

# FUEL OF THE POOR

HOUSEHOLD USE OF  
**FIREWOOD**

COUNTRY PROFILES:  
**BULGARIA, HUNGARY,  
ROMANIA**



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by Habitat for Humanity (HfH)

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Habitat for Humanity (HfH) is an international network of housing organizations. HfH Hungary, Bulgaria and Romania are partners in the Bio-Balance Project which is led by WWF Hungary.

## THE LIFE-BIOBALANCE PROJECT

Funded by EU LIFE Programme Climate Governance and Information, the „Balancing solid biomass for climate neutrality in CEE countries“ (LIFE BIO-BALANCE) projects' overall objective is to support EU Member States to shift to a low-carbon and resilient economy by ensuring that solid biomass is produced and used sustainably at all levels. The project design was motivated by multiple negative trends which connected to the energy utilization of solid biomass, namely climate change, biodiversity, air pollution and energy poverty.



## SURVEY ON FIREWOOD USE IN BULGARIA, ROMANIA AND HUNGARY

In 2022 WWF Hungary and its project partners conducted a survey exploring biomass use in the three countries of the BIOBALANCE project. The respondents were randomly selected from online panels of the respective countries – they had to qualify for the screening criteria of being aged 18-70 and using firewood for heating. The questionnaire had 500 respondents in each country and covered the dimensions of housing, energy efficiency, heating solutions and firewood usage. Since no quota or weighting was applied due to lack of accessible demographic data, therefore results of the study are not representative to firewood users of the given country.

Despite the survey results not being representative, they provide give valuable insights on domestic firewood use in the three countries and as such will be presented in the present study.

# COUNTRY PROFILE:

## BULGARIA

### Housing situation

Unlike other former communist countries in Central Eastern Europe, a wave of privatisation of the housing stock took place in Bulgaria well before the political changes of 1989. In 1985, private ownership of the housing stock already stood at 85 percent.<sup>1</sup> According to the latest census, in 2011, 97.6 per cent of the housing stock is privately owned.<sup>2</sup> Social housing is very scarce in the country, as only 2.4 per cent of all inhabited buildings belong to the central government or municipalities. Public social housing is inadequate both in terms of quality and quantity. There would also be a need for a formalised private rental market – only some 5-15 per cent of the housing stock is being rented out either at market rates, for a reduced price or without charge.<sup>3</sup>

In Bulgaria there are 3.9 million residential dwellings. Nearly a third of the dwellings in the country (31.4%), and 24 per cent in the capital, Sofia, are unoccupied. Despite such a high vacancy rate, over 40 per cent of households live in overcrowded conditions<sup>4</sup>. Nearly half of (47%) of the 3,2 million occupied dwellings are single-family houses, the other half are apartments in multi-apartment dwellings. 8.8 per cent of dwellings are dilapidated, thus in a decaying condition.<sup>5</sup> Lack of basic amenities, such as running water, bathroom and toilet, is a further problem (see

Access to basic infrastructure).

Affordability of housing is a major issue in Bulgaria, as the housing cost overburden rate is the third highest in the EU: 14.4 per cent of Bulgarian households spend more than 40 per cent of their income on housing. 6.2 per cent of the total population (compare to 3.2 EU average) spend over 40 per cent from their income on housing. Specific groups are especially impacted by the too heavy burden of housing costs. 37 per cent of single person households, and 44.8 per cent of tenants on the private rental market and 44 of

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<sup>1</sup> World Bank, 'Bulgaria - Housing Sector Assessment. Final Report'.

<sup>2</sup> National Statistical Institute, '2011 POPULATION CENSUS – Main Results'.

<sup>3</sup> Zahariev, Dyliana, és Yordanov, „TENLAW: Tenancy Law and Housing Policy in Multi-level Europe National Report for BULGARIA".

<sup>4</sup> National Statistical Institute, '2011 POPULATION CENSUS – Main Results'.

<sup>5</sup> Government of Bulgaria, 'Long-Term National Strategy to Support the Renovation of The National Building Stock of Residential and Non-Residential Buildings By 2050'.

the lowest-income quintile live in households where housing costs represent more than 40 of total incomes.<sup>6</sup> Similarly, more than a third of young adults are unable to live independently due to high prices and continue to live with their parents.

In multi-apartment buildings a high share of the owners has low incomes, making it more likely that they would be unable to pay common costs, which then contributes to low levels of maintenance and lack of renovation. Poor maintenance is a general issue, as more than three quarters of apartments in the country are in buildings older than 35 years. The lack of maintenance of these buildings has led to their rapid deterioration. A large share of the poorest households lives in informal and non-standard housing in marginalized neighbourhoods, which leads to severe housing deprivation. These households typically rely on solid fuel use. Public expenditure in the housing sector, and especially funding targeted at lower income and vulnerable groups, is less than 1.5% of the overall budget.<sup>7</sup> The National Roma Integration Strategy 2012-20 calls for the improvement of housing conditions in Roma neighbourhoods including infrastructure upgrading and titling, but it is unclear how much funding is set aside for this purpose.<sup>8</sup> At the same time, the two largest programs in the housing sector – National Program for Energy Efficiency of Multiapartment Buildings (NEEP)<sup>9</sup> and Regions in Growth focus heavily on energy efficiency, while excluding infrastructure upgrading, which is much needed in low-income settlements.

### Energy poverty

Bulgaria ranks first in the EU in many poverty-related indicators. In 2020 Bulgaria has the highest share of population at risk of poverty (23.85% versus 16.8% in the EU) or living in serious material deprivation (19.4% versus 5.6% in the EU). Also, the share of the population having low income (22.6%) is among the highest in the EU, along with Romania and Latvia.

Specific energy poverty indicators also show that important share of the population face difficulties. In 2020, over one-fifth of Bulgarians (22%) did not pay their utility bills in times, thus had arrears, compared to 6.3 per cent in the EU. 27.5 per cent of households are unable to keep their home adequately warm, which is 3.5 times higher than the EU average. The share of households that spend an unusually high share of their income on

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<sup>6</sup> EU-SILC Survey; Eurostat, - EU-SILC Survey; Eurostat, 'Housing Cost Overburden Rate by Income Quintile - EU-SILC Survey[ilc\_lvho07b]'.

<sup>7</sup> World Bank Group, 'A Roof Over Our Head - Housing in Bulgaria'.

<sup>8</sup> Bulgarian Government, '[National Roma Integration Strategy 2012-2020](#)'.

<sup>9</sup> Ministry of Development and Public Works, 'Energy Efficiency of Multi-Family Residential Buildings National Programme - Energy Efficiency'.

energy expenditure is 11.5% which is lower than the EU average.<sup>10</sup> In general households with higher the average energy expenditure are likely to live in a dwelling with low energy efficiency and poor thermal comfort, where income distributions are more unequal or generally share of energy consumption from income is already high, variance in energy expenditure translates to lower share of this indicator. The share of Bulgarian population that spends an unusually low share of their income on energy expenditure is 9.4 % which is also lower than the EU average.<sup>11</sup> These households might restrict their energy spending below what is necessary to meet their needs.

### **National energy poverty approach and strategies**

In Bulgaria neither a legal definition of energy poverty nor a definition of households at risk of energy poverty have been yet introduced. There is no established system of indicators to monitor and evaluate the dynamics of energy poverty. Since July 2012, vulnerable customers have been identified in the Energy Act.<sup>12</sup> However, there are no policies to prevent consumers from becoming “vulnerable”, no identification has been established and there is a lack of appropriate measures in place to address the problem.

Energy poverty is mainly a subject of discussions on different platforms of interest representation. There is also a lack of comparative understanding of the root causes of energy poverty. This leads to a mixture of concepts of absolute poverty and energy poverty both at the level of measurement by indicators and in terms of identifying appropriate measures to overcome the problem in the sense of European guidelines.

Despite EU requirements, the Bulgarian National Energy and Climate Plan (NECP)<sup>13</sup> does not indicate the number of households affected by energy poverty, nor does it put forward an indicative target for reducing their number. Devising an agreed upon definition of energy poverty would be crucial ahead of the approaching deregulation/liberalisation of the energy/electricity market, which will demand protection of vulnerable consumers. In all climate impact scenarios considered, rising commodity prices can significantly reduce real incomes and increase poverty. In these scenarios, however, the analysis of the social impact is not comprehensive; no estimates are provided in social areas, including the affordable housing and social housing sectors.

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<sup>10</sup> Energy Poverty Observatory, „Indicators”, 2022.

<sup>11</sup> EU Energy Poverty Observatory, ‘Indicators’.

<sup>12</sup> Republic of Bulgaria, ‘Energy Act’.

<sup>13</sup> Ministry of the Environment and Water, ‘INTEGRATED ENERGY AND CLIMATE PLAN OF THE REPUBLIC OF BULGARIA 2021–2030’.



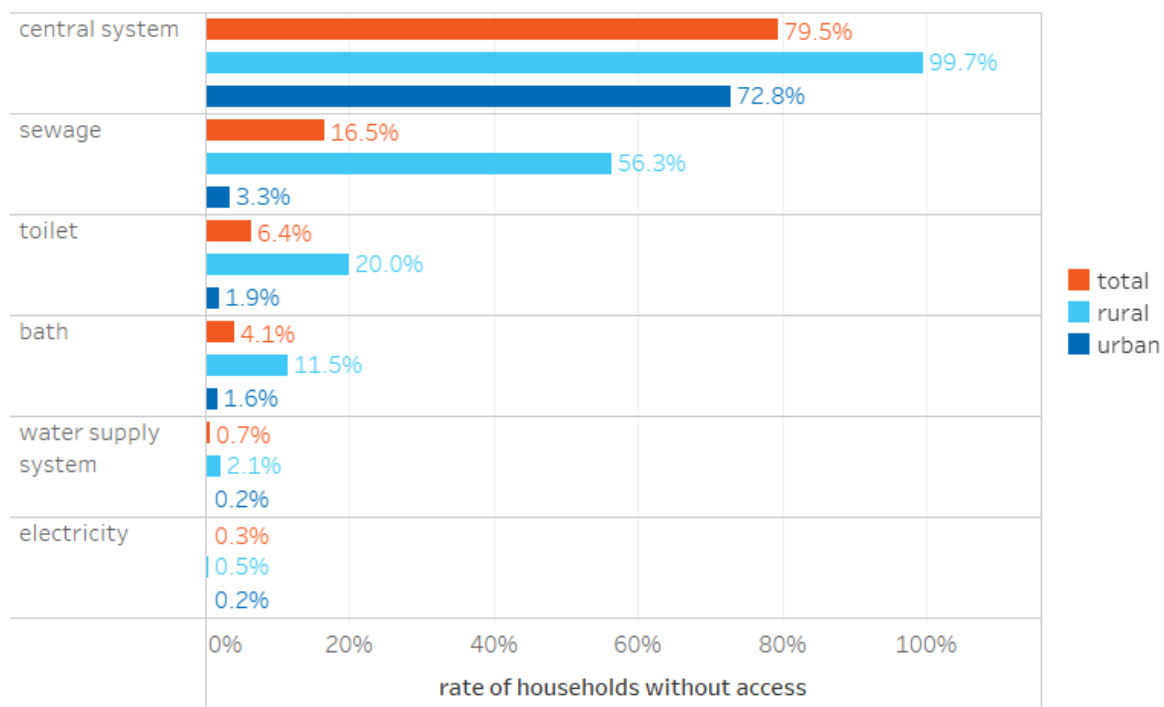
The NECP acknowledges that the phasing out of regulated prices for end-users will increase competition between electricity suppliers, but at the same time expose consumers to greater price volatility. However, measures to protect households from dramatically increasing energy prices in the NECP seem to be superficially outlined and lack guarantees of implementation : “In order to ensure the protection of energy vulnerable customers, the state will introduce support measures to allow the process of market liberalisation to pass without social disturbances.”<sup>14</sup> A highly discussed but not yet implemented political measure to protect vulnerable consumers from rising energy prices after the deregulation of the market is the social tariff for electricity. The plan, however, describes the existing heating subsidy, a measure which is currently the only available targeted financial support to vulnerable households to cover their heating costs in winter (November 1 - March 31).<sup>15</sup> Households whose average monthly income in the last six months is less than or equal to the differentiated minimum income are entitled to a heating benefit. The measure reaches almost 7 percent of the population (about 500,000 or about 250,000 households per year) and limits the reach of vulnerable consumers of energy, given the high share of households impacted by energy poverty.

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<sup>14</sup> Ministry of the Environment and Water, 88.

<sup>15</sup> Social Assistance Act through Ordinance No. RD-07-5 of 16 May 2008)

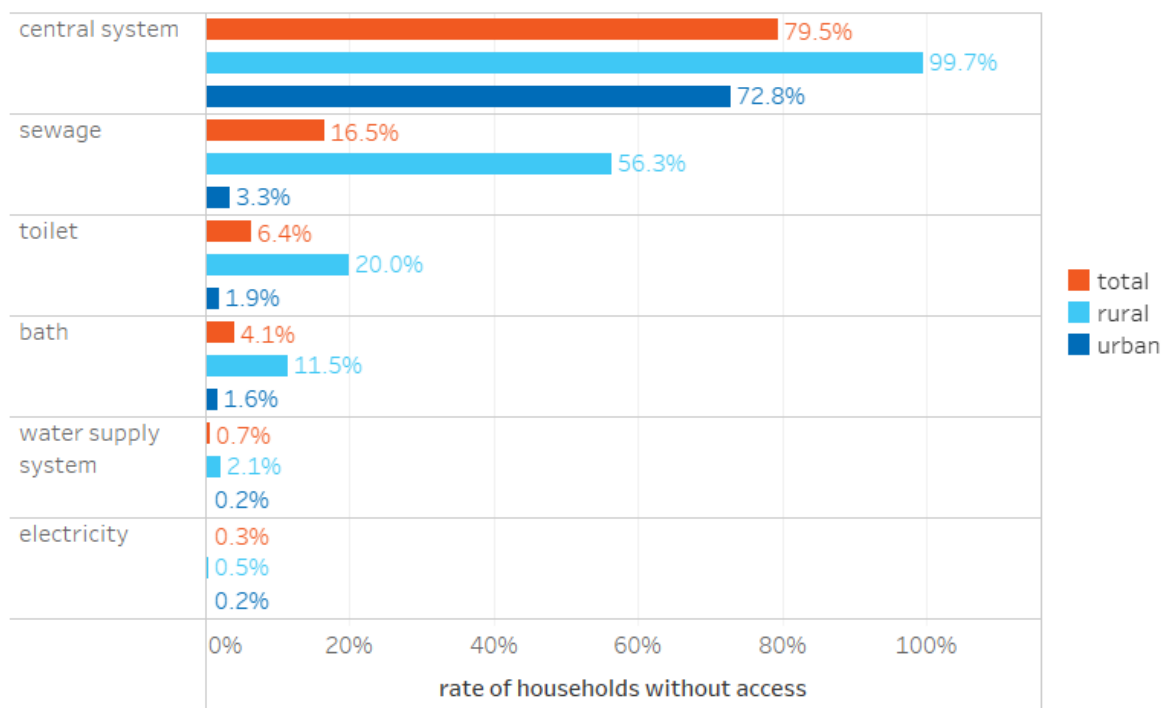
## Access to basic infrastructure



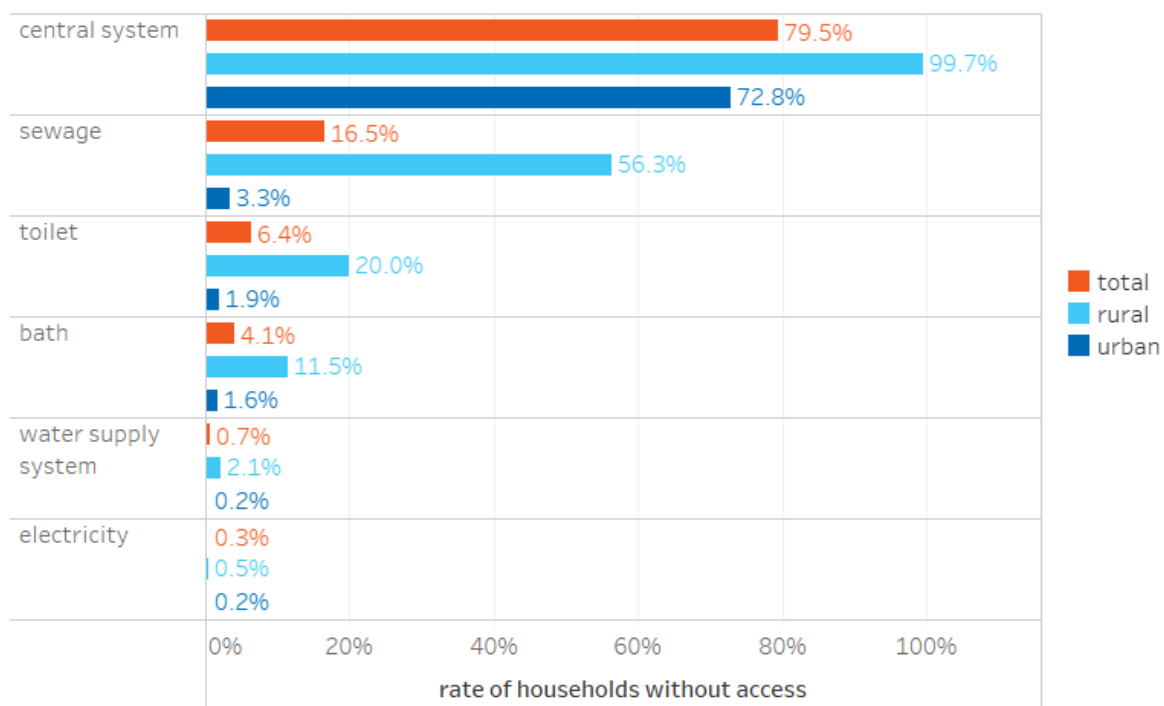
1. Figure share of dwellings without access to central heating system water supply system, sewage, electricity, bath and toilet by location, 2020 <sup>16</sup>

<sup>16</sup> Infostat, 'Report Result'.

## COUNTRY PROFILE: BULGARIA

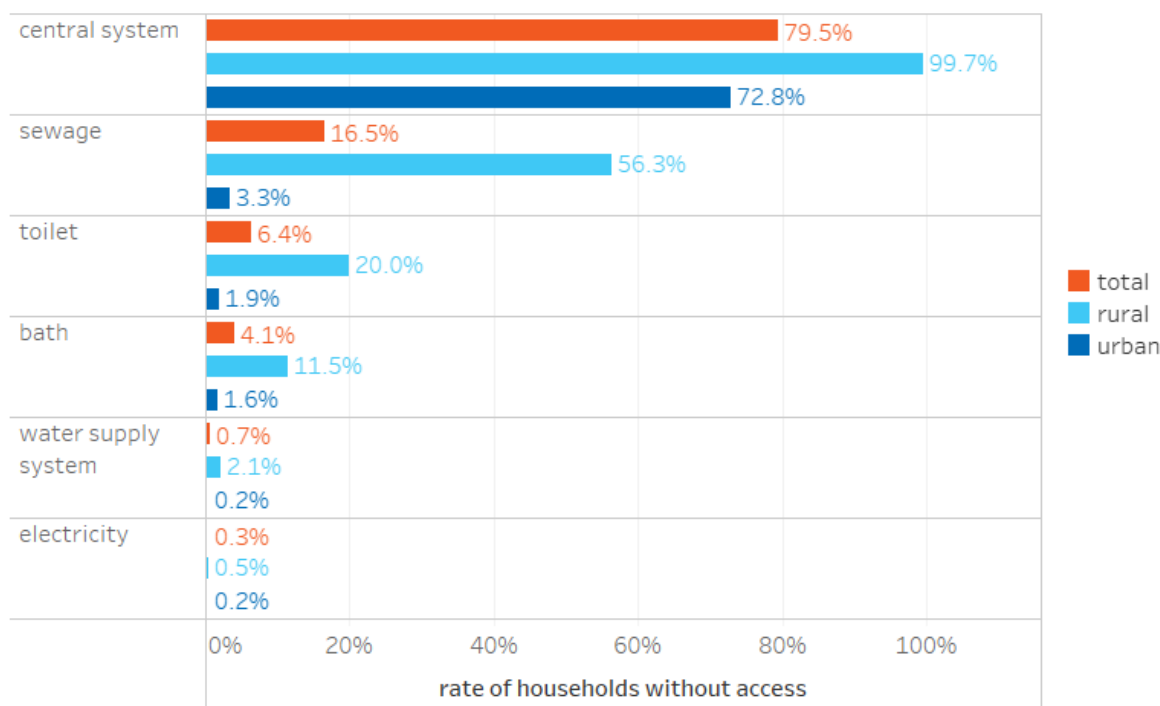


1. Figure share of dwellings without access to central heating system water supply system, sewage, electricity, bath and toilet by location, 2020



1. Figure shows Nearly all dwellings in Bulgaria are connected to electricity and water supply systems, large majority of dwellings are equipped with bathroom and toilets. 90

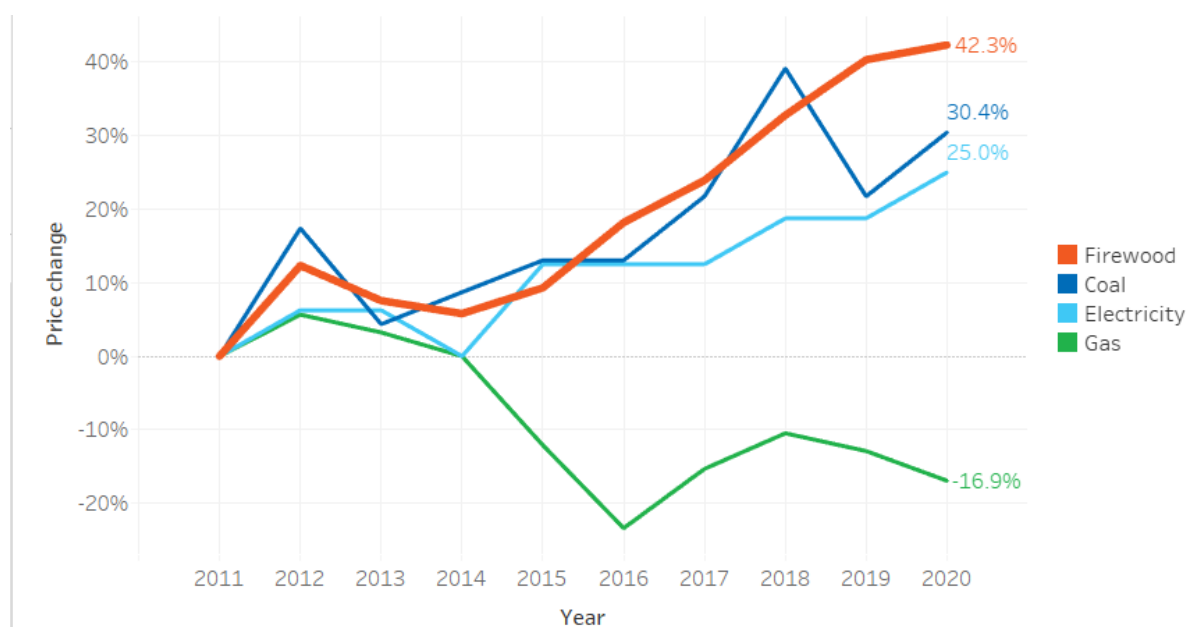
per centare equipped with toilets and bathrooms.



1. Figure shows that rural dwellings are less equipped with toilets or bathroom. Though, rural dwellings are less equipped with these facilities: one-fifth of rural dwellings have no indoor toilet and more than one in ten rural dwelling has no bath. Access to sewage system is highly problematic as over half of the rural population has no access to it. Only one fifth of dwellings have access to a district heating system, and these dwellings are in urban environments.<sup>17</sup>As a low share of apartments is equipped with central heating system or connected to district heating, the role of solid fuels and electricity in heating is paramount. Thus, in general there is space for extending basic infrastructure to make accessible basic facilities to households. Furthermore, rural areas should be prioritised when extending access to sewage, heating system and bath and toilets, as there a striking difference in access rate of urban and rural areas.

## Affordability of energy

<sup>17</sup> National Statistical Institute, 'District Heating and Cooling Systems'.



2. Figure [BG] *Changes in average energy prices 2011-2020*<sup>18</sup>

The price of solid fuels has been increasing dramatically in the last decade: the price of firewood and coal increased by 42 and 30 per cent, respectively. As for electricity, prices rose by 25%. At the same time costs of liquid fuels and gas have gone down by 30 and 17 percent.<sup>19</sup> As we highlighted already, share of energy expenditure of the poorest Bulgarian households from their total expenditure is the third highest in the EU and nearly twice as high as the EU average.<sup>20</sup> The increasing tendency of energy prices, especially of firewood prices will further increase the burden of already high energy costs of poor households.

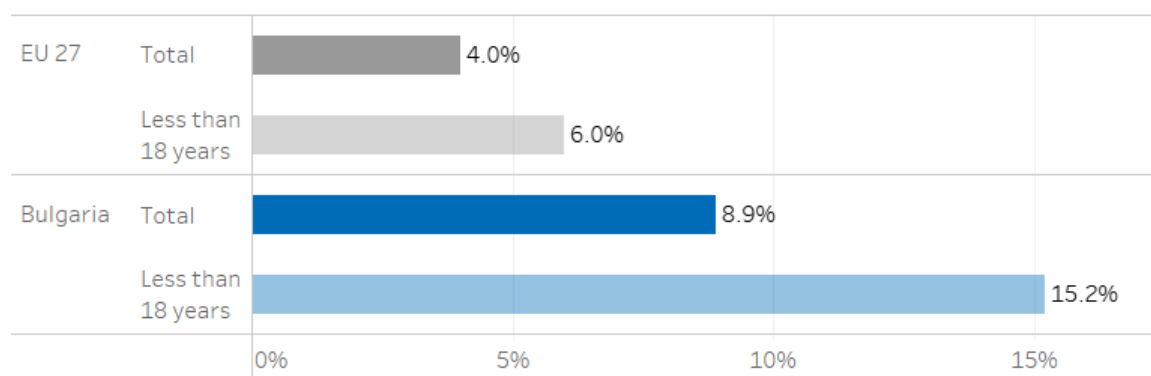
## Housing quality and energy efficiency

<sup>18</sup> National Statistical Institute, 'Overall Energy Balance Sheet'.

<sup>19</sup> National Statistical Institute.

<sup>20</sup> European Commission, 'Energy Prices and Costs in Europe, Part II Energy Costs for the Economy, Households and Industry'.

## COUNTRY PROFILE: BULGARIA



3. Figure: Severe housing deprivation rate BG VS EU total + less than 18 <sup>21</sup>

8.9 per cent of the population and 16.2 per cent of children are affected by severe housing deprivation, meaning that they live in a dwelling which is overcrowded and has at least another quality problem, such as lack of toilet or bathroom, leaking roof, or too dark dwelling.<sup>22</sup>

Regarding the energy efficiency of the dwellings, according to the latest census data from 2011, 15.5 percent of dwellings in Bulgaria have thermal insulation and 29 per cent had their windows renovated or changed.<sup>23</sup> 91 per cent of non-renovated buildings belong to energy classes E, F and G. These number suggest that majority of dwellings need complex energy efficient renovations to reduce their energy consumption significantly.

## Energy use and biomass

The most important energy sources in Bulgaria are solid fossil fuels, oil and petroleum products and nuclear energy. Coal plays an important role in the energy mix as 34.5 per cent of electricity is generated from it.<sup>24</sup> Gas and renewables (including biofuels) are each responsible 14 percent of the energy supply. An important share of renewable energy is produced from wood: for example, 85 percent of heat generated from renewables and waste is produced from primary solid biofuels, mostly wood.<sup>25</sup>

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<sup>21</sup> Eurostat, „Severe housing deprivation rate by age, sex and poverty status “.

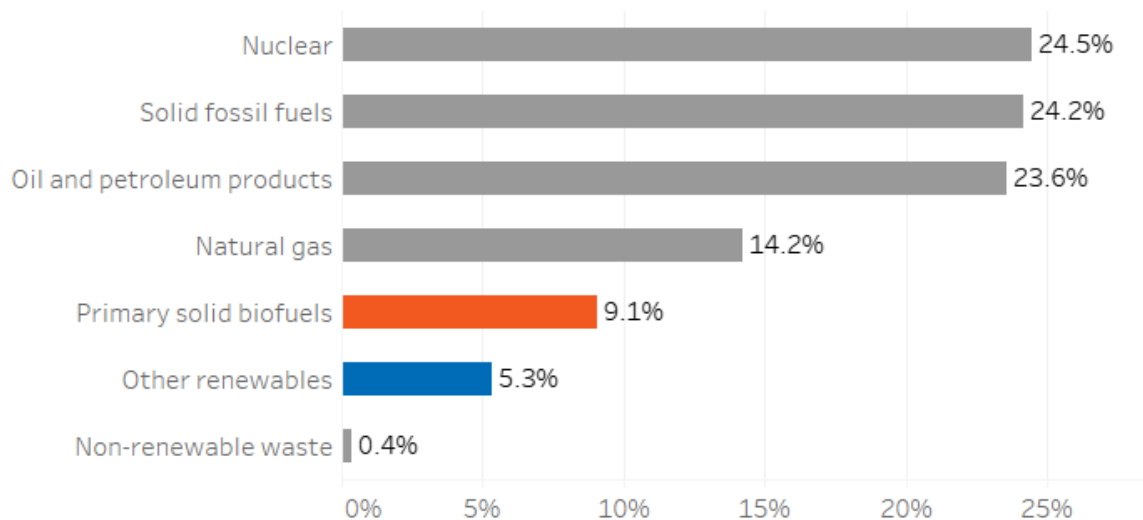
<sup>22</sup> Eurostat.

<sup>23</sup> National Statistical Institute, ‘2011 POPULATION CENSUS – Main Results’.

<sup>24</sup> National Statistical Insitute, „Overall energy balance sheet“.

<sup>25</sup> International Energy Agency, ‘Renewables Information - Data Product’.

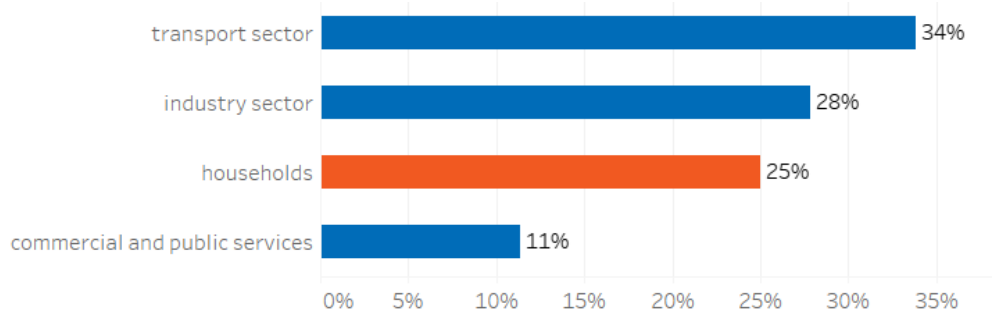
## COUNTRY PROFILE: BULGARIA



4. Figure Energy supply <sup>26</sup>

### Energy consumption by source

Bulgarian households account for one-fifth of the final energy consumption – a proportion slightly lower share than the EU average. Transport is the most energy consuming sector, accounting over a third of the final energy consumption .<sup>27</sup>



5. Figure Final energy consumption by sectors EU VS Bulgaria.<sup>28</sup>

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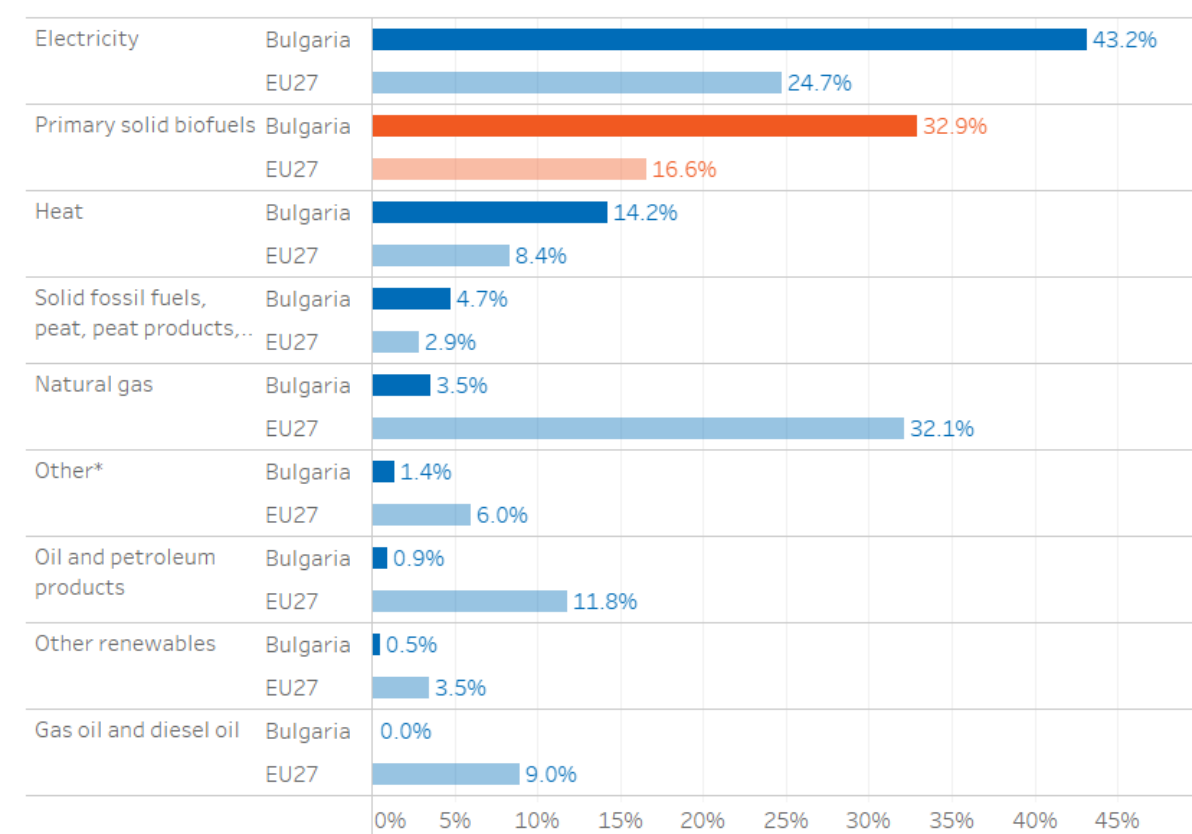
<sup>26</sup> Eurostat, 'Total Energy Supply by Product'.

<sup>27</sup> Eurostat.

<sup>28</sup> Eurostat, „Final energy consumption by sector“.

## COUNTRY PROFILE: BULGARIA

Electricity makes up nearly half of energy consumption of a Bulgarian household. Primary solid biofuels (mostly firewood) are the second most important energy source of households. They account for a third of their energy consumption, which is nearly twice as high as the EU average (16.6%). Gas has a surprisingly low share in the energy consumption of Bulgarian households (3.53%). Solid fossil fuels (mostly coal) represent only five per cent of the final domestic energy consumption, however, as outlined above, coal plays a large part in electricity production, granting it an indirect share in households' energy supply.



6. Figure Final energy consumption in HHs by fuel EU VS Bulgaria.<sup>29</sup>

<sup>29</sup> Eurostat, 'Disaggregated Final Energy Consumption in Households - Quantities'.



## Energy use by end use

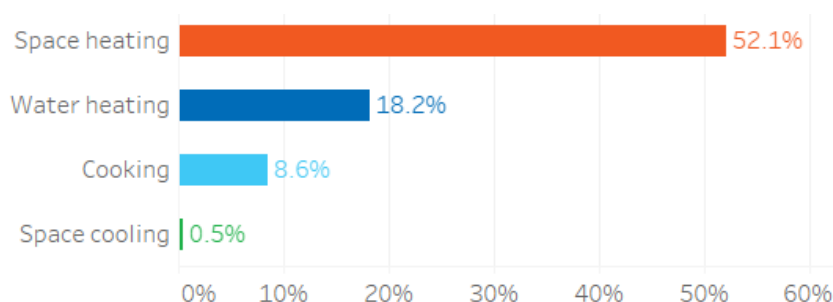
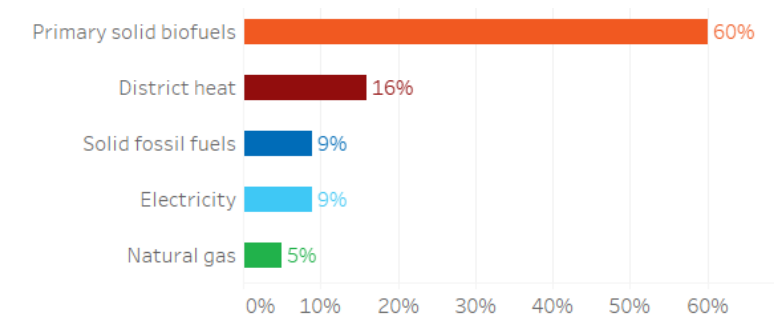
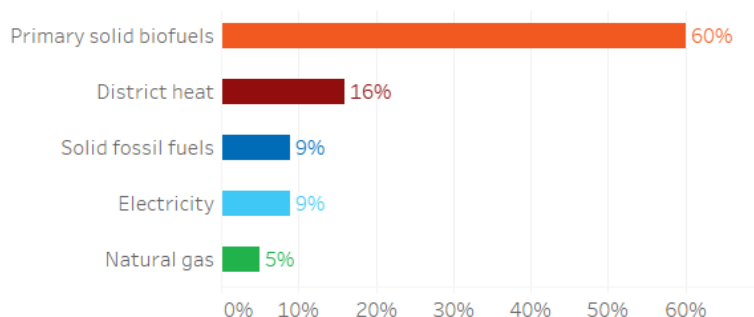


Figure 7. final energy consumption in HHs by end use 2019

Half of the energy used by Bulgarian households is for heating their homes, while in the EU nearly two-thirds of energy consumption is accounted for by space heating. At the same time, Bulgarian households spend a higher proportion of energy on other domestic uses, such as water heating (18%), cooking (9%) or lighting (21%).<sup>30</sup>



8. Figure: Households energy use for space heating<sup>31</sup>



8. Figure clearly shows that majority of households in Bulgaria use solid fuels for heating. In 2019 primary solid biofuels accounted for 60 per cent of households' final energy consumption for heating, which is 12 times higher than the EU average. At the same time gas accounts only for 9 percent of energy use for heating in Bulgaria, compared to 38 per

<sup>30</sup> Eurostat, 'Disaggregated Final Energy Consumption in Households - by End Use'.

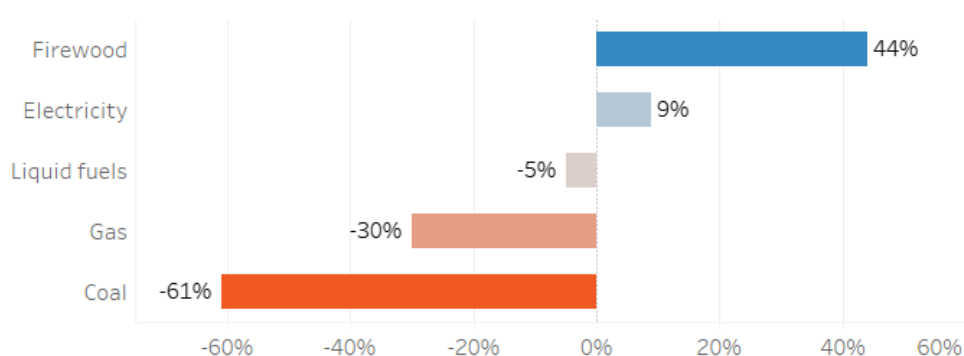
<sup>31</sup> Eurostat, 'Disaggregated Final Energy Consumption in Households - Quantities'.

cent in the EU. Further 9 per cent of final energy consumption for heating comes from solid fossil fuels and another 9 per cent from electricity.

### Role of biomass in the energy mix

Primary solid biofuels provide only 14 per cent of the final energy supply in Bulgaria.<sup>32</sup> In 2018 77 per cent of renewable energy was supplied from biofuels and more than half of renewable energy was consumed in households. Two third of the population uses biomass for heating<sup>33</sup> and 93% of heat generation from renewables and waste is based on primary solid biofuels as well.<sup>34</sup>

### Energy prices



9. Figure Change of energy prices between 2011- 2020

Price of firewood has increased by over 50 per cent between 2011 and 2021. Price of electricity has also 9 %, Price of gas has been lower in 2021 than in 2011. Though, according to the Eurostat statistics, price of gas in purchasing power standard (PPS) has doubled just within the year of 2021 and it is the second highest gas price in PPS in the EU, after Sweden.<sup>35</sup>

### Domestic biomass use

Majority of Bulgarian dwellings are heated with solid fuels, predominantly by firewood and partly by coal. Two-thirds of Bulgarian households use firewood to heat their home.<sup>36</sup> According to a representative study, solid fuel use is prevalent among low income and

<sup>32</sup> Eurostat, 'Total Energy Supply by Product'.

<sup>33</sup> Executive Forest Agency, „Biomass from Forests and its Utilization as Renewable Energy Source in Bulgaria”.

<sup>34</sup> International Energy Agency, 'Renewables Information - Data Product'.{Citation}

<sup>35</sup> Eurostat, 'Gas Prices for Household Consumers - Bi-Annual Data (from 2007 Onwards) [Nrg\_pc\_202]'.

<sup>36</sup> Executive Forest Agency, 'Biomass from Forests and Its Utilization as Renewable Energy Source in Bulgaria'.

rural households. 50 per cent of households with the lowest income heat with wood. 42 per cent of the poorest households use coal, and the use of coal is the highest in this income group. Use of wood becomes less significant with the increase of income, though it remains significant in all income groups.<sup>37</sup> Domestic biomass use is also predominant among large share of the poorest households that live in illegal and non-standard housing in undeveloped neighbourhoods, where severe housing deprivation impacts most households.

According to the survey on biomass use carried out in the frames of Bio-Balance project, 38 per cent of Bulgarians respondents cannot make use of a room in their dwelling as they are unable to heat it and 17 per cent have a unheated room that is in use.

Two-thirds of firewood users said that they use firewood wood with other sources, mostly electricity. Tile stoves are the most common firewood-fuelled device among the Bulgarian respondents, present in 41 per cent of households, followed by metal stoves, present in nearly 31 per cent of households. Air conditioners (52%) and electric heaters (27%) are also very common. Nearly half of Bulgarian respondents' plan to improve their heating system, mostly upgrading the appliances to a more modern one. One third of respondent would switch entirely to electric heating and 28 per cent would switch to solar power.

Respondents of the survey on Bulgarian firewood users buy on average 9.8 cubic meters of firewood for approximately 250-499 euros a year, with 70 per cent of them acquiring their wood from local entrepreneurs and *less so from other sources* (e.g. woodyards, cutting it themselves) than in the other two countries in the study. per cent Bulgarian households usually buy firewood in instalments and mostly merely two months prior the heating season. They also dry the wood for shortest time among the three countries and estimate that the ideal drying time of firewood is on average 2.8 months – which is the shortest time span among the three respondent countries.

Two-thirds of Bulgarian respondents use a mix of dried and wet wood for heating, which is the highest share among the survey respondents. The average ideal drying time of wood according to Bulgarian respondents is 2.8 months, which is the lowest among the three countries. 2.8 months is far shorter drying time then expert suggest (minimum 6 month but ideally a year). 46.2 per cent of Bulgarian respondents hold that air pollution related to firewood heating is quite or very significant, highest share among the three countries.<sup>52</sup> This might indicate that while firewood users are concerned about air-pollution due to firewood heating and at the same time they lack information on the ideal

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<sup>37</sup> Ивайло és Ивайло, „Какво Мислят Хората За Отоплението С Твърди Горива [What Do People Think About Solid Fuel Heating]”.

length of wood-drying that could also reduce combustion-related air-pollution. Also, financial capacities of households might not be sufficient to invest in advance in firewood

## Heating appliances and chimneys



1. Picture [source](#)



2. Picture [source](#)

Picture 1. Picture and 2. Picture show two typical heaters used for solid fuel heating in Bulgaria, made from iron and steel. The first is suitable for cooking as well, thus allowing for some energy savings when simultaneously heating and cooking. Both heaters can be considered inefficient, nonetheless - they heat up and cool down quickly, thus not providing an even temperature and need to be fed often as well.

Chimneys of residential buildings are not subject to specific regulation in Bulgaria. Requirements are only set for industries regarding limiting dispersion of emissions, considering their proximity to the settlements, topography, and meteorological conditions of the area.

## Ecodesign

Colleagues of a biomass heater retailer company<sup>38</sup> mentioned that the new eco-design regulation has a large impact on the product range of producers and retailers. For example, until recently, one of the largest manufacturers, traders, and distributors of wood biomass equipment in Bulgaria has been mostly focusing on the production of solid fuel boilers, but due to the new regulations they switched to the production of the pellet stoves. They are still receiving inquiries about solid fuel boilers, as they are the cheapest heating devices. Companies might also invest time and money in certification processes (such as BDS EN ISO 14001) that ensures the protection of the environment and the prevention of pollution in a way that considers socio-economic needs. Another retailer offers in-depth trainings for employees on the competitive characteristics of the products, their specifications, energy class and energy efficiency evaluation parameters, etc. Sales colleagues always try to comprehensively present the higher energy class products to customers to help them better understand the environmental benefits. Despite their attempts, for customers the most important selection criteria is still the product's price, with design or efficiency only being secondary. According to the company, even though businesses face many challenges in meeting new regulations, at the end of the day it is households that are most affected by the new regulation -- the products that do meet new standards of the Ecodesign regulation are unaffordable for low-income households. Despite the Ecodesign regulation already being in effect, products that do not comply with its standards are still available on the market.

## Environment and climate

Particulate matter (PM<sup>10</sup>) is the pollutant of greatest concern for Bulgaria, as PM<sup>10</sup> emissions were above EU standards in the period of 2005-2010 in all measurement areas. That said, in recent years PM<sup>10</sup> emissions have slightly gone down, likely resulting from switching from solid fuel heating to gas, electric or district heating. The burning of solid fuels, especially wood, in conventional stoves and boilers used for residential heating has been identified as the principal source of PM<sup>10</sup> pollution, as the most exceedances of the daily PM10 limits occurred during the residential heating period in winter<sup>39</sup>

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<sup>38</sup> <https://eco therm.bg/en/>

<sup>39</sup> Madzharova, 'Review of the National Air Pollution Control Programme – Bulgaria'.

Air quality became a widely discussed societal issue in Bulgaria mainly due to civil society organising and awareness raising. At the time of writing, for the new programming/funding period 2021-2027 concrete programs have not yet been approved, but it is expected that air quality improvement measures will be implemented.

### **Policies**

In recent years two support programs aimed at easing heating related difficulties have been implemented. The first one provides a subsidy of 270 euros (BGN530) for households with an income lower than a given threshold. Annually 300.000 households are supported.<sup>40</sup> The aid provides a short-term relief for households. Though, it is not considered sustainable in the longer term, as it does not incentivize the reduction of one's energy consumption or the use of cleaner heating methods, for example through supporting energy efficiency measures).

The second policy measure is a stove exchange program introduced in 2019, aiming to improve air quality in eight highly polluted municipalities. The program had a budget of 60 million EUR/ (BGN119) from the Operational Programme Environment and it covered 100% of the costs of replacement of stoves.

The National Energy Efficiency Program for Multi-family Residential Buildings 2015-2020 was fully funded by the government with 1 billion Euro and supported the energy efficient retrofit of multi-apartment buildings. Regardless of their social-economic status, both low- and high-income owners received a 100 per cent grant to cover the costs of the retrofit.<sup>41</sup>

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<sup>40</sup> Пресцентър МТСП, 'Помощта За Отопление През Зимния Сезон Се Увеличава На 523,55 Лева'.

<sup>41</sup> Ministry of Development and Public Works, 'Energy Efficiency of Multi-Family Residential Buildings National Programme - Energy Efficiency'.

# COUNTRY PROFILE:

## HUNGARY

### Housing situation

Since the regime change of 1989 the number of people affected by housing deprivation or affordability problems has been constant, at around 2-3 million (out of a population of under 10 million).<sup>42</sup> In 2020, 7.6 per cent of the population was affected by severe housing deprivation.<sup>43</sup> In the past 30 years, housing policy has never been the focus of the governments in power; there is no ministry or secretary of state dedicated to housing. During the last decade housing policy has been subordinate to “demographic policies”, favouring the (upper) middle classes.<sup>44</sup>

The largest housing issues currently are the following:<sup>45</sup> First, the buildings stock is outdated, with 70-90 per cent of the stock in need of renovation. Over 90 per cent of dwellings are privately owned as publicly owned housing stock was privatised after 1989. The share of social housing is marginal. The private market is under regulated leading to insecurities for both tenants and landlords. The relatively small size of the rental market contributes to the dramatically increasing rent prices. Soaring property and rent prices makes housing more and more unaffordable: the rise of property prices-index was the second highest in the EU between 2010 and 2020.<sup>46</sup> Rural segregation (especially affecting the Roma population) is another severe housing issue, that impacts over 2 per cent of the population and equals isolation, extremely poor housing quality and lack of access to infrastructures and services. Finally, the criminalization of homelessness is incorporated into the constitution and lead to further stigmatisation of homeless people instead of providing adequate support for them.

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42 Czirfusz, M., & Jelinek, Cs. (2021). Lakhatási közpolitikák és a lakhatás megfizethetősége az elmúlt három évtizedben. In L. Vankó (Ed.), Éves jelentés a lakhatási szegénységről 2021. Habitat for Humanity Magyarország.

43 Eurostat. (2020c). Severe housing deprivation rate by age, sex and poverty status - EU-SILC survey. [https://ec.europa.eu/eurostat/databrowser/view/ilc\\_mdho06a/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/ilc_mdho06a/default/table?lang=en);

Eurostat. (2020d). Total population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor - EU-SILC survey. [https://ec.europa.eu/eurostat/databrowser/view/ilc\\_mdho01/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/ilc_mdho01/default/table?lang=en)

44 Czirfusz, M., & Jelinek, Cs. (2021)

45 Bajomi, A. Z. (2021). A lakhatási szegénység csökkentésének Európai Unió keretei. In L. Vankó (Ed.), Éves jelentés a lakhatási szegénységről 2021. Habitat for Humanity Magyarország.

46 Eurostat, 'House Price Index' Eurostat, 'House Price Index'

## Energy poverty

Hungary, similarly to Bulgaria and Romania ranks high in various energy poverty indexes.<sup>47</sup> Regarding single energy poverty indicators, one out of ten persons had arrears in utility bills in 2019. Although the share of persons having difficulties paying their bills has decreased significantly after the introduction of the utility price cut cap, still their share is 1.6 times higher than the EU average.<sup>48</sup> The share of household whose energy expenditure in income was twice the national median was 8.95 per cent in 2015, which is significantly lower than EU average (16.19%). This can be partly explained with the already high average share of energy expenditure of Hungarian households (~13%). The share of households with an abnormally low energy expenditure (half the national median) was 933 per cent compared to the 14.58 per cent EU average.<sup>49</sup>

## National approach to energy poverty

There is no nationally adopted definition, nor indicators of energy poverty. The first mention of energy poverty in national strategical documents occurred in the National Environmental and Climate Plan (NECP) in 2019, however no targets or action plan has been set for its alleviation.<sup>50</sup> Vulnerable households to be supported to through the energy saving obligation scheme are defined in energy efficiency law as households that would have to spend a too high share of their income on energy bills to heat up properly their home.<sup>51</sup> At the same time the question of household energy prices has been highly politicised in the last two decades, making the introduction of environmentally and socially just policies an especially challenging.

## Access to basic amenities

In 2018, more than a hundred thousand dwellings lacked running water, bathrooms, or toilets.<sup>52</sup> Living in a dwelling without neither bath nor bathroom and toilet is 1.9 more frequent among children than in the total population.<sup>53</sup> Furthermore, almost a fifth of all

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<sup>47</sup> Recalde et al., 'Structural Energy Poverty Vulnerability and Excess Winter Mortality in the European Union'; Bouzarovski and Tirado Herrero, 'The Energy Divide'; OPENEXP, 'European Energy Poverty Index Tool'.

<sup>48</sup> Eurostat, 'Arrears on Utility Bills - EU-SILC Survey Online Data Code: ILC\_MDES07'.

<sup>49</sup> EU Energy Poverty Observatory, 'Indicators'.{Citation}

<sup>50</sup> Ministry of Innovation and Technology, 'National Energy and Climate Plan'.

<sup>51</sup> Hungarian Parliament, '2015. Évi LVII. Törvény Az Energiahatékonyságról [2015/57 Law on Energy Efficiency]'.

<sup>52</sup> Hungarian Central Statistical Office, 'Háztartási Költségvetési És Életkörülmények Adatfelvétele (HKÉF), Referencia Év: 2018, Mikroadatok [Household Budget and Living Condition Survey (HBLCS), Reference Year: 2018, Microdata]'. The calculations and conclusions drawn from them are solely the intellectual property of the author, Nóra Feldmár.

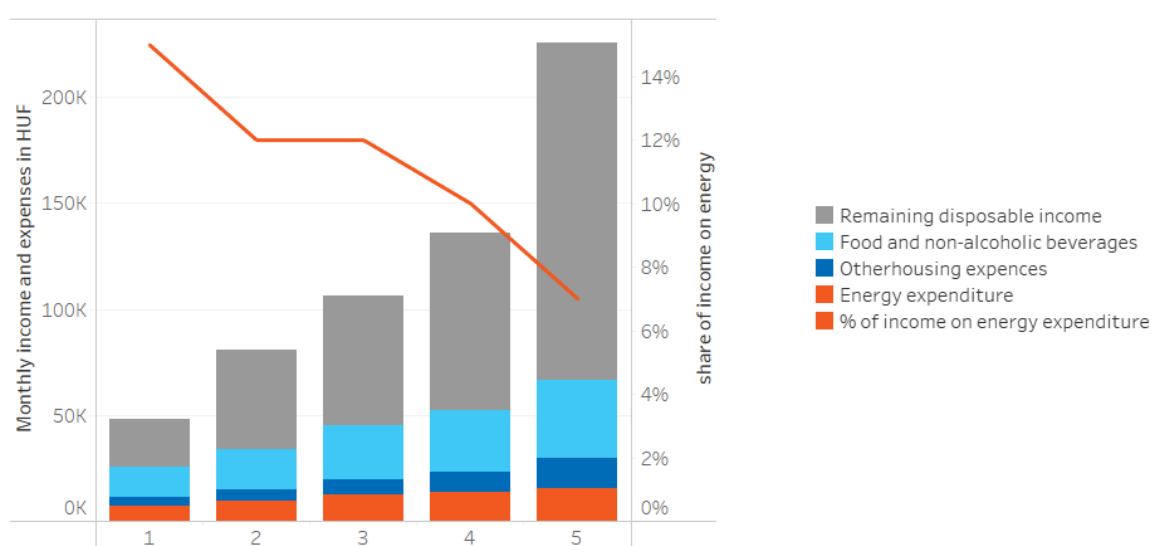
<sup>53</sup> Eurostat, 'Total Population Having Neither a Bath, nor a Shower, nor Indoor Flushing Toilet in Their Household - EU-SILC Survey'.



households - and 40 per cent of those in the poorest income quintile - are not connected to piped gas or district heating.

## Affordability of household energy

Households spend approximately 13 per cent of their income on energy. Energy (electricity, heating, hot water) accounts for almost two-thirds of all the housing related costs (utilities, rent, maintenance) of an average household.<sup>54</sup> Low-income households consume significantly less energy, while they spend significantly larger share of their income on energy than their better-off ones.



Since the Utility Reduction Bill<sup>55</sup> reduced and fixed the prices of electricity, gas and district heating in 2013 (see Policies), the affordability of centralised energy services has improved somewhat, as well as the number of households reporting arrears in utility bills. Still, one out of ten persons has arrears on utility bills. More than one fifth of single persons with dependent children struggles with utility bill payments. While Hungarian gas and electricity prices are among the lowest in the EU, still the share of energy expenditure of the poorest households in their total expenditure is among the highest. This is partly due to high energy need of dwellings<sup>56</sup> and that incomes in Hungary are the third lowest in the EU.

<sup>54</sup> Hungarian Central Statistical Office, 'Háztartási Költségvetési És Életkörülmények Adatfelvétele (HKÉF), Referencia Év: 2017, Mikroadatok [Household Budget and Living Condition Survey (HBLCS), Reference Year: 2017, Microdata]'.  
<sup>55</sup> Act 2013/LIV on act on the enforcement of utility cost reduction [2013. évi LIV. törvény a rezsicsökkentések végrehajtásáról].  
<sup>56</sup> Odyssee-Mure, „Sectoral Profile - Households Energy consumption”.

## Housing quality and energy efficiency

Most of the Hungarian housing stock of around 4 million dwellings is in poor condition and fall far behind modern energy efficiency requirements.<sup>57</sup> Hungarian dwellings needed the second highest amount of energy to heat a square metre of dwellings in the EU in 2019.<sup>58</sup>

Hungarian dwellings energy consumption for heating is among the fourth highest in the EU.<sup>59</sup>

Compared to Bulgaria and Romania, Hungarian respondents of the study on firewood use reported in the highest share among all respondents neither having any energy saving measures carried out on their homes (27%) nor the wall of their house insulated (55%). Hungarian respondents were also the least sure to carry out energy efficiency measures (only 8% told so), and the most constrained in carrying out such measure due to financial reason (19%).<sup>60</sup>

The share of municipally owned housing stock amounted to merely 2.6 per cent in 2019, and they are in an even more devastating condition than the average building stock - around 40 per cent of social housing was built before 1945 and municipalities typically lack the resources to renovate these dwellings.

In 2019 more than one-fifth of the population and nearly a third of children lived in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor. Seven per cent of the population and 17 per cent of children live in severe housing deprivation, which is significantly worse than the EU average.

The segment of the housing stock in the worst condition are the mud-brick houses with over 500 thousand residential buildings. This is also where the highest proportion of low-income, disadvantaged households live and where all the factors of energy poverty are concentrated. While most of these buildings are past a point where they can be (economically and/or technically) renovated, they require constant maintenance in order to be habitable.

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<sup>57</sup> Ministry of National Development, 'Hungary's National Energy Efficiency Action Plan until 2020'.

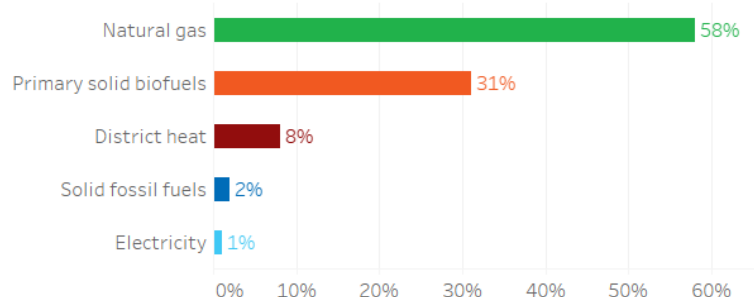
<sup>58</sup> ODYSSEE, „Energy Indicators”.

<sup>59</sup> ODYSSEE.

<sup>60</sup> CURIOCITY Kft., 'Firewood Usage in Bulgaria, Hungary and Romania. Results of the Online Survey Conducted for WWF Hungary and Its Partner Organisations'.

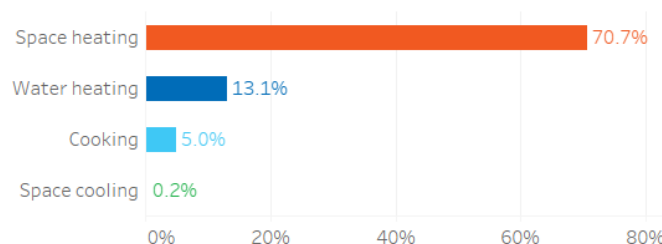
## Energy mix

Energy supply in Hungary is covered in the largest share from natural gas (34%), followed by oil and petroleum products (28%) and nuclear heat (16%). The share of renewables in the energy supply of Hungary is lower than the EU average, and is mostly covered by solid biofuels (see the section on the Role of biomass in the energy mix).



10 Figure Energy supply

Energy consumption Energy consumption increased by 13.8 per cent between 2000 and 2018, despite the overall progress in energy efficiency. In 2018, the residential sector accounted for the largest share of energy consumption, accounting for over third of the total consumption and at the same time demonstrated a rather low increase in energy efficiency compared to other sectors.



11. Figure energy use by end use

The main use of energy in households is for heating, covering 71% of energy consumption in 2019. The share of heating in domestic energy use in Hungary is among the highest in the EU.<sup>61</sup> Energy consumption of heating per square meter was higher in 2018 than in 2000.<sup>62</sup> Space heating consumption rose by 20% from 2009 to 2010: the global financial crisis radically decreased incomes and increased gas prices. This led to a number of

<sup>61</sup> ODYSSEE, 'Energy Indicators |'.

<sup>62</sup> Odyssee-Mure, 'Hungary | Energy Profile, April 2021'.

households switching from gas and district heating to the less efficient heating methods of wood and waste, which may have played a role in the increase of energy consumption in times of crisis. In general, the share of gas for space heating decreased from 64 percent to 49 per cent in the period of 2000-2015. As residential network-based energy prices have been frozen in 2012 by Government (for electricity, gas and district heating, but not for wood and waste), the share of since 2015 gas is growing again, climbing back to 56 percent in 2018. The share of solid biomass increased from 8 to 40 per cent between 2000-2015, to then drop to 32 per cent in 2018, as biomass prices kept increasing in stark contrast to the frozen prices of gas and district heating. Domestic gas and district heating prices are kept artificially low and do not provide the necessary incentive for households to implement energy efficiency upgrades related to heating.<sup>63</sup> At the same time users of biomass are overrepresented among the poorest households, thus do not have the financial capacity to invest in energy efficiency.

### **Role of biomass in the energy mix**

Renewable energy sources account for 11 per cent of the total energy supply in Hungary and biomass is the most important source for renewable energy use in Hungary. Its consumption was 74 PJ in 2019, accounting for 73 per cent of total gross final renewable energy consumption.<sup>64</sup> The majority of solid biomass was consumed for heating purposes (67 PJ, 91%), of which households made up 53 PJ. The NECP predicts a significant increase in bioenergy use until 2030. In the electricity sector, renewable electricity from bioenergy is expected to increase by 60 per cent, in the thermal sector by 28 per cent by 2030. The pressure on biomass sources is expected to remain in the long-term, as decision makers will be looking for negative emission measures and technologies. Bioenergy with carbon capture and storage (BECCS) is envisaged by the Long-Term Strategy of Hungary. However, in the long-term carbon sequestration is also inevitable to reach climate neutrality.

A detailed roadmap is missing which would assess how to reach the needed amount of sequestered carbon in order to meet the 2050 climate neutrality target, considering the reliability on BECCS, the future sequestration of afforested land, the trade-off between logging rate and carbon sink of existing forest, including the substitution effect of energy and material use of wood in a 2050-time horizon.

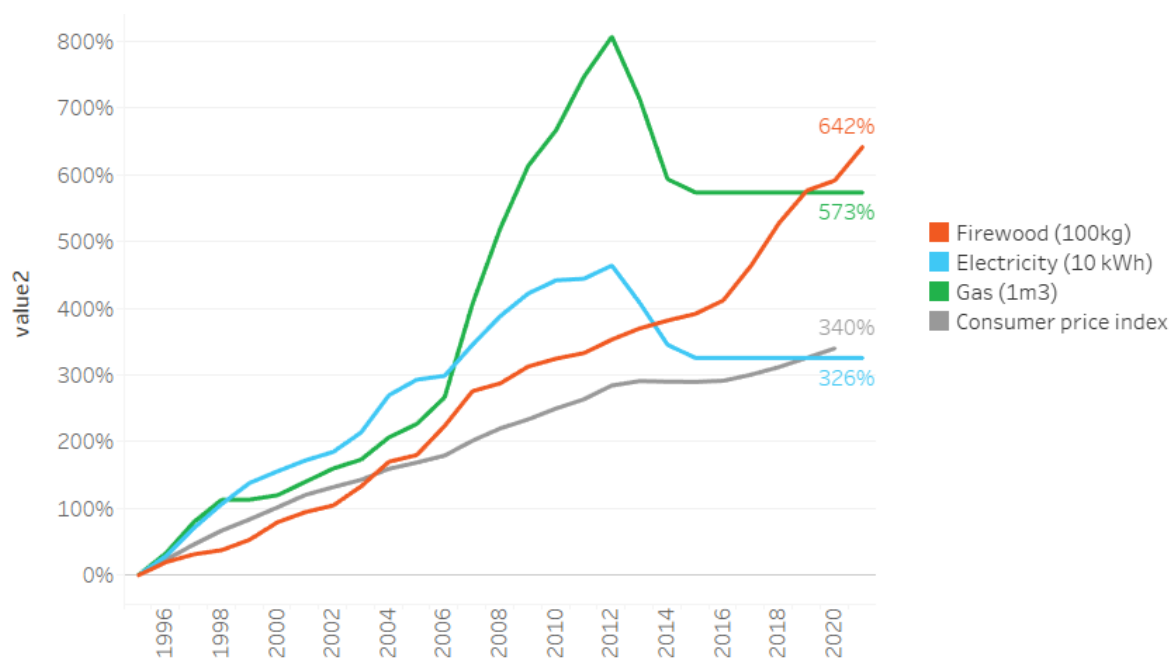
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<sup>63</sup> Odyssee-Mure.

<sup>64</sup> Magyar Energetikai és Közmű-szabályozási Hivatal, 'MEKH IEA Típusú Országos Részletes Energiamérleg (Éves) 2014-2020'.

Biomass plays an important role in the final energy use of households, covering over one-fifth (22,25%) of domestic energy use and nearly a third (31%) of the energy used for heating.

## Energy prices



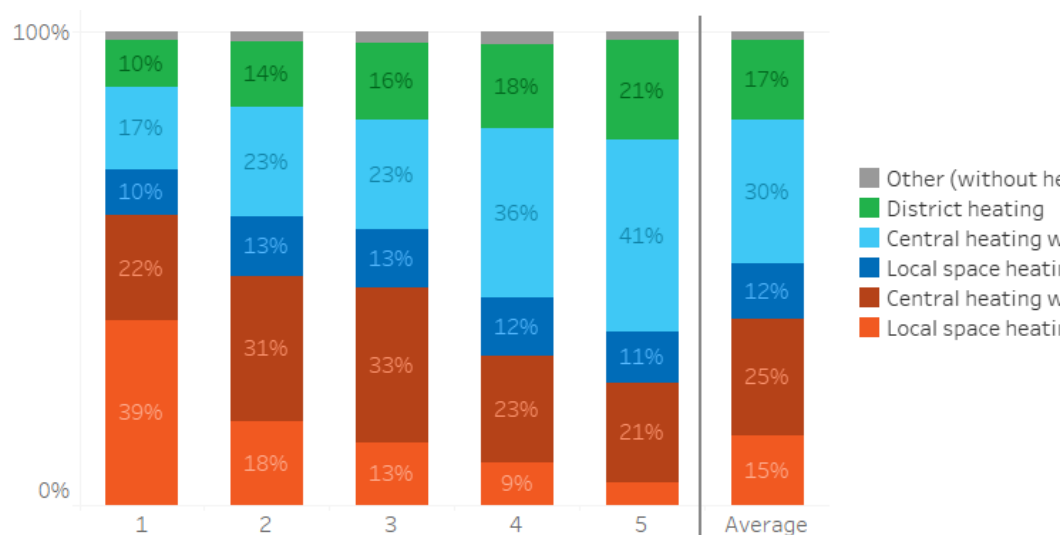
12. Figure: Hungarian energy prices change

The regime change in 1990 had a large impact on energy prices that were increasing more swiftly than the price of any other goods. Energy prices have always been a highly politicized issue. In the 2000s gas and district heating subsidies aimed to ease the burden of energy costs on households, still a coping strategy of households was to switch from gas to solid fuels. The increasing burden of the subsidy on the budget became unsustainable. The subsidy was replaced by the measure of reduction of gas, electricity, and district heating prices by 20 to 25 per cent and the price was fixed at that level. The measure did not impact the price of biomass, the primary fuel of significant share of households, especially low-income households. Consequently, since 2013 electricity and gas prices are among the lowest in the EU, while the price of biomass is steadily increasing.

## Household solid fuel use

### Overview

## COUNTRY PROFILE: HUNGARY



### 13. Type of heating

More than one in four households' (26.5%) primary heating method is central or local space heating with solid fuels, mostly firewood.<sup>65</sup> Solid fuels are prevalent among the poorest households: nearly two-thirds of them heat with solid fuels, while only quarter of the richest income group rely on them. As opposed to solid fuels, gas is only used by a small share of low-income households, and it became more important as income grows.

Similarly, the use of individual heaters is also predominant among the poorest households and their relevance decrease as income grows. While nearly 40 per cent of the poorest households burn solid fuels in individual heaters, this way of heating is only present in less than 5 per cent of the richest income group. Therefore, we can say that biomass, the most prevalent solid fuel in Hungary is the predominant fuel of the poor, often burnt in the least efficient ways.

Local practitioners suggest that low-income solid fuel users burn fuels in the cheapest stoves available on the market that are highly inefficient and produce significant outdoor (and indoor) air pollution per unit of biomass burned.

40 per cent of Hungarian survey respondents exclusively use firewood, while 60 per cent use firewood mixed with other sources, with gas heating being the most important complementary method. This contrasts with Romania and Bulgaria, where the use of electricity alongside solid fuel heating is more significant. Gas pipeline was far the most available in the case of Hungarian households: 86 per cent of them had the pipeline in their street, compared to 56 and 31 per cent in Romania and Bulgaria, respectively. Nearly

<sup>65</sup> Central Statistical Office, '14.1.1.23. Data on Housing by Activity Status, Deciles', 1.

## COUNTRY PROFILE: HUNGARY

two-thirds of Hungarian respondents buy firewood at least six months before the heating season. At the same time, buying all the necessary wood in one go is the less typical among Hungarians (35% compared to the 45% three country average), while 9 per cent of respondents are only able to buy it during the heating season - which is a higher than share than in the other countries. Hungarians typically dry wood for four and a half months which is the best in region - at the same time, respondents said that they are aware that firewood should ideally be dried for twice as long, for over eight months. Hungarian households mostly buy firewood from woodyards and local entrepreneurs, while buying it from friends and cutting it from own wood is a slightly more common in Hungary. Also, receiving firewood as a social support is the most common in Hungary, where there is a dedicated national social fuel subsidy, though only 7 per cent of respondents benefited from it (which is still twice the regional average). The average amount bought by Hungarians is the smallest among the three countries and the amount spent on wood respectively is also smaller.

Central heating system run by wood is the most common heating device among Hungarian respondents, followed by central gas system and metal stoves. Gas convectors are significantly more present in Hungary than in the other two countries. One in ten Hungarian had open or normal fireplaces while these were not present in the houses of the respondents living in Bulgaria and Romania.

Regarding energy efficiency, Hungarian respondents told in the highest extent (27%) that there has not been any investment made on the house to save energy and that there is no insulation on the house (55% compared to 38% average). Also, Hungarians expressed the lowest willingness to invest in energy efficiency in the future and the highest rate of households that „can't afford to do so” appears in Hungary. Similarly Hungarian were the least keen to upgrade their heating system. Two-thirds of them do not plan do not know yet if want to change the heating system. Only one third of them plans to make changes, mostly in the form of changing the heating device to a more modern heating system or improving the current central system. Finally, switching to another heating fuel was also the least popular among Hungarians.

Hungarians were the least concerned about the impact of firewood burning on air quality.<sup>79</sup>

## Heating appliances and chimneys



*3. Picture Different biomass heaters commonly used in Hungary*

In Hungary there are different type of individual biomass heaters in use. In the upper left of the picture there is a metal stove and on the right a steel fireplace. These devices heat up rapidly, yet they heat indoor spaces unevenly and cool down shortly after the fuel is combusted. Therefore, they need frequent feeding, also during the night.<sup>66</sup> These are also true for the two devices in the bottom row of picture, the ones in the middle and on the right side. These two (white) devices, however, can also be used simultaneously for cooking. Finally, in the bottom left corner down is the tiled masonry heater. The large thermal mass of the materials of tiled heaters and their appropriately designed

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<sup>66</sup> Bajomi, Feldmár, and Tirado-Herrero, 'Will Plans to Ease Energy Poverty Go Up in Smoke?'



combustion chamber retain heat and are therefore significantly more efficient than metal or steel stoves. They also emit substantially less air pollutants.

### **Ecodesign**

Since 2020 biomass boilers and 2022 biomass individual heaters in the market must be compatible with the eco-design regulation, otherwise they cannot be sold in Hungary. The eco-design regulation impacts the energy efficiency and the emission of the boilers and heaters.

There has not been much public discussion about it in the media. During a phone interview, a colleague of an online stove store said that they are aware of the Eco-design regulation since the manufacturers whose products they distribute in Hungary keep them updated and they also only supply devices that comply with the regulation. According to him, regulations of EU member states are not very homogenous and the Hungarian eco-design regulation is among the less strict ones. Based on their experience there are plenty of products on the Hungarian market that “already should not have been produced ten years ago” but apparently received the Eco-design certification. Consequently, products of Hungarian manufacturers and some cheaper stoves sold in large retail stores meet very high energy efficiency standards according to their label/certification, “that even reputable foreign manufacturers cannot easily achieve”, despite being on the lower end price range.

For low-income households the price of the products is the priority, and they do not prioritize the efficiency or environmental aspects of the product. In some EU member states successful stove exchange programmes were carried out, and it would be useful to have such program in Hungary too. In the view of the interviewee “the goal is not to put an end to solid fuel heating – there's nothing wrong with using wood to heat – rather bad quality stoves should be replaced”.

Inflation in Hungary has been the highest in the last 15 years in 2022 and construction prices have been rising significantly as well. These macro processes paired with the disappearance of the cheapest stoves from the market will make it difficult for low-income households to replace their stoves.

### **Environment and climate**

Illegal logging is only one potential reason of the serious inconsistency between biomass supply and demand data. The recorded illegal logging is negligible, around 12-17 thousand m<sup>3</sup>/year, however, according to the National Food Chain Safety Office, which is

the authority of the EUTR Regulation, the reported amount is only a fraction of the actual volume of illegal harvest.<sup>67</sup>

The burning of wet or contaminated biomass fuels affects air quality and poses health risks: as an average of 2014-2018, 59 per cent of PM10 and 83 per cent of PM2,5 is originated from households.<sup>68</sup> According to the European Environment Agency, in 2018, the latter caused 13 100 premature deaths in Hungary.<sup>69</sup> In spite of it being illegal biomass burning is often happening with household waste, causing more serious air pollution. The serious air problem also hindered the EU to reach air quality targets. As a result, decision has been released after an infringement procedure against Hungary by the European Court of Justice in February 2021, stating that Hungary has infringed the rules of EU law on ambient air quality.

### **Policies**

Different policies exist that aim to reduce energy poverty. Some of the address its root causes, other provide rather or ease its consequences. The most typical policies are the following:

- increasing energy efficiency of the dwellings and appliances to reduce the energy need of the household
- price support programs in the forms of subsidized, regulated prices or direct financial support to low-income households to pay their will.
- Protection of vulnerable consumers, e.g., from disconnection.
- Other additional interventions, such as awareness-raising among relevant stakeholders, energy consulting for households and small-scale energy efficiency measures.

### **Energy efficiency**

In Hungary, the last major energy efficient retrofit program was launched in 2008, targeting prefabricated multiapartment buildings. In the last decade generous subsidy programs were introduced for the renovation of privately owned dwellings and for property acquisition, though these have not been incentivizing energy efficiency measures. Low-income households are systematically neglected and/or excluded from

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<sup>67</sup> Kiss, 'Az illegális fakitermelés kockázatával kapcsolatos 2016-2020. évi statisztikai adatok'.

<sup>68</sup> Hungarian Central Statistical Office, „STADAT – 5.3.1.

<sup>69</sup> European Environmental Agency, 'Air Quality in Europe'.

larger housing and energy policies. Most households lack the savings to invest in energy efficiency or to be eligible for the subsidies.

The “Warmth of the Home” program has been providing funding for energy efficient retrofits and for a series of heaters and household appliances exchange programs. The program is funded from incomes of the European Union Emissions Trading System (EU ETS) CO<sub>2</sub> emission trading system. Less than one per cent of Hungarian dwellings<sup>70</sup> received support for complex energy efficient retrofits from this this program. The exchanges of heaters aimed only gas users and mostly high-income households benefited from it.<sup>71</sup> The household appliances exchange programs were more accessible to low-income households, though the call was highly competitive and managed online, therefore probably many of vulnerable households did not benefit from it.

### Support of energy costs

#### Social fuel subsidy

The **social solid fuel subsidy** provides in-kind support (wood or coal) for low-income households that heat with solid fuels. The support is not available in all settlements, often low-quality fuels (wet wood or lignite) are distributed, and the distribution mechanism increases inequalities. Municipalities might offer housing subsidies and debt-management services, though these are far from reaching all households in need as these are not centrally provided normative support schemes.

#### Utility cost reduction

In 2013 utility **price cut and cap** were introduced in Hungary. These measures reduced gas, electricity, and district heating prices and since then guarantee a price stability for domestic consumers. Though, price of solid fuels, such as biomass, that is used by poorer households has not been impacted by that measure and continue to rise. The price cut reduced the high energy burden of households, consequently the share of population having arrears in utility bills reduced by half in 9 years (though still higher than the EU average).<sup>72</sup> Due to the flat rate of the measure, savings of rich households were significantly higher, as their consumption tends to be higher. Currently, households are

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<sup>70</sup> Ministry of Innovation and Technology, ‘Második Nemzeti Éghajlatváltozási Stratégia’.

<sup>71</sup> MEHI, ‘Támogatott Kazáncsere – Csak Gazdagoknak?’

<sup>72</sup> Eurostat, ‘Arrears on utility bills - EU-SILC survey: ILC\_MDES07’.

protected from direct impacts of volatile changes in energy prices, except for those relying on solid fuels, especially biomass.

### **Home-maintenance and debt-management support**

The home-maintenance provides modest financial support to cover housing costs of households while the debt-management support is a mixed services of financial support and advice for households with a certain amount of debt. The central provision of these supports was abolished in 2015. Instead, a municipality-based settlement support was introduced that might include housing subsidies and debt management services. The new system most probably reduced the number of people receiving this kind of support, and it “widened the differences between municipalities regarding eligibility conditions and availability of provisions and services”.<sup>73</sup>

### **Protection of Vulnerable consumers**

Vulnerable consumers (a legal status based on social and health criteria) are eligible for instalment payments for arrears and prepayment meters if they are indebted. The number of consumers under protection is much lower than the actual number of households having difficulty in paying their bills. Also, firewood users are not protected in any ways by this measure: if they are unable to buy the necessary amount of wood for heating, they are not protected from remaining without energy supply.

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<sup>73</sup> Albert, ‘Access to Essential Services for Low-Income People’, 17.

# COUNTRY PROFILE

## ROMANIA

### Housing situation

Romania currently has a total of about 8.5 million homes, of which about 7.5 million are inhabited. Of these, approximately 4.2 million (67%) are individual homes, and approx. 2.7 million homes (33%) are apartments located in blocks of flats (condominium).<sup>74</sup> The number of dwellings exceeds the number of households: the percentage of vacant dwellings was 16% in 2011, among the highest in the EU.<sup>75</sup> Migration patterns of the past decade have generated an imbalance in housing supply and demand, resulting in overcrowded urban centres and a high incidence of unoccupied housing in other localities.

During state socialism, the dwellings were owned by the state. Many Romanians suffered from living in improper living conditions as many houses were undersized, did not meet minimum quality standards, and there was a lack of infrastructure and of construction materials on the Romanian market. After the system changed to market capitalism, Romania became the country with the most homeowners in Europe. Currently Romania has the highest homeownership rate in the EU: 96.1 per cent of homes in Romania are occupied by the owners and officially less than 4 per cent are rented.<sup>76</sup>

Housing quality is still a major issue in Romania: the country has the highest share with 14.3 percent of population living in severe housing deprivation in the EU. This means that every seventh person lives in a dwelling which is overcrowded and has at least another quality problem such as lack of toilet or bathroom, leaking roof or too dark dwelling. According to Eurostat statistics, in Romania nearly half of the population (45.8%) live in overcrowded houses.<sup>77</sup> The highest rates of overcrowding among the population at risk of poverty in the EU were recorded in Romania (56.4%), which nearly is twice as high as the EU average (28.9%).

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<sup>74</sup> Ministry of Energy Romania, 'Strategia Energetica a Romaniei\_aug 2020.Pdf'.

<sup>75</sup> National Statistical Institute, 'PRESS RELEASE February 2, 2012, on the Provisional Results of the 2011 Population and Housing Census'.

<sup>76</sup> Eurostat, 'Distribution of Population by Tenure Status, Type of Household and Income Group - EU-SILC Survey'.

<sup>77</sup> European Commission, 'Housing in Europe - Statistics Visualised'.

## Energy poverty

Energy poverty is often linked to the inability of households to meet their energy needs for cooking, heating, cooling or lighting to a level that meets basic needs. In other words, if a family cannot afford to pay the bills for energy consumed for the basic needs of a household, without putting pressure on their general economic well-being, we can speak in the case of this family of energy poverty

Energy poverty is determined by high energy costs (electricity, liquid fuel, natural gas, etc.), low household income (unemployment, low wages, high living costs), energy-inefficient housing (inadequately insulated buildings, windows, and doors without double or poorly sealed thermal insulation, inefficient heating systems, etc.), lack of access to adequate energy sources.

Romania had the highest electricity prices in purchasing power standards. Furthermore, 9.4 per cent people live in a house with a leaking roof.<sup>78</sup>

## National energy poverty approach/strategy

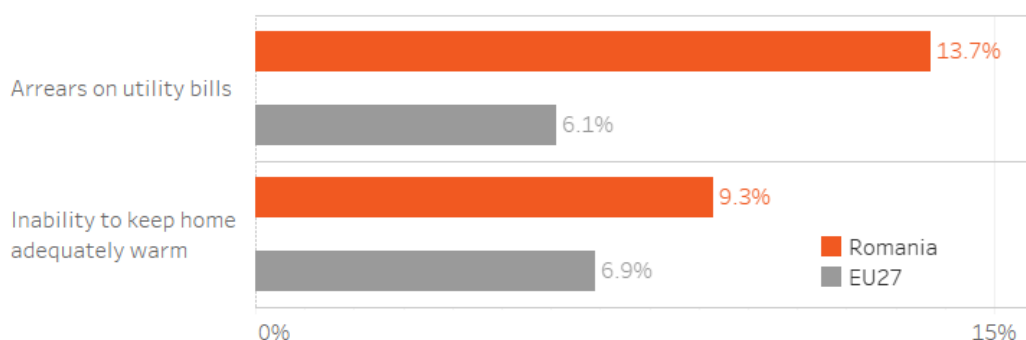
Romania has recently adopted a specific legislation on energy poverty and vulnerable consumers, that established social protection measures for vulnerable energy consumers. Before this law there were several definitions in different laws which caused an overlap and confusion in legislation. Despite the above, there is still no established national definition of energy poverty. The Romanian NECP only very briefly touches upon the issue of energy poverty without setting clear targets and goals. The NECP merely mentions several measures that need to be taken (including setting a definition for energy poverty) without setting a deadline for implementation. Both the Law no. 123 of 2012 on electricity and gas and the NECP refer to an energy poverty national action plan – this plan has been mentioned in the law since 2012 but the setting up of the action plan has not begun. The Romanian energy strategy acknowledges the fact that 45 per cent of dwellings across the country – and 90 per cent in rural areas – are heated with firewood, with these dwellings being “[...] often only partially heated, by burning wood in traditional stoves with incomplete combustion.”<sup>79</sup> As such the strategy highlights the need to support the use of biomass under less polluting and more efficient forms.

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<sup>78</sup> European Commission.

<sup>79</sup> Ministry of Energy Romania, ‘Romanian Energy Strategy 2016-2030, With an Outlook to 2050’, 7.

## Energy poverty indicators



14. Figure Arrears on utility bills + inability to keep adequately warm (RO vs EU : (Eurostat 2021; 2022)

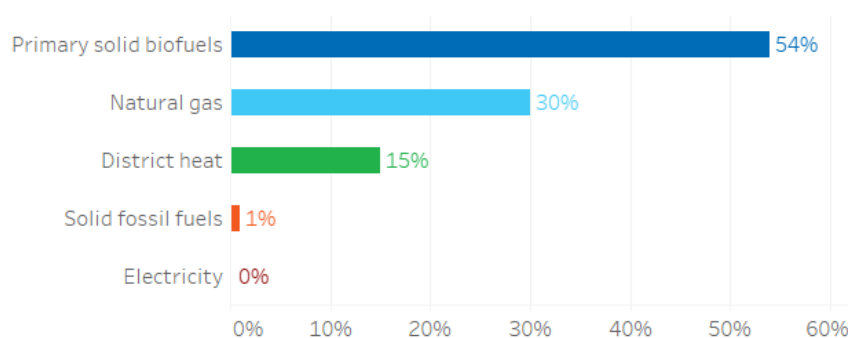
As 14. Figure shows, a larger share of Romania's population is affected by energy poverty than the EU average. The share of the population with arrears on utility bills (13.7%) was more than twice as high as the EU average (6.1%), with the share of population unable to keep their home adequately warm due to financial reasons was also higher (9.3 per cent compared to 6.9 per cent in the EU).

| Indicator                | Value | Explanation  |
|--------------------------|-------|--|
| 2M                       | 10%   | Household energy expenditure is higher than <u>dubble</u> the <u>national average</u>  |
| M/2                      | 11,7% | Household energy expenditure is lower than 1/2 the national average (hidden energy poverty)  |
| LIHC                     | 13%   | Household falls under the <u>poverty threshold</u> after paying energy bills and energy expenses are higher that national average. |
| 10%                      | 45,3% | Household spends more than 10% of their <u>income</u> on energy.   |
| Arrears on utility bills | 14,4% | EC   |
| Inability to keep warm   | 9,6%  | EC   |

The low absolute energy expenditure (M/2) indicator presents the share of households whose absolute energy expenditure is below half the national median<sup>80</sup>, or in other words abnormally low. In 2015, 16.5 % of Romanian households had abnormally low absolute energy expenditures, that might signal underconsumption, especially underheating of the dwelling. On the other hand, the proportion of households whose share of energy expenditure in income is more than twice the national median was 16.9% in 2015.<sup>81</sup>

## Access to basic infrastructure

According to the national housing strategy, only about 40% of the homes are connected to the gas network, and the percentage is below 22% in the case of rural homes.<sup>82</sup> District heating reaches 14 per cent of households.



15. Figure Final energy consumption in households by fuel

What stands out from 15. Figure is the high share of solid fuels in the domestic energy mix for heating. Over half (53%) of Romanian dwellings, approximately 3.5 million households are not connected to gas or district heating networks, thus are heated with solid fuels (41%), mostly wood or other ways (liquid fuels, electricity).<sup>83</sup> Those in direct contact with the households affected, such as local authorities, estimate that to help facilitate the energy transition of those 3.5 million households currently using solid fuels, at least 17 billion euros worth of investment would need to be realised in the expansion of the gas network. On top of this hefty sum, households would need to make a one-time investment of at least 5,000 euros for the connection and the installation of central heating and radiators. Finally, the additional gas imports needed to cover such expansion of the system would amount to 3 billion euros per year.

<sup>80</sup> EPOV, 'The Low Absolute Energy Expenditure'.

<sup>81</sup> ODYSSEE, 'Energy Indicators |'.

<sup>82</sup> Ministry of Energy Romania, 'Romanian Energy Strategy 2016-2030, With an Outlook to 2050'.

<sup>83</sup> Statista.com, 'Energy Sources by Type of Power Plant Romania 2021'.



## Affordability of energy

Romania had the highest electricity prices and 9th highest natural gas prices in purchasing power standards in the EU in 2021.<sup>84</sup> While the poorest Romanian households' energy expenditure in Euro was the second lowest in the EU, its share from their total expenditure ranked 5th highest.<sup>85</sup> Therefore the low absolute expenditure still is a huge burden on the poorest households, partly due to their low income compared to other countries. 13% of households in Romania fall below the poverty line after paying their electricity and heating energy bills.<sup>86</sup> 11.7 per cent of households practise under-consumption, that is they consume less energy than the minimum necessary for a comfortable life. For almost half of Romanian households (45.3 percent) energy bills are too heavy a burden on the family budget. Over half of the homes in Romania are only partially heated in winter.<sup>87</sup> Moreover, almost 14 per cent of households in Romania have arrears in utility bill payments<sup>88</sup> and 10 per cent of them were unable to heat their homes properly.<sup>89</sup>

## Housing quality and energy efficiency

Housing quality is a vital issue in Romania, both in terms of access to amenities and services. While across most of the EU a bathroom and a flushing toilet are considered a basic amenity, available for nearly the total population (98.3%), **in Romania over one-fifth (21.2%) of the population and one-fourth (25.4%) of children have neither a bath, nor a shower, nor indoor flushing toilet in their household.**<sup>90</sup> Furthermore, only 5% of the apartments are energetically modernised by thermal insulation.<sup>91</sup>

## Energy mix

Among primary energy resources in Romania, crude oil (29%) and natural gas (28%) are the most common, followed by imported petroleum products and fuelwood (9%). The energy sector is highly dependent in fossil fuels and it is responsible for 66 per cent of emissions. With the current energy mix, Romania will have challenges in achieving the

<sup>84</sup> Eurostat, ['Gas Prices for Household Consumers](#)

<sup>85</sup> European Commission, 'Energy Prices and Costs in Europe, Part II Energy Costs for the Economy, Households and Industry'.

<sup>86</sup> Sinea et al., 'Energy Poverty and The Vulnerable Consumer in Romania and Europe'.

<sup>87</sup> Ministry of Energy Romania, 'Strategia Energetica a Romaniei\_aug 2020.f'.

<sup>88</sup> Eurostat, 'Arrears on Utility Bills - EU-SILC Survey Online Data Code: ILC\_MDES07'.{Citation}

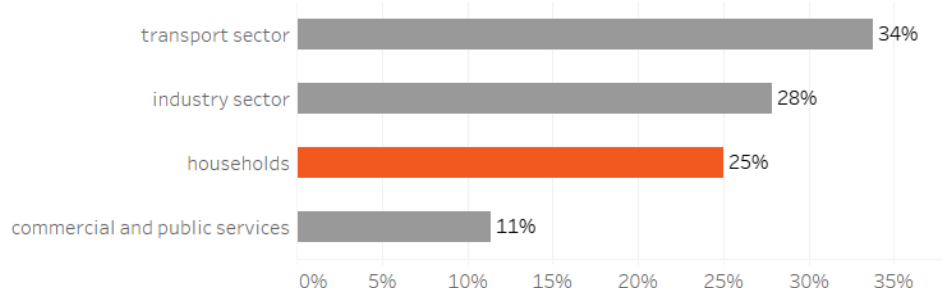
<sup>89</sup> Eurostat; EU Energy Poverty Observatory, 'Inability to Keep Home Adequately Warm'.

<sup>90</sup> Eurostat, - EU-SILC Survey'; Eurostat, ['Children \(Aged 0 to 17\) Having Neither a Bath, nor a Shower in Their Dwelling](#) - EU-SILC Survey Online Data Code: ILC\_MDHO02C'.

<sup>91</sup> Ministry of Energy Romania, 'Strategia Energetica a Romaniei\_aug 2020.Pdf'.

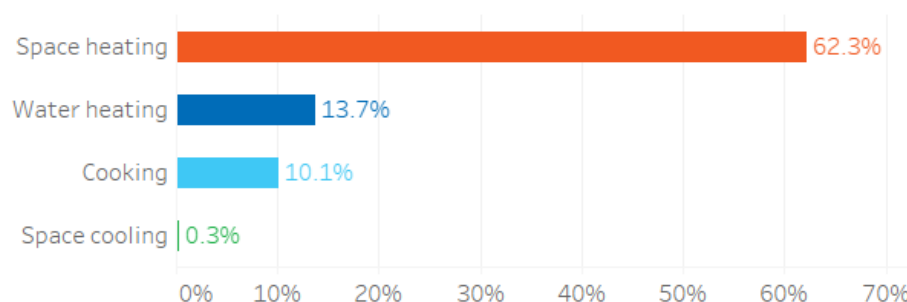
objectives of reducing emissions by 2030, set in its National Energy and Climate Plan. Romania needs to reduce its non-ETS emissions by two percent compared to 2005, while the European Commission' anticipated in 2019 that emissions will increase by up to 6%, even in the context of the additional measures announced.<sup>92</sup>

## Energy consumption



16. Figure: Final energy consumption by sector<sup>93</sup>

Households' energy use represents one third of the final energy consumption, being the largest share among sector. The share of households from the final consumption is larger than the EU average (28%), which might point towards an inefficient dwelling stock.



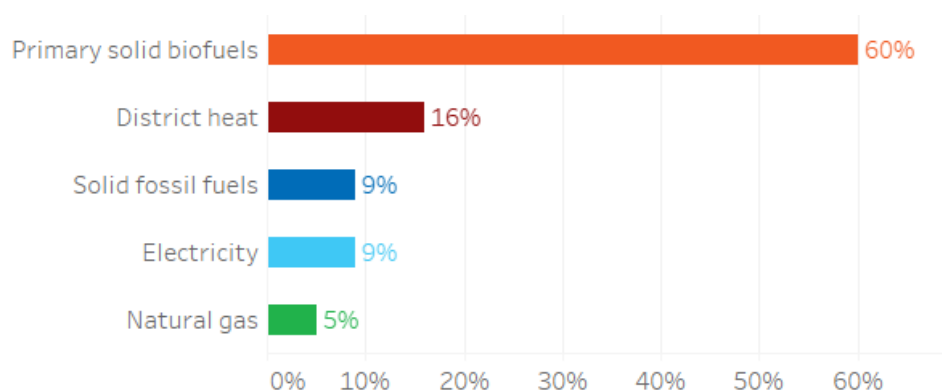
17. Figure Disaggregated final energy consumption in HH by end use<sup>94</sup>

Figure 5 shows that energy consumption patterns of Romanian households are similar to the European average. That being said, the share of energy used for heating in Romanian households is slightly lower than the EU average, while the share of energy used for cooking is 66% higher (10%) than the EU average (6%).

<sup>92</sup> EUR-Lex - 32009L0072 - EN - EUR-Lex'.

<sup>93</sup> Eurostat, „Final energy consumption by sector”.

<sup>94</sup> Eurostat, 'Disaggregated Final Energy Consumption in Households - by End Use'. [https://ec.europa.eu/eurostat/databrowser/view/nrg\\_d\\_hhq/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/nrg_d_hhq/default/table?lang=en).



18. Figure Households energy use for space heating<sup>95</sup>

As we can see in Figure 6, primary solid biofuels (mostly firewood in the case of Romania) play an extremely important role, as they represent over half of households' energy consumption. As a point of comparison, the EU average for the share of biofuels used for heating is half as large at 24 percent., Prevalence of district heating is fifty per cent higher in Romania than across EU (15% compared to 10%). Gas plays a somewhat smaller role in heating (with 30% in Romania and 38% in the EU) (see Figure 1).

14 per cent of dwellings are connected to district heating - half of them are in the capital city of Bucharest - approximately one third of Romania's households are heated directly with natural gas, using apartment heating plants, but also stoves with extremely low efficiency (at least 250,000 homes). The remaining households use either liquid fuels (fuel oil, diesel or LPG) or electricity to heat.<sup>96</sup>

## Role of biomass in the energy mix

Renewable energy sources account for 17 per cent of the total energy supply, of which 65 per cent was covered by bioenergy, mostly solid biomass. Bioenergy accounted for 71 percent of final renewable energy consumption in Romania. Biomass plays an important role in the final energy use of households, covering over one-fifth (22.25%) of domestic energy use and nearly a third (31%) of the energy used for heating. Romania on biomass when it comes to reaching renewable energy targets, even though a large share of biomass is utilized in rural households' often inefficient heating devices.<sup>97</sup>

<sup>95</sup> Eurostat.

<sup>96</sup> Petrescu, 'Încalzire în România, al 2-lea cel mai mare producător de gaze din UE, în cea mai complicată iarnă'.

<sup>97</sup> European Commission, 'Assessment of the Final National Energy and Climate Plan of Romania'.

## Prices

In terms of domestic energy prices, in 2021 across the 27 EU member states, Romania had the highest electricity prices and the 9<sup>th</sup> highest gas prices in purchasing power standards.<sup>98</sup> The growth rate of electricity prices in Romania is among the highest in the EU, with an increase of almost 25 per cent from August 2020 to August 2021, as opposed to the EU average of a 9.3% rise in the same period. Similarly, the price increases in natural gas remain significantly above the EU average. Romania ranks 10<sup>th</sup> among EU countries in terms of rising gas prices, with a 20.5 per cent increase in the same period. Compared to EU prices, consumer prices for natural gas increased by 14.2%.<sup>99</sup>

The price of firewood doubled from 2020 to 2021, due to the respective increases in the price of electricity and gas, as well as to blockages in the forestry administration. If in 2020 a cubic meter of firewood could be bought for € 50, in 2021 the cost went up to at least € 100. With current market prices for firewood - on average € 100 / ton - wood heating is still? 2.5 to 5 times cheaper than gas heating. The use of pellets and lighters, with maximum energy efficiency, even at prices of € 240 / ton is still twice cheaper than producing the same amount of energy from gas.<sup>100</sup>

Measuring dispatchable consumption is also difficult as meters and smart grids are insufficiently spread in Romania. The lack of investments in the digitalization of the energy sector makes it difficult to integrate prosumers and renewable energy in general in the energy system.

## Household solid fuel use

### Overview

As we have seen, over half of the energy used in households for heating is covered by solid fuels, and about 45 per cent of dwellings and 90 per cent of rural dwellings are heated with firewood. Over fifty per cent of energy used for heating of dwellings is covered from primary solid biofuels, as access to gas infrastructure, renewable energy

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<sup>98</sup> Eurostat, '[Electricity Prices for Household Consumers - Bi-Annual Data](#)'; Eurostat, (from 2007 Onwards) [Nrg\_pc\_202]'.

<sup>99</sup> Marinescu, 'Prețurile Energiei Și Provocările Securității Energetice | Contributors'.

<sup>100</sup> POROJNICU, 'Prețul Lemnului de Foc S-a Dublat Față de Anul Trecut Din Cauza Creșterii Tarifelor La Energie Și Gaze, Dar Și a Blocajelor Din Administrația Silvică'.

sources and district heating is limited. Those not connected to gas are using wood or very marginally coal.<sup>101</sup>

An Inscop Research survey shows that 43.4 per cent of respondents heat in the winter with a wood, coal or natural gas stove, 35.7 per cent in their own natural gas boiler, 13.5 per cent are connected to central heating (at block or neighbourhood level) and 1.8 per cent make use of an electric heating system. 5.5 per cent of respondents indicated that they use a different type of heating source, mostly wood and pellet boilers. In rural areas 85 per cent of households use solid fuels.<sup>102</sup> Solid fuel use for heating mostly means firewood, but also coal, and these are often burned in stoves with very low efficiency.

The timber market is not fully regulated, which allows for illegal logging and trade. As the price of wood has sharply increased in recent years, ways to acquire cheaper firewood on the illegal market have proliferated.<sup>103</sup> The lowest income groups simply cannot afford to buy firewood and thus turn to alternative/substitute solutions, such as burning cardboard, plastic or agricultural waste. Non-regulation renders market extremely volatile, pushing the price of wood much higher especially in the cold season.

The regions most affected by volatile prices (for example in the southern part of Romania) are the ones with the least access to wood resources and are otherwise also more affected by poverty than other areas of the country.<sup>104</sup>

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<sup>101</sup> Jigla, Sinea, and Mura, 'Oportunitatea Gazelor Naturale În Sectorul Rezidențial Din România :: Centrul Pentru Studiul Democratiei'.

<sup>102</sup>

<sup>103</sup> G4media.ro, 4.

<sup>104</sup> POROJNICU, 'Prețul Lemnului de Foc S-a Dublat Față de Anul Trecut Din Cauza Creșterii Tarifelor La Energie Și Gaze, Dar Și a Blocajelor Din Administrația Silvică'.

## Heating appliances and chimneys



4. Picture



5. Picture



6. Picture



7. Picture

Pictured above are the typical heating appliances used for solid fuel heating. The first two pictures show iron and steel stoves and fireplaces. These types of stoves are among the cheapest on the market. They heat up quickly but also cool down fast and need to be fed often. The third picture shows a cast-iron stove covered with tiles that is suitable for cooking as well. Tiles radiate heat more smoothly thus providing a better thermal comfort, but these kinds of stoves have a higher cost. Finally, the last picture shows a tiled masonry stove that can store heat for a long period and radiate it equally, providing a more stable temperature over time and pleasant thermal comfort. Tile masonry stoves are expensive as they are built by professional stove builders and have a need for a higher amount of quality materials (tiles, inner bricks, etc).

Smoke discharge is one of the most important factors to consider when buying a heating device. The possibility of installing a chimney depends on the dwelling, and it is necessary to ensure that the smoke discharge is in accordance with the standards in force. The regulations regarding chimneys are provided in an order of the Ministry of Internal Affairs. The regulation's primary aim is to set norms of security to prevent fires associated with the chimneys' installation in the households. The same regulation introduces fines in case of non-conformity or delays in renovating or updating the chimney. All these norms have a strong safety component, without addressing the environmental impact of improper chimneys.<sup>105</sup>

Chimney prices are high, as they must be constructed in accordance with the regulations, so that the smoke evacuation is done safely. The regulation imposes fines in case households miss their yearly check-up, repair and periodic sweeping of the chimneys, as well as for not having adequate thermal insulation.<sup>106</sup> Despite the financial deterrents and

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<sup>105</sup> Ministerului Afacerilor Interne, Obligations of chimney owners or users.

sanctions, in the cold season house fires occur frequently due to malfunctioning chimneys, leading to major damage.

According to the survey on biomass use, sole firewood usage is the most typical for Romania among the three surveyed countries with 58 per cent of respondents running their heating entirely on firewood.

Among Romanian respondents the most typical heating devices were the following: central heating (using firewood) was the most prevalent, followed by tile stoves, central heating (fuelled by gas) and finally, metal stoves.

Romanian firewood users appeared to be the most proactive among the three countries in terms of having already installed energy efficiency measures and also in terms of showing an interest in switching fuels or implementing further energy efficiency measures in the future or upgrading their heating system.

74 per cent of respondents have installed insulation and 54 per cent of them have replaced their windows – an interesting finding in the light of the overall share of insulated buildings in Romania being low according to statistics (see [Housing quality and energy efficiency](#)). Nearly half of respondents would switch from wood to gas completely, and another 39 per cent show an interest in switching to solar power. 61 per cent of respondents plan to improve their heating method, with the installation of a central heating system (40%) or the improvement of the existing central system (37%), as well as the installation of solar panels (35%) being most popular options for upgrade.

### **Firewood use**

Half of the Romanian survey respondents are buying wood from woodyards, while 37 per cent acquire their solid fuels from a local entrepreneur. 63 per cent of respondents buy their wood at least six months prior to the heating season, while the rest of them acquire theirs maximum two months before. The average drying time is 4.3 months.

According to the survey, Romanians buy the highest amount of wood (14.18 m<sup>3</sup>) for a heating season and spend the highest amount of money 550 euros on average.

Romanian respondents signalled with the highest frequency that they have a room that they cannot make use of as they are unable to heat it. On the other hand, the share of households that do not have an unheated room is the highest (51% among the three countries in Romania, though only slightly higher than in other two countries.

44 per cent finds that firewood heating has an important impact on air quality, compared to 46% of Bulgarians and 31% of Hungarians.

## Ecodesign

Both firewood and pellets have a substantially reduced impact on CO<sub>2</sub> emissions into the atmosphere and create fewer total CO<sub>2</sub> emissions than fossil fuels such as gas. But if they are used in technologically obsolete appliances, they affect air quality, especially in terms of particulate emissions and unburned gases. The solution would be to gradually replace obsolete appliances with state-of-the-art stoves, fireplaces and boilers that can drastically reduce this impact.

In Romania with the Eco-design Directive since 2022 all manufacturers of stoves and fireplaces will be obliged to market greener products in terms of pollutant emissions, efficiency, and efficiencies. There has not been much discussion about this directive, it is likely to be implemented over time and will lead to price increases in the heating sector.

Based on interviews conducted with sales representatives of companies selling solid fuel stoves, the Ecodesign Regulation has not gained full awareness yet, and it will take some time until retailers find out all the details. Products from previous years not complying with the new regulations are still on the shelves of the stores. Stoves that comply with the new regulations are expected to appear by the end of 2022, and until that the old stocks are sold in small quantities, but there are already products on the Romanian market that are manufactured in compliance with new design requirements. These products have higher prices and people will tend to buy the old products since these are cheaper. Not all the stove manufacturers have started so far producing stoves according to the new regulations.

## Environment and climate

Throughout its history, Romania has been a country largely covered by forests. The area covered by the forest has dropped dramatically in the last hundred years, reaching only 29 per cent today, well below the European average of 43 percent. Every hour, according to the latest estimates, about 6 hectares of forest disappear from legal and illegal logging. The control authorities detect only one per cent of the total illegal logging that takes place in Romania: about 200,000 m<sup>3</sup> of the 20 million cubic metres of wood that disappear annually without documents from the forests of Romania.<sup>107</sup>

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<sup>107</sup> Neagoe, 'Tăierile Ilegale Din Pădurile României În 2018. Raport Greenpeace - Greenpeace România'.



In 2021 the European Commission proposed the ambitious “Fit for 55” package to meet the EU's climate targets, along with a distribution of national greenhouse gas emission reduction targets on which the 27 member states will have heated debates. Among the measures proposed by the EU's executive body is to achieve the goal of reducing greenhouse gas emissions by 55% compared to 1990 and achieving climate neutrality in 2050 is increasing costs for CO<sup>2</sup> emissions from heating, transport and industry (including by reforming the EU Emissions Trading Scheme - ETS). The target for reducing these emissions will increase in the case of Romania from 2 to 12.7 percent.<sup>108</sup>

Air pollution in Europe would be, as before, the biggest threat to environmental health.<sup>109</sup> The worst situation in the EU is in Romania, where every fifth death could be related to environmental factors. At the other end of the spectrum are Denmark and Sweden, where only one in 10 deaths can be attributed to environmental pollution. Domestic heating is an important source of exceedances of air quality standards and represents the principal cause of PM10 emissions. In Romania, 36 per cent of exceedances of air quality standards were related to domestic heating.

According to the Law on waste management, burning hazardous waste is punishable by imprisonment from 3 to 5 years.<sup>110</sup>

### **Policies**

In Romania various forms of heating benefits and social tariffs for energy consumption have been in place for more than 20 years.

The recently adopted Vulnerable Consumer Law defined vulnerable consumers lowered the threshold/barrier of entry, allowing for more people to benefit from subsidies. For two winter months, November and December 2021, the money allocated from the national budget for heating benefits exceeded 560 million RON, around 111 million Euros. The scheme offers support for domestic heating with central heating, natural gas, electricity and solid and/or oil fuels. In the winter season of 2021- 2022 (November 2021- March 2022), around 500.000 households are receiving heating benefits. There are another 500.000 households receiving a support scheme for energy consumption, but of a very low amount of maximum 10 euros (RON 50). The Ministry of Labor and Social Solidarity established the following maximum income thresholds for the beneficiaries of heating schemes:

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<sup>108</sup> Agerpres, ‘Planul climatic al Comisiei Europene’.

<sup>109</sup> European Environmental Agency, ‘Air Quality in Europe’.

<sup>110</sup> PARLIAMENT of Romania, “Law No. 211 Of 15 November 2011 On The Regime For Waste” (Romania).

## COUNTRY PROFILE ROMANIA

- 1386 lei (approx. 280 Euros) per person in multi-member households
- 2053 lei (approx. 410 Euros) per individual for single member households.
- In addition to this criterion, the beneficiaries need to demonstrate they don't have any other additional properties or means of income.

The aid is granted according to the average monthly net income per family member or single person. The reference value, depending on the heating system used, shall be updated by Government decision and may not be less than:

- 250 lei (50 euro)/ month, for natural gas;
- 500 lei (100 euro)/ month, for electricity;
- 320 lei (64 euro)/ month, for solid and / or oil fuels.

The government also offers inclusion support for low-income people - people who earn an average monthly net income of up to 1386 lei (270 euros) / person for the family and up to 2053 lei (410 euros) for the single person. The amounts offered are between 5 and 100 euros per home and are calculated according to income.<sup>111</sup>

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<sup>111</sup> Romanian Parliament, „LEGE 226 16/09/2021”.