



South East Europe
Sustainable Energy
Policy



**ENERGY POVERTY IN SOUTH EAST EUROPE:
SURVIVING THE COLD**



October 2016

Lead Author:

Slavica Robić (DOOR, Croatia)

Lead Editor:

Stefan Bouzarovski (Collaboratory for Urban Resilience and Energy, Manchester Urban Institute, University of Manchester, United Kingdom)

Contributors:

Lira Hakani (EDEN, Albania)
Irma Filipović-Karadža, Tanja Jokić (CPI, Bosnia and Herzegovina)
Ivana Rogulj (DOOR, Croatia)
Vjosa Macula (ATRC, Kosovo*)
Sonja Risteska (Analytica, Macedonia**)
Sanja Orlandić (Green Home, Montenegro)
Lidija Kesar (Fractal, Serbia)

Additional Inputs:

Garret Tankosić-Kelly (SEE Change Net, Bosnia and Herzegovina)
Pippa Gallop (CEE Bankwatch Network)
Petra Remeta (WWF Adria)
Dragana Mileusnić (CAN Europe)
Maja Božičević Vrhovčak (DOOR, Croatia)

Publication Manager:

Masha Durkalić

Cover Design:

Ana Lukenda

Typesetting and Layout:

Ivan Hrašovec

We would like to thank all civil society organizations who contributed to the content of this report, including MAC-EF (Macedonia) and Center for Ecology and Energy (Bosnia and Herzegovina). We also extend our thank you to all volunteers who were involved in this project.



This publication has been produced with the assistance of the European Union. The contents of this publication are the sole responsibility of SEE Change Net on behalf of the SEE SEP implementing partners and can in no way be taken to reflect the views of the EU.



This work is licensed under a Creative Commons Attribution-NonCommercial 3.0 Unported License. If you wish to use any data from this report for commercial purposes, please contact SEE Change Net.

Contents

Foreword by Dr Brenda Boardman:

Solving energy poverty is
a social and climate imperative 4

Context 6

Introduction 8

What is energy poverty? 10

Who is vulnerable to energy poverty? . . 12

A glimpse into energy poverty:

SEE country analyses 14

Methodology 14

Albania 15

Bosnia and Herzegovina 18

Croatia 22

Kosovo 26

Macedonia 29

Montenegro 32

Serbia 35

The adverse effects of energy poverty in SEE . . . 38

Getting out of the dark 42

Recommendations 46

References 48

* According to the UN, Kosovo is "under the United Nations Interim Administration Mission in Kosovo (UNMIK) established pursuant to Security Council Resolution 1244." In this publication it is referred to as "Kosovo".

** According to the UN, the official name for Macedonia is "The former Yugoslav Republic of Macedonia". In this publication it is referred to as "Macedonia".

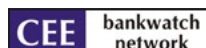
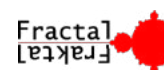
South East Europe Sustainable Energy Policy Programme

With approximately 25 million potential new EU citizens in South East Europe, who are all energy consumers, energy is perhaps one of the most complex issues which is facing the region. It has inter-related and far reaching impacts on several areas, including society, the economy and the environment, particularly as South East Europe faces the imminent deregulation of the market in a less than ideal governance environment.

The South East Europe Sustainable Energy Policy (SEE SEP) programme is designed to tackle these

challenges. This is a multi-country and multi-year programme which has 17 CSO partners from across the region (Albania, Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro and Serbia) and the EU, with SEE Change Net as lead partner. It is financially supported by the European Commission.

The contribution of the SEE SEP project is to empower CSOs and citizens to better influence policy and practice towards a fairer, cleaner and safer energy future in SEE.



Supported by





Foreword by Dr Brenda Boardman,
Emeritus Fellow, Environmental Change Institute

Solving energy poverty is a social and climate imperative

For over 40 years, there has been a recognition of the problem of fuel poverty in the UK, and for a similar period in Ireland and New Zealand. In winter, these are not especially cold countries, but they are places where historically there has been inadequate focus on the energy efficiency of the housing stock. Hence, for significant periods of the year, the cost of keeping warm is considerable and beyond the ability of the poorest households.

As the problem of energy poverty (effectively the same as fuel poverty) has become recognized in other countries, it has been found to be present for the same reasons: the combination of high fuel prices and energy inefficient homes causes problems for people on a low income. The result is fuel debt, cold homes, physical ill, health and mental distress and a host of resultant problems, such as children missing school and premature deaths among elderly people.

The fact that this is a growing problem, particularly in Europe, is partly a result of this increased awareness and partly – as demonstrated in this report – the result of ever-higher fuel prices as the market is liberalised. Yet Governments have had a duty, under *The universal declaration of human rights 1948*, to ensure that:

Everyone has the right to a standard of living adequate for the health and well being of himself and his family.

During the cold, it is impossible to keep warm and healthy in a space that is too expensive to heat on your income. The implication, as the recommendations in the report make clear, is for large-scale investment in making the homes of the poor sufficiently energy efficient, so that they can afford to heat them. This is a huge, but necessary challenge that requires a raft of policies and considerable expenditure.

While the main focus is on heating, energy poverty refers to all uses of energy in the home, whether for lighting, washing, keeping food cold or whatever. It is the household's total energy bill that matters, so the policies must encompass all the fuels and all the uses of energy in the home.

In 2016, as the Paris Agreement is about to be ratified, all countries have an added responsibility to curb their emissions of greenhouse gases so that the world does not ever warm up by more than 1.5°C. This is another huge but necessary challenge that affects all households, not just those on the lowest incomes.

Fortunately, the solutions that help the fuel poor with the energy efficiency of their homes are also those needed to mitigate the effects of climate change: reducing the demand for energy, whilst preserving and enhancing the levels of service provided, is the first task for policy. Then the required amount of low or zero carbon energy supply is minimized. This sequence of policy interventions is crucial, as all new sources of clean energy have to be paid for through higher customer bills and, hence, risk increasing energy poverty.

This report is, therefore, extremely timely. In its thorough analysis of the situation in South East Europe for the energy poor, it highlights for governments the extent of the problem and the suffering caused. This demonstrates clearly that interventions on vastly improved energy efficiency in the housing stock have a social as well as a climate imperative.

Dr Brenda Boardman, MBE, FEI
Emeritus Fellow, Environmental Change Institute
University of Oxford



This report gives a glimpse into the everyday life of those who are severely affected by adverse impacts of living in energy poverty throughout South East Europe, while trying to provide guidance for possible paths to solving the problem. Tools and mechanisms that can provide immediate and much needed assistance for many families are also discussed. It is principally political will – the willingness to act and make a difference – that is lacking.

The first part of the report (“Context”, “Introduction”) explains what is energy poverty and energy vulnerability and what are the specificities of the SEE region.

The second part of the report provides insights into everyday life of the energy poor in the SEE region, based on findings of field visits undertaken in all seven countries.

This is followed by a discussion of adverse impacts of energy poverty – which are the most common effects of living in energy poverty and what the main causes are.

The final part of the report (“Getting out of the dark”, “Recommendations”) is focused on possible means and mechanisms to prevent and alleviate energy poverty in the SEE region.

Context



Photo by:
Lasta Slaviček
Photography, 2015,
taken during the
field visits to energy
poor in Croatia

The South East Europe (SEE) region – which for the purpose of this publication is understood to consist of Albania, Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro and Serbia, has faced, and is still facing, many difficulties in the energy sector. These can be attributed to its recent turbulent history resulting with infrastructural damage and the stagnation or decline of national economies, on the one hand, and the liberalization of energy sector related to EU accession, on the other.

Increases in energy prices and the shift to a liberalized energy market pose a significant problem for many households in the region. South East Europe is part of the wider post-socialist region, which is especially vulnerable to energy poverty as a result of many years of regulated and heavily subsidized energy prices and an energy inefficient housing stock [1] [2] [3]. While energy use per capita in the SEE countries is about half that of the European Union (EU) (see Figure 1), the inefficiency of building stock, household appliances and heating systems means that the energy required to provide the same comfort levels is much higher than in the EU [4].

Looking at electricity consumption for the household sector per capita and per household it is evident that households in the SEE are much more burdened with unnecessarily high electricity consumption and thus related costs (Figure 3). Because most of the region's

electricity production originates from coal powered power plants, excessive electricity use leads to a tremendous environmental and health burden [6]. Kosovo, the EU's poorest country with record rates of unemployment (see Figure 2) has the highest consumption of electricity per household (Figure 3). This can be

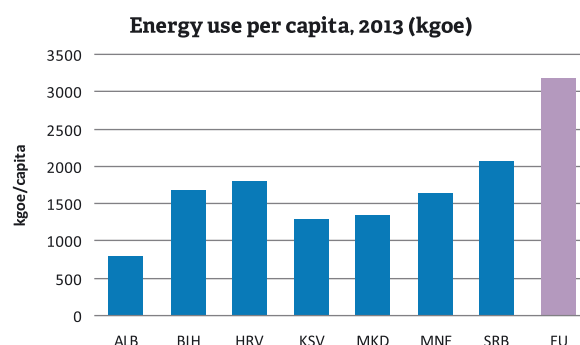


FIGURE 1 Energy use per capita in 2013. (Modified from [5])

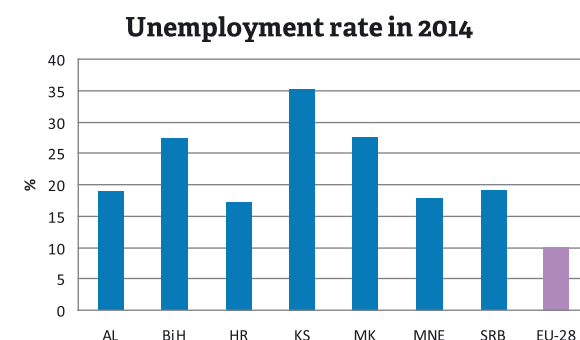


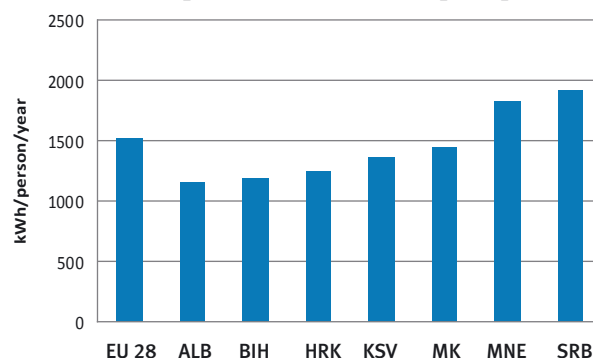
FIGURE 2 Unemployment rate in 2014 (combined 2014 data from national sources and Eurostat)

attributed to its inefficient housing and household appliances stocks, coupled with high rates of electricity-based domestic heating.

With the desire for further development, the requirements for energy are expected to increase significantly for those households which are most affected by energy poverty, if no targeted measures are put in place. At the same time, the region remains heavily dependent on energy imports and with an energy inefficient housing stock, heating systems and household appliances [4]. The high reliance on imports, coupled with the shift to a market-based energy sector without protection mechanisms in place, leads to increased prices of energy. This hits the residential sector the hardest, leaving the poor with limited means to decrease their energy costs. They are forced to make decisions which often leave them in dark, cold and damp homes.

Without funds available to invest in energy efficiency of their dwelling, to improve their heating systems, or to buy new household appliances, poor households are forced to give up on aspects of their basic living standards – decreasing living space in winter, turning down the thermostat, using inadequate heating, washing, cooking, lighting and in warmer climates, cooling services. Many of those affected by energy poverty in the Western Balkans are forced to deal with the ‘heat or eat’ dilemma, often giving up on much-needed energy to provide for food, or in harsh winter conditions, giving up on food to provide much needed heating.

Electricity use in household sector per capita



Electricity use in household sector per household

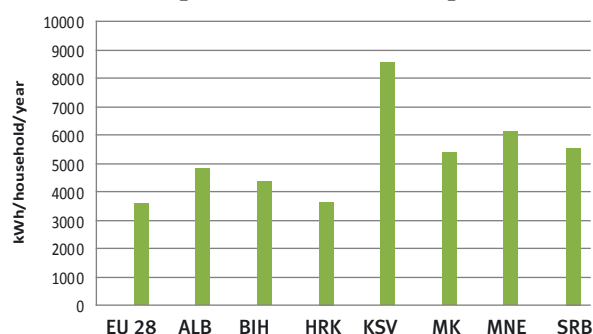


FIGURE 3 Comparison of electricity use in households sector per capita and per household¹

This report gives a glimpse into the everyday life of those who are severely affected by adverse impacts of living in energy poverty throughout South East Europe while trying to provide guidance for possible paths to solving the problem. There is insufficient public debate and awareness of the ever-rising problem of energy poverty in the region, while the EU is trying to make (too) slow steps in finding solutions, there is almost no recognition of the severity and magnitude of energy poverty prevalence in South East Europe.

This report aims to focus the debate on those who are in greatest need, and to stress that there are tools and mechanisms available to provide immediate and much needed assistance for many families. It is principally political will – the willingness to act and make a difference – that is lacking.

¹ Modified from [81] and combined with data on number of households from most recent census for every country.

Introduction

The South East Europe (SEE) region has faced many difficulties in the energy sector as result of its turbulent history, which has resulted in infrastructural damage and the stagnation or decline of national economies. It is commonly falsely assumed that energy poverty has the same characteristics across the region, regardless of cultural, climatic or political conditions. Through practice and research it has been shown that regional and historical differences play a significant role in the prevalence and characteristics of energy poverty [7]. The adverse effects of energy poverty are particularly evident in in South-East Europe.

Energy price rises pose a significant social and political issue in the whole of Europe [1]. The shift to a liberalized energy market, without protection mechanisms in place, has been particularly burdensome for people in the countries which have already started the liberalization process, making them vulnerable

and lacking tools for coping with price increase as a result of many years of regulated and heavily subsidized energy prices and non-efficient housing stock [1] [2] [3] [8]. Although prices in SEE are still significantly lower than in EU (as shown on Figure 4) with removal of state regulation and shift to a liberalized energy market increases in prices can be expected and they are likely to create significant problems in covering basic energy needs [3], [2], [9], [10]. Liberalization process is not a problem by itself, however, it has to be implemented with adequate protection mechanisms to enable smooth transition.

If the current trends continue it is likely that market liberalization and removal of price control mechanisms will close the „price gap” (Figure 4). As result, without adequate protection for vulnerable groups and significant investment in energy efficiency, many people will

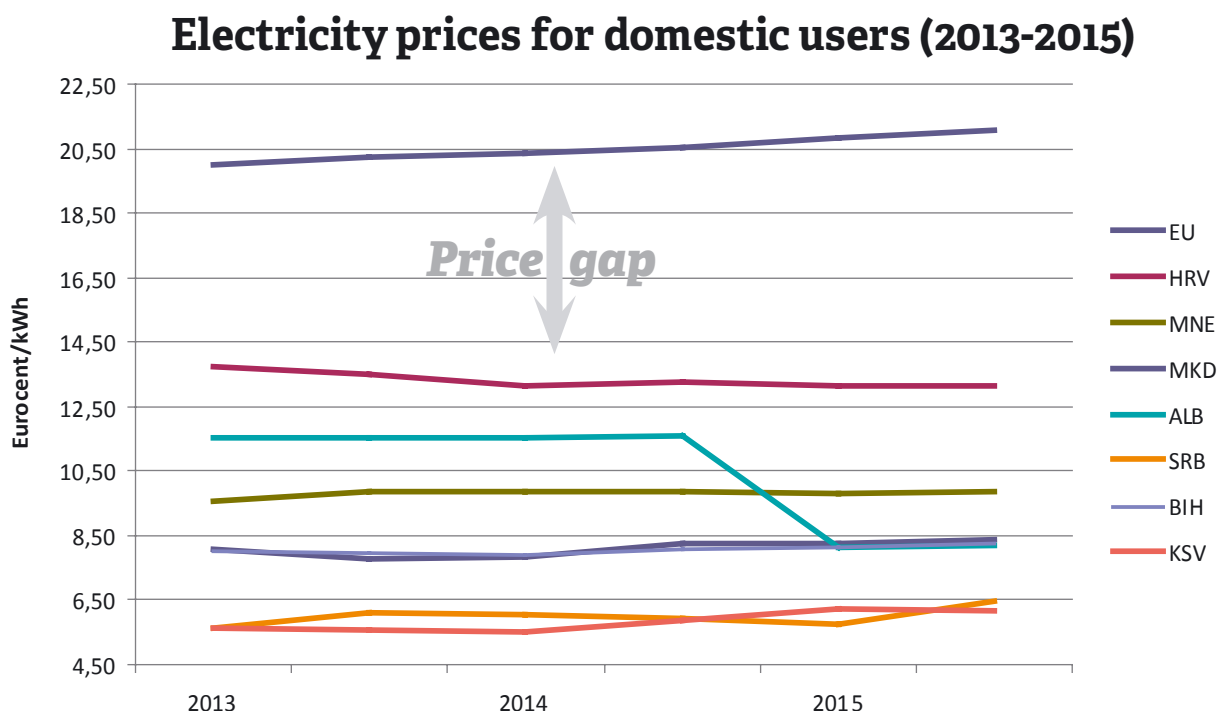


FIGURE 4 Electricity prices for households in Western Balkans compared to EU prices for the period 2013-2015 in Eurocents per kWh (Modified from [11]).

be pushed into energy poverty. This would lead SEE to an unsustainable, unhealthy and dangerous future.

Living in energy poverty has proven adverse impacts on health, ranging from the high prevalence of pulmonary disease to excess winter deaths and poor mental health² [12] [13] [14] [15].

While it has long been acknowledged that continuous increases in energy costs drive many families into energy poverty, particularly when it is combined with inefficient housing stock, old household appliances and low income, there have been only limited efforts to implement protection systems for the vulnerable in the SEE. Affected families are forced to choose between food and basic energy services. As a result they often resort to living in inadequate conditions and shifting to alternative fuel. Most common fuel switching is to biomass (fuelwood), which, although it is more beneficial in terms of carbon emissions and pricing, is starting to pose a serious threat to regional forests because of poor control mechanisms, illegal logging and fuelwood sales.

Deforestation is an increasing problem in the whole of South East Europe. Governments' inability to address energy poverty in South East Europe is increasing the threat of deforestation, as illegal logging is seen by vulnerable people as their only chance for surviving harsh winters [16].

Throughout more than thirty years of research in the field of energy poverty, attempts have been made to provide a comprehensive definition of vulnerable groups and universal definition on energy poverty, however no consensus has been reached on how to measure the prevalence of energy poverty or how to explicitly define vulnerable groups. What is more important is that there is no comprehensive guidance on how specific countries or regions should approach this issue.

With the EU unable to provide a definitive solution or at least clear guidance how to fight this problem, it should be in the interest of governments of the most affected countries, those in SEE, to take their own initiative and lead by example as this is the only way to provide a sustainable, healthy and economically stable future for their citizens.

2 These are deaths which are directly related to the cold weather. These are people who generally have underlying health problems but would not have been expected to die during this period. [82]

What is energy poverty?

Defining energy poverty has caused and still is causing numerous debates [17] [18] [19] [20] [21] [9] [22] [23].

Energy poverty, in general terms, represents the inability of a household to secure adequate amounts of energy in the home – allowing it to keep living spaces adequately warm and well lit, to have access to a needed range of energy services, and to be able to afford a sufficient amount of energy for everyday requirements.

What is difficult to define is what “adequate” is. Adequate heating can be, and often is, defined as the optimal temperature for health, which is according to the WHO 21 degrees Celsius in the living rooms and 18 in other rooms. However, much of the perceived comfort is culturally determined which makes precise definition difficult. Energy poverty is a complex issue, in which many factors which determine whether a family will be facing adverse impacts (Figure 5).

Understanding energy poverty is central to any efforts to alleviate it. This requires a structured approach to the manner in which energy poverty is defined, measured, monitored, recorded and reported [24].

Defining energy poverty in a way that could be measured and monitored is a challenging task requiring extensive research [25]. There is no all-encompassing EU definition [21], only a limited number of EU member states have official definitions of energy poverty [9], while at the same time it is estimated that some 11 per cent of the EU population is energy poor [26]. Some definitions see energy poverty as lack of access to modern energy services – electricity and clean cooking sources [27], [28]. Energy poverty is also seen as the inability to keep heat the home to socially – and materially-necessitated level, which has been developed based on the assumption that poverty is “a lack of access to resources and denial of opportunities” [25]. In the SEE public and political discourse on energy poverty Boardman’s definition is commonly used, which states that a household is energy (fuel) poor if it needs to spend more than 10 per cent of its income on energy costs in order to keep the home adequately warm³ [29],

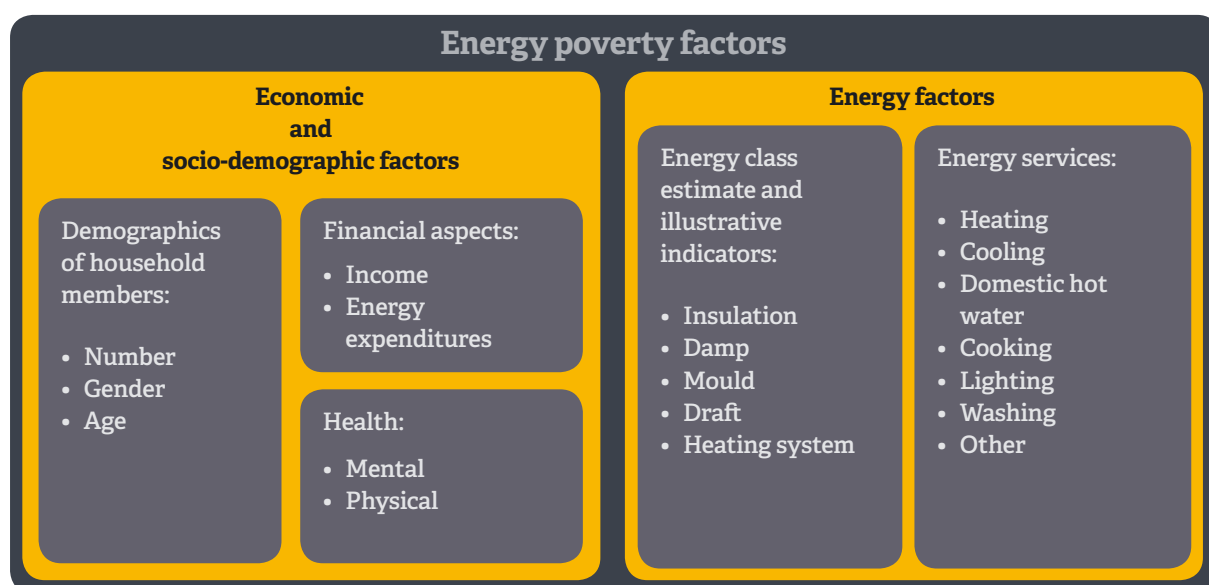


FIGURE 5 Factors describing energy poverty

3 Adequate indoor temperatures are defined as 21 degrees Celsius in living rooms and 18 in other rooms according to the WHO standard from 1987.



FIGURE 6 *Unsuitable living conditions in SEE*
(Photo by Lasta Slaviček Photography)

[30]. It is important to clarify that Boardman's definition uses modelling to determine the needed amount of energy and related costs, not actual reported data. In the SEE region, this has commonly caused misinterpretations in the media and in high level debates on energy poverty, where it is often falsely interpreted as an absolute 10 per cent threshold based on the actual bills and monitored energy consumption. Energy poverty estimates based on such assumptions are problematic.

Boardman's definition was used in the UK for national statistics and monitoring of energy poverty until 2013 when much of the country shifted to the Low Income High Cost (LIHC) approach. The LIHC method considers a household to be energy (fuel) poor if it has energy costs above average and if the income which remains at the household's disposal after paying for its energy costs, would push the household below the official poverty threshold. The main difference to Boardman's definition is that LIHC compares the national average of costs and income, taking into consideration the number of household members who have low incomes and high energy costs, and the depth of energy poverty in those households.

An increasing body of research shows that different combinations of indicators should have a role in the evaluation of energy poverty [9], [31], [32]. As for SEE, although there is no clear definition nor national statistics available focusing on energy poverty, it is clear that many households are living in substandard and inadequate conditions as result of their inability to pay their energy bills or invest in energy efficiency improvements.

The faces of energy poverty in Balkans are those of extreme hardship and immediate action is needed regardless of the exact definition of energy poverty or its threshold.

While waiting for science to come up with an applicable definition to enable the measurement and monitoring of the problem, it is necessary to design and implement measures for protecting the most vulnerable.

Who is vulnerable to energy poverty?

Current practice defines specific groups which are vulnerable and more likely to be energy poor and focuses policies them. Good targeting of policies per specific vulnerable group is the key to success.

Vulnerable groups are those who, according to the economic and socio-demographic and energy indicators linked to their households, have a higher probability of becoming energy poor than the general population.

For example, it has been determined that recipients of social welfare are significantly more often energy poor than the average, and that single parent households

are more likely to be energy poor than two-parent ones. Pensioners are more commonly energy poor than employed persons [32], [33], [34] [35]. Older people are commonly affected by energy poverty as they may require more home heating than others for physiological reasons and they spend most of the time at home, unlike the employed population [33]. This group is also most affected by excess winter deaths. Older, disabled, ill and single parent families are more likely to be energy poor than general population.

At the same time it is important to bear in mind that belonging to a certain vulnerable group does not necessarily mean that a person or a family is energy poor. Although retired people have difficulties in covering their basic energy needs – often due to low incomes and the age of the housing stock – there are many who are retired and well off. It is important to bear that in mind when designing policies and mechanisms,



because imprecise targeting may lead to inefficient use of the state budget and not achieve the desired impacts.

While SEE governments are struggling to align their policies with the EU acquis, the EU provides no clear guidance on how to deal with energy poverty or the vulnerability issue. With the European Commission recognizing the fact that the problem of energy poverty is on the rise and that there is still no clear framework, a Working Group for Vulnerable Consumers was established in 2013. The Working Group was formed with the goal of *performing a qualitative and quantitative review of different aspects of vulnerability and to give recommendations for defining vulnerable consumers in the energy sector* [10]. It concluded that *it is not possible to have a unified definition of vulnerable consumers which would apply to the entire EU*.

As for the EU acquis, the idea of energy poverty came into the EU legal framework for the first time via the so-called “Third Energy Package” when the protection of vulnerable energy consumers was first defined with the goal of reducing energy poverty. On the basis of the EU Internal Market in Electricity (2009/72/EC) and Natural Gas (2009/73/EC) Directives, member states must define energy poverty and protect vulnerable energy consumers. The Internal Market in Electricity Directive (2009/72/EC) states that energy regulators should be empowered to contribute to ensuring a high standard for universal and public services in compliance with the open market, protection of vulnerable consumers, and fully efficient measures of consumer protection. The Energy Efficiency Directive (2012/27/EU) states that member states should be enabled to include, within their own national systems of energy efficiency obligations for communal energy enterprises, demands in relation to the realization of social goals – specifically in order to ensure access to greater energy efficiency to vulnerable consumers. It is now up to each government to find their own way to deal with this complex issue.

In an attempt to highlight the severity of the problem of energy poverty in SEE and to illustrate hardships affected families are facing, analyses were undertaken in all seven countries. As data is in some cases very limited due to financial limitations, these analyses can only provide limited results. However, while it is impossible to establish the precise magnitude of the problem, or to pinpoint all of the affected households based on these results, they are nevertheless indicative of the severity of the problem and a represent an urgent call for immediate action.



FIGURE 7 Left: A typical SEE family house conducive to energy poverty – no insulation and single glazing; Right: Fuelwood stove heating (Photos taken in Croatia during the field visits)

A glimpse into energy poverty: SEE country analyses

Methodology

The data used for the country reports presented here have been obtained through the projects “Reduce energy use and change habits, REACH”⁴, REAC CEI, “With knowledge to warm home”⁵ and South East Europe Sustainable Energy Policy (SEE SEP). In order to analyse energy poverty in the seven countries a review of national legislation was undertaken for each country, in addition to a desktop study of existing research.

In an attempt to highlight the severity of energy poverty, and to illustrate hardship, a series of field visits to affected households were undertaken. Subject to available funding, in some countries (Croatia, Bosnia and Herzegovina, Macedonia, Montenegro) a questionnaire was used to gather data on energy consumption habits, and provide insights into the difficulties energy poor face. In other countries, as result of limited funding, fewer households were visited so as to illustrate problems that are commonly seen among the energy poor (Albania, Kosovo and Serbia). The respondents targeted were either those who receive compensation and/or receive social welfare support. Overall, 833 (Albania N=10, BiH N=103, Croatia N=397, Kosovo N=10, Macedonia N=206, Montenegro N=97, Serbia N=10) households were visited throughout the SEE region, providing valuable qualitative and quantitative insights into the severity and experience of energy poverty. Out of 833 households visited, complete and comparable data was collected for 612 households. This was used for highlighting the overall situation in the region.

The first part of the questionnaire relates to the health and economic status and socio-demographic aspects of the households visited, while the second part of the questionnaire relates to the energy aspects of the dwelling in which they live. In the context of the

health-status part of the questionnaire, questions were designed to cover the health-related behaviours of users, their health status and self-assessment of personal health. The questionnaire comprised basic economic and socio-demographic indicators that are relevant to research related to health outcomes – age, gender and education. The second part of the questionnaire relating to the energy aspects of households includes basic information about the household electricity consumption, water consumption, the consumption of thermal energy and the general conditions of relevance in the context of energy poverty, such as temperature, damp and mould in the household.

It is important to note that certain estimates have been made for the calculations. Data on electricity consumption was collected through energy bills, however, in cases when respondents did not have bills available, a calculation was made based on the price of the monthly bill they reported. For heating, as most of the households use wood, they reported the consumption in cubic metres. Heat consumption was calculated based on the assumption that 1srn=1.575 kWh.

All respondents were provided with and implemented simple energy efficiency measures (LED lightbulbs, reflective foils for radiators, timers for electrical boilers, draught proofing for doors and windows and water pearlators). Through inexpensive measures the goal was to improve the quality of life and reduce energy consumption. All visited households members were advised on the efficient use of energy directly by the field-workers and through brochures and leaflets. The actions taken resulted in annual energy savings in the 2-8% range, with water savings higher than 10%. Given the low income levels in relation to high energy costs, those savings offer relief while somewhat improving living conditions going beyond energy.

All respondents from the quantitative and qualitative research sections were asked to give informed consent to participate in the research and their identities were anonymized, while data is presented in an aggregate manner.

4 www.reach-energy.eu, Co-funded by the Intelligent Energy Europe Programme of the European Union.

5 Funded by the European Union through European Social Fund and Government of the Republic of Croatia Office For Cooperation with NGOs.

Albania

General information

After transport, the building sector in Albania has the highest final energy consumption. The total final energy consumption for the period 2005-2012 in the residential sector of Albania shows that for households the main energy source is electricity (45%), followed by biomass (38%). Albania has a high unemployment rate of 19% which has been continuously growing. Inadequate access to energy services is a common issue in Albania where just above 40% of households have cooking appliances, water heating and other electric appliances. 11.2% of connected households are late with paying their bills and 20.7% have inadequate heating. It is also important to note that 12.5% of households have damp walls, floor or basement and 7.7% have a leaking roof [36]. All those numbers highlight the severity and prevalence of inadequate access to energy services in Albania.

Vulnerability and energy poverty in national legislation

Similarly as in other SEE countries, energy poverty in Albania is not clearly defined and systematically monitored. There are no specific policies in place designed to alleviate energy poverty. Vulnerability is addressed through different energy and social policies. The Albanian Law on the Power Sector (OG 43/2015) defines a vulnerable customer (Article 3) as a household consumer who due to social reasons, in special conditions and by definition of this law, is entitled to certain special rights regarding the supply of electricity. The vulnerability criteria are, according to Article 95, determined by the Ministry of Social Affairs in cooperation with the Ministry for Energy and Ministry of Finance together with the state Energy Regulatory Entity. The following criteria are taken into account for acquiring vulnerability status:



FIGURE 8A *Inefficient walls in Albania*
(taken in Tirana in 2016 during household visits)

- customers with low income, who use electricity to supply their permanent residence;
- customers who consume electric power supplied through single-phase grid with maximum power of 16 Amperes;
- maximum level of energy consumption per person reflecting seasonality;
- manner of direct support by the Government budget;

This is in line with guidance provided in the Social Strategy in the Energy Community (2013), and following basic guidance provided in the Social Action Plan on the implementation of the Memorandum of Understanding on Social Issues of the Energy Community from 2010 (SAP). The SAP was the first document requiring protection of “socially vulnerable consumers” within the energy sector. This was one of the key components of SAP, with the following activities aimed at its realization:

- Analysis of existing legislative study on protection mechanisms
- Criteria on definition of socially vulnerable energy consumers
- Analysis of existing mechanisms for poverty to define indicators of poverty related to energy use

Some of the steps have partially been undertaken (i.e. criteria on definition of vulnerable consumers), however, no thorough protection has been put in place and publicly available data on results of foreseen analysis is scarce so it is questionable whether, and to which extent, have they been undertaken.

According to the aforementioned Law on the Power Sector, once defined, vulnerable consumers are listed in a register under the authority of the Ministry of Social Affairs. The register is shared with the distribution system operator and with electricity suppliers. The registry defines vulnerable customers who can have subsidies on their electricity bills. Article 96 ensures universal access to electricity supply to those who acquire “vulnerable” status and who are listed within the registry.

Starting with January 2015 the price for households is 9.5ALL(0.072 EUR)⁶/ kWh. Prior to this regulation the households that consumed less than 300 kWh paid 7.7 ALL (0.056 EUR)/kWh and those who used more than 300 kWh paid 12.5 ALL (0.091EUR)/kWh. Following this regulation, in mid-January 2015 an additional mechanism for protection of vulnerable customers was set up; it provides compensation of costs due to changes in prices of electricity to those who use up to 300 kWh though a monthly deduction of 648 ALL (4.7 EUR) from their electricity bills if they meet the vulnerability criteria.

Unlike the old law, which differentiated prices for all consumer groups solely based on their consumption level, this approach is more socially sensitive while trying to provide relief to those in need. Eligible for this benefit are: a) households that receive social aid, and

families that have members with disabilities, declared unable to work; b) heads of families, that are beneficiaries of a state invalidity pension and are beneficiaries of invalidity pension in village and do not have other members of their family employed or self-employed; c) heads of families, who benefit from a state retirement pension or who benefit from a retirement village pension, but they live in a city and do not have family members employed or self-employed; d) families with a member employed in state institutions, with monthly gross salaries under 35,000 (thirty five thousand ALL) (253.75 EUR); e) legally blind f) persons with paraplegia and tetraplegia. This criterion is aligned with the Act on Social Assistance and Services (9355/2005) and Law on the State Budget (160/2014).

The Law on the Natural Gas Sector defines a vulnerable customer as a customer who, based on his income, cannot afford the price of gas and thus benefits from Government subsidies. This definition needs to be refined. Furthermore, the Ministry in charge of the energy sector is obliged to develop programmes for protection of vulnerable customers in cooperation with other authorities [37].

The National Energy Efficiency Action Plan 2010-2018 has foreseen a subsidy scheme for comprehensive refurbishment of multi-family residential buildings, which could provide assistance to vulnerable groups if drafted in a manner which takes into consideration vulnerability criteria.

A glimpse into reality

Given the lack of a comprehensive data on levels of energy poverty in Albania and the need for understanding the potential causes and consequences of Albanian energy poverty, 10 households were visited in the capital Tirana. The household's contact details were obtained through Caritas Albania. All but one of them lived in a house without any insulation, with single-glazed windows.

6 9.5 ALL= 0.069 EUR (1 EUR =137.5)



FIGURE 8B *Inefficient heating systems in Albania (taken in Tirana in 2016 during household visits)*

The average monthly income of the households visited is around 150 EUR for a whole household, which on average had 4 members. Most of the interviewees were ready to move to another home if it would enable them to save energy and money which is indicative of the inadequate living conditions they are faced with. When it comes to health, most were faced with long term illness, chronic illness or disability and they reported that their health problems influence social activities with family and friends.

The average monthly electricity bill is 39 EUR in winter and 22 EUR in summer⁷. The respondents noted that they used electricity for space heating and for domes-

tic hot water heating. All of the visited families had a gas stove as well. It was difficult to correctly calculate how much gas they were spending and how long a gas bottle lasts, as the families were using bottles of different capacity and they were unable to estimate how much gas they use within a year. Some of the families were not paying for their water bills, and the greatest difficulties reported were encountered in paying electricity bills. For water heating in the kitchen and bathroom they were using mainly big electric boilers. It is also important to note that as a result of inefficient and old windows and doors, draught is an evident problem. Another issue recorded and discussed with the households visited was mould which was evident in some or most of the rooms. Members of the households visited complained that air quality was not good as it was too damp, and during the winter time they stressed that it is often too cold as they are unable to heat their rooms to comfortable levels.

Key steps for Albania

- Broaden the scope of measures for protection of the vulnerable to include energy efficiency measures, which should have priority;
- Define energy poverty to enable monitoring of the measures implemented;
- Provide publicly accessible statistics on energy expenditures and living conditions.

⁷ Most of the families were paying a fixed tariff in winter and in summer. The persons that were interviewed most of the time were not directly involved in paying the bills, so the actual costs may differ.

Bosnia and Herzegovina



FIGURE 9 *Gathering data on energy and health conditions in a vulnerable household in BiH*

General information

The Dayton Peace Agreement of 1995 established a new constitution for Bosnia and Herzegovina. Bosnia and Herzegovina was established as a state made up of two Entities, the Federation of Bosnia and Herzegovina and Republic Srpska. The Brčko District is under the direct jurisdiction of the State administration [38]. Energy prices were traditionally set by the Governments of the Entities and kept artificially low, especially for households for social reasons. This approach is now undergoing change. Residential buildings are the largest single consumers of energy and a major source of greenhouse gases [39]. Current construction standards are lagging behind EU levels, and old building stock is inefficient and deteriorated. More than 83% of the population lives in family buildings with an average of 3.1 family members [40]. Although

most households (93%) have washing machine, they are mostly (65%) older than 6 years, with 27% being older than 10 years [40]. The situation is even worse with freezers which are commonly older than 10 years (42.5%) and fridges, 32.3% older than 10 years. Statistics indicate that household appliances are old and inefficient and heating systems, especially in rural areas, rely on individual stoves commonly heating just one room. The BiH administration has undertaken some attempts in protecting vulnerable groups, however, the complex administrative constitution coupled with economic difficulties has led to slow adaptation of national legislation in many segments, and is far behind schedule. However, some progress has been made regarding the protection of vulnerable energy consumers.

Vulnerability and energy poverty in national legislation

Following the same trend as other countries from the SEE region, that are parties to the Energy Community, the first requirement to protect vulnerable energy consumers was made within the Social Action Plan (SAP, OG 79/2010). One of the key activities under the SAP is development of a programme for helping socially vulnerable households – electricity consumers. The basic suggested criteria are to define vulnerable energy consumers as those who are recipients of social welfare, based on a material census of welfare users and their income. Those who are defined as vulnerable energy consumers should be eligible to receive discounts on specified amounts of electricity consumed. The social care centres should deliver lists of eligible customers to the electricity suppliers who then request funds for discounts from the Ministry of Finance. The same model has been suggested for gas consumers.

Energy efficiency is listed as an important tool for the protection of vulnerable consumers within the SAP; it is recommended to be used as a social welfare service. The emphasis is on educating energy consumers about the benefits of rational energy use, by using simple awareness raising methods such as brochures and leaflets, and low cost energy efficiency measures, such as replacing lightbulbs with energy efficient ones. It is concluded that realization of the activities and recommendations listed in this document is in the interest of BiH, however, it is also noted that the fiscal situation limits possibilities for the implementation of new measures to be financed from the state budget. The SAP is foreseen as a minimum which the state should achieve, and competent authorities are invited to undertake additional efforts aligned with the basic guidance provided within the SAP.

The electricity laws in the Federation of Bosnia and Herzegovina and Republic Srpska fail to fully transpose the customer protection provisions of Directive 2009/72/EC, and have not at all transposed provisions

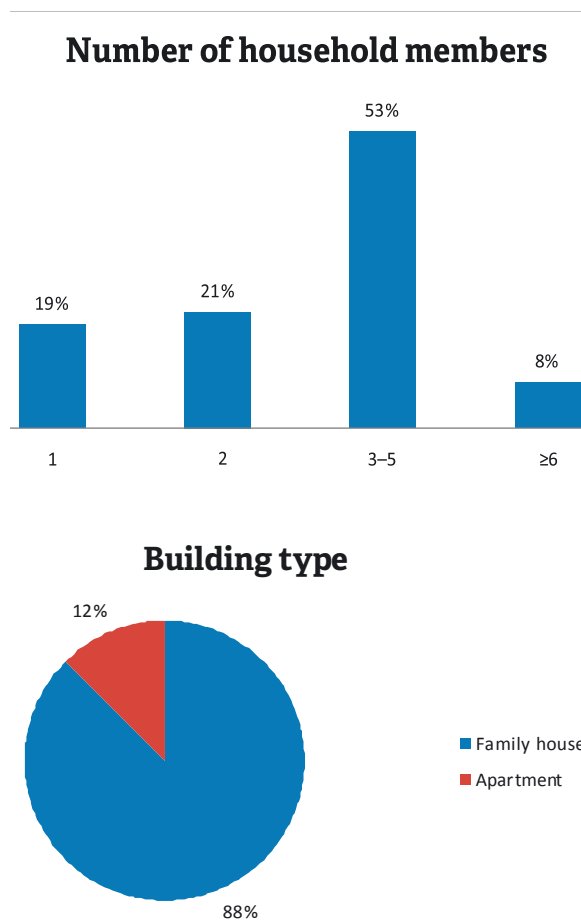
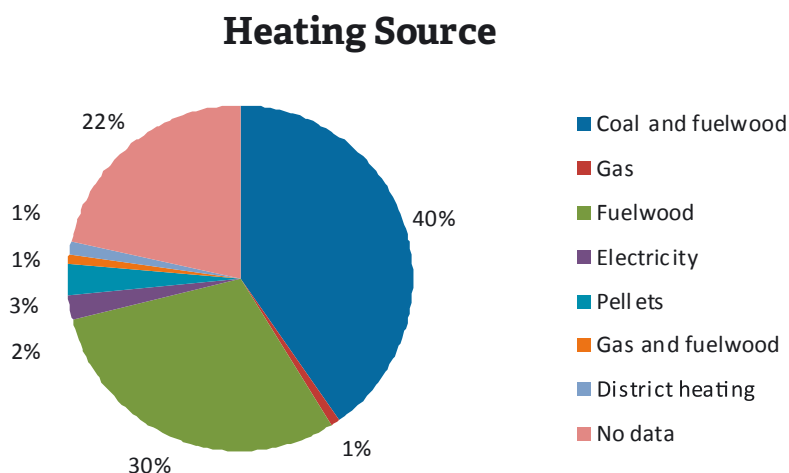


FIGURE 10 Building type and number of household members for households visited in Bosnia and Herzegovina

related to vulnerable consumers by Directive 2009/73/EC. The Brčko District legal framework does enforce protection of customers under general public service [41]. The regulatory acts, such as general conditions for electricity supply and the rules for supply of eligible customers, in all three jurisdictions promote customer protection in terms of conditions for disconnection, complaints and information rights. The existing legislation of the Federation defines protected customers and provides obligations for the supplier of tariff customers (although tariff customers should have ceased to exist by 1 January 2015) as a manner of customer protection, but allows discrimination between customers through price regulation [42]. Transposition of directives in general remains fragmented and asymmetrical.

FIGURE 11 Heating type in the households visited in BiH



The first binding document dealing with vulnerable energy consumers on the state level was the Electricity Act (OG 66/13) which states that energy policy needs to provide a programme for the protection of vulnerable energy consumers (Article 5), and that this programme needs to protect vulnerable consumers from disconnections and provide protection in remote areas (Article 13). Based on the requirement set in the Electricity Act, in June 2015 the Commission for the Development of a Programme for the Protection of Vulnerable Household Electricity Buyers was formed (OG 51/15). The Commission has the task of defining activities which can be implemented with the aim of protecting socially vulnerable categories of electricity consumers, to protect vulnerable consumers from disconnections, to ensure protection in remote areas and to find mechanisms for the social protection of potential surplus employees during reforms in the energy sector.

The Law on Transmission of Electric Power, the Regulator and Electricity Market was drafted in 2014. Article 16 requires protection of vulnerable consumers in terms of ensuring that consumers benefit through the efficient functioning of the electricity market, promoting effective competition as well as transparency regarding contractual terms and conditions, general information, dispute settlement mechanisms, and easy switching to a new supplier.

In 2007, the Republic Srpska Government adopted a wider, systematic programme with measures aiming to protect socially vulnerable categories, a Programme for the protection of Socially Vulnerable Categories of Electricity Consumers with subsidies for 150 kWh of electricity per month, which was implemented in 2008, 2009 and 2010. There were between 28,000 and 35,000 eligible consumers. In 2011 and 2012 there were no funds provided for electricity buyers. To secure funding for further support the National Assembly requested that the Government of Republic Srpska, within a timeframe of six months analyses and suggests a mechanism for using the profit of the electricity utility for electricity subsidies for the socially most vulnerable consumers. This has resulted in securing 8.6 million KM (4.3 million EUR). In 2012 120kWh per user were subsidized monthly, increasing to 167 in the last three months of 2012.

Republic Srpska has also adopted a Strategy for the Development of the Energy Sector until 2030 (01-794/09) with the first aim of ensuring the provision of an adequate quantity and security of supply for all needed energy services, taking into consideration the protection of vulnerable consumers. The second key aim is to increase energy efficiency in all segments of the energy sector, especially in buildings.

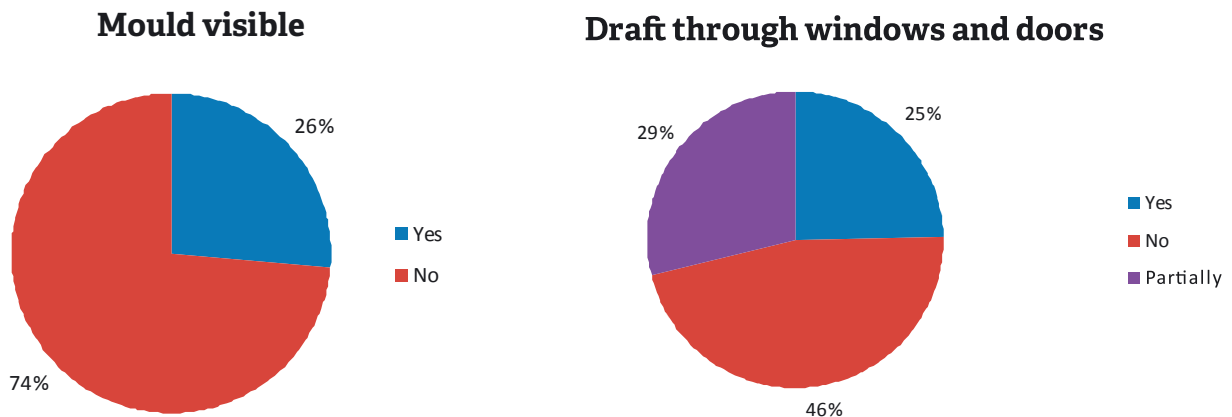


FIGURE 12 Occurrence of draught and mould in visited households in BiH

A glimpse into reality

A survey on a sample of N=97 households was undertaken in summer 2016 in the vicinity of Tuzla, based on social status. Suggestions for interviewees were received from civic' associations (a pensioners' association, women's association, local communities etc.). The residents of the selected households were people with lower income (mostly retirees)⁸. 88% of the respondents lived in family houses (in line with the state average of 83%) with a living area of about 80 square meters (state average 86m²) and have on average 2.9 family members (state average 3.1). On the state level a bit more than 51m² of the average 86m² living space is heated during the winter periods [40], indicating that many families are forced to reduce their living space as a result of inability to afford adequate heating.

More than half of the families visited live in dwellings older than 36 years, with partial insulation or none at all and inefficient windows (old and often only with single glazing). The main heating sources of the respondents are wood and coal, and on the state level most households have individual sources and types of heating, furnaces and "split systems" (73%) [40].

Most survey respondents indicated the occurrence of draught through windows and doors, which in

addition to having adverse impacts on health (as a continuous flow of cold air leaves the lower parts of rooms permanently cold) it also indicates high energy losses as a result of inefficiency. Most respondents in BiH did not report any occurrence of mould (Figure 12).

On average the surveyed households consume 3,975kWh of electricity annually (state average 4,568kWh [40]) on which they have to spend about 9% of total household income (monthly average income of the households visited is 321 EUR). Most of the freezers and washing machines are older than 10 years [40] contributing to inefficient energy use and increased energy costs.

Key steps for Bosnia and Herzegovina

- Alignment of state legislation with the EU acquis in relation to energy consumer protection, so as to provide mechanisms for the protection of energy consumers in both the electricity and gas sector with special focus on energy efficiency improvements;
- Defining and monitoring energy poverty on the national level;

8 Field visits were undertaken within the project REACH CEI by The Center for Ecology and Energy Tuzla <http://www.ekologija.ba/>

Croatia

General information

In 2012, the largest changes in consumer costs in Croatia happened in energy and food prices. Energy prices increased by 10.5% in 2012; in fact the rise of the cost of electricity (16.4%) and natural gas (21.3%) had the most significant influence on the growth of costs in that category [43]. The fact that more than a quarter of Croatian households pay their energy bill late is significant [44]. There has also been a worrying rise in the share of people with arrears in utility bills (28% in 2010, 30.4% in 2013, compared to 10.1% in the EU28) [45]. Additionally, 29.9% of Croatian households are at risk of poverty or social exclusion⁹ (in comparison to 24.5% in the EU28 in 2013) [44]. 13.3% of the population lives in households with leaky roofs, damp walls, floors or foundations, or with rotten window frames or floors. The largest portions of household expenditures were related to food and non-alcoholic drinks, 31.7%, and housing and energy expenditures, 15.7%. Of that 9.9% was spent on electricity, natural gas, or other types of fuel. Overall, according to results of the survey on household expenditures [46]:

- 9.9% of people lived in households which were unable to maintain adequate warmth during the coldest months,
- 30.4% of people lived in households which were unable to pay bills for communal services on time during the previous 12 months,
- 68.4% of people lived in households in which the total housing expenses presented a large financial burden, while only 2.1% of people lived in households in which the total housing expenses did not present a burden of any kind.

9 Basic indicator of poverty which is shown by the percentage of people whose income falls below the level of at – risk for poverty.



Vulnerability and energy poverty in national legislation

In Croatia, there is no all-encompassing definition of a vulnerable consumer, nor are there methods for defining and monitoring energy poverty; however there is public policy which concerns (in part) vulnerable consumers (customers). Additionally, at the moment there is no program specifically aimed at energy poor households. The Energy Act (OG 120/12, 14/14) in Croatia has been harmonized with the Third EU Energy Package, meaning that it relies on setting the criteria for the status of vulnerable consumer of energy. However, to date, officially adopted criteria which would encompass the wider vulnerable category have yet to be written, except for aid for vulnerable households intended to ease the costs of electricity. In the Energy Act a vulnerable consumer is defined as a consumer from the household category who, due to their



FIGURE 13 *Extreme energy poverty in Croatia*
(Photos by Lasta Slaviček Photography)

social welfare status and/or due to health status has the right to receive energy under specific conditions. The Regulation on criteria for achieving the status of vulnerable consumer was adopted in September 2015 (OG 95/15). The Regulation states that funding for the compensation for energy costs of vulnerable consumers shall be secured by way of a solidarity fee, 0.4EUR cents/kWh, for all final customers, which for the average household will amount to roughly 0.8 EUR per month. To date (September 2016) an agreement with suppliers is in effect in which they forswear profit as a way to satisfy funding, and as result social compensation for the end consumer is currently set to zero. It is unclear for how long will this agreement be valid and at when will the passing of costs to end consumers take place. Electricity bills already foresee a solidarity

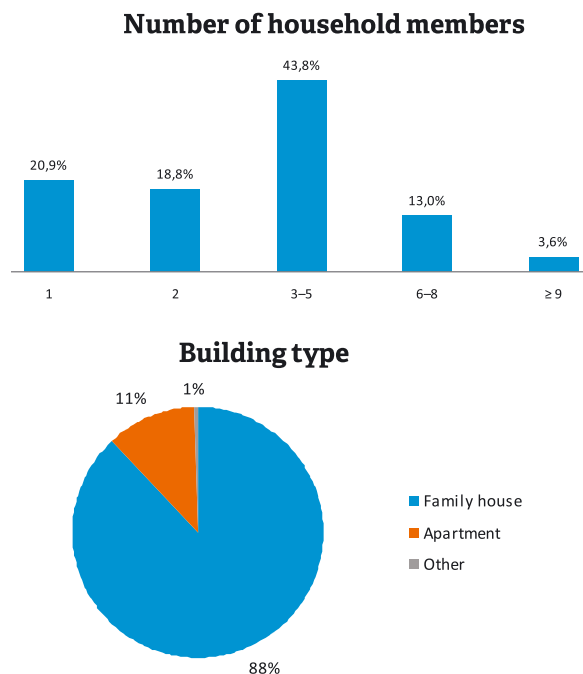


FIGURE 14 *Number of household members and building type (N=394)*

tariff which is, as result of the aforementioned agreement, at the moment set to zero per kWh.

The Regulation regarding the Monthly Amount of Compensation for Vulnerable Customers of Energy (OG 102/15) defines that the amount of compensation for a vulnerable customer is set to an amount not exceeding 200 HRK (26EUR) per month. On the basis of the determined status of vulnerable customer, the user has the right to compensation to help finance electricity expenses. In the Social Welfare Act (OG 157/13, 152/14) it is stated that all recipients social welfare (guaranteed minimal monthly allowance) have the right to financial aid for the purpose of housing expenses and related bills and heating. Article 43 defines minimal compensation for households which use wood heating, on the basis of which they would be provided with either 3 srm of wood for heating or an approved monetary amount to ease this expense. The decision regarding the manner of compensation is to be made by the local administrative unit, and be paid out on a yearly basis.

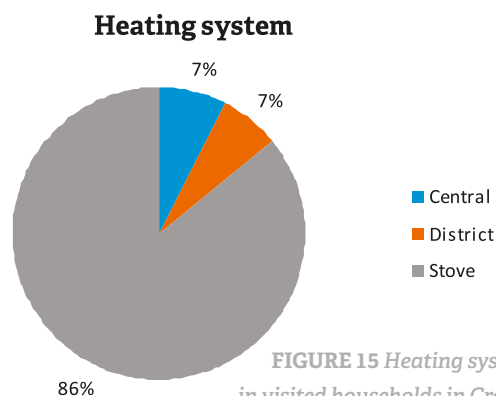


FIGURE 15 Heating systems in visited households in Croatia

In the Energy Efficiency Act (OG 127/14), in Article 13, distributors' obligations for accomplishing energy savings through measures of energy efficiency are defined. DSOs are required to achieve energy savings by implementing energy efficiency measures and thus helping reduce energy consumption for their end consumers.

In the National Programme for Renovation of Multi-family Buildings for the period 2013-2020 [47] it is stated that energy poverty is one of Croatia's growing problems which is a consequence of increases in the price of energy, and, though there is still no clear definition (of energy poverty) in Croatia, its existence is shown in the inability of many to maintain adequate heating. It is recommended that the Ministry of Social Politics and Youth, as well as local providers of social welfare, become involved in carrying out and co-financing measures for the most vulnerable citizens and in this way contribute to a solution to the problem of energy poverty with which a long-term reduction in state subsidies for energy expenses for the socially vulnerable can be secured. Additionally, the Programme states that in carrying out these measures, local administrative units, together with local providers of social welfare and competent bodies should envisage providing additional funding for the socially vulnerable, of up to 85% of the total investment expenses.

Individual legal documents do not directly speak about energy poverty; however they contain the legal

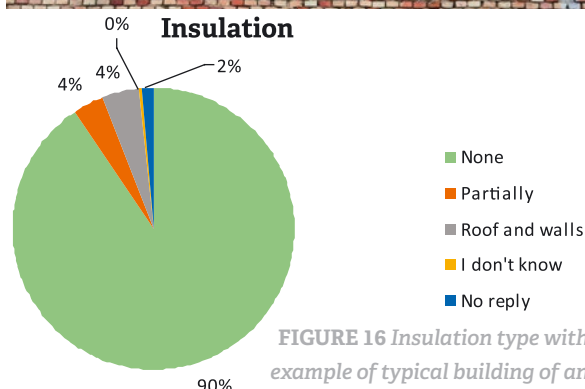


FIGURE 16 Insulation type with example of typical building of an energy poor household in Croatia

basis upon which funding can be directed to, among other things, the fight against energy poverty. As such, in the example of article 100 of the Air Protection Act (OG 130/1, 47/14) it is stated that financial means obtained from the sale of emission units by way of auctions in the EU Emissions Trading System shall be paid into a special account of the Fund for Environmental Protection and Energy Efficiency. Financial funding obtained in this way is to be spent in accordance with the plan to be finalized by the Government as per the recommendation of the competent Ministry, and one of the stated possible applications of said funding is the financing of energy efficient measures and insulation, e.g. for securing financial aid to resolve social problems in households with low to middle income.

A glimpse into reality

The Croatian case-study involved surveying a total of 394 households in Sisak-Moslavina County¹⁰. Sisak-Moslavina County was chosen as it is one of the poor-

¹⁰ Field visits were undertaken within the projects REACH and With knowledge to warm home.

est counties and it is not far from the Croatian capital, Zagreb. The majority (60%) of households visited had three or more household members living primarily in family houses built before 1990. The average living space was 72 m² out of which 55m² are heated. It is important to note that for living space only estimates provided by household members have been used, not real data. The difference between overall living space area and area which is heated in winter months occurs as many households are forced to reduce their living space in winter as result of inadequate access to heating services and inability to afford needed heat.

Similar results were shown by research undertaken in 2012/2013 on sample of 1,722 respondents randomly chosen via phone survey across the whole of Croatia [48], [49] where 22% of households reported they reduce their living space in winter months, primarily as result of inability to afford the needed energy (55%) and because of lack of heating systems in certain rooms (22%).

Average consumption of electricity for a household based on results of survey (N=394) amounts to 4,475 kWh/annum, which is higher than national average which in 2012 was in 3,766 kWh/annum for entire Croatia, and 3,551 kWh/annum for Sisak-Moslavina County (calculated from [46], [50]). Average heat consumption is 23,362 kWh/annum, double of the national average from 2012 which was 10,889kWh/annum and similar to the average of Sisak-Moslavina County in the same year – 23,209 kWh/annum.

Most dwellings have no building insulation whatsoever. Windows and doors are also inefficient, with single glazing or double single glazed windows, and heating is mostly done by a single inefficient stove.

Individual wood stoves and inefficient old central heating systems without the possibility of regulating temperature or distributing heat evenly across rooms result in high energy consumption and adverse impacts on health. In addition to the indoor pollution, inhabitants are exposed to a continuous flow of cold

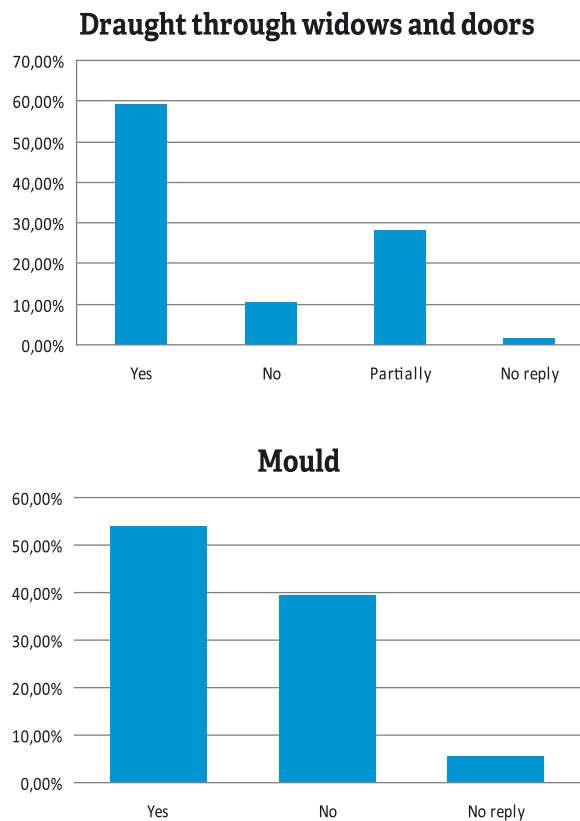


FIGURE 17 Share of households exposed to draught and mould in Croatia

air through windows and doors, and high levels of damp and mould. Poor insulation, inefficient heating systems and draught result in uneven distribution of indoor temperatures within rooms and across rooms.

Key steps for Croatia

- Widen the definition of vulnerability from focusing only on electricity to gas, district heating and fuelwood, and shift the focus from a solidarity tariff towards energy efficiency improvements;
- Define energy poverty for Croatia and implement statistical monitoring;

Kosovo

General information

With per capita GDP estimated at around €3,000, Kosovo is one of the poorest countries in Europe. Its average per capita income is about one-tenth that of EU levels. According to the World Bank's methodology about 80% of the population is below the poverty line. Using the domestic poverty line of €1.72 per day (2011 data) as defined by the Kosovo Agency of Statistics, 29.7 % of its population of 1.8 million are considered poor [51]. Kosovo also has the highest unemployment rate in Europe [52].

At the same time, prices of energy in Kosovo have gone up several times during the past decade and in 2012 alone, electricity bills increased by 8.9% [53]. Most households use either wood or electricity for heating. Coupled with inefficient housing stock, Kosovars are faced with high levels of energy related costs. Electricity supply is unreliable [54] and both use and production are inefficient. In combination with high rates of poverty and unemployment, this leaves many in harsh living conditions unable to meet their basic energy needs. According to Agency of Statistics of Kosovo, about 38% of the family costs are spent on food, while about 31% on accommodation costs, where the energy bill is one of the main components of the cost [53]. Kosovo also has high rates of electricity theft, tampering with meters, delays in meter installation and false readings of electricity meters. This results in high commercial losses and questionable data on actual electricity consumption [55]. Energy efficiency and renewable energy can help to mitigate projected power shortfalls, while enhancing Kosovo's energy security and environmental sustainability [52].

Vulnerability and energy poverty in national legislation

Kosovo has a general definition of vulnerable customer related solely to electricity usage for household customers whose low level of income, ill-health or disability qualifies them for protection or assistance according to rules set by the Energy Regulatory Office on the basis of qualifying rules established by the Ministry of Labour and Social Welfare. There is no definition of energy poverty. Vulnerability is regulated in such a way that customers who are recipients of social aid as defined by the Law on the Social Assistance Scheme (OG 2003/15) and the Law on the Status and Rights of Families of Martyrs, Disabled People, Veterans and Members of the Kosovo Liberation Army and Families of Civil War Victims (OG 04/L-054) have the right to a cheaper tariff for the consumption of electricity for personal use. There are no specific support schemes for vulnerable energy consumers; only the aforementioned type of general social welfare, which to a certain extent can be used for energy purposes. Yearly about € 4.5 million in subsidies are used for customers that are under social aid. About 10% of households meet the criteria for subsidies related to electricity consumption.

The Law on the Energy Regulator (OG 03/L -185) requires protection of vulnerable consumers (as defined above). The law grants the possibility of providing subsidies to vulnerable consumers (Article 45). It does not discuss in details the types of subsidies or mechanisms for implementation. The Law on Energy Efficiency (OG 04/L-16) does not specifically refer to energy poverty or vulnerable consumers, but it does set the basis for undertaking energy audits in buildings, which could offer an opportunity for assessment of building stock and supporting energy efficiency measures targeted specifically for the energy poor in future. The Law on Electricity (OG 2004/10), Article 32, states that

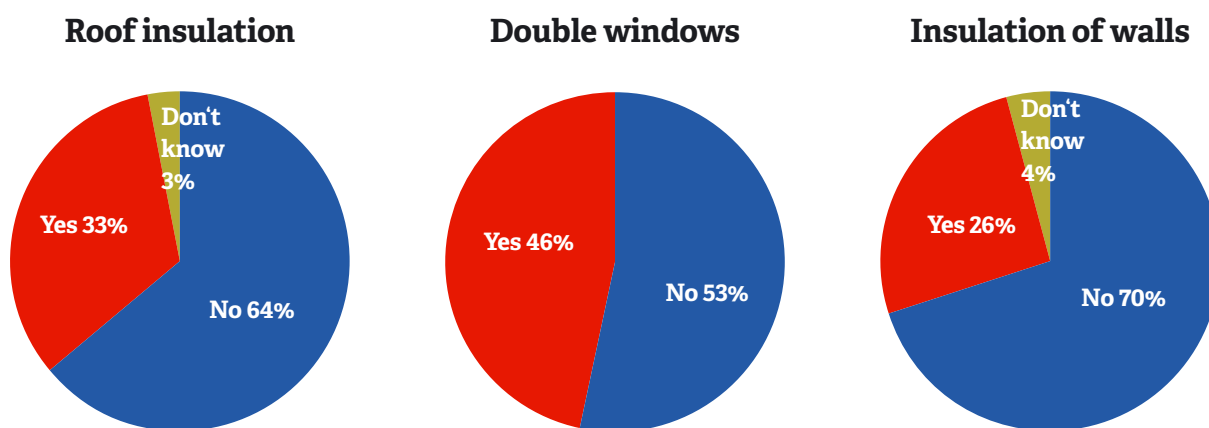


FIGURE 18 Insulation in households in Kosovo [53]

suppliers have the right to cut off customers for non-payment, consistent with the rules and regulations issued by the Energy Regulatory Office regarding the protection of vulnerable persons and cut-offs during the winter season. This type of non-financial support is providing protection against disconnection for those vulnerable customers defined by the rules prescribed by the regulatory authority.

The Energy Strategy of the Republic of Kosovo 2013-2022 is the main document outlining energy policies and development objectives of the energy sector. This Strategy was developed based on a review of its predecessor, the Kosovo Energy Strategy 2009-2018. The Strategy states that subsidies for electricity prices will continue so to minimize impacts of price increases, and that the measures needed will be taken to protect those who are affected by the developments of energy sector.

The Second Energy Efficiency Action Plan for Kosovo (2013-2015) emphasizes that key financial constraints for implementing energy efficiency measures are the lack of affordable energy efficiency financing schemes for lower income households unable to access the loan market and the high level of commercial losses and non-payment of energy bills..

A glimpse into reality

To gain insight into the living conditions of energy poor people in Kosovo, ten households were visited in Obiliq Municipality and their energy and living conditions were discussed. The selection of the households was done based on recommendations by the Obiliq Municipality representatives. Most of those visited were families living in a family house with on average 6.6 family members. The dwellings in which they were living had no, or in some cases only partial, insulation with single glazed and aged windows. Similar results have been reported in other previously undertaken studies on larger samples giving more quantitative insights – all clearly indicating that the building stock is highly inefficient and with questionable indoor air quality (see Figure 18) [53] [56] [57] [58].

For the ten visited households, the yearly cost of electricity for a household is 340 EUR, and for fuelwood 260 EUR. This means that households with an average monthly income of 224 EUR would have to spend more than 13% of their total income on electricity only, and for fuelwood and electricity combined more than 22%. This is actual spending. Calculated spending needed for achieving desired levels of thermal comfort is likely to be higher.

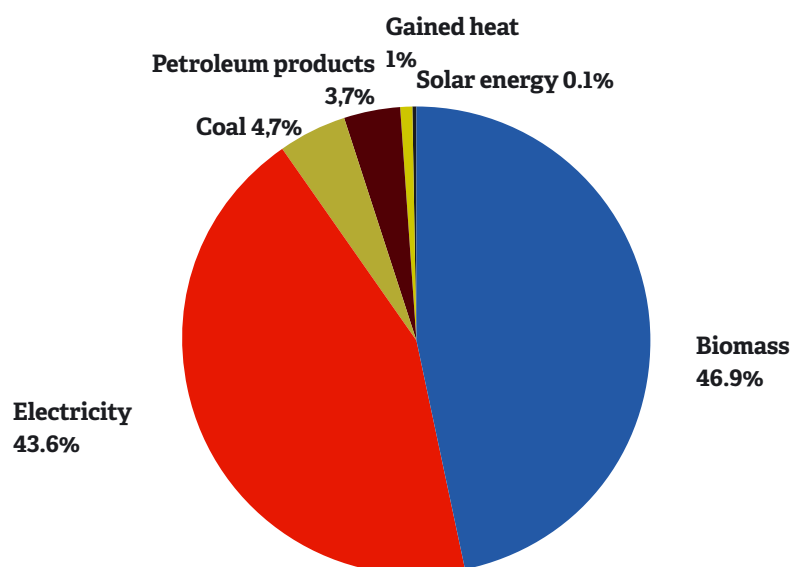


FIGURE 19 Composition of final household energy consumption in Kosovo (2014) [59]

Based on previously undertaken research in Kosovo, the monthly cost of electricity was even higher amounting to more than 515EUR yearly, and more than 550 EUR on fuelwood [56] [58]. “Consumers are price sensitive to which energy source is used. An increase in electricity price, from one tariff block to the next, results in a 58% decrease in electricity as a share of energy demanded... The share of electricity that could have been consumed at the higher price is replaced by a 7% increase in wood fuels, and 18% increase in lignite quantity demanded” [56]. In recent years as result of inability to cope with increasing energy costs, many households are shifting to increased use of biomass and coal with fuelwood consumption increasing from 2.41 srm per year to 7.3 [52]. Similar amounts were used by the ten visited households, whose average fuelwood consumption was 7.4 srm yearly. If the current trend continues Kosovo will be facing severe deforestation issues. At the same time the only alternative for many is to use electricity, which is expensive.

For the ten households that were visited, average yearly consumption of electricity amounts to 6.462 kWh,

which is already high, compared to the EU average, and statistics indicate even higher rates of electricity consumption. All the surveyed households have reported that they have difficulty in paying their energy and water bills. All of the households visited also noted they have visible mould and most of them have constant draught through windows and doors. Those findings are in line with the larger survey (N=605) undertaken in 2014, where 44% of households had draught around their windows and doors, and mostly heated by wood burners mostly heating only about 40% of their living space [58].

Key steps for Kosovo

- Define vulnerable energy consumers and design mechanisms for support focusing primarily on energy efficiency measures;
- Define energy poverty and ensure statistical monitoring;
- Provide publicly accessible statistics on energy expenditures and living conditions;

Macedonia

General information

According to the results of the state Survey on Income and Living Conditions for 2014, the percentage of the population at risk of poverty has decreased from 26.2% in 2012 to 24.2% in 2013 to 22.1% in 2014. However, the percentage of the households which had issues with leaking roofs, damp walls, floors, foundation or rot in window frames or floors has rose from 14.1% in 2012 to 15.3% in 2014. Also the number of those who felt that their homes were too dark has actually increased from 4.2% in 2012 to 4.5% in 2014. The same survey also finds that 9.8% of all employed persons are poor, 40.4% of all unemployed, 8.4% of all pensioners and 26.1% of other inactive persons are poor [60].

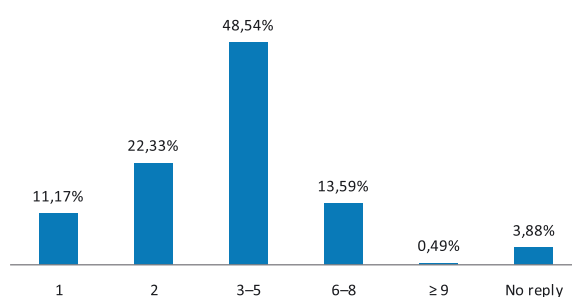
Macedonia has an unemployment rate of 24.4%, and it is important to note that only 39.9% of able-bodied women are employed compared with 60.1% of the male workforce. This is important as women are more likely to suffer from adverse impacts of energy poverty, as they spend more time in inadequate conditions at home [61].

The signing of the Memorandum of Understanding on Social Issues in the context of the Energy Community created the legal basis for development of the energy poverty concept in the Macedonian legislation and for undertaking measures for protection against energy poverty. Although there is no official definition of energy poverty, in Macedonia the term “energy poverty” is mentioned within existing energy legislation. This is unlike most SEE countries.

Vulnerability and energy poverty in national legislation

One of main goals of the Strategy for Energy Development (OG 61/2010) is that a programme for support of socially vulnerable consumers is prepared

Number of household members



Building type

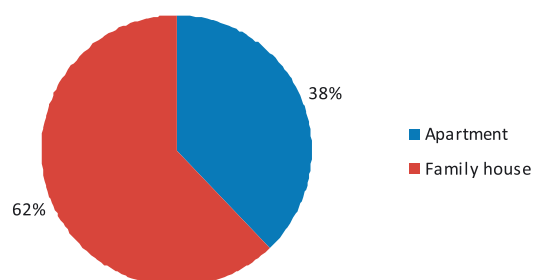


FIGURE 20 Number of household members and type of building for vulnerable in Macedonia (N=206)

and implemented, showing that energy poverty is recognized as a priority issue. This Strategy also clarifies that the current price of electricity subsidizes all households, meaning that the poorest 20% receive only 3% of the subsidies. Therefore, reaching the market price of electricity is in the Strategy set as a precondition for better protection of socially vulnerable consumers and reducing energy consumption.

The Strategy mentions two models for supporting socially vulnerable consumers of electricity: block tariffs and targeted subsidies. Block tariffs introduce a low electricity price (below the real costs) for socially vulnerable households which will be compensated by a higher electricity price paid by other consumers. Targeted subsidies are in the form of vouchers with which socially vulnerable consumers pay for electricity. A

weakness of both models is objectively determining socially vulnerable consumers. This Strategy recommends the second model so that, instead of vouchers, the bills are to be directly subsidized with budget funds for recipients of social welfare. In addition, the Strategy recommends that the state finance energy efficiency improvements for socially vulnerable households, as well as supporting the residential energy efficiency of middle-income households in order to prevent a drop in their standard of living. The Strategy estimates that 15-20 million EUR in budget funds should be spent for realizing the social energy programme.

The Energy Law from 2011 mentions energy poverty in Article 9, which says that the energy policy should enable inter alia measures for protecting citizens against energy poverty. This Law also dedicates a whole article only to energy poverty: Article 14: *"For the purpose of implementing the social protection of citizens against energy poverty, the Government of the Republic of Macedonia on request of the Ministry in collaboration with the Ministry responsible for social affairs, adopts an annual programme for reducing energy poverty in which, among other things, provided are: subsidies for energy consumption and for energy sources for separate households; the types of energy and energy sources that will be covered with the subsidy; more efficient usage of energy, the means of implementing the measures, budget sources and other funding measures; and the bodies responsible for the implementation of the measures."*

In 2010 the subsidy for energy consumption (electricity, fuelwood, coal, light heating oil for households/ oil for households and district heating) of 600 denars (9.8 EUR) per month was introduced, targeting households entitled to social welfare and to permanent financial support. The eligibility requirements say that the consumers need to have paid for the energy consumed in the duration period of the programme and that they will lose the right to this energy subsidy in case they are not entitled to social welfare or permanent financial support. This measure continued in 2011 and in

the first half of 2012. Since August 2012 the monthly amount has risen to 700 denars (11.4 EUR), accompanied by the explanation that from this subsidy approximately 20,000 households have benefited so far, and that with this increased subsidy the households can cover about 170 KWh electricity, or about 50% of their entire consumption. This measure continued in 2014 and 2015 as well. In 2015 the amount subsidized was 700 and 800 denars – 700 denars to cover bills from 1 January to 30 June 2015 or 800 (13 EUR) to cover bills from 1 July to 31 December 2015. The total amount dedicated for this measure in 2015 was 1,309,620 EUR. These funds are sourced from the state budget.

The Program for Realizing the Strategy for Energy Development (OG 50/2013), which is the action plan for the Strategy for Energy Development, envisaged a more complex set of measures addressing socially vulnerable consumers. One measure was a subsidy program for replacing the old stoves and purchase of new efficient stoves especially for socially vulnerable households, to take place in 2012-2013 under the Ministry of Economy. It also envisaged an increase of the subsidy in the Program for Subsidizing Energy Consumption. Other planned measures include education and promotion of energy efficiency, financial support for households ready to invest in energy efficiency, tax reductions for investing in energy efficiency as efficient biomass stoves, solar collectors etc. The Renewable Energy Strategy does not tackle the matter of energy poverty into detail. However, when discussing biomass, it mentions that there should be subsidies for replacing old stoves and purchase of new efficient stoves especially for socially vulnerable consumers.

The Energy Efficiency Strategy (OG 143/2010), which stipulates a target of 9% energy savings in the final energy consumption until 2018 compared to the average energy consumption in the country in the period 2002–2006, is more devoted to socially vulnerable consumers. It clearly identifies energy efficiency as an optimal measure for dealing with energy poverty. The envisaged social measures are improving energy

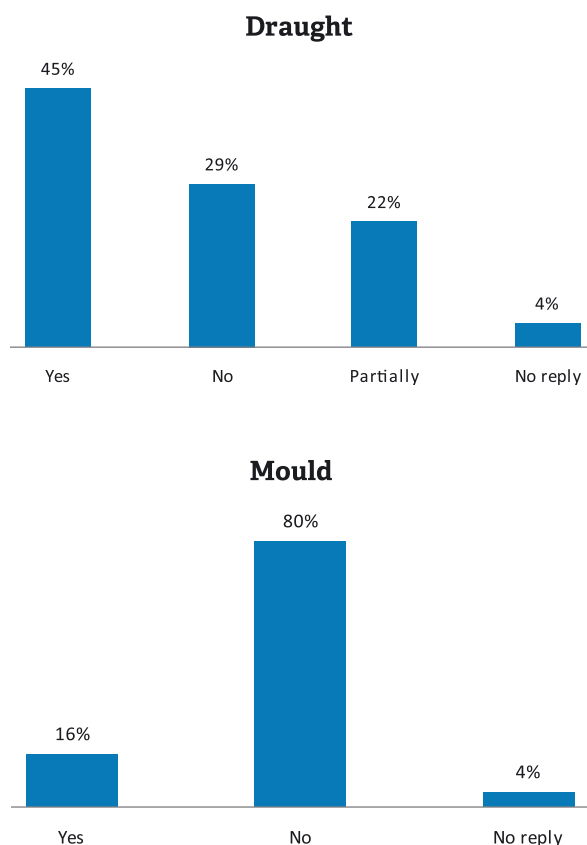


FIGURE 21 Occurrence of draught and mould in Macedonian homes (N=206)

efficiency in social housing, block tariffs for electricity, as well as introducing metering in district heating, replacement of fuelwood stoves with energy efficient stoves, solar systems, introducing energy codes for buildings and similar. Social housing is also prioritized in this Strategy. The Government is to take a leading role in implementing this Strategy and funds are to be provided inter alia from the Energy Efficiency Fund.

The 1st National Energy Efficiency Action Plan (NEEAP) clearly states that the targeted social assistance for low income citizens and the construction of social housing for most vulnerable households is a significantly more appropriate solution to energy affordability in the long run than subsidies. It has also envisaged an ambitious project – 7000 social dwellings until 2020 with applied energy efficient measures for

socially vulnerable households. The NEEAP also envisaged the adoption of secondary legal acts on energy efficiency in the building sector. It also states that the introduction of new highly efficient stoves will reduce fuelwood consumption. The NEEAP also emphasized the need for further awareness rising through information campaigns on measures for improving energy efficiency. Regarding finances, subsidies for solar collectors and the establishment of an Energy Efficiency Fund are also foreseen.

The 2nd NEEAP identifies the main objective of energy efficiency policy – and the overall energy sector – as ensuring sustainable development of the state in general and the energy sector. One of the conditions for that is, according to the Action Plan, protecting vulnerable consumers due to increasing energy prices. The National Strategy for Poverty Reduction and Social Exclusion requires setting up indicators for monitoring energy poverty, the variables which condition energy poverty as well as an index of energy poverty, while demanding the implementation of measures to lower or abolish the causes of energy poverty [62]. Most of the energy efficiency measures are implemented on the local level and are the obligation of municipalities. However there is no official data on the average yearly rate of implementing energy efficiency measures on national or local level.

Unlike the laws on the energy sector, The Law on Social Protection (OG 79/ 2009) only states that prevention and reduction of social risk for the public must be ensured by implementing measures for subsidizing energy consumption and other communal services.

Glimpse into reality

Information about energy consumption and living conditions was assessed for 206 households in Macedonia¹¹. The selection of the households was done in collaboration with Red Cross of Gazi Baba Mu-

11 Field visits were undertaken within the project REACH by Macedonian Center for Energy Efficiency <http://macef.org.mk/>

Montenegro

municipality where most of the visits have taken place. Analysis of the collected data shows that most of the households visited have three to five family members that mostly live in a family house built 35 to 60 years ago (59%) (Figure 20).

Similarly as in other countries most households choose to reduce their living space in winter so out of an average 85 m² of living space, 70 m² are heated. 40% of buildings have no insulation and 13 % have only walls insulation in different standards. Combined with mostly stove-based fuelwood heating (47%) or electrical heaters (18%) this shows high levels of inefficiency and waste of heat energy. The average visited household uses 5,295 kWh of electricity as compared with national averages of 5,423 kWh (Figure 3). The households visited on average use 12,571 kWh of heat energy annually, which is twice lower than in the Croatian case study. This can likely be attributed to a warmer climate.

Similar to other countries with a warmer and drier climate, mould does not appear to be an issue even in the the energy poor homes. However, draught, resulting primarily from an inefficient building envelope (no insulation) and single old windows, is present in 45% of the investigated homes.

Key steps for Macedonia

- Broaden the definition of vulnerability to target electricity, gas and fuelwood consumers and shift the focus from financial measures to supporting energy efficiency improvements in the homes of vulnerable households;
- Define energy poverty to enable monitoring of the impact of implemented measures

General information

Similarly to other countries in the region, Montenegro's energy sector development has been marked by continuous increases of energy prices and the existence of an energy-inefficient housing stock. In addition, from the 1990s to the beginning of the 2000s there were low levels of investment in all segments of the energy sector [63]. All of this has contributed to increasing the burden of energy costs for many families. Thus, one of the key goals of Montenegro's energy sector development is ensuring protection of vulnerable consumers. With a poverty rate of 8.6% [64] it is likely that there are many people who are facing extreme energy poverty.

Montenegro has a high level of electrical heating (68%) with the other main source of heating being fuelwood

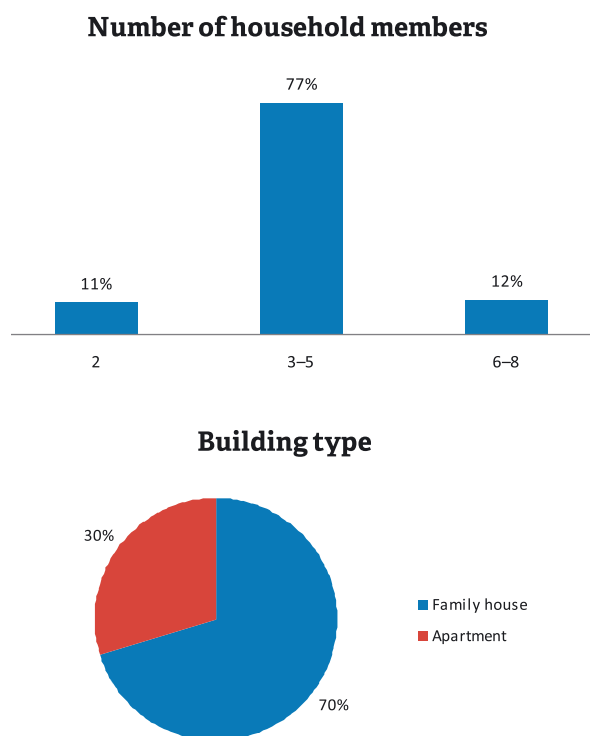


FIGURE 22 Building type and number of household members in households visited during 2016 in Montenegro

FIGURE 23 Family house of energy poor in Montenegro taken during the field visits



(25%) [65]. Both are typically inefficient and costly. Importantly the cost of electricity-based heating and fuelwood heating during the winter is similar, leaving many options with limited options for fuel switching to reduce energy costs. As result of high energy costs many households (70.5%) are unable to pay their utility bills on time. On a yearly basis the average electricity debt per household is 400 EUR [63]. According to the household budget survey 74% of all households still have in use a solid fuel stove, while almost 98% also have electrical stoves. Additionally about 17% of households have various electricity fuel heating devices and more than 96% use electricity for heating domestic hot water (electrical boilers)[65].

Vulnerability and energy poverty in national legislation

Montenegrin legislation partially addresses energy poverty related issues, mostly by defining socially vulnerable groups and providing support in form of subsidies and education on energy efficiency. The only mention of energy poverty as a term has been noted in the Montenegrin Report on the Analytical Overview of Harmonization of Legislation (Chapter 15) (2013) [66]. The Report states that protection of consumers is ensured through various measures applicable to energy providers as well as through measures for tackling

energy poverty. The report notes that since 2008 Montenegro has had a system of subsidies in place for the protection of socially vulnerable households. It is unclear from the report which measures are specifically targeting energy poverty.

As in other SEE countries, the Social Action Plan (2010) was the first document to legally require protection of vulnerable groups with the aim of decreasing and preventing energy poverty. The National Programme for Protection of Consumers 2012-2015 puts an emphasis on energy efficiency. It also foresees a strategy for protection of small energy consumers, including households, to ensure a secure and uninterrupted supply of energy. The Programme furthermore states that special tariffs will be designed in cooperation with local authorities in order to protect vulnerable energy consumers.

The requirement for protection of vulnerable consumers is further developed within the new Act on the Energy Sector (OG 05/2016). Article 198 states that vulnerability criteria are defined based on health status of household members (disability, bad health which could result in death if supply of energy is interrupted). Vulnerability status can also be acquired based on social status. Government defines the levels of subsidies for those who acquire vulnerability status, while also setting up a monthly limit of electricity and gas

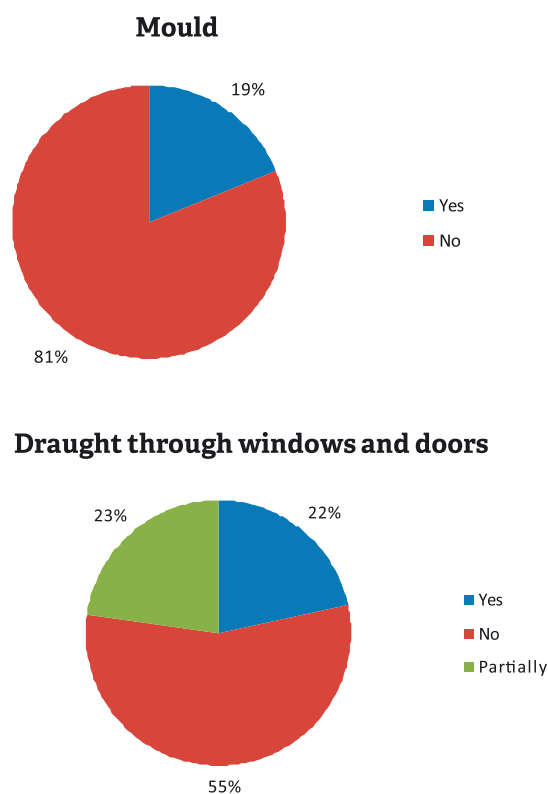


FIGURE 24 Occurrence of draught and mould in the households visited

consumption by which the subsidy can be applied. The Act also forbids disconnection of users who have acquired their vulnerability status based on health conditions at any time, and for those who have acquired vulnerability status based on their social status from beginning of October until end of April, regardless of arrears or non-payment.

Montenegro also has a National Energy Efficiency Action Plan for the 2013-2015 period, which, although not specifically addressing energy poverty or vulnerability, sets an important basis for promotion of energy efficiency which could then to a certain extent be directed for vulnerable groups in future. The Energy Policy of Montenegro until 2030 (2011) foresees the definition and implementation of a subsidies programme for vulnerable customers of electrical energy and gas in line with the Act on the Energy Sector. These subsidies should be used to ensure the provision of the required minimum of energy and living conditions.

A glimpse into reality

In Montenegro, 101 households were visited in Podgorica in 2016, with the aim of collecting data on energy consumption habits, financial circumstances and living conditions, as well as providing households with low-cost energy saving tools¹². Households have been selected based on a vulnerability status and with support of the Red Cross Montenegro.

The data collected shows that most households have three to five household members, which is similar to the results of the field visits undertaken in other countries of the region, and most dwellings were privately owned family houses.

The average yearly electricity consumption per household for these 101 households was 6,623 kWh which is almost 10% more than national average electricity use per household in 2014 – 6,065 kWh. 60% of the households visited use electricity for heating with the remaining ones using fuelwood (on average about 8.5 srm per year). The average monthly income of surveyed households was about 640 EUR, while they had to spend about 53 EUR solely on electricity bills.

It is interesting that a relatively low incidence of mould was reported. This can perhaps be explained by the drier climate of areas where the surveyed households lived.

Key steps for Montenegro

- Widen the definition of vulnerability to electricity, gas and fuelwood and shift focus to a wide scope of energy efficiency measures targeted at vulnerable households;
- Define energy poverty and monitoring progress in national statistics;

¹² Field visits were undertaken within the project REACH CEI. All visits were realised in cooperation with students and teachers of technical school "Vaso Aligrudić" from Podgorica.

Serbia

General information

In Serbia most of the buildings were built before 1962 (59%). A high share of the dwellings consists of buildings constructed between 1962 and 1991 (36%), which exhibit a high final energy demand and oversized secondary heating installations [67]. During Serbia's privatization process in the 1990s, state-owned apartments were sold to the tenants free of tax and transaction costs, leading to an increased share of privately owned housing; today most residents (97.3 %) are living in apartments owned by one of the household members. Rented social housing is not common. Apartments are usually rented by households living above the poverty line and the majority of households below the poverty line (85%) live in individual houses (primarily self-built) and 9 % live in residential buildings [67].

More than 50% of electricity use in Serbia can be attributed to the household sector, and most of the households rely on electricity for domestic hot water. The average Serbian household uses over 4,700kWh of electricity annually which is in line with the situation in other SEE countries and higher than European average. There is a high rate of non-payment to energy utilities, and arrears on utility bills are common. Households in Serbia spend a monthly average of 11.3% of their total disposable income on household energy expenditure [68]. The relatively high costs of energy, as compared to available income, undeveloped and inefficient heating systems and inefficient building stock are culprits for the likely high prevalence of energy poverty in Serbia [69].

By making progress in aligning its legislation with the EU acquis, Serbia has gone furthest in the region in its attempts to create a protection scheme for people vulnerable to energy related costs.



FIGURE 25 Deteriorated buildings with poor insulation in Serbia (Photo documentation of Fractal, 2016)

Vulnerability and energy poverty in national legislation

The Serbian state energy strategy until 2025 (OG 101/2015) notes that measures for improving living conditions for socially vulnerable consumers of energy have been set up and will be further developed. The Act on the Energy Sector (145/14) defines a vulnerable energy buyer as a household which as result of its social status or health conditions has the right to provision of energy under specific conditions. The Act states that a vulnerable customer of energy, referring to electricity or natural gas, is a customer from the household category living in a residential unit with a single metering point. A household may acquire the status of an energy vulnerable customer at its own request if 1) it belongs to the category of citizens with the lowest earnings per household member, taking into account all the household members and entire immovable property in the country and abroad; 2) it does not own or use another residential unit other than a residential unit whose structure and surface area match the household's needs, pursuant to the law regulating the social housing area. The status of an energy vulnerable customer may also be obtained by a household, at its own request, if the life or health of a member of

such a household can be jeopardized by the interruption of electricity or natural gas supply due to his/her health condition.

The status of an energy vulnerable customer may also be obtained on the basis of a request submitted to the local authority, which issues a decision on obtaining the status of an energy vulnerable customer. An energy vulnerable customer is entitled to electricity or natural gas supply with a reduction of the monthly payment. Article 364 defines a vulnerable consumer of thermal energy. An electricity customer supplied with thermal energy may acquire the status of a vulnerable customer under the conditions and in the manner prescribed by the act under Article 10, or in accordance with a separate law or an act of the local authority.

The Ordinance on Vulnerable Buyers of Energy entered force as of January 2016 (OG05/2016). Although its aim can be attributed to efforts to fight energy poverty, there is no mention of energy poverty in the document itself. The Ordinance sets vulnerability criteria based on the household's monthly income, number of household members, means test and health status. A vulnerable buyer is entitled to subsidies for monthly energy bills (electricity and gas). The monthly income thresholds for eligibility are defined by the Regulation on harmonized amounts of household's monthly income as eligibility criteria for acquiring status of vulnerable energy buyer (40/2015).

TABLE 1 *Maximum monthly household income and amount of electricity which can be compensated through subsidies*

No. of household members	Total monthly income	Monthly subsidy (kWh)
1	12,900 RSD (105 EUR)	120
2-3	18,786 RSD (150 EUR)	160
4-5	24,672 RSD (200 EUR)	200
≥6	30,558 RSD (250 EUR)	250

The Needs Assessment Document 2014 – 2017 for the Republic of Serbia defines energy poverty as households inability to afford basic energy services, primarily heating, at reasonable cost, as compared to their income.

The National Strategy on Social Housing (OG 13/2012) defines "housing poverty" which can to some extent be comparable to energy poverty. The document states that housing poverty is excluded from the social protection system and no measures have been defined for protection of vulnerable consumers that lack sufficient funding for ensuring minimum housing standards. The absolute poverty line, to which social policy commonly refers to in Serbia, does not include imputed rent in the costs of housing. In 2009 6.6% of all households had to use more than 50% of their income to cover housing costs. As housing costs include costs of electricity and heating, this data may indicate a high prevalence of energy poverty. Neither the Act on Social Housing nor the Act on Housing recognizes energy poverty as an issue, nor do they discuss energy vulnerability.

The Poverty Reduction Strategy of Serbia (2003) suggests that the poor should be protected with the aid of tariff system reform within the electricity sector. All prices should reflect actual costs, and the most vulnerable households should be supported by direct subsidies. It is interesting to note that unlike most similar legislative documents from the region, this Strategy specifically states that subsidies should be given with the condition that energy is used rationally. Furthermore, the Strategy foresees financial support for switching to cheaper heating sources as well as for setting up mechanisms for increasing energy efficiency. Although the Strategy states that detailed goals and activities for decreasing energy poverty are described in the Annexes, those do not seem to be publicly available.

Energy poverty is inadequately recognized as an issue at the local level. Research of available documents showed that only the city of Valjevo seems to have eradication of energy poverty in its vision. Valjevo is striving to ensure that all households in its vicinity are



able to meet their heating requirements while being left with sufficient funds for other necessary expenses.

A glimpse into reality

In Serbia ten households were visited as a part of a larger ongoing study¹³. Overall, 100 visits to households are planned and the results will be available by end of 2016. Ten visits were carried out in three Belgrade municipalities: Palilula, Zvezdara and Savski venac. The selection of households was done in close cooperation with the municipal departments of the Belgrade Centre for Social Welfare based on their social welfare status.

Poor living conditions and low level of knowledge on the potential of rational energy use and low-cost energy efficiency measures which could help them use less energy were noted by the staff undertaking the visits. All ten households visited were situated in deteriorated dwellings (see Figure 25) with alarming levels of energy poverty visible.

A commonly seen sight on the streets of Belgrade, facades of buildings are damaged and problems of mold are clearly visible, especially on the ground level and in the basement. Pipes and heating installations are in most cases not insulated, increasing the unnecessary losses of energy and costs for homes. Mold is present and lighting is poor. The same case was noted in ten visited households.

The situation inside the homes can be described as a lack of resources and lack of adequate information. Although ten households is too small a number to draw

FIGURE 26 *Common issues in the homes of energy poor people in Serbia (Photo documentation of Fractal, 2016)*

overall conclusions, the findings can be illustrative of the severity of the situation of those who are faced with energy poverty in Serbia.

For the members of the ten visited households, paying energy bills regularly presents a considerable problem and requires cutting most other household necessities. By paying irregularly or not being able to pay at all, they fear that their electricity will be cut off. In terms of energy consumption behaviour, while there is a significant potential for improvement of habits, it must be stressed that the representatives of visited households show a genuine interest and put significant effort into achieving a balance between keeping energy consumption low and trying to maintain sufficient warmth for health and enough energy for basic everyday activities (cooking, lighting, hot water, etc.). However, because of the poor financial situation and lack of information that is suitable to the specific situation in their homes, they lack solutions for improvement. A detailed analysis of energy consumptions and costs will be published after the fieldwork data collection and processing.

Key steps for Serbia

- Design specific energy efficiency measures and implement within the vulnerable groups;
- Set monitoring of vulnerable consumers on a national level and enable state centralized support;
- Define energy poverty and ensure statistical monitoring with publicly available data on energy expenditure and living conditions;

¹³ Field visits were undertaken within the project REACH CEI by Fractal from Belgrade, Serbia.

The adverse effects of energy poverty in SEE



FIGURE 27 Commonly seen mould and humidity
(Photo from Sisak-Moslavina County in Croatia)

Even if the deleterious consequences of energy poverty are well known, there has been little focus on analysing the magnitude of health consequences of energy poverty in the SEE. With the region being particularly vulnerable to energy poverty as result of inefficient and deteriorated housing stock (Figure 30) with poor access to adequate energy services and old and inefficient housing appliances, it is likely that the consequences for health are far beyond those commonly reported for Western Europe. Energy poor households are living in deteriorated buildings, with constant draughts through the poorly insulated windows and doors, damp walls with mould and dark rooms as a result of inadequate indoor lighting. The inability to heat homes and the permanent exposure to high levels of damp and mould are the main culprits for health damage among those living in energy poverty. Long exposure to high levels of indoor damp and mould increase risk of asthma exacerbation

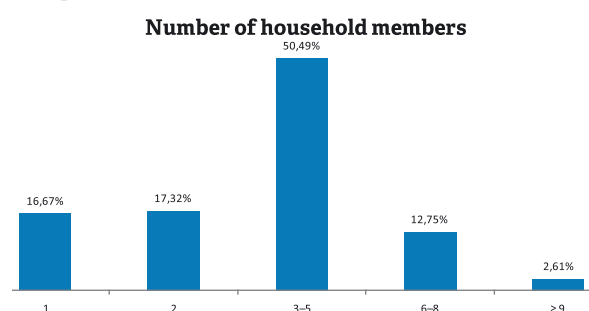


FIGURE 28 Number of family members in visited households in SEE (N=612)

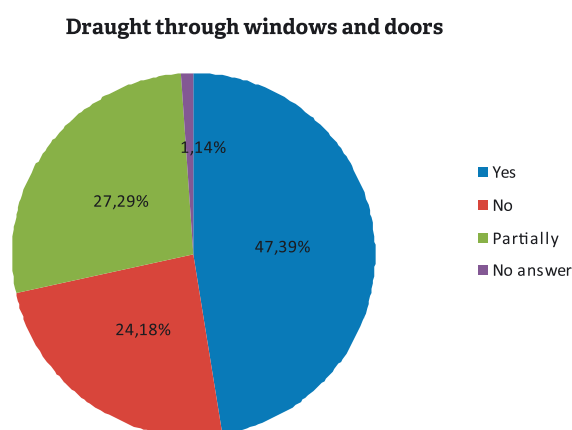
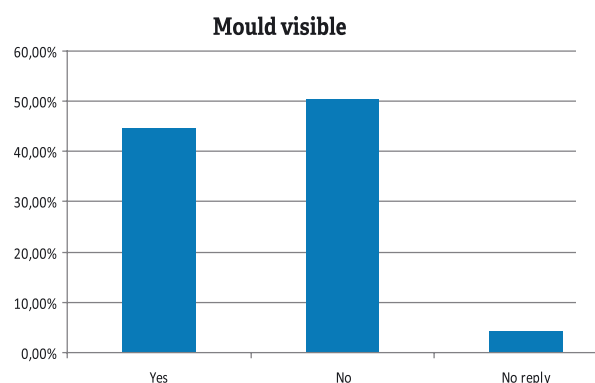


FIGURE 29 Occurrence of mould and draught in SEE (N=612)

[67]. What is furthermore worrisome is that marginalized groups, the disabled, elderly, and ill are more likely to be affected by the consequences of energy poverty [34]. The analyses gathered during visits to vulnerable households undertaken in all seven countries indicate that most of the affected families (50.5%) have three to five family members, with a significant number of single person households¹⁴.

Heating is required in all countries of SEE, and many families are forced to reduce their living space in winter. Multifamily buildings in larger cities are often connected to outdated fuel oil-powered district heating systems, usually without individual metering or regulation. This means that energy provided is very expensive and inefficient and that families have no ability to control their own heating bills. Unlike those in private houses who are forced to reduce their living space in winter, in urban residential multifamily buildings many families are even experiencing excessive heat, and without thermostats or the ability to turn down the heating, they commonly open windows to cool down. This paradox is evident throughout SEE countries, showing large inequalities between the urban and rural (energy) poor.

Some countries have started implementing individual metering schemes to comply with EU legislation. With the introduction of individual metering many are left with sky-high bills because they are not familiarized with energy saving mechanisms. This leads to those with low income being forced to turn down the heating. In older buildings which have a chimney system in place it is not uncommon for households to disconnect from the district heating and to shift to fuelwood and individual stoves accompanied by electric heaters. This type of heating is common in rural areas, where fuelwood heating and individual stoves are practically standard.

¹⁴ The results presented hereafter are based on findings from 612 households (out of 833 visited) in which complete and comparable quantitative data was gathered: Although the sample cannot be considered representative the results are indicative and can be used for illustrating for the severity or problems energy poor are faced with.

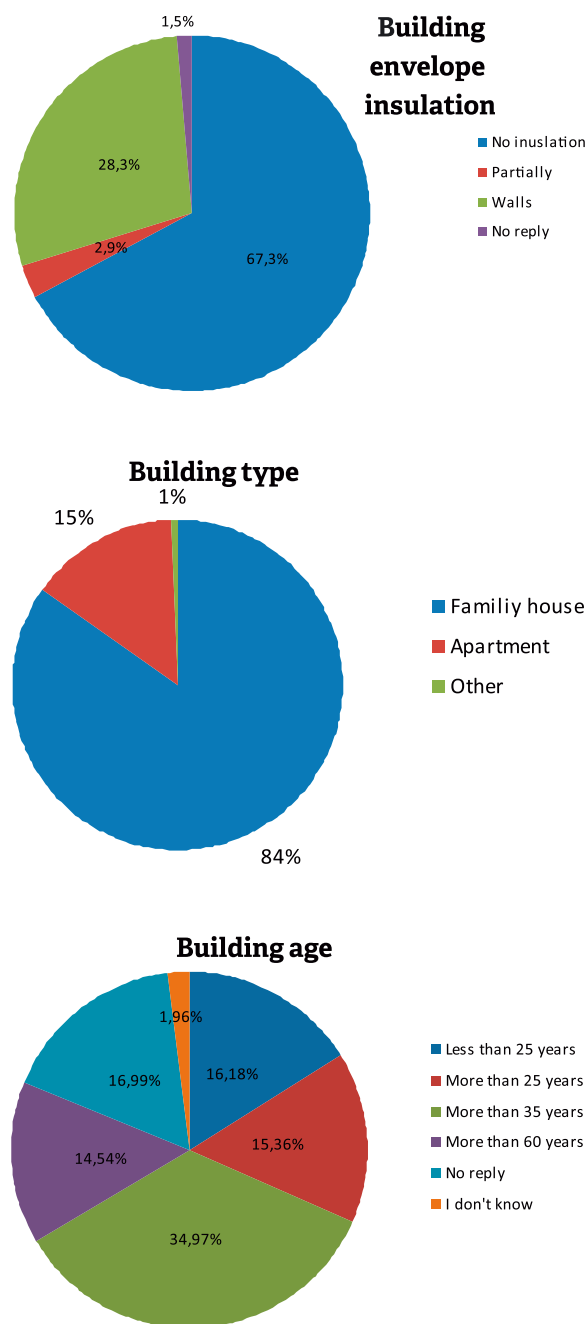


FIGURE 30 Level of isolation, building type and age in visited households in SEE (N=612)

Inadequate heating coupled with no insulation and old single glazed windows results in permanent exposure to a cold and damp environment [70] [71]. Mould, mites, draught, leaking roofs – this is the reality of life for many in SEE (Figure 29). A distinct problem

of energy poverty is directly related to distributional injustice where poorer and more vulnerable households live in more deteriorated dwellings and have almost no chance to invest in energy efficiency improvements [33].

Health conditions

Over 46% of respondents of the survey undertaken in SEE (N=612), are suffering from long-term illness, chronic illness or have certain disabilities, with more than 17% assessing their overall health as weak.

A significant number of respondents (50%) stated that in the last four weeks (at the time of the survey) they had had difficulty in carrying out work or household activities due to health problems, around 54% had

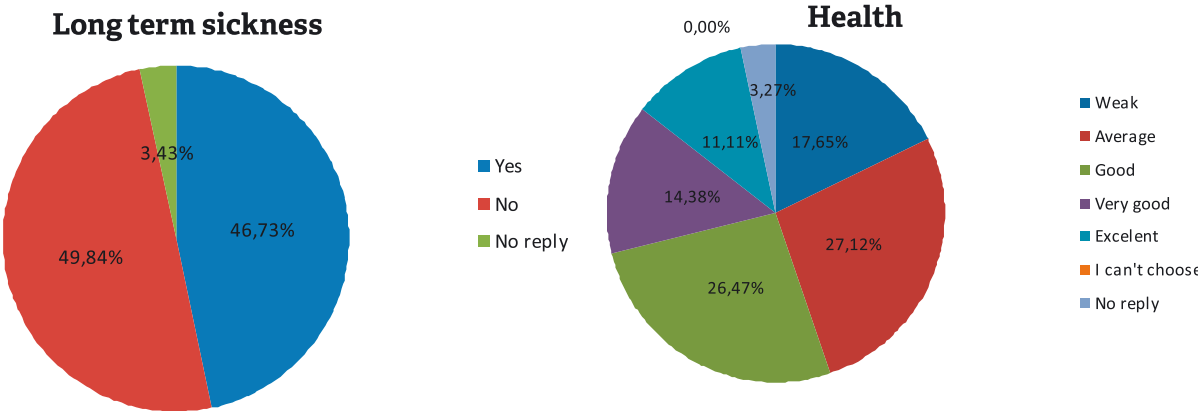


FIGURE 31 Indicator of illness and indicator of general self-assessment of health

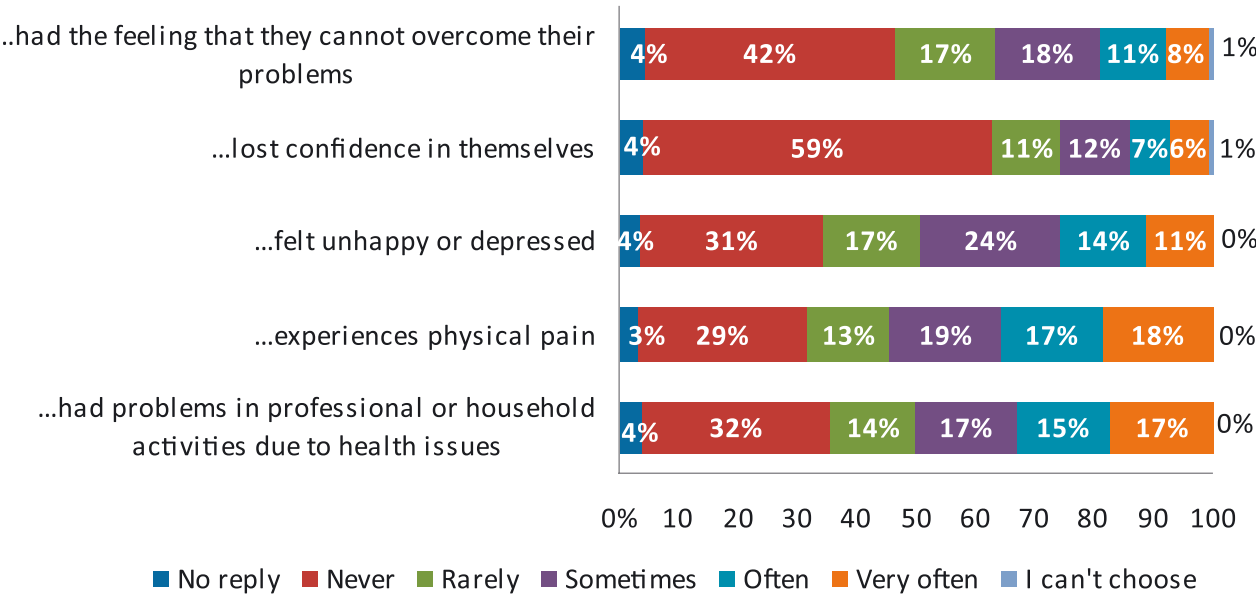


FIGURE 32 Indicators of self-assessment of psychological and physical health (N=612)

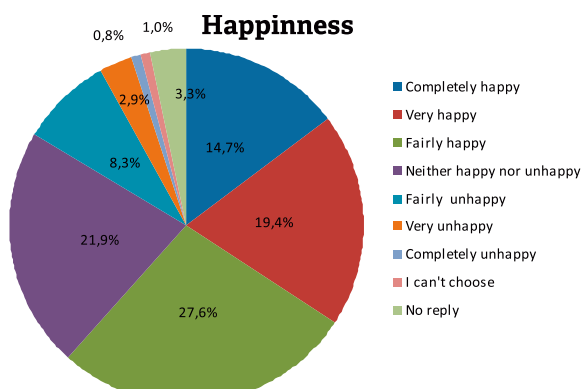


FIGURE 33 Indicator of personal well-being (N=612)

bodily aches or pain, and around 49% felt unhappy and depressed. Additionally, in the case of households from Croatian case study, analysis has shown that those subjects who are exposed to a continuous flow of cold air around the window to a significant extent report worse physical health [72].

Besides the poor material conditions of households and implication for the physical health of residents, mental health and wellbeing should be taken into account. Previous analysis has shown that those users who had difficulties paying for the heating reported significantly poorer mental health than those who do not have difficulties in paying heating bills. These initial results indicate the necessity of such research at national level and suggest the need for further statistical analysis of the data collected. Despite living in objectively inadequate conditions, which include all the above-mentioned factors (permanent exposure to moisture, mould, draught, inadequate heating systems and energy services,) a significant number of respondents – over fifty per cent – feels completely, very or fairly happy.

Households are often forced to choose between having access to adequate amounts of energy and food.

All this clearly indicates that immediate action is needed not only because there is, to an extent, a humanitarian crisis on the rise in certain population groups, but also because investing in



FIGURE 34 Top: Common improvisation in attempt to draught-proof old windows; Bottom: Improvised gas cooking.

(Photo credit: Lasta Slaviček Photography, taken during field visits in Croatia)

the alleviation of energy poverty means improving the economy and decreasing energy import dependency. It also protects the environment and climate by decreasing deforestation rates and eliminating unnecessary CO₂ emissions. Immediate action would enable more people to become active members of society and, by removing adverse health culprits, directly decrease national health care costs.

There are almost no downsides of investing in energy efficiency of dwellings and improving heating systems while providing access to adequate energy serves.

Getting out of the dark

The ability to afford adequate amounts of energy and adequate quality of energy services is an important governance issue and a key social policy concern [73]. As was described in the Country reports, the most common approach and basically the only attempt to deal with energy poverty in the region, has so far been through financial support targeted at socially vulnerable groups. While it is good that at least some action has been taken – showing governments’ attempts to address the issue – direct financial support should not be the first step. It should be a measure of last resort.

Direct financial support does, to some extent, alleviate burdens related to high energy costs. However it only deals with the consequences of energy poverty, not with the causes. Families receiving this kind of support still live in the same damp, deteriorated, draughty and dark dwellings, without any options available that would enable them to change any of those symptoms. In Croatia, as was described, there is a system in place which is designed to provide direct financial support to socially vulnerable enabling them a 200 HRK (27 EUR) monthly deduction from their electricity bills; money needed for that is collected through the social levy paid by all electricity consumers. Even if the agreement between the electricity distributor and Croatian government means that the levy is currently set to zero, it is only a matter of time when the distributor will refuse to give up their profits and the electricity bills will once again be on the rise – even for the poor.

Prior to devising any national regulation it is important to understand how energy prices are formed, as well as the main components that determine the final cost for consumers (Figure 35). As most accessible data

is available for electricity, and as the Croatian example so far focuses solely on electricity (which has to be noted is a severely limited and exclusive approach), electricity pricing is used to explain pricing mechanisms.

The main components of electricity price are the costs of distribution and transmission system network use, the costs of energy and supply (wholesale and retail) and, last but not least, taxes and levies.

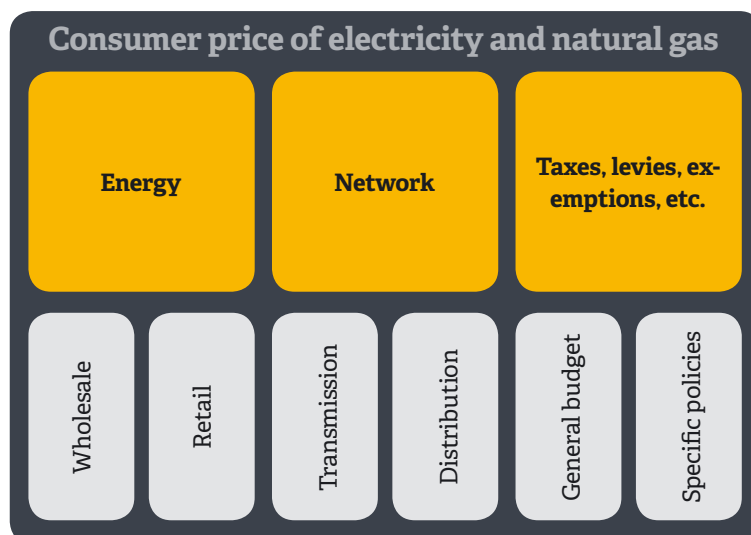


FIGURE 35 Elements of consumer energy prices [74]

Between 2008 and 2014, for the EU 28+ Norway, average electricity price levies (various policy support costs, PSC) increased on average by 170% for households. In 2014, the weight of the levies was almost equal to the energy and supply component for the average residential consumer [75]. Energy prices are further influenced by different taxes and levies, which add more burdens on final consumers. As it was mentioned, some governments opt for their policy solutions for energy poverty to be focused on energy prices. This has to be taken with caution because adding additional levies poses a potential risk, without knowing the magnitude of consequences for borderline energy poverty cases. The potential spill over of costs to the general population must be considered very seriously.

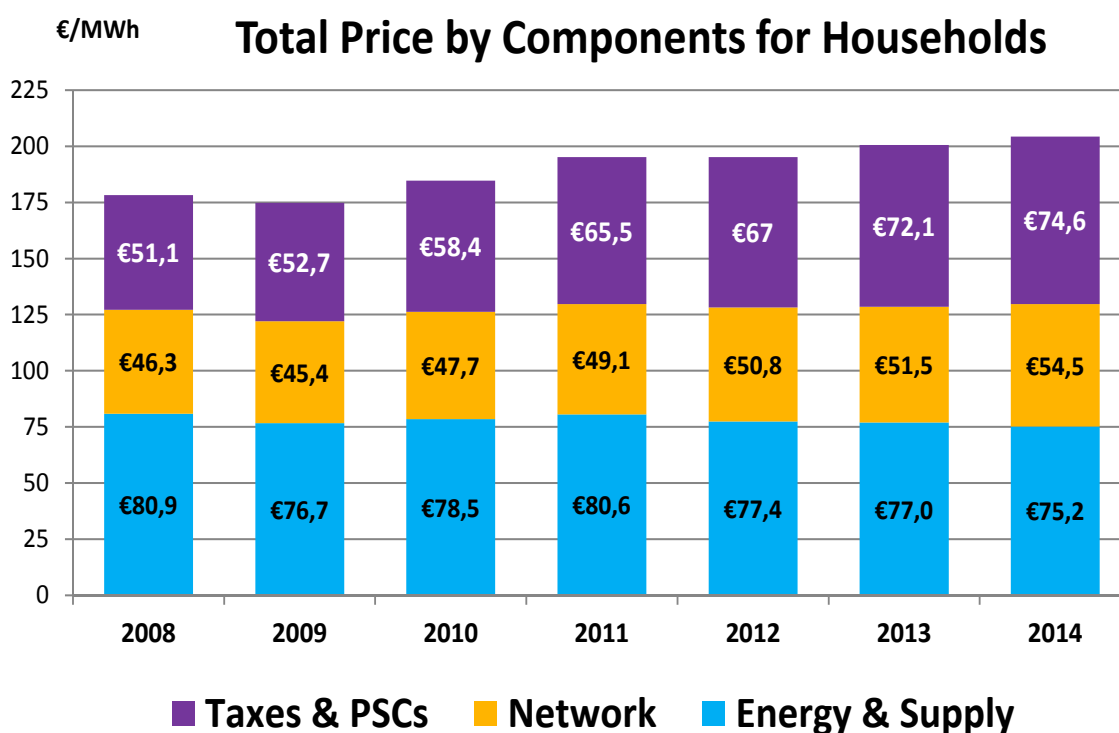


FIGURE 36 Electricity price components for households for the EU 28+Norway [75]

Prior to making decisions to impose additional levies on the energy price, it is important to consider that the price consumers pay for electricity and gas reflects various elements, influenced by both market forces and government policy. The European Commission states that it is of crucial importance to understand energy pricing mechanisms and structures when defining possible financial and legislative frameworks for tackling energy poverty to prevent passing on costs to consumers [74]. As is shown in Figure 37, with the opening and widening of electricity market the wholesale and retail energy and supply prices have actually been decreasing. However, that decrease has been erased by the fast increase of taxes and policy support costs, resulting in an overall increase in electricity prices for the final consumers.

It is indispensable to seek corrections to the adverse impacts of energy market liberalization and to avoid policy solutions through different taxes and levies on the already burdened household bills.

The first and foremost step in tackling energy poverty should, thus, involve dealing with main causes of energy poverty, instead of easing its consequences through mechanisms whose adverse effects we can only estimate and which have proven to increase overall energy costs. The principal solution to most energy poverty-related hardships is energy efficiency.

Investing in a whole range of energy efficiency solutions, ranging from simple low-cost energy efficiency measures as has been done for the households included in the visits described, to full retrofitting of buildings and improvement of heating systems, has proven to be the best mechanism for alleviating all aspects of energy poverty. Energy efficiency measures help reduce energy consumption and thus decrease energy while increasing the level of comfort. Energy efficiency helps improve quality of life through decreased air humidity, leaking roofs and mould; it eliminates cold draught, resulting in improved health conditions.

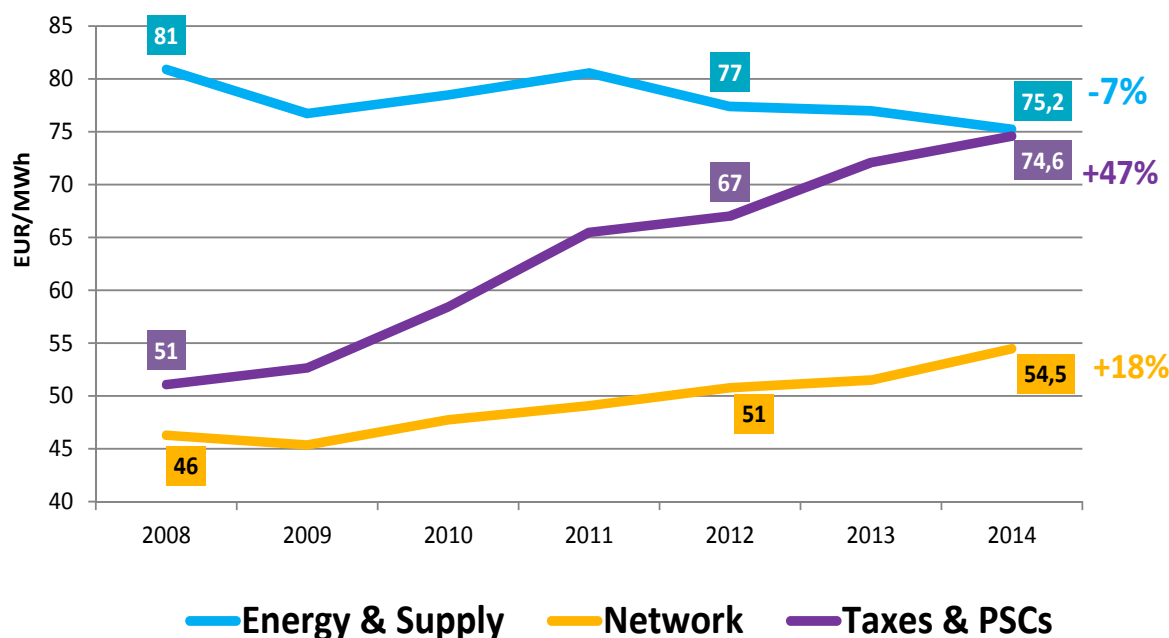


FIGURE 37 Evolution of household price components from 2008 (European Averages include EU 28+Norway weighted by consumption of the respective sector [75])

Improving the energy efficiency of dwellings and of household appliances, while improving the heating and ventilation systems is the most effective and sustainable approach to alleviating energy poverty [76] [77] [13] [78] [73] [7].

What is even more interesting is that poorer households seem to experience greater benefits of such improvements [78] and while most of the studies have reported small but significant health improvements it is likely that even greater health improvements occur but are not recorded as they appear through longer time periods than those analysed [79].

Households that have no access to the electricity grid are facing particular difficulties. In such situations it is hard to address energy poverty with measures for improving energy efficiency and hence alternative programmes for ensuring access to the electricity

network would be needed. In some cases there is a grid but households cannot afford the connection; in other cases grid is relatively close but not at the site where it is needed and in some cases it would not even be cost-effective to consider grid connections, so installing off-grid PV systems and similar solutions need to be considered.

While some countries of the region have recently started providing different support schemes for energy efficiency improvement available for households, energy poor households typically fail to use available mechanisms because the application documentation is too demanding and they do not have any funding available to close the financing gap. Energy efficiency programmes for energy poor households should be carefully designed so that they would be available and accessible to those in need. It is important to minimize bureaucracy and if necessary free assistance should be provided for filling in documentation and applications for receiving various forms of support for energy efficiency.

Energy efficiency support schemes typically offer only a percentage of the needed investment, leaving the poor out of their scope. Lack of funding for energy poverty abatement measures is a common problem in the region. EU funding, i.e. through the Cohesion Funds and the Instrument for Pre-Accession, should offer funding lines targeted specifically for tackling energy poverty. On the national level, funds available through different schemes, i.e. through the Emissions Trading Scheme and other polluter pays principles, should also be considered for funding energy efficiency improvements in vulnerable households.

Programmes for increasing 'energy literacy' and energy advising should interlink with other energy efficiency programmes. Vulnerable groups should be provided with the information needed to understand their energy habits and read energy bills. Information on costs and benefits of different energy efficiency and energy savings should be available and presented in a simple manner.

Another important barrier to successfully tackling energy poverty is that energy efficiency is in the domain of energy authorities, while energy poverty is a social problem. Although it is a social issue, social actors commonly avoid dealing with it as they perceive it falls within the energy sector.

It is of the utmost importance to increase awareness that energy poverty is a cross-sector issue which needs immediate attention from both social and energy actors. It is a social issue requiring primarily technical energy solutions followed by financial support mechanisms.

It is of crucial importance that energy and social policies are aligned in the segment of energy poverty, and that social care recognizes energy poverty as an important social issue while cooperating with energy experts in designing adequate policy responses. Energy poverty is not solely an issue of expenditure as it is often interpreted; it is a development issue.

Immediate action is needed both on the national EU level to provide help and support to those in need, and to alleviate adverse impacts of energy poverty while eradicating its causes [80]. Although the results of undertaken visits to energy poor households in SEE region which are presented in this report are indicative and clearly stress the importance of immediate action, it is highly recommended that further detailed research is conducted using representative samples in each country. Such research would provide valuable insights and ensure solid basis for adequate policy responses in each country.

Recommendations

Civil society organizations from SEE SEP propose the following recommendations¹⁵:

- Continue discussions to adopt measurable definitions of energy poverty – at the national, regional and EU level
- Develop and adopt national, regional and EU wide indicators for monitoring energy poverty
- Undertake detailed analysis of the problem at the national level in collaboration with national bureaus of statistics
- Ensure publicly available and easily accessible national statistics data on energy expenditures and living conditions (on a yearly basis)
- Improve data collection based on selected indicators so that results could be comparable between countries, change monitored over time and energy poverty statistics continuously monitored
- Improve definitions of vulnerable groups at national, regional and EU level

Financial support, such as compensation and support for paying the energy bills should be used as a measure after all cost-effective energy efficiency options have been implemented. It should not be the first measure as it does not contribute to overall improvement of quality of life and it does not promote rational energy use.

¹⁵ Recommendations build on those presented and discussed during the Conference on Energy Poverty in South-East Europe organized within the project REACH in European Parliament on June 1st 2016 [7] and take into consideration results of pilots implemented in all 7 countries within projects SEE SEP, REACH, REACH CEI and With knowledge to warm home.

Energy poverty should be included in national programmes, using the following measures as guidance:

- Low-cost energy efficiency and energy saving measures (efficient indoor lighting, draught proofing of doors and windows, reflective foils for radiators, thermometers etc.)
- Replacement of household appliances (“old for new”)
- Replacement of inefficient heating system (with use of renewables when possible)
- Different levels of retrofitting building envelope
 - replacing windows and doors
 - insulating roofs
 - insulating walls
 - insulating floors
 - deep renovation of the buildings whose occupants are vulnerable should be promoted and, if impossible due to the deteriorated state of the building, replacement homes should be ensured.
- Investment subsidies for energy efficiency measures with high co-funding rates and support system for filling out the paperwork and strong eligibility criteria
 - minimizing bureaucracy
- No-interest loans mainly for deep renovation
- Refurbishment of all state-owned social housing
- Low energy consumption requirements for all new social housing
- “Energy literacy” campaigns for vulnerable groups

References

- [1] B. Boardman, *Fixing Fuel Poverty: Challenges and Solutions*. Earthscan, 2010.
- [2] S. Tirado Herrero and D. Ürge-Vorsatz, "Trapped in the heat: A post-communist type of fuel poverty," *Energy Policy*, vol. 49, pp. 60–68, Oct. 2012.
- [3] S. BUZAR, "The 'hidden' geographies of energy poverty in post-socialism: Between institutions and households," *Geoforum*, vol. 38, no. 2, pp. 224–240, Mar. 2007.
- [4] "Western Balkans: Scaling Up Energy Efficiency in Buildings," 2014.
- [5] World Bank, "Energy use (kg of oil equivalent per capita) | Data." [Online]. Available: <http://data.worldbank.org/indicator/EG.USE.PCAP.KG.OE?view=map>.
- [6] D. M. Kammen and N. Kittner, "SOUTH EAST EUROPE: THE EU ROAD OR THE ROAD TO NOWHERE? An energy roadmap for 2050: Technical analysis," 2016.
- [7] S. Robic, L. Zivcic, and T. Tkalec, "Energy poverty in South-East Europe: challenges and possible solutions." 2016.
- [8] S. Petrova, M. Gentile, I. H. Mäkinen, and S. Bouzarovski, "Perceptions of thermal comfort and housing quality: exploring the microgeographies of energy poverty in Stakhanov, Ukraine," *Environ. Plan. A*, vol. 45, no. 5, pp. 1240–1257, 2013.
- [9] H. Thomson and C. Snell, "Quantifying the prevalence of fuel poverty across the European Union," *Energy Policy*, vol. 52, pp. 563–572, Jan. 2013.
- [10] S. Fankhauser and S. Tepic, "Can poor consumers pay for energy and water? An affordability analysis for transition countries," *Energy Policy*, vol. 35, no. 2, pp. 1038–1049, 2007.
- [11] Eurostat, "Electricity prices for domestic consumers – bi-annual data (from 2007 onwards)." [Online]. Available: <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>.
- [12] E. Lacroix and C. Chaton, "Fuel poverty as a major determinant of perceived health: the case of France.," *Public Health*, vol. 129, no. 5, pp. 517–24, May 2015.
- [13] H. Thomson, S. Thomas, E. Sellstrom, and M. Petticrew, "Housing improvements for health and associated socio-economic outcomes.," *Cochrane database Syst. Rev.*, no. 2, p. CD008657, 2013.
- [14] J. Teller-Elsberg, B. Sovacool, T. Smith, and E. Laine, "Fuel poverty, excess winter deaths, and energy costs in Vermont: Burdensome for whom?," *Energy Policy*, vol. 90, pp. 81–91, 2016.
- [15] L. Camprubí, D. Malmusi, R. Mehdipanah, L. Palència, A. Molnar, C. Muntaner, and C. Borrell, "Façade insulation retrofitting policy implementation process and its effects on health equity determinants: A realist review," *Energy Policy*, vol. 91, pp. 304–314, 2016.
- [16] EurActiv.com, "Energy poverty takes toll on Balkan forests – EurActiv.com." [Online]. Available: <http://www.euractiv.com/section/social-europe-jobs/news/energy-poverty-takes-toll-on-balkan-forests/>.
- [17] C. Waddams Price, K. Brazier, and W. Wang, "Objective and subjective measures of fuel poverty," *Energy Policy*, vol. 49, pp. 33–39, 2012.
- [18] B. Boardman, "Opportunities and constraints posed by fuel poverty on policies to reduce the greenhouse effect in Britain," *Appl. Energy*, vol. 44, no. 2, pp. 185–195, 1993.
- [19] C. Liddell and C. Morris, "Fuel poverty and human health: A review of recent evidence," *Energy Policy*, vol. 38, no. 6, pp. 2987–2997, Jun. 2010.
- [20] J. D. Healy and J. P. Clinch, "Fuel poverty, thermal comfort and occupancy: results of a national household-survey in Ireland," *Appl. Energy*, vol. 73, no. 3, pp. 329–343, 2002.
- [21] R. Moore, "Definitions of fuel poverty: Implications for policy," *Energy Policy*, vol. 49, pp. 19–26, Oct. 2012.

- [22] C. Liddell, "Fuel poverty comes of age: Commemorating 21 years of research and policy," *Energy Policy*, vol. 49, pp. 2–5, Oct. 2012.
- [23] B. Boardman, "Fuel poverty synthesis: Lessons learnt, actions needed," *Energy Policy*, vol. 49, pp. 143–148, Oct. 2012.
- [24] S. Pachauri and D. Spreng, "Measuring and monitoring energy poverty," *Energy Policy*, vol. 39, no. 12, pp. 7497–7504, Dec. 2011.
- [25] S. Buzar, *Energy Poverty in Eastern Europe: Hidden Geographies of Deprivation*. Ashgate Publishing, Ltd., 2007.
- [26] S. Pye and A. Dobbins, "Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures," 2015.
- [27] "Energy poverty." [Online]. Available: <http://www.iea.org/topics/energypoverty/>. [Accessed: 14-Nov-2015].
- [28] International Energy Agency, "Access to Electricity," *World Energy Outlook 2009*, 2010. [Online]. Available: <http://www.iea.org/weo/electricity.asp>.
- [29] B. Boardman, *Fuel poverty: from cold homes to affordable warmth*. Belhaven Press, 1991.
- [30] DECC, "Annual Report on Fuel Poverty Statistics 2013." [Online]. Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/199833/Fuel_Poverty_Report_2013_FINALv2.pdf. [Accessed: 15-Sep-2015].
- [31] S. Bouzarovski and S. Petrova, "A global perspective on domestic energy deprivation: Overcoming the energy poverty–fuel poverty binary," *Energy Res. Soc. Sci.*, vol. 10, pp. 31–40, Nov. 2015.
- [32] B. Legendre and O. Ricci, "Measuring fuel poverty in France: Which households are the most fuel vulnerable?," *Energy Econ.*, vol. 49, pp. 620–628, May 2015.
- [33] G. Walker and R. Day, "Fuel poverty as injustice: Integrating distribution, recognition and procedure in the struggle for affordable warmth," *Energy Policy*, vol. 49, pp. 69–75, Oct. 2012.
- [34] C. Snell, M. Bevan, and H. Thomson, "Justice, fuel poverty and disabled people in England," *Energy Res. Soc. Sci.*, vol. 10, pp. 123–132, Nov. 2015.
- [35] J. D. Healy and J. P. Clinch, "Quantifying the severity of fuel poverty, its relationship with poor housing and reasons for non-investment in energy-saving measures in Ireland," *Energy Policy*, vol. 32, no. 2, pp. 207–220, Jan. 2004.
- [36] INSTAT, "Living Standard Measurement Survey 2012 (Albania)." 2013.
- [37] "Energy Community – Albania Gas." [Online]. Available: https://www.energy-community.org/portal/page/portal/ENC_HOME/AREAS_OF_WORK/Implementation/Albania/Gas.
- [38] Energy Charter Secretariat, "In-Depth Review of Energy Efficiency Policies and Programmes: Bosnia and Herzegovina," 2012.
- [39] "REELIH Project in Bosnia and Herzegovina – REELIH – Residential Energy Efficiency for Low-Income Households." [Online]. Available: <https://getwarmhomes.org/our-approach/reelih-project-in-bosnia-and-herzegovina/>.
- [40] Agency for Statistics of Bosnia and Herzegovina, "Anketa o potrošnji energije u domaćinstvima BiH. Survey on household energy consumption in BiH," 2015.
- [41] "Energy Community – Bosnia and Herzegovina Electricity." [Online]. Available: https://www.energy-community.org/portal/page/portal/ENC_HOME/AREAS_OF_WORK/Implementation/Bosnia_Herzegovina/Electricity.
- [42] "Energy Community – Bosnia and Herzegovina Gas." [Online]. Available: https://www.energy-community.org/portal/page/portal/ENC_HOME/AREAS_OF_WORK/Implementation/Bosnia_Herzegovina/Gas.
- [43] "Energija u Hrvatskoj 2012." [Online]. Available: http://www.mingo.hr/userdocsimages/energetika/Energija2012_web%281%29.pdf. [Accessed: 16-Nov-2015].
- [44] "Main tables – Eurostat." [Online]. Available: <http://ec.europa.eu/eurostat/web/income-and-living-conditions/data/main-tables>. [Accessed: 16-Nov-2015].

- [45] "POKAZATELJI SIROMAŠTVA U 2011. – konačni rezultati/POVERTY INDICATORS, 2011 – Final Results." [Online]. Available: http://www.dzs.hr/Hrv_Eng/publication/2012/14-01-03_01_2012.htm. [Accessed: 16-Nov-2015].
- [46] DZS, "Statističko izvješće 1484: Rezultati Ankete o potrošnji kućanstava u 2011.," Zagreb, 2013.
- [47] "PROGRAM ENERGETSKE OBNOVE VIŠESTAMBENIH ZGRADA ZA RAZDOBLJE OD 2014. DO 2020. GODINE." [Online]. Available: http://www.mgipu.hr/doc/Propisi/Program_EO_VS_ZGRADE.pdf. [Accessed: 16-Nov-2015].
- [48] "Anketa o energetske učinkovitosti u kućanstvima." [Online]. Available: http://cenep.net/uploads/cenep/document_translations/doc/000/000/069/anketa_-_RH.pdf?2013. [Accessed: 14-Feb-2016].
- [49] "Prijedlog mjera za poboljšanje energetske učinkovitosti u kućanstvima za razdoblje 2014.-2016." [Online]. Available: http://cenep.net/uploads/cenep/document_translations/doc/000/000/060/NEAP_final.pdf?2013. [Accessed: 16-Nov-2015].
- [50] "Popis stanovništva, kućanstava i stanova 2011." [Online]. Available: http://www.dzs.hr/Hrv_Eng/publication/2011/SI-1441.pdf. [Accessed: 14-Feb-2016].
- [51] World Bank, "Country Snapshot Kosovo," 2015.
- [52] B. Pira, I. Cunaku, and A. Bajraktari, "ENERGY CONSUMPTION IN HOUSEHOLDS SECTOR IN KOSOVO – FUTURE DEVELOPMENTS," *TMT*, pp. 12–18, 2011.
- [53] K. Civil, S. Consortium, and S. Development, "Electricity Score," 2013.
- [54] GAP Institute, "The use of Electricity for Heating. The impact of cogeneration on energy consumption," 2015.
- [55] M. Dugolli and P. Kopacek, "Identification of Commercial Losses in Electrical Power System in Kosovo," *IFAC Proc. Vol.*, vol. 43, no. 25, pp. 107–110, 2010.
- [56] L. Service, K. Final, and A. English, "Energy consumption and Potentials for Energy Efficiency Implementation : Analyzing Low Energy Consumption and Potentials for Energy Efficiency Implementation : Analyzing Low Income Low Service Areas of Kosovo," no. August 2016, 2015.
- [57] K. Civil, S. Consortium, and S. Development, "Efficiency for Development : Economics of Energy Efficiency in Kosovo," no. May, 2014.
- [58] H. B. Brian, A. M. James, A. Myderrizi, and H. Ble-
rina, "KOSOVO HOUSEHOLD ENERGY CONSUMPTION," 2013.
- [59] Q. V. Government, "Republika e Kosovës ANNUAL ENERGY BALANCE OF THE REPUBLIC OF KOSOVO FOR THE YEAR 2014," 2014.
- [60] Republic of Macedonia State Statistical Office, "SURVEY ON INCOME AND LIVING CONDITIONS, 2014," 2016.
- [61] Republic of Macedonia State Statistical Office, "Active Population in the Republic of Macedonia Results from the Labour Force Survey, I quarter 2016," 2016.
- [62] R. Janssen, "Energy Efficiency...Just do it! Act now for warmer homes, local jobs and cleaner air!," 2015.
- [63] N. Jablan, Mi. Daković, and J. Marojević-Galić, "Održiva energija u Crnoj Gori," 2014.
- [64] "About Montenegro | UNDP in Montenegro." [Online]. Available: <http://www.me.undp.org/content/montenegro/en/home/countryinfo.html>.
- [65] "Zavod za statistiku Crne Gore – MONSTAT." [Online]. Available: <http://www.monstat.org/cg/page.php?id=72&pageid=72>.
- [66] "Izvještaj o analitičkom pregledu usklađenosti zakonodavstva Crne Gore," no. april. pp. 27–28, 2013.
- [67] H. Stadtmüller, "Understanding the link between energy efficiency and energy poverty in Serbia," 2014.
- [68] Statistical Office of the Republic of Serbia, "Household budget survey 2013," 2014.
- [69] T. Petrić and B. Jasna, "Fuel Poverty Challenges in Serbia: Evidence from the Suburban Settlement of Kaluđerica," *Hassacc*, pp. 116–121, 2015.

- [70] D. Kolokotsa and M. Santamouris, "Review of the indoor environmental quality and energy consumption studies for low income households in Europe.," *Sci. Total Environ.*, vol. 536, pp. 316–330, Jul. 2015.
- [71] S. Robić, "ENERGETSKO SIROMAŠTVO U HRVATSKOJ – rezultati terenskog istraživanja provedenog u Sisačko-moslavačkoj županiji," 2016.
- [72] "Istraživački izvještaj o energetsom siromastvu." [Online]. Available: http://www.door.hr/wordpress/wp-content/uploads/2011/02/Izvjestaj-EN-siromastvo_FINAL.pdf. [Accessed: 16-Nov-2015].
- [73] R. Walker, C. Liddell, P. McKenzie, C. Morris, and S. Lagdon, "Fuel poverty in Northern Ireland: Humanizing the plight of vulnerable households," *Energy Res. Soc. Sci.*, vol. 4, pp. 89–99, Dec. 2014.
- [74] "Energy prices and costs in Europe. CORRIGENDUM Annule et remplace le document COM(2014) 21 final du 22.1.2014. Concerne la version EN uniquement, page 6, page 9 et figure 9. ." [Online]. Available: https://ec.europa.eu/energy/sites/ener/files/documents/20140122_communication_energy_prices.pdf. [Accessed: 14-Nov-2015].
- [75] EURELECTRIC, "Drivers of Electricity Bills: Supporting graphs, methodology and country notes," 2016.
- [76] R. Walker, P. McKenzie, C. Liddell, and C. Morris, "Estimating fuel poverty at household level: An integrated approach," *Energy Build.*, vol. 80, pp. 469–479, Sep. 2014.
- [77] R. A. Sharpe, C. R. Thornton, V. Nikolaou, and N. J. Osborne, "Fuel poverty increases risk of mould contamination, regardless of adult risk perception & ventilation in social housing properties," *Environ. Int.*, vol. 79, pp. 115–129, Jun. 2015.
- [78] C. D. Maidment, C. R. Jones, T. L. Webb, E. A. Hathway, and J. M. Gilbertson, "The impact of household energy efficiency measures on health: A meta-analysis," vol. 65, 2013.
- [79] H. Thomson and S. Thomas, "Developing empirically supported theories of change for housing investment and health," *Soc. Sci. Med.*, vol. 124, pp. 205–214, Jan. 2015.
- [80] REACH, "Key conclusions of the conference Energy Poverty in South East Europe." www.reach-energy.eu, 2016.
- [81] "Eurostat – Electricity consumption by households." [Online]. Available: <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tsdpc310&plugin=1>.
- [82] www.winterwarmthengland.co.uk, "Excess Winter Deaths – Facts and Figures." 2010.

