy saving measures like replacement/buying efficient heaters and other efficient appliances, higher energy class insulation, but also RES with different support levels. EERSF could serve as a facilitator and mediator between contributors like future European funds for actions on climate change, the obliged parties under DEE; EU-ETS (trade with CO2 emission), ESCOs, the budget of WSP on energy allowances and energy poor people.
- Energy suppliers as part of their energy saving obligations could change old and inefficient heaters/appliances and/or perform other EE saving measures such as insulation and windows change on behalf of energy poor citizens. Still, they should not be forced, but incentivized through bonuses like slightly greater recognized percentages, so that they will choose to support energy poor citizens themselves.
- All anti-energy poverty measures should be accompanied by a wide information campaign on “How to save energy at home?”.

8.2. Recommendations on Social tariff:

- The support of 1/3 of the energy bills seems too low. If increased to cover at least half of the bill, a stronger motivational effect for energy savings could be reached, additional to the more meaningful and adequate support, while administrative costs of the program would remain the same.
- Helpline / hot line providing support and advice on the procedures of changing the energy supplier could be considered. Such functions could be delegated to social workers too.

8.3. Recommendations on WSP:

- An increase of the energy allowances threshold should be made. IME (2015) proved that many poor people are staying outside the measure, because of the low threshold level, as if it will be increased with only 10 levs many new beneficiaries will be included.
- Receiving energy benefits in the form of direct money transfers eases the budget of the energy poor. Thus, in order to provide them with flexibility, but also to spend effectively the scarce public funds, the money on administering payments to multiple private fuels suppliers should be allocated by social workers for making unexpected visits and checks on used fuel type. A supporting measure could be stricter sanctions for non-targeted spending such as terminated right to participate in the program for a certain period plus financial penalties.
- WSP to be continued after the termination of the social tariff as an emergency measure for support of new people fallen into energy poverty state and as short-term measures for

immediate support for people with very low income and living in the worst housing before being covered under EE schemes.

- If heating with wood fuel is the only option for a region, then on a local level the sale of wet wood fuel should be prohibited or wood cutting should be allowed only till May, in order to dry till November/December, resulting in less air pollution.
- The alternative gas heating method can become more accessible and affordable after building connecting gas infrastructure and creating incentives for home gasification like credit lines with favourable conditions from the fund for support of energy poor people.

8.4. Recommendations on the National Program for EE in multifamily residential buildings:

- A prioritization with clear aims is needed for effective spending of public money. The program has big potential for easing the situation of energy poor Bulgarians, but can also bring multiple benefits, if implemented (on security, climate, employability).
- During the co-financing phase, an initial co-financing percent of 20-25 should be adopted, accompanied with financial threshold differentiating different support levels. For the energy poor – 10% self-contribution seems as a suitable amount, paid by low interest loans with grant elements, in order to have interest in energy saving measures and practices.
- The co-financing, combined with differentiated support levels can solve the problems associated with low energy class renovations. On the affordability issue Flexible low-interest credit options can also contribute to overcoming the affordability issue. Such opportunities are provided by the specialized fund for energy poor people, the "step by step" renovation approach of EnEffect and BPIE (Manchev *et al.* 2016).

- A rentable building stock for exercising social policy should be prioritized beyond the plans for construction under OPRG 2014-2020 with incentives for private companies.
- A parallel support for individual and multifamily houses should be pursued, in the case of a single family house, through a combination of co-financing and a grant.
- For reaching consent in multifamily buildings, the absent homeowners should not be counted in the final count. In order to incentivize homeowners to participate if some of them decline to pay, an information campaign on the benefits for all could possibly help.
- For the future financial sustainability of the program, taxes on transactions and increased property taxes could contribute.

9. Conclusion

After examining the current situation of energy poverty in Bulgaria, testing the applicability of current and proposed measures and possible amendments to them with respected experts from the governmental and non-governmental sector, a possible answer to the question "How the Bulgarian mix of policy solutions against energy poverty should looks like?" follows:

9.1. On energy price and incomes:

Social tariff to be phased out as soon as possible and replaced with direct payments for the people with lowest incomes and those in the worst housing, as well as crises payments in case of extreme weather conditions.

Energy benefits / payments should encourage the usage of environmentally friendly heating options such as DHS, natural gas, RES or efficient burning – dry wood fuel burned in efficient (and thus consuming and polluting less) stoves / boilers.

9.2. On housing conditions:

A National Program for EE in multifamily and individual houses should offer differentiated levels of support for poor and non-poor, but for both groups with a certain co-financing percent – for valuing and taking care. Energy poor people should become a priority and have yearly targets for EE measures on their behalf.

9.3. On financing:

A national fund for support of EE measures for energy poor households should be created. It could be administered by the EERSF and to provide low interest, loans with grant element, which to be used for deep renovation, low-tech measures, purchase of efficient heating units and household appliances. Financial resources from climate funds, Emissions Trade Scheme,

incentivized obliged parties, re-directed funds from the energy benefits program could capitalize the fund.

9.4. On behavioral change:

A wide information campaign on the benefits of EE measures is required plus energy literacy and advices on smart energy use, supported by social workers on individual level, part of which to be unemployed energy poor people. For the success of the campaign are needed simplified procedures for change of supplier and application process to the above mentioned fund and EE program.

For countries like Bulgaria, where many households are in a severe energy poverty state, a holistic approach for its eradication is recommendable, according to Boardman (2010), the pioneer on energy poverty. For the Bulgarian case, this means taking care of both the cause and the symptoms by integrating financial support (payments of energy benefits) and targeted funds for investments in EE of the building envelope and for efficient heaters and other appliances. Interventions on prices are undesirable and unnecessary, as the price should reflect the full costs and only the most vulnerable should receive support for paying their energy bills. Lifestyle changes like adoption of energy saving habits and rational energy use behavior are required for the reduction of bills and improved thermal comfort. In this way, the long-lasting actions against energy poverty involving EE will improve the general poverty too, by easing the budget on energy and diverting funds for other essential needs and services. They will also contribute to the efforts against climate change and energy security, while being probably the most cost-effective type of low-carbon measure in EU. Furthermore, by prioritization of the energy poor, the rebound effect will be prevented or reduced, as the main benefit of under-heated dwellings is the

improved thermal comfort, and only then reaching adequate temperature, higher energy class renovation and bigger energy savings could be achieved.

9.5. Areas of future research

Opportunities for future research stem from the limitations of the current research. After energy poor people are localized with the implementation of the social tariff, hearing their voice will be very beneficial for future researchers on the topic. The same is valid for energy companies - sharing their views on how they would like to interact with this target group and what kind of support they would need. Hearing the ideas of social workers will be especially valuable, as they could share "secrets from the kitchen".

While this thesis provides the concepts and proposed measure changes, the practical aspects, positive and negative nexus implications and estimates are the subject of further research. Possible areas to focus on could be: the use of innovative and flexible financial solutions against energy poverty, how the current definitions and indicators could be unified, what level of thermal comfort stays behind the current energy expenditures, and what the actual cost for adequately meeting households' needs should be. Assessing the effectiveness of the different policy solutions should be an ongoing process.

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