COUNTRY PRACTICE IN ENERGY STATISTICS

Topic/Statistics: Annual energy statistics

Institution/Organization: National Institute of Statistics

Country: Romania

Date: 20.02.2012

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Abstract

Write a short abstract of the statistics, and try to limit it to one page. The purpose of the abstract is to give the reader a general overview of the statistics/topic. It should therefore include a brief overview of the background and the purpose of the statistics, the population, the sample (if relevant), the main data sources, and the main users of the statistics. The abstract should also mention what is the most important contribution or issue addressed in the country practice (e.g. the practice deals with challenges of using administrative data, using of estimation, quality control, etc.). If there are other elements that are considered important, please feel free to include them in the abstract.

Keep in mind that all relevant aspects of the statistical production will be covered in more detail under the different chapters in the template. Therefore, the abstract should be short and focused on the key elements. What the most important elements are can vary from statistics to statistics, but as a help to write an abstract you can use the table below. The table can either replace a text or can be filled out in addition to writing a short text.

	Key elements
Name of the statistics	Annual energy statistics
Background and purpose of the statistics	Annual energy statistics data collection is based on 3 annual surveys; these are: E01- energy resources and consumption in year E02- electricity and heat production in year P- inputs/outputs of refineries in year The data are used for energy balance computation;
Population, sample and data sources	The population refers to all enterprises, active on national territory in the reference year; The surveys are a combination of census and sample; The data sources are enterprise/establishment surveys.
Main users	Government, policy makers, Eurostat, IEA, UNECE, enterprises or businesses;
Important contribution or issue addressed	Not relevant
Other remarks	Not relevant

1. 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.

Annual energy statistics: solid fuels, liquid fuels, natural gas, renewables, electricity and heat production and consumption;

1.2. History and purpose

State when the statistics were first published.

Starting with year 2001, NIS is computing and publishing the energy balance in the present Eurostat format and filling in the Joint IEA/Eurostat/UNECE Annual Questionnaires. A back casting was performed in 2001 for 1992-2000.

E01 is an annual survey, dedicated to ESR requirements.

The indicators are: resources (initial stock, own production, input from other national territory, imports) and consumption (exports, losses, *in situ* consumption, deliveries to other national territory (of which population), final stocks) for more than 40 energy carriers.

In situ consumption is breakdown by KAU at 4 digits NACE Rev.2.

This survey is performed since 2001, being developed and updated every year according to national and international (including ESR) requirements.

There is no break in series, although previous to year 2007 the threshold for census for units with NACE Rev.2 >40 was 250 employees.

E02 is an annual survey, dedicated to ESR requirements.

The indicators are: electricity production, by type (hydro, wind, nuclear, thermoelectric, etc), installed capacities for electricity production (of which for hydro by size), by fuel for thermoelectric (coal, liquid fuels, gas, biomass, etc), total of which CHP; heat production, by fuel (coal, liquid fuels, gas, biomass, etc), by plant type (CHP or heat only); fuel consumption for electricity and/or heat production, total of which CHP, by fuel

This survey is performed since 2001, being developed and updated every year according to national and international (including ESR) requirements.

There is no break in series.

All the respondents of E02 survey also fill in E01 questionnaire.

"P" is an annual survey, dedicated to ESR requirements.

The indicators are: input to refineries (crude oil, NGL, etc).output of finished products (refinery gas, LPG, etc)

This survey is performed since 2001, being developed and updated every year according to national and international (including ESR) requirements.

There is no break in series.

All the respondents of "P" survey also fill in E01 questionnaire and, if they are electricity and heat producers, also fill in E02.

Describe briefly the main purpose of producing the statistics and why it is relevant. The annual energy statistics data collection is used for the computation of the annual energy balance.

1.3. Reference period

State the time period the data are collected for.	
The data are collected in year "y" for year "y-1".	

1.4. 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.

The statistics are disseminated annually, with no irregularities.

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.

The statistics were disseminated in the form of energy balance by printed publication until 2 year ago; currently a CD is produced. The online publication can be found at: http://www.insse.ro/cms/rw/pages/balanta%20energetica.ro.do:jsessionid=d8bea1bb975fd8bf25dd5a3bad5b2b8af458c2e4ae25a60044c6fd5e9820dcd.e38QbxeSahyTbi0Nb3j0

The online database can be found at: https://statistici.insse.ro/shop/

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 energy balance is available only at NUTS 0 level. No regional data are available.

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.

Eurostat, IEA, UNECE; Romania: President Administration, Government, Parliament, national environment agencies, mass media

1.8. Responsible authority

Write the name of the institution and department/office with the main responsibility for disseminating the statistics (e.g.: Statistics Norway, Department of Economics, Energy and the Environment). National Institute of Statistics

1.9. Legal basis and legally binding commitments

State the national legal basis for the data collection. Include a complete reference to the constitutional basis, and web address to an electronic version (e.g.: The Statistics Act of 16 June 1989 No. 54, §§2-2 and 2-3, <u>http://www.ssb.no/english/about_ssb/statlaw/forskrift_en.html</u>).

The Statistics Act 226/2009, <u>http://www.insse.ro/cms/files/legislatie/Legea%20nr.%20226%20-%20Organizarea%20si%20Functionarea%20Statisticii.pdf</u>

Annual Statistical Programme, approved by Government Decision http://www.insse.ro/cms/files%5Clegislatie%5Cprograme%20si%20strategii%5CPSNA%202010.pdf

If the data collection is not based on a legal basis, give a short description of other agreements or volunteer arrangements.

Not relevant

If applicable, give reference to national and international commitments that are legally binding (e.g. EU statistical legal acts).

Regulation (EC) No 1099/2008 of European Parliament

1.10. Resource requirements

Specify how the production of the statistics is financed (e.g. over the ordinary budget, project based support, financial support from other institutions or organization). If applicable, state the contracting entity (e.g.: Ministry, EU Commission, OECD). A contracting entity is any entity which is ordering a survey or the compilation of a statistics, and paying for it

Ordinary budget, Romanian Government

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).

Not relevant

1.11. International reporting

List any international organizations and names of reporting schemes that the statistics are reported to. If available, also include the website where the reported data are published (e.g. International Energy Agency, Monthly Oil Statistics, UNSD, etc.).

Eurostat, IEA, UNECE via Joint IEA/Eurostat/UNECE Annual Questionnaires

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 covers all supply and use of all energy products in Romania, according to Regulation 1099/2008.

2.2. Definitions of main concepts and variables

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

The statistics are collected according to territory principle; the NCV is requested for each fuel.

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 energy products and the main variables are identical with those described in Regulation (EC) 1099/2008.

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 efficiency coefficients* of different energy products and consumer groups or by appliance. Thermal efficiency coefficient 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 an annex.

The data are collected in physical units (m3, metric tons); the NCVs are collected in order to transform the physical units in toe and GJ.

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).

The international classifications used are: NACE Rev.2, PRODCOM.

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.

"E01", "E02" and "P" are enterprise surveys; biomass consumption is estimated based on HH survey; administrative data are used for bunkers; imports and exports data are from foreign trade statistics

2.6. Population

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

The target population: all active enterprises in the reference year, on national territory. The data source for the totals is represented by the population of the enterprises used in Structural Business Survey (SBS).

The main statistical unit for E01, E02, P is the enterprise, as defined in the <u>Council Regulation</u> <u>696/1993</u> on statistical units or as defined in the national statistical business register. <u>EU Regulation</u> <u>2186/1993</u> requires that Member States set up and maintain a register of enterprises, as well as associated legal units and local units.

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, observational unit and analytical unit are identical

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.

The sampling frame used is the national business register, named REGIS. E01 is a business survey; this survey is a combination of census and sample. **Census** for: all producers of primary energy all producers of secondary energy all enterprises (except the ones above) with more than 250 employees for NACE REV.2: 01, 02, 03, 07, 08 \leftrightarrow 39 all rail, air, naval and pipe transporters (for NACE REV.2: 4910, 4920, 4950, 50, 51) units with more than 50 employees for NACE REV.2: 41, 42, 43, 45 \leftrightarrow 99 **Sample** for the rest of enterprises, representative at 2 digits NACE Rev.2 and national level.

E02 and P are census based.

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.

The sampling design used was the stratified sampling with simple random sampling within the strata. The strata were defined according to the economical activity and enterprise size by the number of employees.

For the sample allocation, Neymann allocation method was used.

The sample size for E01: approx: 8000 units previous to 2007;

approx. 14000 units starting with 2007;

Energy consumption in the sample compared to total energy use by the population is 93.3%. The list for E02: aprox. 1400 units The list for P: 12 units

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).

E01, E02, P are self-administered paper questionnaires.

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 non-response rate varied between 10% and 12%.

3. The statistical production process

3.1. Data capture and storage

Describe how the data is captured and stored (e.g. if the respondent replies using Internet-based questionnaire, the received data are electronically transferred to the production database. Paper questionnaire responses are keyed manually to the production database).

Paper questionnaires are keyed manually into the database.

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

Manual and automatic error-detection and manual correction; micro and macro editing procedures; data validation procedures and outlier identification.

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

No imputation is performed.

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 computation of the final weight was performed according to the following steps :

1. Calculation of a selection weight (π_{ib}) for each unit. The selection weight is a Horvitz – Thompson weight and is computed as the inverse of the selection probability.

$$\pi_{ih} = \frac{1}{p_{ih}} = \frac{1}{\frac{n_h}{N_h}} = \frac{N_h}{n_h}$$

Where:

- p_{ih} = the selection probability of unit i from stratum h

- N_h = the number of units for stratum h

 $-n_{\rm h} =$ the number of units selected in the sample from stratum h

2. Determination of atypical units. These units are completed enumerated. Atypical units are established using the normal variable (z score).

$$Z_{is} = \frac{x_{is} - x_s}{\sigma_{ss}} \quad \text{ unde :} \quad$$

Where:

- $z^{is} = z$ score for unit i from stratum s

- x_{is} = individual value for the reference indicator (energy consumption), unit I from initial stratum s - x_s = mean value for energy consumption. in stratum s

- σ^{xs} = mean standard deviantion of energy consumption in the initial stratum s

3.Calculation of a non-response weight (cih). The non-response weight is computed at each stratum level, as the inverse of the response probability. The purpose of this coefficient is to compensate the non-respondent units, under the assumption that these non-responding units have the same training patterns compared with the responding units in the same stratum. Another considered premise is the fact that answering and non-answering is a random variable.

$$c_h = \frac{1}{p_{rh}} = \frac{1}{\frac{m_h}{n_h}} = \frac{n_h}{m_h}$$

Where.

- $z^{is} = z$ score for unit i from stratum s

- x_{is} = individual value for the reference indicator (indicatorul pe baza caruia se face extinderea), unit I from initial stratum s

- x_s = mean value for energy consumption in stratum s

- σ^{xs} = mean standard deviantion of energy consumption in the initial stratum s

4. Calculation of the final weight ($COEF_{ih}^{ext}$)

 $COEF_{ih}^{ext} = \pi_{ih} \cdot c_h$

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.

No adjustments are performed.

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.

The statistics were disseminated in the form of energy balance by printed publication until 2 year ago; currently a CD is produced. The online publication can be found at:

http://www.insse.ro/cms/rw/pages/balanta%20energetica.ro.do;jsessionid=d8bea1bb975fd8bf25ddd5a 3bad5b2b8af458c2e4ae25a60044c6fd5e9820dcd.e38QbxeSahyTbi0Nb3j0

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

Aggregated data are available online; database can be found at: https://statistici.insse.ro/shop/

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

The historical data are revised, if some errors are detected, on annual bases.

Starting with 2001, no drastic changes have been performed in methodology, so no such revisions have been performed.

When methodological updates occur (new variables are collected and computed) the series starts at that point, with no back casting.

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

Not relevant

4.3. Microdata

Describe how microdata are stored.

The microdata are stored on NIS server.

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

No microdata are available for scientific and/or public use.

4.4. Confidentiality

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

No restrictions are applied for aggregated data.

Describe the criteria used to suppress sensitive data in statistical tables (cell suppression). Not relevant

Describe how confidential data are handled.

Only the statistical personnel actually involved in data collection and computation has access to the microdata. Statistical personnel are bound by law to keep the confidentiality of statistical data.

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. High.

5.2. Accuracy

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

High

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.

Not relevant

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.

The Un-weighted Unit non-response rate varied between 10% and 12% (2001-2010). There is no item non-response.

The method for correcting unit non-response is described at pct.3.4

Sampling errors

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

DIV NACE Pay 2	CV
1	0.072096
2	0.072090
3	0.230799
	0.222388
	0
	0
2	0
3	0.103301
10	0
10	0.03851
12	0.06179
12	0
13	0.105187
14	0.047062
15	0.097052
16	0.034917
17	0.277388
18	0.349856
19	0
20	0.003855
21	0.084571
22	0.045451
23	0.041731
24	0.004064
25	0.060499
26	0.028378
27	0.045493
28	0.023556
29	0.018731
30	0.038123
31	0.057755
32	0.128494
33	0.104244
35	0
36	0.030278
37	0.135461
38	0.115833
39	0
41	0.03083
42	0.014824
43	0.04792
45	0.048365
46	0.02833

The coefficient of variance for energy consumption, by NACE, is as follows:

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).

November 15 is the publication date for the data of previous year. The date is established according to Regulation 1099/2008 and National Annual Statistical Programme.

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 discrepancies.

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 advance release calendar is available as a paper publication and online at: http://www.insse.ro/cms/files/catalog/E-catalog-

2012.pdf;jsessionid=552f234bea9e032c6b63b8671e983f39998008a8f2f594dd2d1d6249d0ca0497.e38 QbxeSahyTbi0Nb3j0

The metadata are available at: <u>http://colectaredate.insse.ro/metadata/public.htm?locale=en</u> NIS has no knowledge of a visually disadvantaged user.

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.

Stating with 2008 as reference year, the final energy consumption is computed according to NACE Rev. 2.

The impact of the transition from NACE Rev.1 to NACE Rev.2 was insignificant.

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 organisations.

Not relevant

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.

Not relevant

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?

There is a good consistency between monthly, quarterly or yearly statistics. Some differences may occur, as monthly and quarterly data are provisional data and annual are final data.

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

Not relevant

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.?

No

Annexes

Illustrations and flowcharts

Illustrations and flowcharts are useful to summarize information and to get a better overview of the statistical production process. Illustrations and flowcharts can either be places in annexes or be included under relevant paragraphs in the template.

E.g.:

- A conceptual flowchart which illustrates the flow of data in the production of the statistics.
- A flowchart which illustrates the main tasks in the production process and the dependency between them.

Time schedule

Include a time schedule for the different phases of the statistical production process. The statistical production process *may* be divided into the following phases. Phase 1-3 may only be relevant for when a new statistics/survey is set up.

- 1. Clarify needs (e.g. map users needs, identify data sources)
- 2. Plan and design (e.g. plan and design population, sample size, how to analyze and edit data)
- 3. Build (e.g. build and maintain production system, test production system)
- 4. **Collect** (e.g. Establish a frame, draw the sample, collect data)
- 5. Edit (e.g. identify and code micro data, edit data, imputation)
- 6. Analyse (e.g. quality evaluation, interpret, analyse)
- 7. Disseminate (e.g. publish data, user contact)

Questionnaires

Include the complete questionnaire(s)/survey form(s) used

Example of publication tables

Include an example of a typical table published for the statistics. Include web addresses if available online.

Detailed description on analytical methods

If relevant, a detailed description of analytical methods used in the statistical production (like seasonal adjustment, temperature adjustment etc.) may be described in an annex. A short description can also be included in chapter 3.5: Analytical methods or under other suitable chapters.