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Agjencia e Statistikave të Kosovës - Agencija za Statistike Kosova - Kosovo Agency of Statistics

Series 3: Economic Statistics

Energy Consumption in Households in 2015





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Energy Consumption in Households in 2015



AGJENCIA E STATISTIKAVE TË KOSOVËS
AGENCIJA ZA STATISTIKE KOSOVA
KOSOVO AGENCY OF STATISTICS

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Foreword

The Kosovo Agency of Statistics (KAS) for the first time has prepared a survey with data on energy consumption in households. This statistical publication presents statistical data for 2015 regarding the energy consumption.

A questionnaire from KAS was prepared for data collection according to requirements of Eurostat, with a tendency to modify the questionnaire in the future.

This publication will be repeated every three or four years by KAS.

Based on continuous requests from various internal and external data users and based on the indicators for energy statistics published by Eurostat, here we have presented data of interest.

The purpose of the publication is to highlight the development trend of this sector.

The publication will serve as a useful reference basis for all users of KAS statistical data and will serve as useful and relevant economic information for Kosovo.

Publication was prepared by:

Ilir T.Berisha – Director of the Department
Ismail Sahiti – Head of Division of Economic Statistics
Hysni Elshani – Head of Sector of Economic Statistics
Bekim Bojku – Officer
Qendresa Shala – Officer
Violeta Syla – Officer
Sulltane Gashi – Officer
Dafina Kumnova – Officer
Bekim Canolli – Officer
Ahmet Cakolli – Officer for design.

Proposals, suggestions and remarks can be sent to email:
(economic@rks-gov.net)

April, 2018

Chief Executive Officer, KAS
Mr. Isa Krasniqi

Symbols and abbreviations

GWh – Measurement unit for electricity (Gigawatt hours of energy).

MWh – Measurement unit for electricity (Megawatt hours of energy) (1GWh=1000MWh).

TJ – Measurement unit for heat (Terajoule)

CEH – Consumption of energy in households

EA - Enumeration Area

PPS – Proportional Probability to Size

LPG - Liquid petroleum gas

Key to symbols

- Not applicable

: No data.

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1 Definitions, population and methodology

1.1. Definitions¹

Household includes all persons living in a common residence and having common living resources. Households here refer to the concept of the private household as opposed to collective households such as religious groups, health centers, orphanages, etc.

Building - Any independent structure that contains one or more dwellings, rooms or other spaces, covered with a roof and surrounded by exterior walls or dividing walls stretching from the foundation to the roof, whether it is designed for residential use or for agricultural, commercial, industrial or cultural purposes or for the provision of services.

Housing unit, also called apartment - Conventional dwelling or non conventional dwelling place where people are living at the time of population census.

Urban - An urbanized geographic area - defined at the settlement level - is characterized by greater population density and great human traits compared to the surrounding areas. In the census of Kosovo, an area is defined as urban with an administrative decision of the municipality.

Rural - Non-urbanized geographic area - defined at the settlement level - characterized by lower population density and usually most of the land is used for agriculture compared to the surrounding areas. In the census of Kosovo, an area is defined as rural with an administrative decision of the municipality.

1.2. Population

The population of Energy Consumption in Households survey (ECH) consisted of dwellings (houses) in Kosovo. As a sampling frame for the ECH were used data from the Kosovo Population Census in 2011 updated in 2013 and 2014. The sampling frame contained 4626 Enumeration Areas. The sampling frame of EAs was initially divided into strata based on urban and rural areas in each region.

1.3. Sampling frame

Energy Consumption in Household is a study based on a probability sampling, hence population characteristics are estimated by using data collected by sampling units and by applying theory of probability.

The sampling was selected with Proportional Proportion to Size (PPS) in each stratum, where the size was based on the number of households in the enumeration area (EA) from the frame of the census.

To ensure a geographically equal distribution of the sampling, the data in the strata are listed by region code, municipal code and district code.

¹ Obtained from the Population Census Manual

For the energy sampling, in the first phase, a total of 500 EA samplings were selected, divided into strata approximately proportionally to the number of households. In the second phase, 10 households were selected within each EA ($500 \times 10 = 5000$). 4,284 households responded to the survey, Table 1 shows population and sampling sizes, as well as the probability of inclusion by the region.

Table 1. Population, sampling size and probability of household inclusion

Region	Households	Sampling	Probability
1 Prishtina	103.077	1.340	0,013
2 Mitrovica	38.235	650	0,017
3 Peja	33.103	480	0,015
4 Prizreni	57.407	930	0,016
5 Ferizai	33.544	530	0,016
6 Gjilani	36.429	510	0,014
7 Gjakova	33.533	560	0,017
Total	335.329	5.000	

The data collection was done through face-to-face interviews during which the questionnaire was completed.

The interview was conducted with a household member who replied on behalf of the entire household. It was usually a member responsible for the household.

In the case of several households living in the same housing unit, it was considered as a household if there was no specific calculation of the heating costs.

Not all sampling units participated in the survey. There were various reasons for not participating.

In the ECH survey, non-responses occurred because the household could not be contacted, the household refused to attend, the household was unable to attend due to illness, or any other reason, etc.

Table 2. Rate of respondents by region

Region	Sampling size Number	Respondents Number	In %
1 Prishtina	1.340	1.041	77,69
2 Mitrovica	650	491	75,54
3 Peja	480	361	75,21
4 Prizreni	930	906	97,42
5 Ferizai	530	514	96,98
6 Gjlani	510	495	97,06
7 Gjakova	560	476	85,00
Total	5.000	4.284	85,68

Table 3 shows that over half of the non-response was due to the inability to establish contacts with households. This was mainly because the respondent was not at home, where 47.77% were in this category (342 cases). While the rejections, the biggest group was categorical refusal and refusal without justification. This happened in 254 cases, or 35.47%, the other reasons were 16.76%.

Table 3. Number of non-respondents and the cause of non-responses

Reasons for non-resonse	Total	%
Not contacted	342	47,77
Household in the sampling lives abroad	85	11,87
Household in the sampling did not reside in its place of residence during the period of the survey	73	10,20
Interviewer was not able to find the person to be interviewed because he / she was not at home	50	6,98
Interviewer was not able to enter the house	13	1,82
Other reason when the household to be interviewed can not be found	121	16,90
Refusal	254	35,47
Refusal (categorical) to respond	87	12,15
Refusal due to lack of time	28	3,91
Refusal due to poor economic situation	34	4,75
Lack of confidence, doubt about the ability to secure the confidentiality of the data	103	14,39
Respondent has already participated in the survey	2	0,28
Other reason	120	16,76
Did not respond due to extraordinary circumstances in the household	73	10,20
Health problems, invalidity or disability, etc.	10	1,40
Elder, and therefore can not participate in the survey	8	1,12
Respondent was not in the designated place at the agreed time or contact was avoided	4	0,56
Other	25	3,49
Total	716	100

1.4. Estimates

Only one part of the population is observed in the sampling study. Results of the survey have been extended to the whole population by estimating the weights for each household responding.

Estimation of weights consisted of the following phases:

- ✓ estimation of basic weights;
- ✓ adjusting weights for non-response;
- ✓ adjustment;

Design weights: The design weight is the opposite of the probability of inclusion (see Table 1). Inclusion options can be calculated after sampling selection for all sampling units. For the unit j in strata h , the probability of the selection in the sampling, i.e. the probability of inclusion is:

$$\pi_{hi} = \frac{n_h}{N_h},$$

where N_h is the total number of households in the sampling frame in strata h and n_h is the sampling size in strata h .

The design weight is estimated for all selected households: interviewed households and not interviewed households.

A certain amount of non-response is typical in sampling surveys. As with any error, they may affect final estimations resulting in bias estimates. Therefore, there should be procedures to measure the effect of errors and reduce prejudice. Here is used weight correction in order to adapt non-response bias. This is done in two steps.

First, the probability of responding of the household was estimated by applying the logistic regression model to the independent variables of the district type and the urbanized area.

Second, the weight adjustment for non-response is estimated by using the following formula:

$$w_{hi}^* = w_{hi} / r_{hi}.$$

Final estimates were calculated by using adjusted weights in known data based on population projections and from other sources in order to reduce the bias caused by errors of non-response in the frame.

2 Residential units (dwellings, houses)

The total number of dwellings was 366 020, of which 333 290 were habitable, of which 64.88% were in rural areas and 35.12% in urban areas.

Table 4. Housing units by area

Habitable spaces by area	Total	Percentage
Urban	117.051	35,12 %
Rural	216.239	64,88 %
Total	333.290	100,00 %

Regarding the types of dwellings, in urban and rural areas, Table 5 presents their configuration:

Table 5. Configuration of habitable spaces across areas

Areas inhabited by type of construction	Rural	Urban	Total
Apartment	2.279	22.012	24.291
House	193.769	115.229	308.998
Total	196.048	137.241	333.289

3 Households

Household include all persons living in a common residence and having common living resources. Household here refers to the concept of the private household as opposed to collective households such as religious groups, health centers, orphanages, etc. Household may consist of only one member.

Table 6. Size of household by area

Number of members	Urban	Rural	Total
1	2.279	4.166	6.445
2	9.546	10.615	20.161
3	16.950	12.873	29.823
4	54.142	58.280	112.422
5	268.824	310.998	579.822
6 and more	325.929	703.391	1.029.320
Total	677.670	1.100.323	1.777.993

In 2015, the total number of residential areas was 366 020, while the number households was smaller (333 290).

Table 7. Households and their size

Number of members	Apartments	Houses	Total
0	1.683	31.048	32.731
1	1.374	7.138	8.512
2	2.146	16.256	18.401
3	3.938	23.745	27.683
4	5.148	43.058	48.206
5	4.344	63.030	67.375
6 and more	7.341	155.772	163.113
Total	25.974	340.046	366.020

Table 8. Number of households by heating area

Heated space, m ²	In urban areas	In rural areas	Total
Up to 20	25.274	43.541	68.815
21-49	46.812	82.868	129.680
50-100	36.426	54.574	91.000
101-150	9.503	14.190	23.693
151 and more	7.906	12.194	20.101
Total	125.923	207.366	333.289

In Kosovo the average heating is 51.58 m² (square meters) for household.

Table 8a. Heated space by category

Heated space, m ²	In urban areas	In rural areas	Total
Up to 20	396.898	619.327	1.016.225
21-49	1.881.503	2.881.377	4.762.880
50-100	2.062.117	2.693.688	4.755.805
101-150	1.214.869	1.639.879	2.854.749
151 and more	1.531.544	2.269.662	3.801.206
Total	7.086.931	10.103.934	17.190.865

4 Use of energy

4.1. Use of energy by households

The types of energy used by households are presented in Table 9. Energy and fuel consumption analyzes (by the number of households) showed that electricity was used in 99.8% of households, 3.92% by heating purchased from central heating. As for fuels, firewood was the most widely used - with an average used at 93.17% of households.

Likewise, a considerable place also gets LPG (gas) with 49.19%.

Table 9. Energy consumption by households (participation in total number of households, %)

Type of energy	In urban areas	In rural areas	Total
Electric energy	100,00	99,70	99,80
Heat for warming up space	11,68	0,00	3,92
Petrol	7,17	6,13	6,48
Diesel	1,70	1,76	1,74
Wood	89,58	94,99	93,17
LPG	49,67	48,95	49,19
Coal	3,92	2,69	3,10
Solar panels	0,52	0,93	0,79

Household data on fuel consumption levels based on the results of the survey are presented in Table 10. These data cover consumption in all households, excluding energy used for domestic business activities.

Table 10 presents data on total energy use by households

Table 10. Consumption of energy from households (natural units)

Type of energy	Unit	In urban areas	In rural areas	Total
Electric energy	GWh	939,06	1269,53	2208,59
Heat for warming up space	GWh	80,48	0,00	80,48
Petrol	Ton	525,97	337,22	863,19
Diesel	m ³	853,94	1.554,57	2.408,51
Wood	Litër	1.267,03	789,75	2.056,78
LPG	Ton	2.990,71	4.158,53	7.149,24
Coal	Ton	29.342,02	17.434,53	46.776,56
Solar panels	m ²	3233,08	2130,75	5363,83

Total energy consumption from households was calculated by using average calorific value of fuels. The survey showed that the largest amount of energy used by households is based on wood fuel.

Table 11. Consumption of energy from households expressed in Terajoule (TJ)

Type of energy	In urban areas	In rural areas	Total
Electric energy	3380,24	4569,82	7950,06
Heat for warming up space	289,69	0,00	289,69
Petrol	23,14	14,84	37,98
Diesel	4.764,07	8.672,82	13.436,89
Wood	53,60	33,41	87,01
LPG	136,25	189,45	325,71
Coal	797,80	474,04	1.271,85
Solar panels	58,88	38,81	97,69

To analyze the amount of consumption of any energy source from a household, the total amount was divided by the number of households consuming this particular source.

Table 12. Average energy consumption for a household by type of energy

Type of energy	Unit	In urban areas	In rural areas	Total
Electric energy	kWh	8022,61	5870,98	6626,64
Heating	kWh	687,56	0,00	241,47
Petrol	Liter	5,78	1,98	3,31
Wood	m ³	7,30	7,19	7,23
Diesel	Liter	12,99	4,38	7,41
LPG	Liter	45,99	34,62	38,61
Coal	Ton	0,25	0,08	0,14
Solar panels	kWh	23,36	8,33	13,61

4.2. Space heating

In Kosovo, central heating systems are widespread in supplying dwellings with heating, particularly in urban areas such as Prishtina and Gjakova. About 70.35% of households use wood² as a heating source, 18.18% use only electricity as a source of heat, 7.10% use coal as a source of energy, 4.02% consume heat from the central or local heating system, and 0.35 % use other alternatives.

Table 13. Heat sources for space heating (%)

Sources of heating	%
Wood	70,35
Electric energy	18,18
Coal	7,10
Electric heater	4,02
Other	0,35

² Wood consumption also includes wood waste and palette and briquette.

5 Electrical appliances in households

Electricity consumption in Kosovo has increased in recent years. Studies in some EU countries have shown that increasing electricity consumption for households does not mean that they do not save electricity. The use of electricity is growing mainly due to the increasing number of household-owned appliances. The results of this survey allow to show the current state of the electricity consumption for all appliances and in particular the main appliances.

Households use a large number of electrical appliances, most of them participating in total electricity consumption.

Table 14. Use of the most widespread electrical appliances

Type of appliance	In 100 households
TV	114,11
Washing machine	103,75
Electric cleaning machine	103,64
Hair dryer	89,99
Iron for ironing	82,52
Refrigerator	81,59
Electric stove	80,45
Freezer	69,06
Computer	45,10
Mixer	40,65
Water pump	37,63
Microwave	22,59
Electric heater	17,84
Musical studio	9,22
Gas bottles	4,65
Baking oven	4,02
Air cooler	3,51
Air conditioner	1,63
Electric grass cutting machine	1,06

Kosovo Agency of Statistics

short description

Kosovo Agency of Statistics is a professional institution which deals with collection, processing and publication of official statistical data. As such acts since 1948 and has passed through several historical stages, structured according to state regulation of those times.

On 2 August 1999, the Agency has resumed his professional work (after nine years of interruption of all statistical series detrimental to the interest of Kosovo), as an independent institution under the Ministry of Public Administration. Since 12.12.2011 the Agency operates in the frames of the Prime Minister's Office. Office is funded by the Kosovo Consolidated Budget, but also by donors for specific projects and for technical professional support.

Kosovo Agency of Statistics acts according to the Law No. 04/L-036 which entered into force on 12.12.2011. Programme of Official Statistics 2013/2017 is in implementation for the development of statistical system in correlation with the European Union statistics (EUROSTAT).

Kosovo Agency of Statistics has this organizational structure: production departments; (Department of Economic statistics and National Accounts, Department of Agriculture and Environment statistics and Department of Social statistics. **Support Departments**; Department of Methodology and Information Technology, Department of Policy Planning, Coordination and Communication, Department of Census and survey and Department of Administration. **Within the Agency are also established Regional Offices**; Gjakove, Gjilan, Mitrovica, Peja, Prizren, Pristina and Ferizaj

In KAS are employed in total 147 workers, of whom 100 (68,0 %) at the headquarters of the Agency, while in the Regional Offices, 47 (32,0%). Agency's educational qualifying structure is as follows: 73,5% with university education, 13,6% with with non-tertiary education, and 12.9% with secondary education.

We have professional and technical cooperation with all Ministries of the Government of Kosovo, especially with the Ministry of Economy and Finance, Central Bank of Kosovo, with international institutions, EUROSTAT, International Monetary Fund, World Bank, Sweden's SIDA, DFID, UNFPA, UNDP, UNVEF, and with the statistical institutions of the countries in the region.

Kosovo Agency of Statistics almost completely covers the territory of Kosovo, based on the statistical structure of the enumeration areas as the basic unit and sole in the country from which it gets first hand information. All surveys conducted in the field use the extension of the samples in these enumeration areas but also a statistical methodology according to international recommendations. During the collection of statistical data and reports from reporting entities are involved professionals, technicians, administrators, servants of the country offices, field enumerators from regional offices, etc.

In 2011, the project of Population Census , Households and Dwellings was successfully implemented, and in 2014 was successfully carried out the Agriculture Census. The result obtained from these censuses will have an important role in the development policies.

The mission of the Agency; to meet the needs of users with qualitative statistical data, objective, in time and space so that users have reliable base to conduct regular analysis in the interest of planning and project development at the municipal and country level. To support government institutions, scientific institutes, research academies, businesses in order to provide proper information for decision-makers and other users in Kosovo.

- **Address: KOSOVO AGENCY OF STATISTICS**
Street. "Zenel Salihu", No. 4, 10000 Pristina
- **Telephone:** +383 (0) 38 200 31 129
CEO: +383 (0) 38 200 31 112
- **Fax::** +383 (0) 38 235 033
- **E-mail:** infoask@rks-gov.net
- **Web:** <http://ask.rks-gov.net>