Report for the European Climate Foundation

Baseline analysis covering household heating options, expenditures and needs in the Western Balkans

RES Foundation

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Contents

Introduction

This baseline analysis presents national data on household heating options, expenditures, and needs. It provides comparative data on six Contracting Parties of the Energy Community form the Western Balkans: Albania, Bosnia and Herzegovina, Kosovo*, Montenegro, North Macedonia, and Serbia.

The analysis was supported by the European Climate Foundation (ECF) and is meant to provide meaningful evidence and inform future activities carried out under the project “Mitigating climate change through improved residential heating in the Western Balkans”.

This review and analyses are based on the desk research and the data available In English language and local languages including but not limited to:

- IEA reports and statistics
- World Bank statistics
- EUROSTAT
- National report submissions under the Convention on Long-Range Transboundary Air Pollution (CLRTAP)
- Survey on Income and Living Conditions (SILC)
- Household Budgetary Survey (HBS)
- National Census

Energy profiles

Contracting Parties of the Energy Community from the Western Balkans rely mostly on coal and oil for their primary energy supply. Renewables also take part in the energy mix primarily through traditional use of biomass in inefficient domestic devices followed by large hydro. Modern sources of renewable energy are at an early stage of development.

Table 1: Structure of total primary energy supply in the WB6 region in ktoe

	Coal	**Natural gas**	**Hydro**	**Biofuels and waste**	**Oil**	**Wind, solar, etc.**
Albania	223	32	735	271	1139	14
Bosnia and Herzegovina	4230	199	552	1192	1681	11
*Kosovo**	1434	0	23	377	737	0
Montenegro	361	0	182	151	368	12
North Macedonia	861	209	154	211	963	16
Serbia	7523	2132	915	1087	3664	19
Total	14632	2572	2561	3289	8552	72

Source: Source: International Energy Agency. Countries and Regions. Accessed: https://www.iea.org/countries
Note: The data for all the Contracting Parties is from 2018.

Energy and carbon intensity of the region is comparatively high both to the EU and the World average values. This points to significant space for the improvement in the efficiency of the energy use and production. Import dependency of the region is below the EU average. Currently the region depends on import of the natural gas form Russia.

Table 2: Basic data on Contracting Parties in 2018

	Population (million)	**GDP (billion 2010 USD)**	**TPES (ktoe)**	**Import Depe-ndency**	**Energy intensity TPES/GDP (toe/thousand)**	**GHG emissions per capita tCO2/capita**	**GHG intensity kgCO2 / GDP**
Albania	2.9	14.5	2336	21%	0.18	1.50	0.34
Bosnia and Herzegovina	3.3	20.2	7468	24%	0.42	6.68	1.26
*Kosovo**	1.8	7.7	2588	29%	0.36	4.49	1.14
Montenegro	0.6	5.1	1056	32%	0.23	4.05	0.55
North Macedonia	2.1	11.4	2579	58%	0.24	3.33	0.65
Serbia	7.0	48.2	15349	35%	0.35	6.42	1.03

Source: World Bank and International Energy Agency statistics.

Apart from Albania which almost exclusively relies on hydro power, the remaining five Contracting Parties generate most of their electricity in 16 coal-fired thermal power plants. Large hydropower plants constitutes the second most important source of electricity production.

Table 3: Electricity generation by source in GWh

	Coal	Oil	Natural gas	Hydro	Biofuels	Solar PV	Wind
Albania	0	0	0	5206	0	22	0
Bosnia and Herzegovina	10544	44	25	6081	9	30	254
*Kosovo**	6037	10	0	210	0	10	91
Montenegro	1555	0	0	2113	0	0	143
North Macedonia	3508	61	957	1164	55	0	102
Serbia	26390	89	633	10172	116	14	848
Total	48034	204	1615	24946	180	76	1438

Source: Source: International Energy Agency. Countries and Regions. Accessed: https://www.iea.org/countries
Note: The data for all the Contracting Parties is from 2019, with exception of Montenegro, which is from 2018.

In terms of final energy consumption in the WB6 region, oil products have the largest share (7849 ktoe). Serbia is the region's biggest consumer, with final energy consumption of 9125 ktoe.

Table 4: Total final energy consumption by source in ktoe.

	Coal	Oil and oil products	Natural gas	Wind, solar, etc	Biofuels and waste	Electricity	Heat
Albania	223	1085	7	13	269	523	0
Bosnia and Herzegovina	389	1527	148	0	1127	985	127
*Kosovo**	18	732	0	0	377	378	15
Montenegro	7	367	0	0	150	245	0
North Macedonia	114	948	43	5	192	525	47
Serbia	536	3190	1195	5	1049	2412	738
Total	1287	7849	1393	23	3164	5068	927

Source: Source: International Energy Agency. Countries and Regions. Accessed: https://www.iea.org/countries
Note: Category oil and oil products consists of "oil products" which contribute 7845 ktoe and "crude oil" used in Montenegro which contributes another 4 ktoe. The data for all the Contracting Parties is from 2018.

The residential sector (6367 ktoe) has the largest share in the final energy consumption. It is followed by the transport (5562 ktoe) and industry (4503 ktoe) sectors.

Table 5: Structure of final energy consumption by sectors in ktoe.

	Residential	**Transport**	**Industry**	**Commercial public services**	**Agriculture Forestry**	**Non energy use**	**Fishing**
Albania	507	828	439	213	81	16	37
Bosnia and Herzegovina	1719	1232	863	348	42	98	0
*Kosovo**	573	432	284	155	31	45	0
Montenegro	248	251	135	88	6	42	0
North Macedonia	483	697	411	211	20	50	
Serbia	2837	2122	2371	890	170	735	0
Total	6367	5562	4503	1905	350	986	6367

Source: Source: Ibid

Note: The data for all the Contracting Parties is from 2018.

Energy consumption in households

Biomass accounts for a much larger share of total household energy consumption in the region compared to the EU, according to International Energy Agency. In the EU (28) biomass accounts for 15.3% of total household energy consumption, while in the WB6 42.5%. Bosnia and Herzegovina (63%), as well as Kosovo* (60.5%) are front runners in this regard.

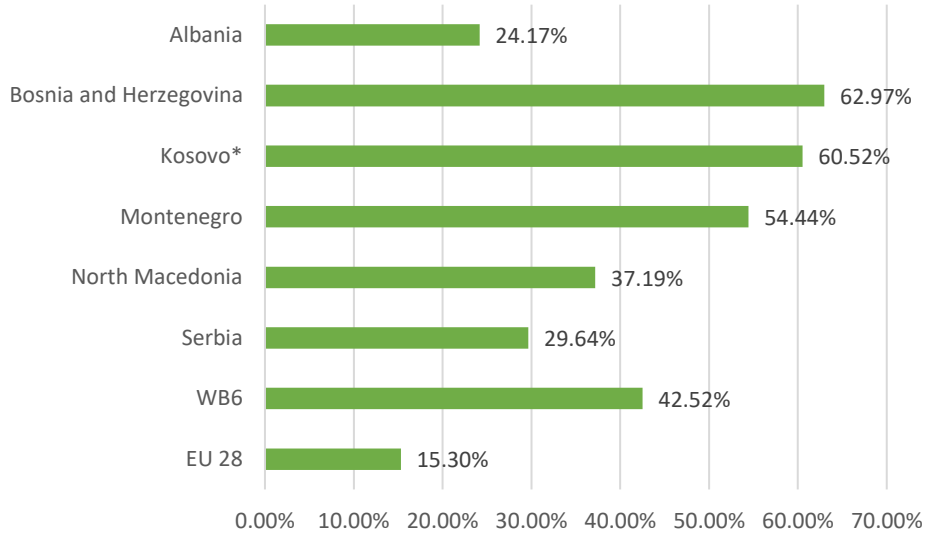
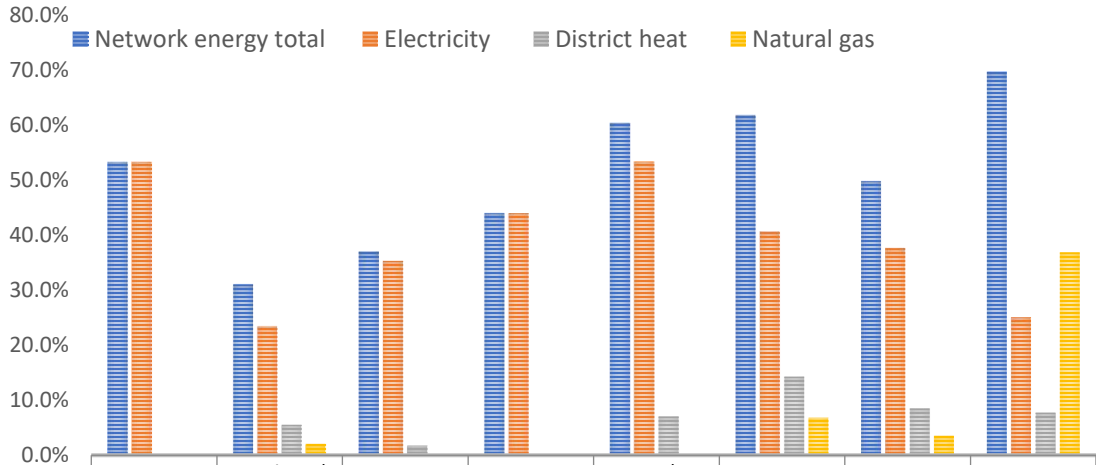


Figure 1. Share of biomass in total household energy consumption by Contracting Party
Source: International Energy Agency. Countries and Regions. Accessed: https://www.iea.org/countries
Note: The data for all the Contracting Parties is from 2018.

Furthermore, share of network energy consumption which includes electricity, district heat and natural gas in the total household energy consumption is much larger in the EU-28 (70%) than in the WB6 (50%). Large reason for this is in the lack of utilisation of natural gas by the households in the region, with exceptions of Serbia and Bosnia and Herzegovina. Natural gas constitutes only a fraction of energy consumption of households in Western Balkans (4%) when compared to the EU 28 (37%). Albania, Kosovo*, Montenegro and parts of North Macedonia and Bosnia-Herzegovina are not even supplied by international gas pipeline networks and none of the countries produce any significant amounts of gas. Electricity consumption on the other hand, is comparatively much higher in the region, due to inefficient appliances as well as consumption of electricity for heating. Electricity accounts for 53% of total household energy consumption in North Macedonia and Albania, the most in the region.

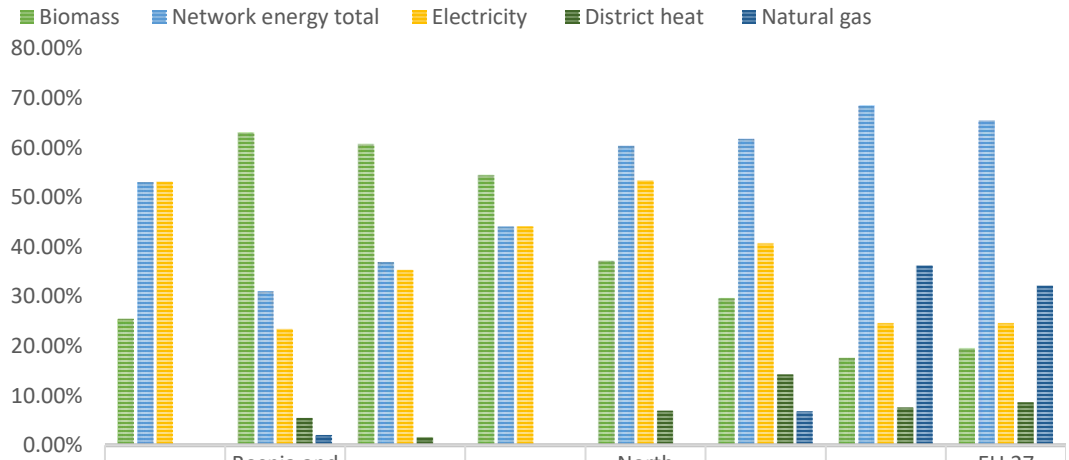


	Albania	Bosnia and Herzegovina	Kosovo*	Montenegro	North Macedonia	Serbia	WB6	EU 28
Network energy total	53.2%	31.0%	37.0%	44.0%	60.3%	61.7%	49.7%	69.7%
Electricity	53%	23%	35%	44%	53%	41%	38%	25%
District heat	0%	6%	2%	0%	7%	14%	9%	8%
Natural gas	0%	2%	0%	0%	0%	7%	4%	37%

Figure 2. Share of network energy in household energy consumption
Source: Ibid
Note: The data for all the Contracting Parties is from 2018.

According to the IEA, energy consumption of households in the EU 28 is on average **50.4%** higher than of that in the WB6.

Eurostat also provides data on energy consumption of households with minimal deviations to that of the IEA. Figure 3 includes both share of network energy and biomass in total household energy consumption.

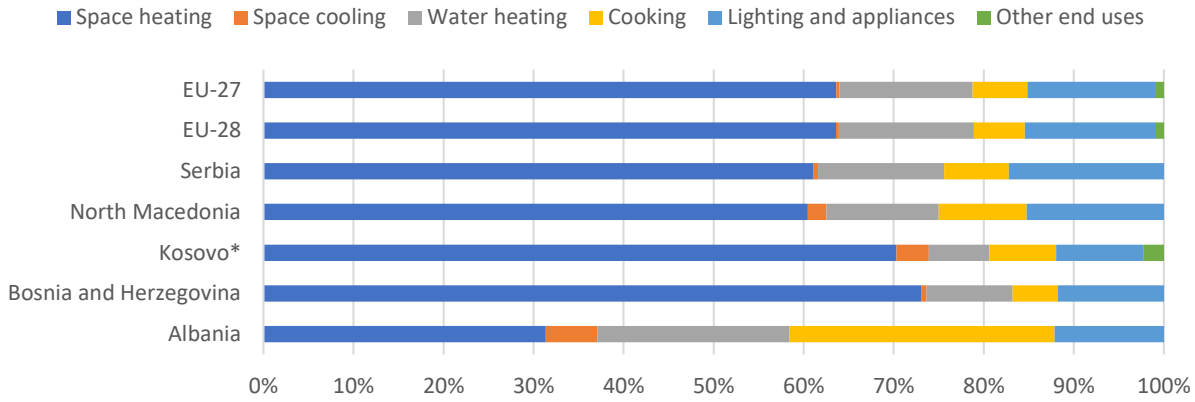


	Albania	Bosnia and Herzegovina	Kosovo*	Montenegro	North Macedonia	Serbia	EU 28	EU 27 (from 2020)
Biomass	25.52%	62.97%	60.64%	54.37%	37.20%	29.63%	17.63%	19.54%
Network energy total	53.01%	31.03%	36.99%	44.10%	60.32%	61.73%	68.43%	65.39%
Electricity	53%	23%	35%	44%	53%	41%	25%	25%
District heat	0%	6%	2%	0%	7%	14%	8%	9%
Natural gas	0%	2%	0%	0%	0%	7%	36%	32%

Figure 3. Share of network energy and biomass in household energy consumption
Source: Eurostat (2021). Energy consumption in households. Accessed: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_consumption_in_households
Note: Data for solid fuels and oil & petroleum products was not specified in the table . The data is from 2017.

Household end-use energy consumption

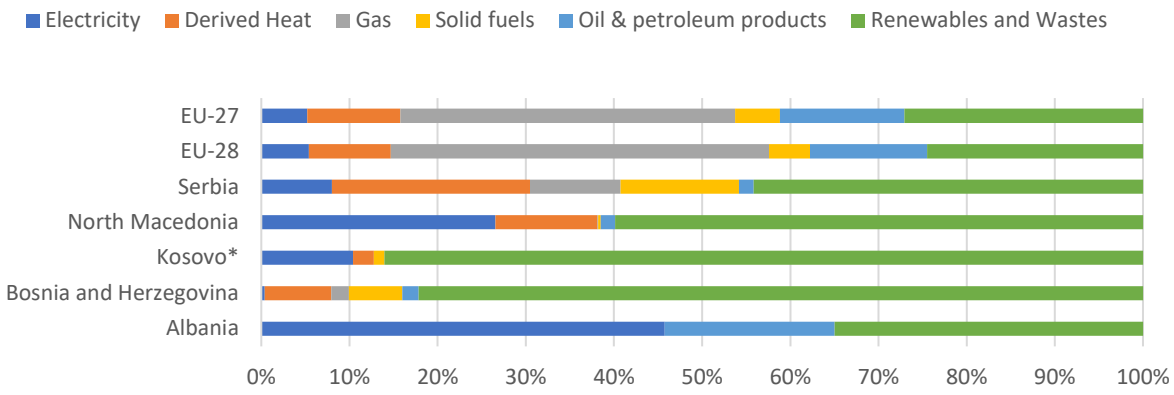
Eurostat also collects data on how energy is consumed by the households. The data is available for all the Contracting Parties in the region, with exception of Montenegro. Similarly to the EU, most of the region uses energy mainly for heating purposes. An exception to this is Albania, which should come as no surprise as the country has a Mediterranean climate and mild winters.



	Albania	Bosnia and Herzegovina	Kosovo*	North Macedonia	Serbia	EU-28	EU-27
Space heating	31.4%	73.1%	70.3%	60.4%	61.1%	63.6%	63.6%
Space cooling	5.7%	0.6%	3.6%	2.1%	0.5%	0.3%	0.4%
Water heating	21.3%	9.6%	6.7%	12.5%	14.0%	15.0%	14.8%
Cooking	29.5%	5.0%	7.4%	9.8%	7.2%	5.7%	6.1%
Lighting and appliances	12.1%	11.8%	9.7%	15.2%	17.2%	14.6%	14.1%
Other end uses	0.0%	0.0%	2.3%	0.0%	0.0%	0.9%	1.0%

Figure 4: Share of final energy consumption by the households by the type of end-use
Source: Ibid

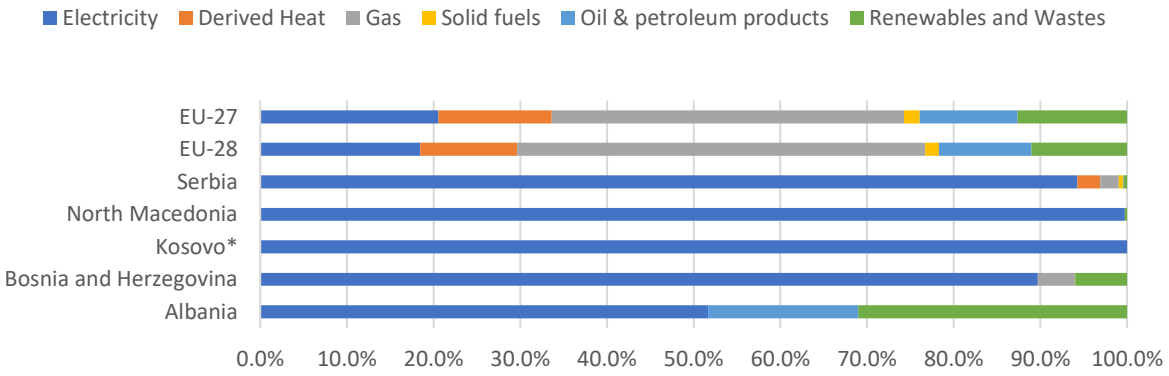
Furthermore, Eurostat collects data on amount of energy resources the households use in relation to space heating, water heating and cooking. The category “derived heat” relates to district heating. Category “solid fuels” is related mostly to coal, while “renewables and waste” referred primarily to biomass. The region is significantly more reliant on biomass for the purpose of **heating households** than the EU. This is especially the case with Kosovo* (86.1%) and Bosnia and Herzegovina (82.2%). Another notable difference is seen in the consumption of natural gas. Natural gas accounts for 38% of total energy used for heating the households in the EU 27, while within the region, it is used only within Serbian households in a significant degree (10.3%).



	Albania	Bosnia and Herzegovina	Kosovo*	North Macedonia	Serbia	EU-28	EU-27
Electricity	45.8%	0.4%	10.4%	26.6%	8.0%	5.4%	5.2%
Derived Heat	0.0%	7.5%	2.4%	11.6%	22.5%	9.3%	10.6%
Gas	0.0%	2.0%	0.0%	0.1%	10.3%	42.9%	38.0%
Solid fuels	0.0%	6.1%	1.2%	0.3%	13.4%	4.6%	5.1%
Oil & petroleum products	19.3%	1.8%	0.0%	1.7%	1.7%	13.3%	14.1%
Renewables and Wastes	35.0%	82.2%	86.1%	59.9%	44.1%	24.5%	27.0%

Figure 5: Share of fuels in the final energy consumption in households for space heating
Source: Ibid

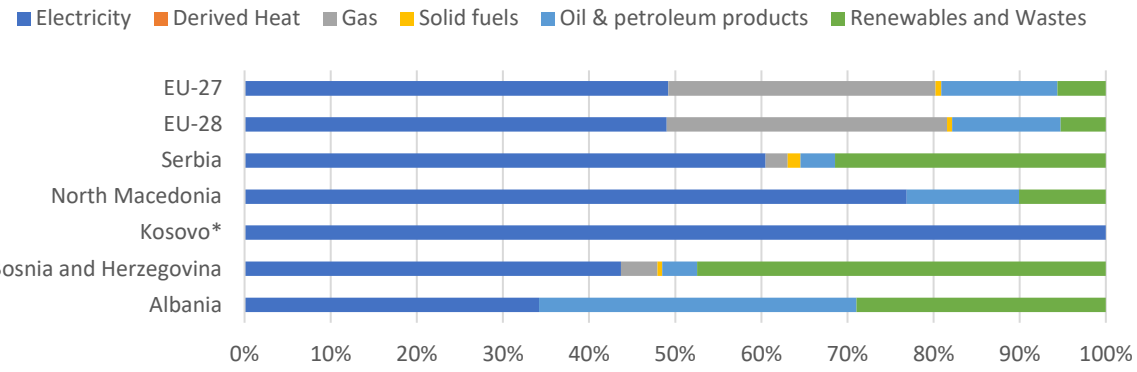
Much larger deviation between the EU and the WB6 region is seen in relation to **water heating**. Electricity accounts as the pivotal energy source used for preparing hot water in the WB6 region. In Kosovo* (100%) and North Macedonia (99.8%) it is almost exclusively prepared using electricity. In the EU 27, natural gas (40.6%) in used almost twice as much as electricity (20.5%) in this regard.



	Albania	Bosnia and Herzegovina	Kosovo*	North Macedonia	Serbia	EU-28	EU-27
Electricity	51.7%	89.7%	100.0%	99.8%	94.3%	18.5%	20.5%
Derived Heat	0.0%	0.0%	0.0%	0.0%	2.6%	11.2%	13.1%
Gas	0.0%	4.3%	0.0%	0.0%	2.1%	47.1%	40.6%
Solid fuels	0.0%	0.0%	0.0%	0.0%	0.5%	1.6%	1.8%
Oil & petroleum products	17.3%	0.0%	0.0%	0.0%	0.1%	10.7%	11.3%
Renewables and Wastes	31.0%	6.0%	0.0%	0.2%	0.4%	11.0%	12.6%

Figure 6: Share of fuels in the final energy consumption in households for water heating
Source: Ibid

Both in the EU and the WB6 region, the households are predominantly reliant on electricity for **cooking**. An exception in this regard is Bosnia and Herzegovina. In terms of total energy used for cooking in Bosnia, electricity comes second after biomass. Households in Kosovo* on the other hand are completely reliant on electricity. In the rest of the region, biomass is the second most widely used energy resource for cooking, while in the EU this is natural gas (31%).



	Albania	Bosnia and Herzegovina	Kosovo*	North Macedonia	Serbia	EU-28	EU-27
Electricity	34.2%	43.7%	100.0%	76.9%	60.5%	49.0%	49.2%
Derived Heat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Gas	0.0%	4.2%	0.0%	0.0%	2.5%	32.5%	31.0%
Solid fuels	0.0%	0.6%	0.0%	0.0%	1.5%	0.6%	0.6%
Oil & petroleum products	36.8%	4.1%	0.0%	13.0%	4.0%	12.6%	13.5%
Renewables and Wastes	29.0%	47.4%	0.0%	10.1%	31.4%	5.3%	5.6%

Figure 7: Share of fuels in the final energy consumption in the residential sector for cooking
Source: Ibid

Additional information on sources of heating for households in four regional countries was retrieved from results of the national Household Budgetary Surveys (HBS) and National Census, in case of Montenegro. Unlike Eurostat's survey, these results show percentages of households which rely dominantly on one of the following sources of energy for heating. The HBS in Serbia and in Montenegro also includes a category combined, which suggests using more than one energy source for heating.

Table 6: Structure of households by the dominant type of heating

	Electricity	**District heating**	**Natural gas**	**Solid fuels**	**Liquid fuels**	**Combined**
Bosnia and Herzegovina	5.0%	9.7%	2.2%	83.1%		
Montenegro	33.1%			66.1%	0.7%	
North Macedonia	6.5%	6.7%		85.0%	1.0%	0.8%
Serbia	11.0%	20.6%	6.3%	55.9%	0.4%	5.8%

Source: Households Budgetary Surveys from Bosnia and Herzegovina (2015), North Macedonia (2017) and Serbia (2019), as well as national Census from Montenegro (2011).
Note: Data for Montenegro has been calculated on the basis of 84% of the total responses in the census. The excluded responses were: 14.8% of the total responses which gave no data, as well as 1.2% who stated that there is no heating in the household

In terms of physical infrastructure, a large portion of the households in the region do not have central heating systems, meaning radiators used for heating. Among the surveyed Contracting Parties in the region, Montenegro has the lowest rate of households with such installations.

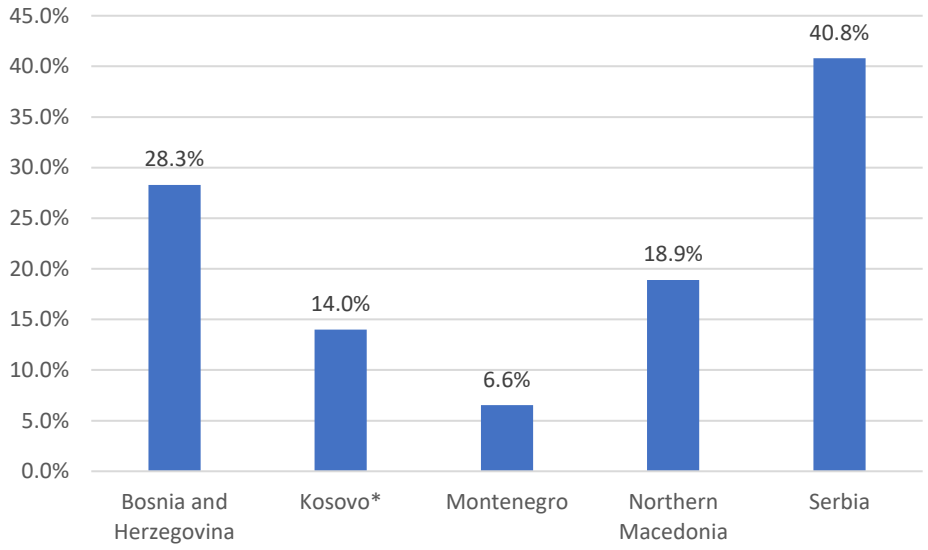


Figure 8: Share of households which have installed central heating systems

Source: Households Budgetary Surveys from Bosnia and Herzegovina (2015), Kosovo* (2017), North Macedonia (2017) and Serbia (2019), as well as national Census from Montenegro (2011).
Note: In the Census from 2011, from which the data for Montenegro was extracted, 13.5% households did not know the answer. The remaining 79.9% of respondents stated no.

Energy poverty

Share of housing, water and energy costs is high in the region, but not as high as is in the EU. In the EU, these expenses account for the largest share of total household expenditure. In the WB6 they are topped by the costs of food and non-alcoholic beverages, which are especially high in Albania, North Macedonia and Bosnia and Herzegovina. Data for Kosovo* was not collected by Eurostat. However, the conducted Household Budgetary Survey provides some evidence in relation to housing, water and energy costs. In 2017, these costs accounted for 29% of the entire household expenditure, which is the same as in 2016 and slightly lower than in 2015 (30%).

Table 7: Share of housing, water and energy costs as part of the entire household expenditure.

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Albania	12.7%	12.6%	13.5%	13.0%	12.6%	12.3%	12.1%	11.9%	11.7% (p)
Bosnia and Herzegovina	14.0%	14.0%	14.0%	13.6%	13.6%	13.5%	13.7%	13.6%	13.2%
*Kosovo**	:	:	:	:	:	:	:	:	:
Montenegro	12.9%	13.8%	14.1%	13.9%	13.1%	12.7%	12.2%	12.1%	11.9%
North Macedonia	24.7%	26.4%	25.8% (p)	:	:	:	:	:	:
Serbia	21.0%	21.1%	20.8%	21.4%	21.3%	21.3%	20.8%	20.4%	20.1%
EU 28 – until 2020	23.8%	24.3%	24.6%	24.3%	24.1%	23.9%	23.6%	23.5%	23.5%
EU 27 – from 2020	24.3%	24.8%	25.0%	24.8%	24.7%	24.5%	24.1%	23.9%	23.9%

Source: Eurostat. Final consumption expenditure of households by consumption purpose (COICOP 3 digit). Accessed: https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_CO3_P3__custom_905904/default/table?lang=en
Note: (:) not available, (p) provisional.

Electricity prices in the region are far lower than in the EU. Lack of carbon pricing, continued subsidies to the coal sector as well as other factors enable governments to maintain relatively low electricity prices.

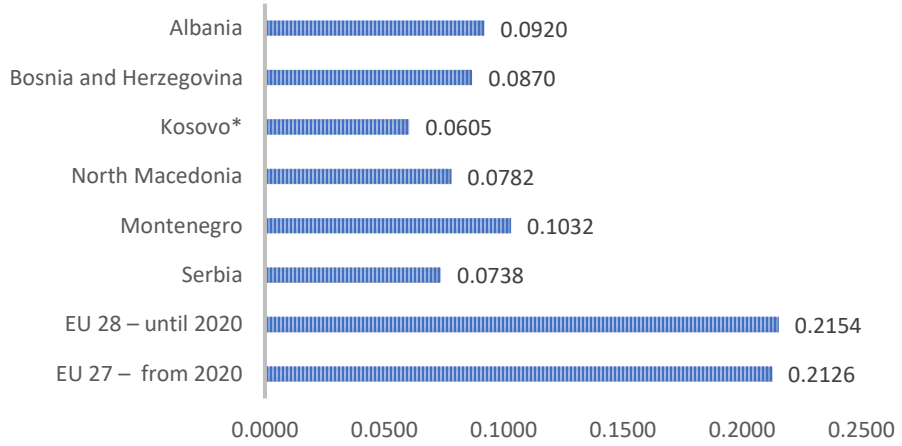


Figure 9: Household electricity prices in EUR per kWh in 2018
Source: Eurostat. Electricity prices by type of user. Accessed: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ten00117&lang=en
Note: Data for Albania, Montenegro and EU 28 are from 2019. Data for other political entities is from 2020.

Survey of Income and Living Conditions (SILC) is performed regularly in Serbia, Montenegro and North Macedonia providing, among others, data on adequacy of heating, arrears on utility bills and burden of housing costs. SILC has also been conducted in in Kosovo* in 2018. Also, the beforementioned information was gathered in Bosnia and Herzegovina through Household Budgetary Survey which was conducted only in 2015.

The data shows that increasing number of households is able to afford sufficient warmth, with the striking exception in Kosovo* where 40.2% of the respondents were not able to heat their homes adequately. Also, in 2019 a dramatic rise has been seen in North Macedonia of more than 8%.

Table 8: Share of the households unable to keep home adequately warm

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Albania	:	:	:	:	:	:	:	:	:
Bosnia and Herzegovina	:	:	:	:	10.8%	:	:	:	:
*Kosovo**	:	:	:	:	:	:	:	40.2%	:
Montenegro	:	:	12.4%	8.6%	8.6%	6.3%	4.5%	11.2%	10.3%
North Macedonia	26.7%	26.8%	26.4%	26.1%	23.4%	25.7%	24.0%	24.9%	33.1%
Serbia	:	:	18.3%	17.1%	15.2%	13.3%	13.1%	10.0%	9.9%
EU 28 – until 2020	9.8%	10.8%	10.7%	10.3%	9.4%	8.7%	7.8%	7.3%	7.0%
EU 27 – from 2020	10.3%	11.2%	10.8%	10.4%	9.6%	9.0%	8.1%	7.6%	6.9%

Source: Eurostat. Population unable to keep home adequately warm by poverty status Accessed: https://ec.europa.eu/eurostat/databrowser/view/sdg_07_60/default/table?lang=en
Note: (:) not available. The data for Bosnia was retrieved from 2015 Household Budgetary Survey.

Households unable to pay utility bills (heating, electricity, gas, water, etc.) on time, due to financial difficulties are far more frequent in the WB6 region than in the EU. This is especially the case in Kosovo* where almost half of the households (49.4%) are unable to pay their utility bills on time.

Table 9: Share of the households unable to pay utility bills on time

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Albania	:	:	:	:	:	:	:	:	:
Bosnia and Herzegovina	:	:	:	:	:	:	:	:	:
*Kosovo**	:	:	:	:	:	:	:	49.4%	:
Montenegro	:	:	37.3%	52.3%	38.4%	34.8%	31.6%	27.7%	32.9%
North Macedonia	36.2%	38.9%	39.6%	38.8%	40.1%	41.0%	38.6%	36.9%	34.4%
Serbia	:	:	36.7%	41.4%	34.8%	34.8%	18.1%	28.4%	25.8%

EU 28 – until 2020	9.0%	9.9%	10.2%	9.9%	9.1%	8.1%	7.0%	6.6%	6.1%
EU 27 – from 2020	9.6%	10.1%	10.4%	10.3%	9.4%	8.4%	7.3%	6.8%	6.2%

Source: Eurostat. Arrears on utility bills - EU-SILC survey. Accessed: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_mdes07&lang=en
Note: (:) not available.

Furthermore, large majority of the households in the region have financial burden or heavy financial burden due to the housing costs. Large portion of these costs originate from utility bills. This is a situation which faces around 90% of households in Kosovo* and North Macedonia, while 96% in Serbia. In EU27, such a number is substantially lower at 76.6%. In table 5, households with **heavy financial burden** due to the housing costs will be presented. In table 6, households with **financial burden** due to the housing costs will be presented. Lastly, in Table 7, households with **both financial burden and heavy financial burden** due to the housing costs will be presented.

Table 10: Share of households with heavy financial burden due to the housing costs

	2011	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Albania	:	:	:	:	:	:	:	:	:
Bosnia and Herzegovina	:	:	:	:	21.4%	:	:	:	:
*Kosovo**	:	:	:	:	:	:	:	53.4%	:
Montenegro	:	:	42.8%	40.1%	42.8%	35.6%	34.8%	33.0%	28.0%
North Macedonia	58.4%	64.0%	57.4%	55.7%	51.9%	55.2%	47.9%	46.3%	45.1%
Serbia	:	:	67.0%	72.6%	70.8%	71.9%	64.9%	66.0%	58.8%
EU 27 – from 2020	36.3%	38.0%	38.8%	37.8%	35.4%	33.4%	31.6%	30.6%	28.3%
EU 28 – until 2020	35.4%	36.9%	38.0%	36.7%	34.0%	32.1%	30.9%	29.3%	28.2%

Source: Eurostat. Financial burden of the total housing cost - EU-SILC survey. Accessed: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_mded04&lang=en
Note: (:) not available..

Table 11: Share of households with financial burden due to the housing costs

	2011	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Albania	:	:	:	:	:	:	:	:	:
Bosnia and Herzegovina	:	:	:	:	49.6%	:	:	:	:
*Kosovo**	:	:	:	:	:	:	:	36.5%	:
Montenegro	:	:	41.1%	44.3%	42.5%	48.2%	47.6%	50.3%	50.0%
North Macedonia	36.3%	31.1%	35.9%	37.5%	39.0%	37.2%	43.0%	44.9%	45.4%

Serbia	:	:	30.4%	25.6%	27.1%	26.1%	32.4%	32.1%	37.1%
EU 27 – from 2020	44.6%	43.3%	42.8%	42.9%	43.7%	45.1%	46.2%	46.4%	48.3%
EU 28 – until 2020	44.5%	43.5%	42.7%	42.9%	43.5%	44.7%	45.8%	45.9%	46.5%

Source: Ibid
Note: (:) not available.

Table 12: Share of households with both financial and heavy financial burden due to the housing costs

	2011	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Albania	:	:	:	:	:	:	:	:	:
Bosnia and Herzegovina	:	:	:	:	71.0%	:	:	:	:
*Kosovo**	:	:	:	:	:	:	:	89.9%	:
Montenegro	:	:	83.9%	84.4%	85.3%	83.8%	82.4%	83.3%	78.0%
North Macedonia	94.7%	95.1%	93.3%	93.2%	90.9%	92.4%	90.9%	91.2%	90.5%
Serbia	:	:	97.4%	98.2%	97.9%	98.0%	97.3%	98.1%	95.9%
EU 27 – from 2020	80.9%	81.3%	81.6%	80.7%	79.1%	78.5%	77.8%	77.0%	76.6%
EU 28 – until 2020	79.9%	80.4%	80.7%	79.6%	77.5%	76.8%	76.7%	75.2%	74.7%

Source: Ibid
Note: (:) not available.

Air pollution

Decades old coal-fired thermal power plants[1], are responsible for the large majority of the SO2 and NOx pollution, as well as particulate pollution to some extent. Majority of the particulate pollution, however, comes from private households in the region which rely on wood or coal stoves and ovens as the main source of heating. These devices, even when new, are inefficient and consume disproportionally high amounts of fuel and emit large quantities of polluting substances.

So far, Serbia and North Macedonia have been the only countries in the region to provide estimates of the particulate pollution in the country and its origins. Their reports support the claim and highlight residential sector as the main source of particulate pollution. This, and other data have been published in their National report submissions under the Convention on Long-Range Transboundary Air Pollution.

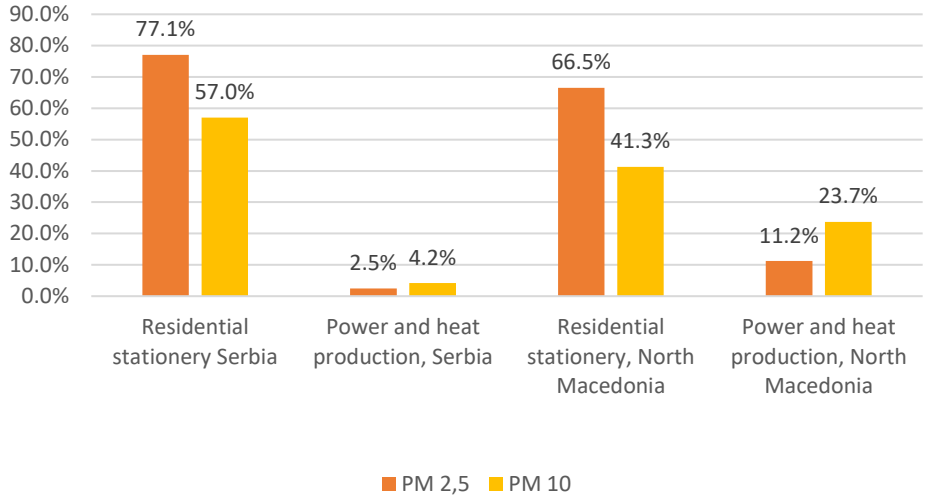


Figure 10: Share of particulate pollution caused by residential and power sectors in Serbia and North Macedonia in the total particulate pollution

Source: National report submissions under the Convention on Long-Range Transboundary Air Pollution in 2020 by Serbia and North Macedonia

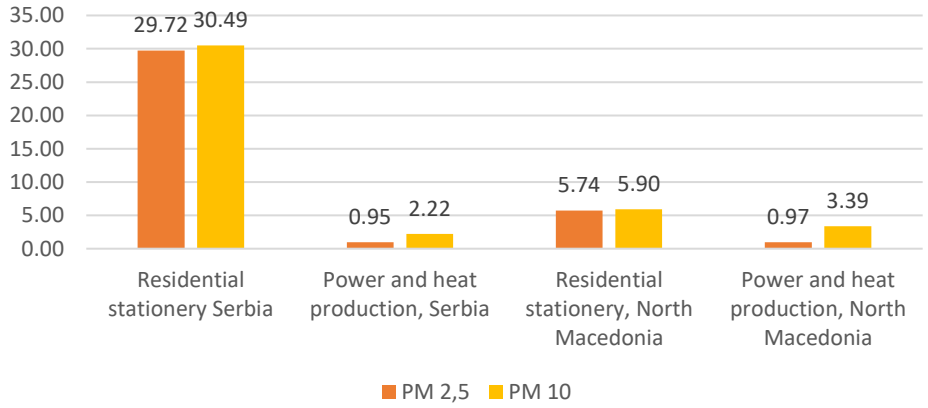


Figure 11: Total particulate pollution emitted by the residential and power sectors in Serbia and North Macedonia expressed in kt

Source: Ibid

[1] Exception to this is private owned CPP Stanari located in Bosnia and Herzegovina which started its operations in 2016.