COUNTRY PRACTICE IN ENERGY STATISTICS

Topic/Statistics:

Sample Statistical Survey on Consumption of Energy by households.

Institution/Organization: State Statistical Committee

Country: Azerbaijan

Date: 26.09.2014

CONTENTS

Abstract

With the purpose of obtaining information on energy consumption the statistical survey, covered 18447 households in all regions of the Republic, has been conducted by the SSC Azerbaijan during 2010.

The following main purposes were achieved by means of survey conduction:

- the data on energy products consumed by households were obtained;
- the completeness of information on energy balance "final consumption sector" was provided;
- the volume of energy consumption by economic regions was defined;
- data on the volume of energy costs of households was obtained.

Key elements

Name of the statistics	Sample Statistical Survey on Consumption of Energy by households.
Background and purpose of the statistics	To obtain the data on energy products consumed by households and provide the completeness of information on energy balance "final consumption sector".
Population, sample and data sources	With the purpose of obtaining information on energy consumption the statistical survey, covered 18447 households in all regions of the Republic, has been conducted by the SSC Azerbaijan during 2010. 26,9 per cent of households were share of Baku city, 22,1 per cent Aran economic region, 13,3 per cent Ganja-Gazakh, 9,0 per cent Lankaran, 7,2 per cent- Shaki-Zagatala, 5,9 per cent Absheron, 5,3 per cent Guba-Khachmaz, 4,0 per cent-Nakhchivan, 3,5 per cent Daghliq-Shirvan, 2,8 per cent Yukhari Garabagkh economic region.
Main users	State Statistical Committee of the Republic of Azerbaijan (Department of Industry and Construction Statistics), Various institutes for research, universities, media etc.
Important contribution or issue addressed	
Other remarks	

General information

1.1. Name of the statistics/topic

The statistics/topic could either be a specific energy statistics (e.g. electricity production) or a topic within energy statistics (e.g. energy balances). For more information, please see Section III of the Instructions.

Sample Statistical Survey on Consumption Energy by households.

1.2. History and purpose

State when the statistics were first published.

2011

Describe briefly the main purpose of producing the statistics and why it is relevant.

To provide the completeness of information on energy balance "final consumption sector" and define the volume of energy consumption by households, to obtain the data on the volume of energy costs of households.

1.3. Reference period

State the time period the data are collected for.

The data were collected monthly: The term of data collecting was from January to December. There is no time break in the time series

1.4 Period of the last annual account (e.g. for electricity), resp. the last 12 months before the term of the survey Frequency

Specify how often the statistics are disseminated (e.g. annually, monthly, quarterly, etc.). If the statistics are not produced at regular intervals, state at what times they have been produced in the past and the main reasons behind the irregularities.

It is the fourth sample statistical survey on consumption of energy by households. The previous surveys have been conducted in 2007, 2008 and 2009.

1.5. Dissemination

Describe how the statistics are published (e.g. printed publications, online publications, online databases, etc.). If applicable, include the web address to the main website of the statistics.

There is printed publication of the results of sample statistical survey. The results of the survey also placed on the webpage of SSC.

1.6. Regional level

State the lowest geographical level (e.g. administrative regions, municipalities, etc.) for which the statistics are made available to the public.

The sample statistical survey had covered all regions of the country (dividing whole country into 10 economic regions and capital).

1.7. Main users

Identify the key users of the data and the main applications. Include both internal and external users, and if possible try to distinguish between end users and others.

State Statistical Committee of the Republic of Azerbaijan; Department of Industry and Construction Statistics;
Various institutes for scientific research, universities, media etc

1.8. Responsible authority

State Statistical Committee of the Republic of Azerbaijan, Department of Industry and Construction Statistics.

1.9. Legal basis and legally binding commitments

"Plan of Actions on EC Energy Reform Support Program for the Republic of Azerbaijan", component "Sample statistical survey on consumption of fuel and energy by households", item 4.1 "Enhancement of official statistics in the field of energy", confirmed by the decree of the Cabinet of Ministers of the Republic of Azerbaijan dated 16 December 2009, № 191.
Law on "Official Statistics". Article 11.

1.10. Resource requirements

The statistical survey is financed with the grant resource appropriated by European Commission to the "Energy Reform Support Program"

Specify the resource requirements for producing the statistics (e.g. man-labour days, number of workers involved in the statistical production process of the statistics/topic in question).

1.11. International reporting

Beneficiary report about financial operations realized with grant resource appropriated by the European Commission to the "Energy Reform Support Program".

2. Statistical concepts, methodology, variables and classifications

2.1. Scope

Describe the scope of the statistics (e.g. the statistics cover supply and use of all energy products in Norway, classified according to International Standard Industrial Classification of All Economic Activities – ISIC).

The statistics cover the energy consumption of Azerbaijan households.

2.2. Definitions of main concepts and variables

Describe the main concepts (e.g.: territory principle, resident principle, net calorific value, gross calorific value).

Territory principle

Describe the main variables (e.g. how are the different energy products defined in the statistics? How are production, intermediate consumption, final consumption, transformation, feed stock, the energy sector, etc. defined?).

The sections of the survey comprise the volume and costs of the consumption energy products by households.

Electricity
Natural gas
Motor petrol
Diesel fuel
Kerosene
Liquid gas
Lubricants
Heating energy
Wood
Wood coal

Consumption of the energy products divides to:

Consumption for domestic necessity;

Consumption by trucks, motor cars and motorcycle

For the other purpose

2.3. Measurement units

Describe in what unit the data is collected (e.g. physical unit (m3, metric tons), monetary unit (basic prices, market prices)). Describe in what unit the data is presented. Describe if the calorific values are collected (e.g. on a net vs. gross basis) and how they are used.
If applicable, describe the density of the energy product(s) and the estimated *thermal efficiencycoefficients*of different energy products and consumer groups or by appliance. Thermal efficiencycoefficient indicates the share of the energy products which is actually usable for end consumption. Descriptions of density and thermal efficiency coefficient could alternatively be put in

Physical (kg, litre, kWh, m^3), monetary units and other quantitative consumption.

2.4. Classification scheme

Include references to relevant international and national standard classifications. If national, give a brief description of the standards. If available, include web addresses to the electronic version of the standards).

Manual on energy statistics prepared by IEA.

2.5. Data sources

Give an overview of the different data sources used in the collection and compilation of the statistics/topic (e.g. household survey, enterprise/establishment survey, administrative data/registers, foreign trade statistics, production statistics and other primary/secondary data sources).
Examples of administrative sources/registers are: business register for enterprises and establishments, population register, land register, housing and building registers, tax registers, international trade registers, etc.

Sample statistical survey on consumption of fuel and energy by households.

2.6. Population

Describe the entire group of units which is the focus of the statistics (the population).

Entire group of the units is households of the Azerbaijan Republic. 1911900 households existed in all the country in 2010. But the survey covered 1% of the population.

Specify the following statistical units:

- Reporting unit
- Observational unit
- Analytical unit

Examples of different kind of statistical units include: enterprise, enterprise group, kind-of-activity unit (KAU), local unit, establishment, homogeneous unit of production.
In most cases the reporting unit, observational unit and analytical unit are identical, but there are examples where this is not the case. In electricity statistics, you may find that energy companies (the reporting unit) provide data about different consumers like the individual household or manufacturing company (the observational unit). The analytical unit may be a group of energy consumers, defined by the ISIC.

The reporting unit, the observational unit and the analytical unit are households of the Azerbaijan Republic.

2.7. Sampling frame and sample characteristics

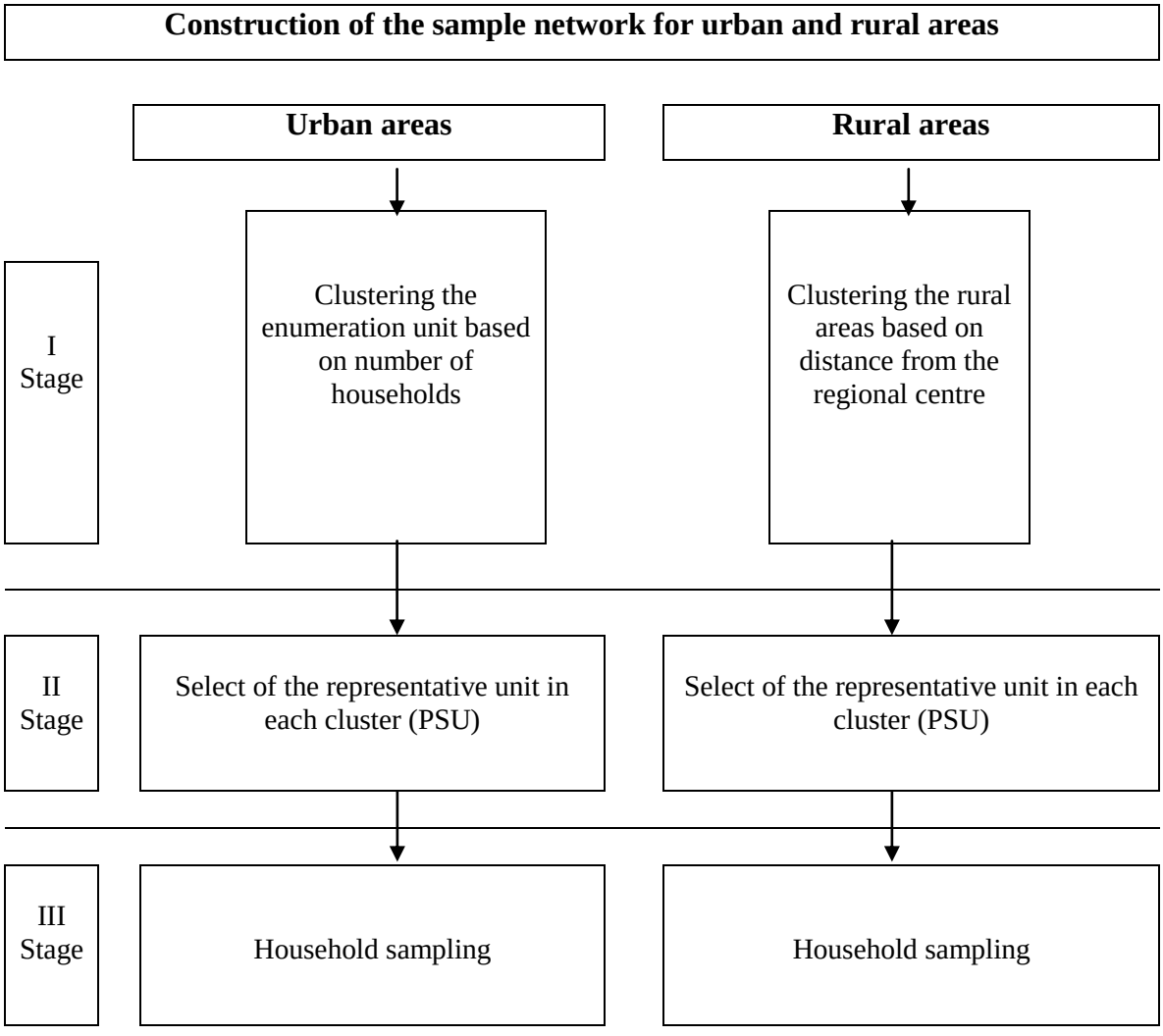
Describe the type of *sampling frame* used in the collection and compilation of the statistics (e.g. list, area or multiple frames). A sampling frame is the source material or device from which a sample is drawn. Note that the sampling frame might differ from the population.

For creation of the sampling networks was using information from the population census. Sampling unit for the survey of "Fuel and energy use in households" of republic are households and the probability sample units for each household in equal. All administrative territorial unit of republic are divided in two groups: urban and rural areas. Scheme for creation sample network on the urban and rural areas is specified below.

The sampling of households was undertaken as follows.

- development of the sampling plan by urban and rural settlement;
- caring out of sampling from representative units according to plan;
-compilation of the address list of the selected households.

Sampling from database has been conducted using SPSS. 13043 households were selected from representative unit by simple random sample method.



Creation of a sample household list in urban and rural areas

For each survey(s) used for the compilation of the statistics, specify the *sampling design* (e.g. random, stratified, etc.). Describe the routines employed for updating the sample. Include information about the sample size, and discuss to what extent the sample covers the population (e.g. energy consumption in the sample compared to total energy use by the population).

Note that chapter *2.7: Sample frame and sample characteristics* may overlap with chapter *3.4:Grossing up procedures.*

Random sample survey. These units were defined by simple accidental sampling order, by the equal probability principle. For realization of this process the total population of household objects was grouped by the regions and types of activity and the sample was conducted within each group by accidental way.

2.8. Collection method

For each survey used for the compilation of the statistics/topic, describe how the data are collected (e.g. face-to-face, telephone, self-administered, paper and internet-based questionnaires, or administrative data and registers).

The data was collected face-to-face and marked on the paper.

2.9. Survey participation/response rate

For each survey used for the compilation of the statistics/topic, specify the average response rate, or refer to response rates for specific surveys conducted.
The respondent rates for the single surveys are:

All sample units were participated.

3. The statistical production process

3.1. Data capture and storage

Creation of sampling network, design of electronic forms, data exchange, conduction of micro and macro control of the data, summarizing were realized by specialists of State Statistical Committee (SSC). During the survey local statistical office accepted filled in questionnaires from interviewers and visually checked up the replies. The errors revealed in questionnaires were corrected and incorrectly filled in questionnaires were returned to interviewers to accurate them in households. Primary control of interviewers' work and creation of electronic database were realized at the Main Calculation Center. The filling questionnaires was forwarded to the address of SSC and received from the local statistical office was checked up by SSC specialists. Foremost, implementation of respondents' sampling design was checked up. After that, the macro control and analysis were realized.

3.2. Data editing

Describe the regular routines employed for detecting and correcting errors. This may include:

- Manual routines for detecting and correcting errors
- Automatic error-detection (and correction)
- Micro- and macro editing procedures
- Data validation procedures
- Outlier identification
- Processes and sources used for quality controls

The completeness and correctness of the questionnaires filled in and presented by households are defined on their initial reception and during the process of data input. For this purpose, control notes were presented in data input documents of the questionnaire; collected, checked and input data were processed and the summary tables were prepared. Models of summary tables were projected by specialist of SSC in electronic form. Output data were prepared and additional calculations and work on design of output data was realized

3.3. Imputation

Describe the principles for imputation and the assumptions that these principles are based on.
Note that this chapter may overlap with chapter *3.2: Data editing* and chapter *5.2: Accuracy*

3.4. Grossing up procedures

Describe how the population is divided into strata and what statistical models the estimations in the strata are based on. Describe how sub-indices are combined into aggregate indices and how uncertainty is estimated.

The criterion for distribution of sampled population by groups was the distribution of subjects by regions.

3.5. Analytical methods

Give a description of any analytical methods used to adjust the data (e.g.: seasonal adjustment and temperature adjustment). A more detailed description of the analytical method can also be included as an annex.

For adjusting data the survey has been carried out every year since 2007 to 2010

4. Dissemination

4.1. Publications and additional documentation

Describe the form of dissemination of the statistics/topics in question (e.g. printed publications, website, etc.). Please provide relevant website link(s) if available.

"Result of sample statistical survey on Fuel and Energy consumption by households" exists in printed form and replaced on the webpage of the SSC. http://www.stat.gov.az/source/balance_fuel

Give a complete reference to publicly available statistics databases where data from the statistics can be extracted. Include web addresses if available online.

Indicate whether you charge users for access to the statistics at any level of aggregation.

No charge.

4.2. Revisions

Describe the current revision policies. E.g.: Is historical data revised when new methodology, new definitions, new classifications etc. are taken into use? Is the data continuously revised, or is the data revised at certain points in times (e.g. every third year, annually, etc.)?

No revision to these statistics.

If applicable, describe any major conceptual or methodological revisions that have been carried out for this statistic/topic in the past.

.

4.3. Microdata

Describe how microdata are stored.

The Main Calculation Center had provided the preparation of the software, obtaining of summary tables and stored.

Specify if microdata are available for scientific and/or public use. If so, describe under what conditions these are made available.

Microdata are available for scientific and/ or public use, as all data are anonymized. These data can be bought with following special rules formed by SSC on transferring data.

4.4. Confidentiality

Describe the legal authority that regulates confidentiality, and what restrictions are applied to the publication of the statistics.

That means data are only supplied in anonymized form, therefore no conclusions to single households are possible.

Describe the criteria used to suppress sensitive data in statistical tables (cell suppression).

Not relevant

Describe how confidential data are handled.

Personal data (e. g name, address, telephone number, etc) was deleted before publishing or using for scientific research.

Describe any confidentiality standards that go beyond what is legally required.

Not relevant

5. Quality

5.1. Relevance

State to which degree the statistical information meet the real needs of clients/users.

The data on energy products consumed by households was obtained; the completeness of information on energy balance final consumption sector was provided.

5.2. Accuracy

State the closeness of computations or estimates to the exact or true values that the statistics were intended to measure.

Measurement and processing errors

Discuss the measurement and processing errors that are relevant for the statistics. Try as far as possible to give an estimation of the size and scope of the errors.

Non-response errors

State the size of the unit non-response and the item non-response, distributed by important variables in the population (e.g. region, industry) . Consider if the non-response errors are systematic, and if so, describe the methods used to correct it. Indicate whether the effects of correcting non-response errors on the results have been analysed, and, if so, describe them.

Non- response errors were correcting immediately during the process of data input. For this purpose, control notes were presented in data input documents.

Sampling errors

Discuss the size of the sampling errors. Compare the population and sample with regards to important properties (e.g. coefficient of variance).

Other sources of error

Discuss other sources of errors that might be relevant for the statistics. E.g.: Model assumption errors, coverage errors

Not relevant

5.3. Timeliness and punctuality

Specify the time between the end of the reference period and publication.
If the statistics are published both as preliminary and final figures, specify the time between publication of preliminary and final figures. You should also point out whether the publication date is set according to certain rules (e.g. advance release calendar, a specific day or prior to other publications).

Planning and conduct of statistical surveys are carried out according to previously declared Program of Statistical Activities.

Point out if there have been any major discrepancies between the planned publication date and the actual publication date in recent years. If so, state the length of this discrepancy and its cause.

No major discrepancies between the planned publication date and the actual publication date in recent years.

5.4. Accessibility

Describe how easily accessible the statistics are. In particular, is there an advance release calendar to inform the users about when and where the data will be available and how to access them?

Are metadata and other user support services easily available? Are there particular groups that don't have access to the published statistics (e.g.: visually disadvantaged)?

The statistics are accessible with following special rules formed by SSC on transferring confidential data.

5.5. Comparability

Discuss the comparability of the statistics over time, geographical areas and other domains.

Comparability over time
Discuss comparability over time and include information about whether there have been any breaks in the time series of the statistics and why. Also describe any major changes in the statistical methodology that may have had an impact on comparability over time.

Comparability over time was provided. There is no time break in the time series.

Comparability over region
Discuss comparability over geographical areas, and include information about whether the statistics are comparable to relevant statistics published by other countries and/or international organizations

Comparability over other domains
Discuss comparability over domains, and include information about whether the statistics are comparable between different industries, different types of households etc.

Not relevant

5.6. Coherence and consistency

Discuss the coherence/consistency between preliminary and final figures.

Discuss the coherence/consistency between monthly, quarterly or yearly statistics within the same subject area. Can the results of different frequencies for the same reference period be combined in a reliable manner?

Discuss the coherence/consistency with other related statistics (also those produced by other institutions/organisations on the same subject).

6. Future plans

Are there any current or emerging issues that will need to be addressed in the future? These could include gaps in collection, timeliness issues, data quality concerns, funding risks, confidentiality concerns, simplifications to reduce respondents' burden etc.?

It is considered to conduct the sample statistical survey on consumption of energy by households in 2016 according to the" State Program on Improvement of the Official Statistics in the Republic of Azerbaijan 2013-2017".

Annexes

Annex I

Statistical analysis of sample survey quality

Sample quality is checked up standard error (Se), that is defined the following formula:

$$Se = \sqrt{\sigma^2 / n} \qquad (1)$$

Where σ^2 – dispersion of sampling unit;
n - number of selected units(PSU, households).

$$\sigma^2 = \frac{\sum_{i=1}^{n} (y_i - \bar{y})^2}{n} \qquad (2)$$

Where y_i -characteristics of (i) household;
$\bar{y}$ - average value of households characteristics;
deff- sample design effect.

Sample survey quality depends on limit of standard error (LSE), relative standart error (RSE) and coefficient of variation (CV):

$$LSE = t*Se \qquad (3)$$

Using the value of limit of standard error the confidence interval is defined

$$Y_L = \bar{y} - LSE ; \quad Y_r = \bar{y} + LSE \qquad (4)$$

Where, Y_L – is the lower limit of confidence interval;
Y_r – is the upper limit confidence interval.

The coefficient of variation (CV) is defined by the following formula

$$CV = (Se/\bar{y}) * 100 \qquad (5)$$

Coefficient of variation is used for definition of relative standard error of the sample. If coefficient of variation is less than 5 per cent (CV<=5 %), the sample is considered as qualitative, when 5<CV<=33 % the sample is considered as normal.Methodological and technological questions impact on the survey quality. Method of sample, sample representativeness, error of sample units grouping, quality of actualized data and etc refer to methodological error. Errors of interviewer, errors of controler, error on preparation, processing, summarizing of data and etc refer to technological errors. By using new IT approch it is possiblity to reduce the above mentioned errors as well as the financial, material and labour resources nedded conducting the survey.

Annex II

Amount of fuel consumed for domestic purposes, thousand tones

	Motor gasoline		Diesel fuel		Liquid petroleum gas		kerosene		Wood, thousand m^3	
	2009	**2010**	**2009**	**2010**	**2009**	**2010**	**2009**	**2010**	**2009**	**2010**
Republic, total	**1,3**	**1,2**	**12,3**	**12,4**	**57,4**	**53,7**	**2,8**	**1,8**	**221,7**	**301,9**
Includinq economical regions:										
Baku city	-	0,1	-	0,3	0,4	0,3	-	0,1	-	-
Nakhchivan	0,2	0,1	0,5	0,4	1,6	1,4	0,2	0,1	8,7	10,6
Absheron	-	-	-	-	0,5	0,3	-	0,1	-	-
Ganja-Gazakh	-	0,1	1,3	1,2	4,3	4,1	0,3	0,2	30,5	47,2
Shaki-Zagatala	-	0,2	2,1	2,2	7,5	6,8	0,2	0,1	28,2	41,0
Lankaran	0,3	0,1	-	0,2	8,5	7,8	0,6	0,4	43,7	60,7
Guba-Khachmaz	-	0,1	0,6	0,5	0,4	0,6	0,2	0,1	18,7	26,9
Aran	0,4	0,2	5,2	5,3	31,1	29,4	1,0	0,5	48,9	59,8
Yukhari Karabakh	0,3	0,2	0,8	0,7	1,0	1,1	0,2	0,1	17,6	23,4
Daglig Shirvan	0,1	0,1	1,8	1,6	2,1	1,9	0,1	0,1	25,4	32,3

Amount of fuel consumed in different modes of transport in households, thousand tones

	Motor gasoline		Diesel fuel		Liquid petroleum gas	
	2009	**2010**	**2009**	**2010**	**2009**	**2010**
Republic, total	**761,2**	**832,3**	**243,6**	**312,9**	**3,1**	**3,2**
Includinq economical regions:						
Baku city	232,7	253,8	22,7	29,2	0,3	0,2
Nakhchivan	50,3	54,9	23,1	29,8	-	-
Absheron	32,5	35,8	7,1	9,7	0,2	0,2
Ganja-Gazakh	97,5	106,5	35,6	42,8	-	0,1
Shaki-Zagatala	49,3	54,2	21,6	30,4	0,2	0,2
Lankaran	48,8	53,3	5,7	7,2	-	0,2
Guba-Khachmaz	39,3	43,2	4,8	6,3	0,1	0,2
Aran	175,4	192,4	109,2	139,5	2,1	1,8
Yukhari Karabakh	18,3	19,9	3,4	4,5	-	0,1
Daglig Shirvan	17,1	18,3	10,4	13,5	0,2	0,2

Annex III

Annual consumption of electricity and natural gas per household by economic regions