Statistical Office of the Republic of Serbia

2020

ENERGY CONSUMPTION IN HOUSEHOLDS IN REPUBLIC OF SERBIA

Belgrade, 2021

2020

ENERGY CONSUMPTION IN HOUSEHOLDS IN REPUBLIC OF SERBIA

Belgrade, 2021

CONTENTS

INTRODUCTION

In 2020, the Ministry of Mining and Energy of the Republic of Serbia requested Energy Community Secretariat (ECS) for technical assistance to conduct a survey of energy consumption of households.

The objective of the project is to obtain reliable and accurate information about the consumption of different energy products and fuels in households in Republic of Serbia with the special focus on the availability and consumption of biomass and other renewable energy sources in households.

One of the main goals of this survey is to capture the level of biomass consumption for energy purposes in households in Serbia and to provide input data on the patterns of energy consumption in households, namely the breakdown of energy consumption in households per type of final use in accordance with the Regulation (EU) 431/2014.

The ECS engaged Energy Institute Hrvoje Požar (EIHP) to acts as Technical Assistance Provider with the aim of providing expert assistance, supervising workflow, coordinating planned activities, providing training and capacity building as well as of executing all the activities that contribute to achieving the objective of the project. The EIHP engaged prof. dr Branko Glavonjić as the Key Expert on this project.

Survey included the following items for all relevant energy commodities:

- Space heating;
- Space cooling;
- Water heating;
- Cooking;
- Other electrical appliances (electricity only);
- Other end-uses.

The survey was carried out by the Statistical Office of the Republic of Serbia using questionnaire based personal interviews in households. The questionnaire consisted of 11 topical sections with the total of 31 questions. In addition to data collection about direct energy use, several questions on behavioural practise of households towards more efficient use of energy were included into the survey questionnaire.

All data collected refer to the year 2020 and first quarter of 2021.

The brief analysis of major results is presented in the following report. The tables with detailed results are included in appendices.

METHODOLOGY

POPULATION

The target population of the Survey on energy consumption consists of all households living in the territory of the Republic of Serbia. The Survey on energy consumption is a sample survey and sampling frame is based on 2011 Census of Population, Households and Dwellings in the Republic of Serbia. Sampling frame is defined by excluding all enumeration areas (clusters of households) with less than 20 households in urban areas and less than 15 households in other. The survey population is reduced by 1% compared with the target population. The sampling frame contains 2,466,316 households.

SAMPLE

The sampling design used in Survey is a two-stage stratified sample: enumeration areas represent the primary sampling units and households are the final sampling units. Enumeration areas are divided into 8 strata (non-overlapping subsets), according to NUTS 2 region (Belgrade, Vojvodina, Sumadija and West Serbia, South and East Serbia) and type of settlement (urban and other).

The planned sample included around 7,000 households, i.e. around 1,400 enumeration areas and 5 households in each selected enumeration area. In Belgrade 365 enumeration areas are selected, in Vojvodina 384, in Sumadija and West Serbia 375 and in South and East Serbia region 305 enumeration areas are selected. Allocation for the enumeration areas, as primary units, is proportional to number of households by region and type of settlement. Table 1 presents the number of households in sampling frame and sample size by region and type of settlement.

Table 1. Sampling frame and planned sample size for households (gross sample size)

NUTS2	Sampling frame			Sample		
	Total	Urban	Other	Total	Urban	Other
Belgrade	605,006	505,978	99,028	1,825	1,525	300
Vojvodina	690,551	420,979	269,572	1,920	1,055	865
Sumadija and West Serbia	656,902	323,114	333,788	1,875	960	915
South and East Serbia	513,857	277,451	236,406	1,525	780	745
Republic of Serbia	2,466,316	1,527,522	938,794	7,145	4,320	2,825

The primary units, enumeration areas, are selected proportional to size (number of households) with replacement. For drawing a sample of households in selected enumeration areas, simple random sampling method is used.

DATA COLLECTION

Data collection phase started from April 1 and finished in June 2021. SORS is conducting the survey using CATI operational mode designed in System of Integrated Data Processing (IST system). It is data integration metadata driven concept, which is fully designed by SORS.

RESPONSE RATE

Non-response is when a survey failed to collect data from all the chosen sample units for various reasons. In the case of the Survey on energy consumption of households, there are several reasons for non-response: non-contact (not occupied housing unit, household is temporarily absent during the survey period), refusals (refusal to answer, refusal due to lack of time, refusal due to poor economic situation, fear of information being misused, etc.), inability to respond (health problems, exceptional circumstances in the household, etc.).

Response rate is 89% on the total level. Table 2 presents the number of respondents by region and type of settlement in absolute and relative measures.

Table 2. Number of respondents (net sample size) and response rate

NUTS2	Number of respondents		Response rate	
	Total	Urban	Other	%
Belgrade	1,577	1,362	215	86.41
Vojvodina	1,714	995	719	89.27
Sumadija and West Serbia	1,712	920	792	91.31
South and East Serbia	1,361	743	618	89.25
Republic of Serbia	6,364	4,020	2,344	89.07

Table 3. Number of non-respondents by the cause of non-response

Reason for non-response	Total	%
Non-contact	384	49.1
not occupied housing unit	112	14.3
household is temporarily absent during the survey period	272	34.8
Refusal	298	38.2
refusal to answer	127	16.3
refusal due to lack of time	86	11.0
refusal due to poor economic situation	39	5.0
fear of information being misused	46	5.9
Inability to respond	99	12.7
health problems, invalidity, disability	34	4.4
not responding due to exceptional circumstances in the household	65	8.3
Total	781	100.0

CALCULATING ESTIMATES

The estimates of parameters of interest for the Survey were calculated by using the weights calibrated onto known data. In calibration, the initial (design) weights are adjusted by a suitable coefficient, determined so that totals estimated using final weights coincided with the known population characteristics.

The household weight was calculated as a product of initial weight as result of sampling design (product of inclusion probabilities from each stage) and correction factor for non-response. Then the weights were adjusted to the estimated number of the households in reference year (total size, size by regions, total number of households by number of household members). Data from other surveys conducted by SORS and data from administrative sources were also used for calibration (total electricity consumption in the population, total heat energy consumption in the population and total natural gas consumption in the population).

1 HOUSEHOLDS

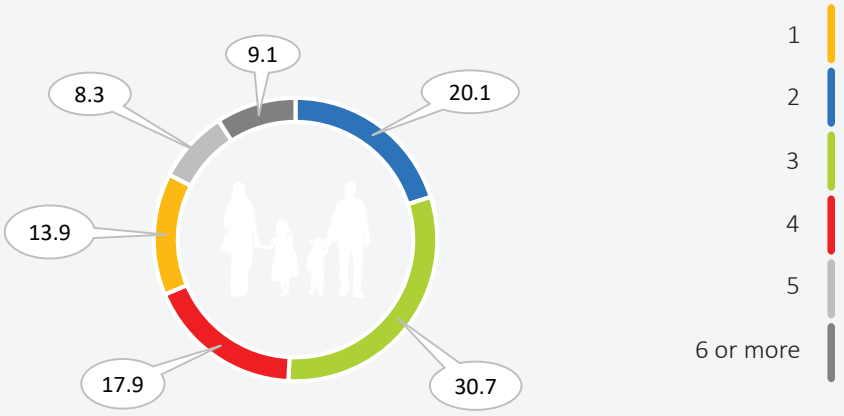
By definition, a household is: a) a community of persons whose members live together, prepare food and spend earned income jointly; b) a single person, living, preparing food and spending income on his/her own.

According to this survey, in Serbia there were 2.4 million households, out of which around 62% (i.e. 1.5 million) were situated in urban areas, while 38% (i.e. 938 thousand) were situated in rural areas. Around half of all households (i.e. 50.8%) had up to two members, while the average size of a household was 2.9 members (Tables 1, 4 and A1). Rural households tend to have more members on average (3.1) compared to the houses in urban household (2.7).

Table 4. Households by size (%)

Number of members	Total	Urban	Rural
1	20.1	22.1	16.9
2	30.7	31.2	29.8
3	17.9	18.4	16.9
4	13.9	13.9	13.9
5	8.3	7.2	10.1
6 or more	9.1	7.1	12.4
Total	100.0	100.0	100.0

Graph 1. Number of members (%)

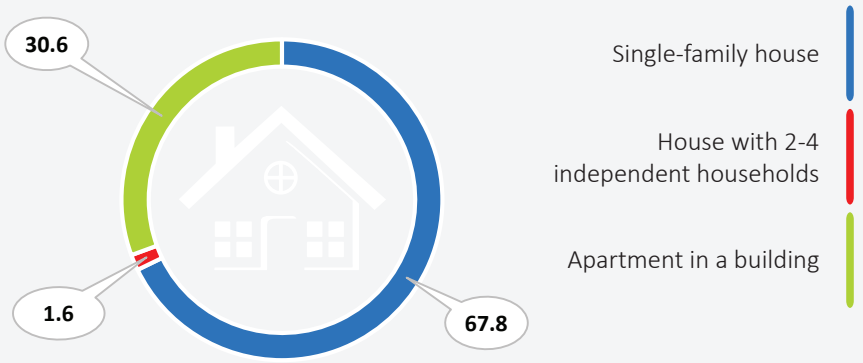


As to types of building, single-family houses account for 51.6% of dwellings in urban areas and apartments for 47.3%, whereas the housing stock in rural areas is dominated by single-family houses (94.4%). (Table 5)

Table 5. Dwellings by type of building (%)

	Total	Urban	Rural
Single-family house	67.8	51.6	94.4
House with 2-4 independent households	1.6	1.1	2.4
Apartment in a building	30.6	47.3	3.2
Total	100.0	100.0	100.0

Graph 2. Dwellings by type of building (%)

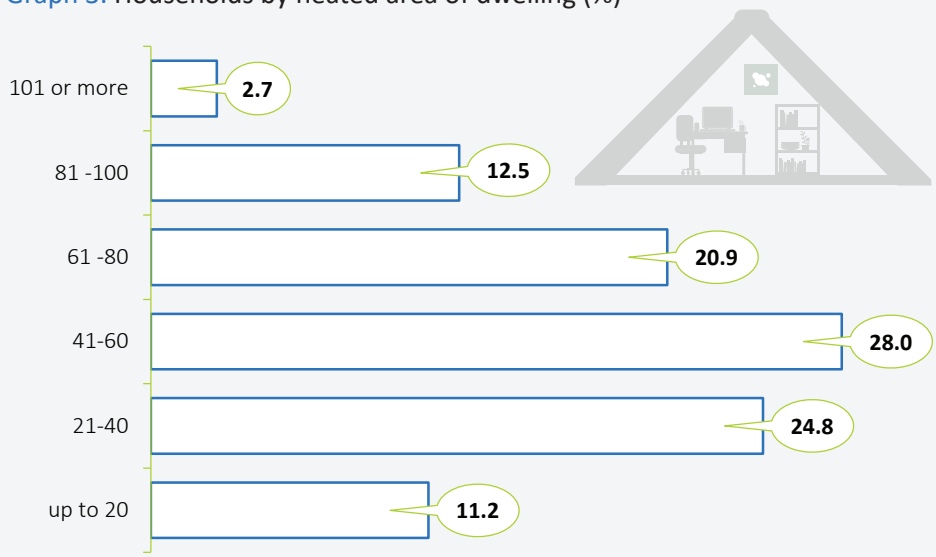


Around two thirds of households live in dwellings with the heated area of 20-80m^2. Detailed data is given in Table 6.

Table 6. Households by heated area of dwelling (%)

	Total	Urban	Rural
up to 20	11.2	8.0	16.5
21-40	24.8	22.7	28.2
41-60	28.0	32.2	21.0
61 -80	20.9	23.2	17.1
81 -100	12.5	11.6	13.9
101 or more	2.7	2.3	3.3
Total	100.0	100.0	100.0

Graph 3. Households by heated area of dwelling (%)



Almost two thirds of households (64%) live in dwellings that have not been renovated in the last 20 years. Out of the dwellings that have undergone renovation, the most common works were the replacement of windows (66.7%) and the renovation of the facade with the additional thermal insulation (47%). (Tables A3-5)

2 ENERGY USE

ENERGY USE BY HOUSEHOLDS

According to this survey, besides the electricity, which is used in all households, the most common fuel type is firewood (used in 46.8% of households), followed by the central heating (20.7% of households) and liquid petroleum gas (LPG) (14% of households) and natural gas (11.6% of households).

The results indicate significant differences between the household in urban and rural areas. In urban areas, a third of households (32.6%) are connected to central heating systems and 28.5% rely on firewood as a source of energy. Meanwhile, in rural areas, the share of households using firewood is significantly larger (76.9%). Other commonly used types of fuel in rural areas are LPG (18.1% of households) and coal (13.9% of households).

The overview of the energy consumption by households, broken down by the share in total number of households is presented in Table 7, while the households' data on the average consumption level of fuels based in natural units is presented in Table 8 and additional details in Tables A6-7.

Table 7. Households by used energy source (%)

Type of energy	Total	Urban	Rural
Electricity	100.0	100.0	100.0
Coal	9.0	6.0	13.9
Wood fuels	49.3	30.8	79.8
Firewood	46.8	28.5	76.9
Pellets	2.4	2.2	2.8
Other wood fuels	0.1	0.1	0.1
Other biomass	2.7	0.7	6.0
LFO	0.1	0.1	0.1
Gas	25.1	24.8	25.5
LPG	14.0	11.5	18.1
Natural gas	11.6	13.8	8.0
Central heating	20.7	32.6	1.0
Solar energy	0.4	0.4	0.4
Geothermal energy	0.1	0.1	0.1
Solid waste	0.5	0.3	0.9

Graph 4. Households by used energy source (%)

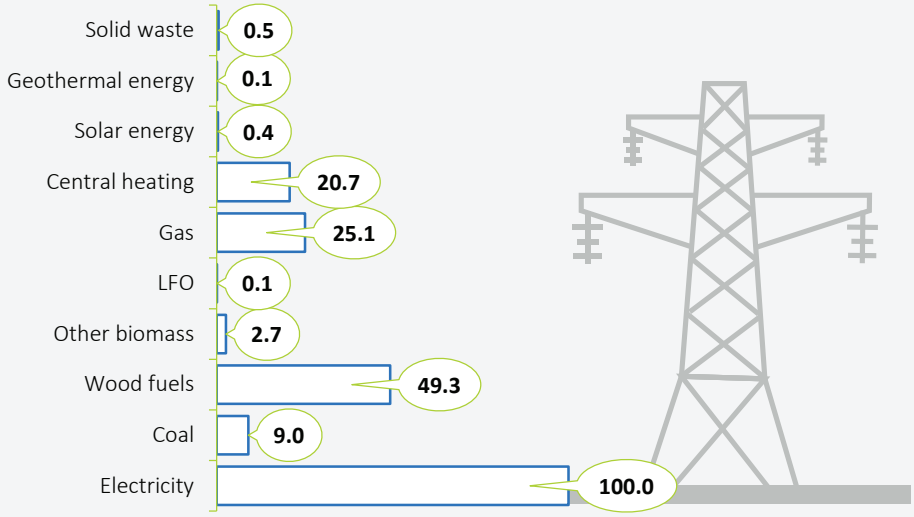


Table 8. Annual average energy consumption by households (natural units)

Type of energy	Unit	Total	Urban	Rural
Electricity	kWh	5,048	5,058	5,032
Coal	t	3.4	3.3	3.4
Firewood	stacked m^3	8.1	7.8	8.3
Pellets	t	2.7	2.7	2.7
LFO	l	809	507	1,700
Natural gas	sm^3	1,075	1,069	1,092
LPG	kg	51	53	48
Central heating	kWh	7,082	7,101	6,049

Based on the average calorific values of different types of fuels, it is estimated that the greatest amount of energy used by households is based on firewood (53.9 PJ), followed by electricity (44.8 PJ) (Table 9).

Table 9. Energy consumption by households (TJ)

Type of energy	Total	Urban	Rural
Electricity	44,824	27,910	16,914
Coal	9,581	3,972	5,609
Wood fuels	56,775	21,444	35,331
Firewood	53,929	19,837	34,092
Pellets	2,808	1,579	1,229
Other wood fuels	38	29	9
Other biomass	5,176	1,169	4,007
Solid waste	451	73	378
LFO	65	31	34
Natural gas	11,074	8,143	2,931
LPG	807	430	377
Central heating	12,969	12,776	193

SPACE HEATING

Around half of households in Serbia use wood fuels as a heat source, with it being the main heat source in 48% of households. The second most common main source of space heating is central heating (20.7% of households), utilized predominantly in urban areas. (Table 10)

Electricity is the most widely used energy source for additional (i.e. supplemental) space heating, used in 16.7% of households. It has also been recorded as a main source of heating in 14.6% of households, while 68.7% of households have access to electricity, but do not utilize it for heating purposes (Table 10).

Table 10. Households by energy source used for space heating (%)

Type of energy	Space heating	
	Main	Additional
Electricity	14.6	16.7
Coal	4.6	4.5
Wood fuels	48.0	1.3
Firewood	45.6	1.2
Pellets	2.3	0.1
Other wood fuels	0.1	0
Other biomass	1.0	1.7
LFO	0.1	0.0
Gas	10.1	0.8
LPG	0.5	0.1
Natural gas	10.0	0.7
Central heating	20.7	0.0
Solar energy	0.0	0.0
Geothermal energy	0.1	0.0
Solid waste	0.0	0.5

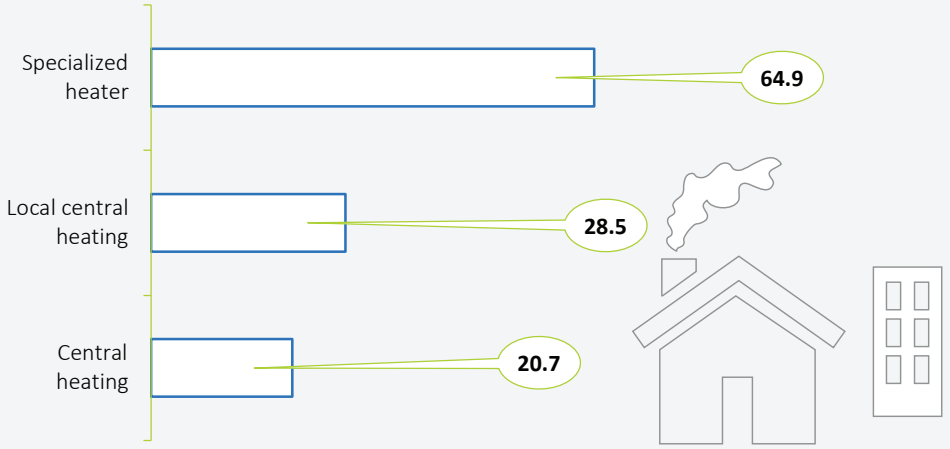
Additionally, the survey indicates that, besides 20.7% of households being connected to central heating and 28.5% having local central heating systems, 64.9% of households use specialized heaters. The most used specialized heaters are TA heaters in urban areas (used by 19.1% of households) and solid fuel stoves in rural areas (used by 60.9% of households).

The breakdown of heat sources is given in Table 11.

Table 11. Households by heat sources used for space heating (%)

	Total	Urban	Rural
Central heating	20.7	32.6	1.0
Local central heating	28.5	26.3	32.1
Specialized heater	64.9	55.9	79.7
TA heater	15.2	19.1	8.8
Electric heater	11.0	12.2	8.9
Air conditioner	9.6	12.6	4.8
Solid fuel stove	33.6	17.0	60.9
Solid fuel furnace	15.1	11.7	20.5

Graph 5. Households by heat sources used for space heating (%)



WATER HEATING

Electricity is by far the most used energy source used for water heating in Serbia. It has been recorded in 92.8% of households.

Besides electricity, 16% of households in rural areas use wood fuels. In urban areas, hot water is also obtained using gas (5.2% of households), wood fuels (5%) and through heat pipes (4.1%). Other sources of water heating are less common.

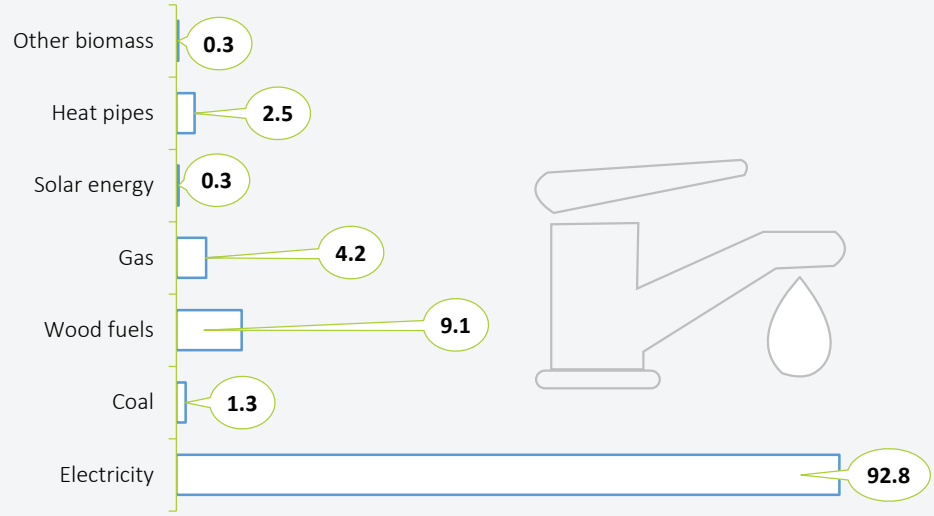
Households without the access to hot water have not been indicated.

The sources of domestic hot water by share of households are presented in Tables 12 and A8-9.

Table 12. Households by energy source used for water heating (%)

	Total	Urban	Rural
Electricity	92.8	91.8	94.4
Coal	1.3	0.9	2.0
Wood fuels	9.1	5.0	16.0
Gas	4.2	5.2	2.5
Solar energy	0.3	0.3	0.4
Heat pipes	2.5	4.1	0.0
Other biomass	0.3	0.1	0.6

Graph 6. Households by energy source used for water heating (%)



COOKING

Similar to the water heating, the most widely used energy source used for cooking in Serbian households is electricity. It is the main energy source for cooking in 56.5% of households, while 35.5% of households indicate it as the additional energy source for this purpose (Table 13). It should also be noted that an electric stove is owned by 91.4% of households.

Other common fuel types that are used for cooking are wood fuels, which are used by a third of all households, and gas, with LPG being used in more households used than the natural gas being for this purpose (Table 13).

Table 13. Households by energy source used for cooking (%)

Type of energy	Cooking	
	Main	Additional
Electricity	56.5	35.5
Coal	1.0	0.7
Wood fuels	27.5	6.3
Firewood	27.3	6.0
Pellets	0.2	0.2
Other wood fuels	0.0	0.1
Other biomass	0.4	0.5
LFO	0.0	0.0
Gas	16.3	5.0
LPG	9.5	4.4
Natural gas	7.2	0.7
Central heating		
Solar energy	0.0	0.0
Geothermal energy	0.0	0.0
Solid waste	0.3	0.1

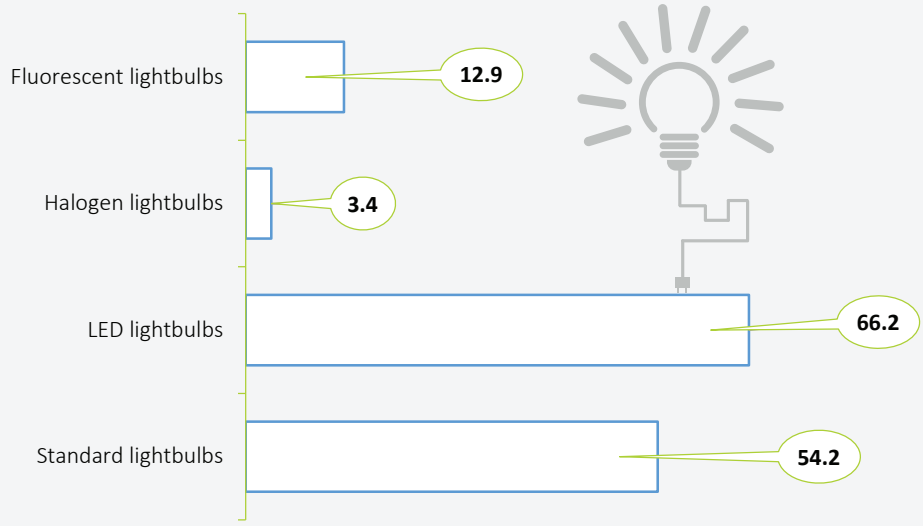
LIGHTING

The survey indicates that the LED lightbulbs are used in 66.2% of households and standard lightbulbs in 54.2% of households, while the fluorescent and halogen lightbulbs are significantly less prominent. This holds true in both urban and rural areas (Table 14).

Table 14. Households by type of lighting (%)

	Total	Urban	Rural
Standard lightbulbs	54.2	51.4	58.8
LED lightbulbs	66.2	68.1	63.2
Halogen lightbulbs	3.4	3.9	2.5
Fluorescent lightbulbs	12.9	14.0	11.1

Graph 7. Households by type of lighting (%)



3 ELECTRICAL APPLIANCES IN HOUSEHOLDS

Most households in Serbia own the main household appliances such as refrigerators and freezers (either combined or as separate appliances), electric stoves, washing machines, etc. Out of all electrical appliances, TV has the highest penetration rate as it is used in 99.1% of households. Other appliances with the penetration rates greater than 90% are the washing machine (95.8%), the iron (94.8%) and the electric stove (91.4%).

On the other hand, the appliances such as dishwashers, microwaves and clothes driers are not that widely owned in Serbia.

It should also be noted that most households own appliances that are at least four years old, with the kitchen appliances mostly being 9 years or older (Tables 15 and A10).

Table 15. Households by used electrical appliances (%)

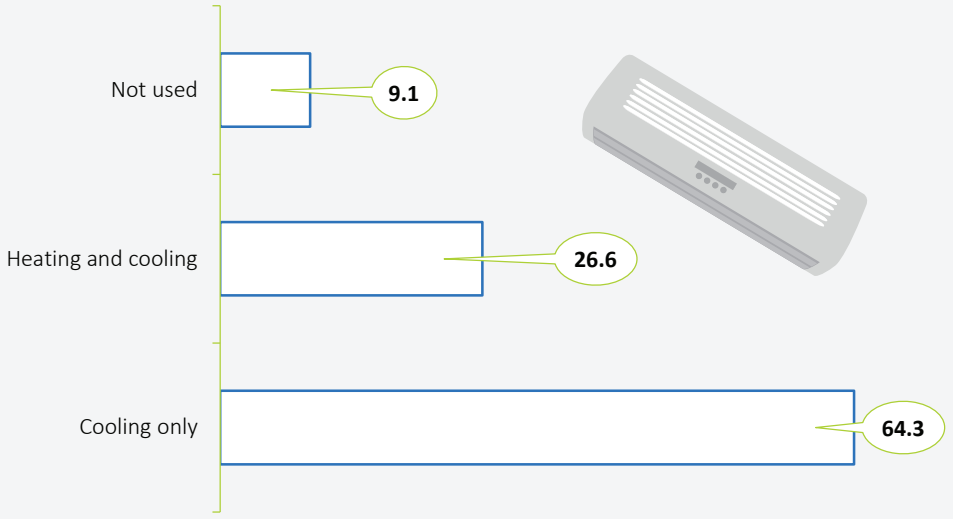
	Total	Up to 3 years	4 to 8 years	9 or more years
Refrigerator without the freezer	57.5	13.2	36.2	56.0
Combined refrigerator and freezer	48.4	14.0	34.8	53.4
Freezer	71.2	11.4	23.3	70.8
Washing machine	95.8	16.5	36.5	49.5
Clothes dryer	6.1	36.4	43.3	21.9
Washing and drying machine	1.3	39.3	43.2	18.5
Dishwasher	23.6	25.0	47.9	28.1
TV	99.1	38.2	50.6	34.7
Electric stove	91.4	10.5	27.5	65.2
Built-in oven	6.9	29.0	45.4	26.7
Built-in stovetop	6.7	33.7	43.2	23.7
Microwave	21.1	17.1	44.5	39.7
Air conditioner	36.3	14.7	41.3	48.1
Iron	94.8			
Hydrophore	7.0			

Air conditioners are owned by 36.3% of Serbian households, namely 46.5% in urban areas and just 19.5% in rural areas (Tables 15 and A10). Their primary use is air-cooling, while the 26.6% of households that own air conditioners indicate that they utilize them for both cooling and heating. Air conditioners are not used in 9.1% of households that own them (Tables 16).

Table 16. Households by the use of air conditioners (%)

	Total	Urban	Rural
Cooling only	64.3	63.3	68.0
Heating and cooling	26.6	27.1	24.6
Not used	9.1	9.6	7.3
Total	100.0	100.0	100.0

Graph 8. Households by the use of air conditioners (%)



4 USE OF RENEWABLE SOURCES OF ENERGY

BIOMASS

In Serbia, wood-based biomass is widely used by households, especially in rural areas. It is used in some capacity by around half (49.3%) of all households, while in rural areas the share of households using wood fuels is 79.8%. Serbian households consume 56.8 PJ of energy from wood fuels, with the about two thirds of that being consumed in rural areas. The survey also indicates that, out of all wood fuels, firewood accounts for 95% of energy used by households, followed by 4.9% energy from pellet. Other wood fuels account for only 0.1%. (Tables 17 and A12)

Table 17. Use of biomass by households (TJ)

	Total	Urban	Rural
Wood fuels	56,775	21,444	35,331
Firewood	53,929	19,837	34,092
Pellets	2,808	1,579	1,229
Other wood fuels	38	29	9
Other biomass	5,176	1,169	4,007

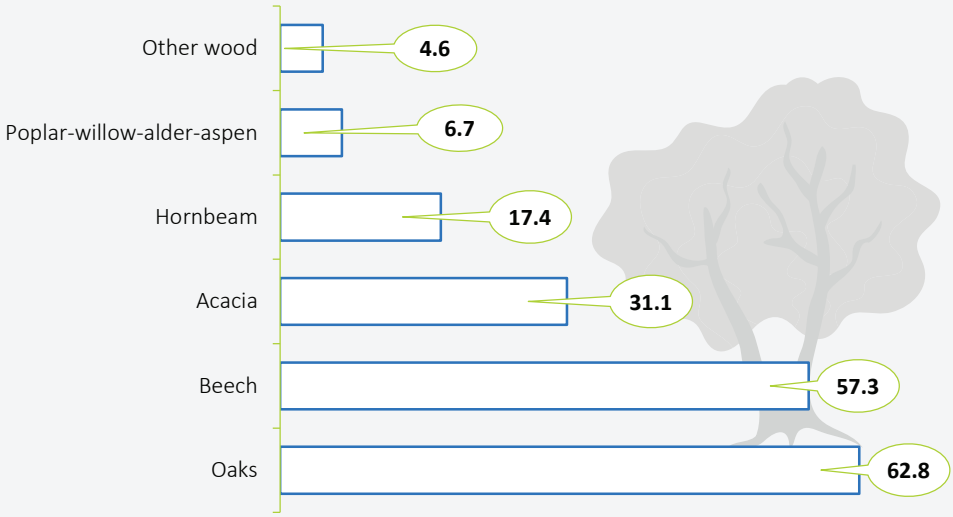
As stated in the previous chapters, the main purpose of firewood is space heating, as it is used as either the main or the additional source for heating in 46.8% of households (i.e. all households that use wood fuels). One third of households use firewood for cooking also, whereas it is not that commonly used for water heating (8.2% of households) (Table A13).

It has been recorded that 69.8% of used firewood has been bought, while 30.2% comes from personal sources (Table A14). Most households acquire firewood several months before the start of the heating season, 2-3 months before in 33.2% of households and 4-5 months before in 28.2% of households (Table A15). As to the type of firewood, around two thirds of households (62.8%) use oaks, cerris or sessile, while beech is used in 57.3% of households (Table 18).

Table 18. Households by the type of firewood used for heating (%)

	Total
Oaks-cerris-sessile	62.8
Beech	57.3
Acacia	31.1
Hornbeam	17.4
Poplar-willow-alder-aspen	6.7
Other wood	4.6

Graph 9. Households by the type of firewood used for heating (%)



The survey also indicates that the average use of firewood by a household grows with the heated area of its dwelling, as well as with the number of household members (Tables 19 and 20).

Table 19. Firewood consumption by heated area (m^3 st)

	Total	0-40	41-60	61-80	81-100	101-120	120 or more
Total	8.1	6.7	8.7	9.5	10.1	9.9	9.9
From personal sources	2.4	2.1	2.7	2.4	2.9	3.0	3.9
Bought firewood	5.7	4.6	6.0	7.1	7.2	6.9	6.0

Table 20. Firewood consumption by the number of household members (%)

	Total	1	2	3	4	5	6 or more
Total	8.1	6.1	7.3	8.4	9.2	9.8	9.9
From personal sources	2.4	1.9	2.0	2.5	2.7	2.9	3.4
Bought firewood	5.7	4.2	5.3	5.9	6.5	6.9	6.5

Other biomass, besides the wood-based, such as waste from forests, yards, or farms, is used by 2.7% of households and the total consumption by households is 5.2 PJ. Out of that, 77.4% (i.e. 4 PJ) is used in rural areas (Table 17).

OTHER RENEWABLE SOURCES

Other sources of renewable energy are rarely used by households in Serbia.

Solar energy is present in 0.4% of households and used mostly for water heating. Geothermal energy is present in 0.1% of households and it is used for space heating in all of them. The survey indicates that the share of households using solar energy or geothermal energy is the same in urban and rural areas.

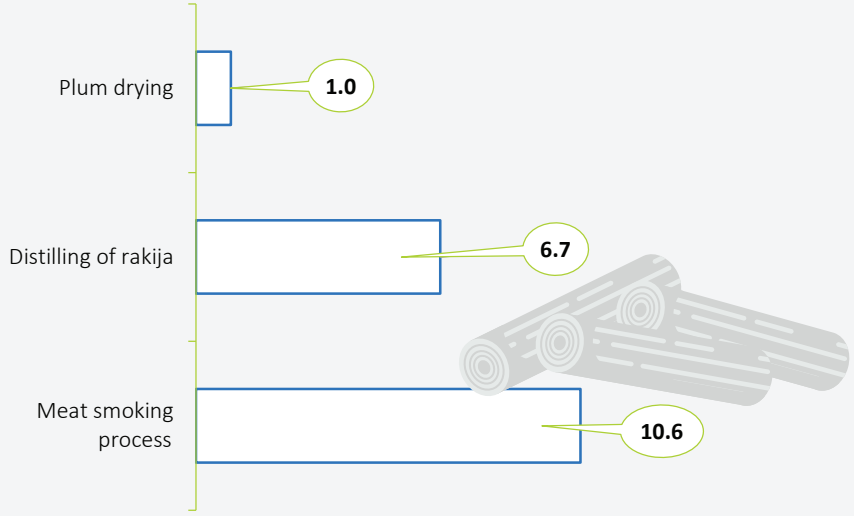
5 OTHER END-USES OF FIREWOOD

Some additional uses of firewood that have been recorded through this survey are the process of meat smoking, distilling of rakija and drying of plums, which are recorded in 10.6%, 6.7% and 1% of households respectively. Naturally, this type of firewood utilization is predominantly detected in rural areas, where almost a quarter (24.4%) of households engages in meat smoking using firewood, while rakija is distilled in 15.9% of households (Tables 21 and A16).

Table 21. Households by other end-uses of firewood (%)

	Total	Urban	Rural
Meat smoking process	10.6	2.2	24.4
Distilling of rakija	6.7	1.2	15.9
Plum drying	1.0	0.1	2.4

Graph 10. Households by other end-uses of firewood (%)



C CONCLUSION

The aim of the project – to collect more detailed data on households' energy consumption – was achieved. In addition, the survey gave reliable and accurate information about the consumption of different energy products and fuels in households in Serbia with the special focus on biomass and other renewable energy sources availability and consumption in households.

As background information, data on households' characteristics were obtained. Specific data on options of space heating, space cooling, water heating, cooking in households were acquired. The data on the amount of energy used in every household were collected by type of energy and fuel. The survey also examined penetration share of electrical appliances in households.

APPENDICES

Table A1. Households by size by region (%)

Number of members	Total	Belgrade	Vojvodina	Sumadija and West Serbia	South and East Serbia
1	20.1	22.2	22.0	18.5	17.3
2	30.7	32.1	31.4	29.2	30.0
3	17.9	18.6	18.7	16.6	17.5
4	13.9	13.0	13.5	14.8	14.3
5	8.3	7.5	7.3	8.9	9.8
6 or more	9.1	6.6	7.1	12.0	11.1
Total	100.0	100.0	100.0	100.0	100.0

Table A2. Has the dwelling been renovated in the last 20 years? (%)

	Total	Urban	Rural
Yes	36.0	34.8	38.0
No	64.0	65.2	62.0
Total	100.0	100.0	100.0

Table A3. Has the dwelling been renovated in the last 20 years by region? (%)

	Total	Belgrade	Vojvodina	Sumadija and West Serbia	South and East Serbia
Yes	36.0	34.6	38.2	36.7	34.0
No	64.0	65.4	61.8	63.3	66.0
Total	100.0	100.0	100.0	100.0	100.0

Table A4. Households by type of renovations done in the last 20 years (%)

	Total	Urban	Rural
Window replacement	66.7	67.2	66.0
Facade renovation with additional thermal insulation	47.0	43.0	52.9
Roof replacement	15.6	13.8	18.3
Attic insulation	9.0	8.6	9.6
Facade renovation without additional thermal insulation	6.2	5.3	7.5

Table A5. Households by type of renovations done in the last 20 years by region (%)

	Total	Belgrade	Vojvodina	Sumadija and West Serbia	South and East Serbia
Window replacement	66.7	73.3	67.0	63.7	62.8
Facade renovation with additional thermal insulation	47.0	35.3	49.1	52.2	50.6
Roof replacement	15.6	14.7	14.0	16.9	17.4
Attic insulation	9.0	7.2	11.8	9.5	6.2
Facade renovation without additional thermal insulation	6.2	7.5	5.3	5.6	6.7

Table A6. Energy consumption by households (natural units)

Type of energy	Unit	Total	Urban	Rural
Electricity	MWh	12,451,166	7,752,688	4,698,478
Coal	t	746,162	301,717	444,445
Firewood	stacked m^3	9,343,556	3,417,362	5,926,194
Pellets	t	160,825	90,409	70,416
LFO	l	1,818,039	850,524	967,515
Natural gas	sm^3	307,619,377	226,188,199	81,431,178
LPG	kg	17,505,134	9,333,952	8,171,182
Central heating	MWh	3,602,481	3,548,797	53,684

Table A7. Energy consumption by households (MWh)

Type of energy	Total	Urban	Rural
Electricity	12,451,166	7,752,689	4,698,477
Coal	2,661,445	1,103,196	1,558,249
Wood fuels	15,770,843	5,956,713	9,814,130
Firewood	14,980,287	5,510,205	9,470,082
Pellets	780,000	438,486	341,514
Other wood fuels	10,556	8,022	2,534
Other biomass	1,437,874	324,599	1,113,275
Solid waste	125,224	20,202	105,022
LFO	18,180	8,505	9,675
Natural gas	3,076,194	2,261,882	814,312
LPG	224,066	119,475	104,591
Central heating	3,602,481	3,548,797	53,684

Table A8. Households by energy source used for water heating (%)

Type of energy	Water heating	
	Main	Additional
Electricity	86.8	6.1
Coal	0.5	0.8
Wood fuels	6.1	2.9
Firewood	5.5	2.7
Pellets	0.4	0.1
Other wood fuels	0.0	0.0
Other biomass	0.2	0.1
LFO	0.0	0.0
Gas	3.8	0.4
LPG	3.8	0.4
Natural gas	0.1	0.0
Central heating	2.5	0.0
Solar energy	0.2	0.1
Geothermal energy	0.0	0.0
Solid waste	0.2	0.2

Table A9. Households by energy source used for water heating by region (%)

	Total	Belgrade	Vojvodina	Sumadija and West Serbia	South and East Serbia
Electricity	92.8	91.2	89.7	94.7	96.5
Coal	1.3	0.3	0.8	2.3	1.8
Wood fuels	9.1	1.3	3.6	14.7	17.8
Gas	4.2	2.5	10.2	2.6	0.1
Solar energy	0.3	0.1	0.4	0.1	0.8
Heat pipes	2.5	7.0	2.8	0.2	0.1
Other biomass	0.3	0.1	0.2	0.7	0.1

Table A10. Households by used electrical appliances (%)

	Total	Urban	Rural
Refrigerator without the freezer	57.5	47.4	74.1
Combined refrigerator and freezer	48.4	57.7	33.1
Freezer	71.2	61.5	87.2
Washing machine	95.8	96.7	94.3
Clothes dryer	6.1	6.8	5.0
Washing and drying machine	1.3	1.7	0.7
Dishwasher	23.6	27.2	17.6
TV	99.1	98.9	99.3
Electric stove	91.4	91.7	90.9
Built-in oven	6.9	8.7	4.0
Built-in stovetop	6.7	8.2	4.2
Microwave	21.1	23.4	17.2
Air conditioner	36.3	46.5	19.5
Iron	94.8	96.0	92.7
Hydrophore	7.0	1.9	15.3

Table A11. Households by the use of air conditioners by region (%)

	Total	Belgrade	Vojvodina	Sumadija and West Serbia	South and East Serbia
Cooling only	64.3	62.5	66.0	64.2	65.8
Heating and cooling	26.6	28.3	26.9	25.2	21.8
Not used	9.1	9.2	7.1	10.6	12.4
Total	100.0	100.0	100.0	100.0	100.0

Table A12. Use of biomass by households (MWh)

	Total	Urban	Rural
Wood fuels	15,770,841	5,956,711	9,814,130
Firewood	14,980,287	5,510,205	9,470,082
Pellets	780,000	438,486	341,514
Other wood fuels	10,556	8,022	2,534
Other biomass	1,437,874	324,599	1,113,275

Table A13. Households by firewood consumption for different purposes (%)

		Total
Total consumption		46.8
Space heating	Main	45.6
	Additional	1.2
Water heating	Main	5.5
	Additional	2.7
Cooking	Main	27.0
	Additional	6.0

Table A14. Firewood consumption structure by acquisition source (%)

	Total
From personal sources	30.2
Bought firewood	69.8

Table A15. Period of firewood acquisition (before the heating season) (%)

	Total
Up to 1 month	9.7
2-3 months	33.2
4-5 months	28.2
6 months	16.0
One year	3.9
Two or more years	1.9
One part several months before the heating season, the rest during the season	7.2
Total	100.0

Table A16. Households by other end-uses of firewood by region (%)

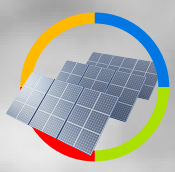
	Total	Belgrade	Vojvodina	Sumadija and West Serbia	South and East Serbia
Meat smoking process	10.6	1.9	5.3	20.8	15.1
Distilling of rakija	6.7	0.7	2.3	12.1	12.9
Plum drying	1.0	0.2	0.3	1.8	1.7

ENERGY CONSUMPTION
IN HOUSEHOLDS IN REPUBLIC OF SERBIA

2020







www.stat.gov.rs