



METHODOLOGICAL EXPLANATION

Maja Kramžer, Teja Rutar, Tomaž Božič

ANNUAL ENERGY STATISTICS

This methodological explanation relates to the data releases:

- Energy supply, Slovenia, annually, provisional data (First Release)
- Energy statistics, Slovenia, annually, final data (First Release)



October 2023

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1 PURPOSE

The purpose of publishing the data is to show the structure of energy production and consumption in Slovenia, which includes domestic production, imports and exports, transformation and final energy consumption.

Key statistics published are:

- Amount of energy for supply by energy sources
- Amount of energy consumed in the process of transformation by energy sources
- Amount of final energy consumed by energy sources and consumption sectors
- Amount of energy consumed in households by end use (space heating and cooling, water heating, cooking, other end uses)

2 LEGAL FRAMEWORK

- [Annual Programme of Statistical Surveys \(LPSR\) \(only in Slovene\)](#)
- [National Statistics Act \(OJ RS, No. 45/95 and 9/01\)](#)
- [Regulation \(EC\) No 1099/2008](#) of the European Parliament and of the Council of 22 October 2008 on energy statistics (CELEX number 32008R1099)

3 UNIT DESCRIBED BY THE PUBLISHED DATA

Units described by the published data are:

- Energy produced, examined by energy source
- Imported and exported energy, examined by energy source and country
- Energy in the form of stocks, examined by energy source
- Transformation of energy, examined by energy source, which enters the transformation and the energy source that is the output from the transformation
- Energy consumed, examined by sector of consumption and energy source
- Energy consumed by households, examined by the end use

4 SELECTION OF OBSERVATION UNIT

Observation units are business entities and dwellings occupied by private households.

The following surveys have full coverage:

- **E1-EE/L** – includes business entities the primary activity of which is electricity production and business entities which produce electricity and/or heat for their own use or sale in addition to their primary activity (220 units)
- **E3-TOP/L** – includes business entities which produce and/or distribute heat (55 units)
- **E4-EEP/L** – includes the electricity transmission business entities (1 unit)
- **E5-EED/L** – includes electricity distribution business entities (5 units)
- **E9-PL/L** – includes business entities which supply natural gas and liquefied petroleum gas (20 units)
- **E11-TG/L** – includes the business entity which extracts brown coal and lignite (1 unit)

E8-NPT/L includes selected business entities which trade with petroleum products (16 units). As a measure for cut-off the full quantity coverage of import/export of LPG, motor gasoline, kerosene jet fuel, biodiesel, diesel and fuel oils is applied.

E-PE/L is a sample survey (selection with threshold) which covers all active business entities with 20 or more employees that are according to NACE Rev. 2 registered in agriculture, forestry and fishing, mining and quarrying, manufacturing, electricity, gas, steam and air conditioning supply, water supply, sewerage, waste management and in construction. Observation units that are additionally included employ less than 20 people, but consume larger quantities of specific energy products. Up to about 1,800 units are included in the sample. Reporting units with a certain activity according to the NACE Rev. 2 (A01, A02, D35) are obtained from other statistical surveys (KME-PMG, E1-EE/L, E5-EED/L). The statistical survey KME-PMG covers all agricultural holdings with agricultural production and business entities, which perform forestry activity. Both surveys have complete coverage of reporting units.

E-RES is a sample survey which covers all active business entities with 2 or more employees that are according to NACE Rev. 2 registered in G – wholesale and retail trade, repair of motor vehicles and motorcycles, H – transportation and storage, I – accommodation and food service activities, J – information and communication, K – financial and insurance activities, L – real estate activities, M – professional, scientific and technical activities, N – administrative and support service activities, O – public administration and defence, compulsory social security (excluding 84.22 – Defence activities), P – education, Q – human health and social work activities, R – arts, entertainment and recreation, S – other service activities and U – activities of extraterritorial organisations and bodies. Up to about 5,000 units are included in the sample.

In the statistical survey on **renewable energy sources** administrative sources have full coverage.

APEGG is a sample survey in which dwellings occupied by private households are chosen. Stratified sampling is used in the survey. The sample is stratified by the type of buildings (according to actual use), years of construction and types of settlements. Also the type of heating, the presence of farm and statistical regions are taken into account implicitly. Allocation of selection units is disproportional. The sample size is around 7,000 units.

5 SOURCES AND METHODS OF DATA COLLECTION

Data are collected annually with the following surveys:

- **E1-EE/L** – Electricity and heat production with technical information on energy devices. With the report the data on production (by energy source), consumption and sale of electricity and heat, on fuel consumption as well as on types, number and power of engines that drive generators are collected. The data are obtained by questionnaires sent by mail (Annual questionnaire on the electricity and heat production) and from the administrative source managed by Borzen.
- **E3-TOP/L** – Heat supply. With the report the data on production of heat by energy source, on purchase of heat, on fuel consumption in heat only plants, on distribution of heat as well as on heat pipelines are collected. The data are obtained by questionnaires sent by mail (Annual questionnaire on the heat supply) and from the administrative source managed by Energy Agency.
- **E4-EEP/L** – Electricity transmission. With the report the data on purchase, transmission, import, export of electricity and on losses in transmission grid are collected. The data are obtained by questionnaires sent by mail (Annual questionnaire on the electricity transmission).
- **E5-EED/L** – Electricity distribution. With the report the data on electricity and fuel consumption are collected. The data on electricity distribution are obtained from the administrative source (EPOS) managed by is the Ministry of Infrastructure – the Energy Directorate.
- **E8-NPT/L** – Petroleum products trade sale to trade companies, energy sector, manufacturing and mining sector, construction sector, road and rail transport, households and other sectors are collected. The data are obtained by questionnaires sent by mail (Annual questionnaire on the petroleum products trade).
- **E9-PL/L** – Gas supply. With the report the data on import, export, purchase, own use and losses and structure of sale of natural gas and liquefied petroleum gas are collected. The data are obtained by questionnaires sent by mail (Annual questionnaire on the gas supply).
- **E11-TG/L** – Coal extraction. With the report the data on production, sale and export of brown coal and lignite are collected. The data are obtained by questionnaires sent by mail (Annual questionnaire on the coal extraction).
- **E-PE/L** – Consumption of energy, fuels and selected oil derivatives. The report includes fuel consumption also for production of electricity and heat for sale. The data in this survey are obtained by online questionnaire (Consumption of energy, fuels and selected oil derivatives). Data for reporting units with a certain activity according to the NACE Rev. 2 (A01, A02, and D35) are obtained from other statistical surveys (KME-PMG, E1-EE/L and E5-EED/L). The KME-PMG survey provides data on energy consumption in agriculture and forestry, by type of energy source. Data from these statistical surveys are obtained with the paper questionnair. Aggregated data on the consumption of certain energy sources for activities A01 and A02 (NACE Rev.2) are obtained from ARSO. Data on

electricity consumption for activities A, C33, D, E and F (NACE Rev.2) are obtained from the Electricity Distribution System Operator (SODO).

- **E-RES** – Energy consumption in the services sector. With the report the data on energy consumption in the services sector by type of energy source and data on the use of alternative technologies are collected. The data in this survey are obtained by online questionnaire (Energy consumption in the services sector).
- **APEGG** – Energy consumption in households. The data in this survey are obtained by modelling. The Jožef Stefan Institute (IJS) also participates in the survey, namely by preparing a model of energy consumption in households by which data on energy consumption by end use and type of energy source, the consumption of electricity, types of space and water heating systems and energy sources for them are calculated. Input data for the model are the result of the survey Household energy consumption (which is carried out by SURS every 4 years), data on energy supply, which are collected by the above mentioned surveys in the field of energy, and data from various administrative sources (Eco Fund, Geological Survey of Slovenia).
- **Renewable energy** – With the report the data on renewable energy sources (wood biomass, biogas, wind energy, solar energy, geothermal energy, etc.) are collected. The data in this survey are obtained by the above mentioned questionnaires sent by mail, by combined (web and field) survey combined with modelling (APEGG) and from the administrative sources (EPOS, Geological Survey of Slovenia, Borzen).
- **E3-TOP/L** – Heat supply. With the report the data on production of heat by energy source, on purchase of heat, on fuel consumption in heat only plants, on distribution of heat as well as on heat pipelines are collected. Data are obtained from administrative source, which administrator is Energy Agency. The Energy Agency, acting under public authorisation, carry out the administrative and other tasks specified in the Energy Act, EU regulations, which determine the competences of the national energy regulators, or in general act of the agency adopted on the basis of the energy legislation.
- **APEGG** is a sample survey in which dwellings occupied by private households are chosen. SURS does not obtain data for APEGG from the administrative sources. The Jožef Stefan Institute - Energy Efficiency Centre, itself obtains data from administrative sources and these are the input data for the model of energy use in households.

6 DEFINITIONS

Ambient heat includes aerothermal, hydrothermal or geothermal energy captured by heat pumps from the environment; energy used to drive heat pumps (electricity, etc.) is not included.

Autoproducers are undertakings which generate electricity and/or heat wholly or partly for their own use as an activity which supports their primary activity. They may be privately or publicly owned.

Carbon intensity is the ratio between total amount of CO₂ emissions and total primary energy supply in the country.

CHP plants are combined heat and power plants which are designed to produce both heat and electricity.

Energy dependency is the ratio of net imports (import – export) and total primary energy supply. It measures the extent to which the country relies on imports to meet its energy needs.

Energy efficiency is the ratio of total final consumption and total primary energy supply.

Energy intensity is the ratio of energy quantity (total primary energy supply or total final consumption) and gross domestic product at constant prices. Energy intensity decreases with energy efficiency improvements.

Energy sector includes fuel and energy that is consumed by the energy industry to support the extraction and production of fuels and transformation activities. It excludes own use of plants. The energy sector covers section Electricity, gas, steam and air conditioning supply (D) and subsections Mining and quarrying (B): Mining of coal and lignite (B05), Extraction of crude petroleum and natural gas (B06), Mining of uranium and thorium ores (07.21), Extraction of peat (8.92), Support activities for petroleum and natural gas mining (09.1) and Manufacturing (C): Manufacture of coke and refined petroleum products (C19) of the Standard Classification of Activities.

Energy use is total consumption of electricity and fuels for drive, internal transport, heating of workplaces and offices, consumption of warm water and steam for drive and technological processes.

Firewood is a traditional form of wood fuel. These are sawn and split pieces of wood, 30-50 cm long, which are made directly from round timber of inferior quality or prefabricated meter logs.

GCV (gross calorific value) measures the total amount of heat produced by fuel combustion.

Heat only plants are plants which are designed to produce heat only.

Heat pumps are devices that use heat from their surroundings and convert it into useful heat for space heating and/or water heating.

Types of heat pumps are divided according to the source they use:

- air-water heat pumps cool outside air (in some cases indoor air, e.g. large cellar for wine, food, etc.), and heat radiator and sanitary water;
- ground-water heat pumps use heat from the earth;
- water-water heat pumps use heat from underground and surface water;
- air-air heat pumps use the heat from the ambient air; they heat the air inside the living space and they can't be used to heat sanitary water.

Liquefied petroleum gas – LPG is butane, propane or a mixture of both. It is used for space heating, heating of sanitary water and cooking, and also as motor fuel for cars.

Main activity producers are supply undertakings which generate electricity, electricity and heat or heat only as their primary activity. They may be privately or publicly owned.

Manufacturing and construction covers section Manufacturing (C) without subsection Manufacture of coke and refined petroleum products (C19) and section Construction (F) of the Standard Classification of Activities.

Natural gas is a fossil fuel in the gaseous state. The main component is methane with up to 20% (by volume) of filth and other constituents. It is used for space heating, heating of sanitary water and cooking.

NCV (net calorific value) measures the amount of heat we can use. The other part is used for evaporation of fuel moisture.

Net power is power with which a power plant can operate for a longer time.

Renewable energy sources (RES) renewable energy sources include biomass, biofuels, biogas, wind and industrial and municipal waste.

RES electricity represents a share of renewable electricity; it is a quotient between gross final electricity consumption from renewable sources and gross final electricity consumption.

RES heating and cooling represents a share of renewable energy for heating and cooling; it is a quotient between gross final renewable energy consumption for heating and cooling and gross final energy consumption for heating and cooling.

RES overall share represents a share of renewable energy in gross final energy consumption.

RES transport represents a share of renewable energy for transport; it is a quotient between gross final consumption of energy from renewable sources for transport and gross final energy consumption for transport.

Sm³ - standard cubic meter is gas volume at standard conditions (at temperature 15°C and pressure 1,01325 bar).

Solar energy collectors (solar collectors) are used to convert solar energy into heat and can be designed exclusively for heating sanitary water or for heating both sanitary and heating water.

Stock change reflects the difference between opening stock level at the beginning of the period and closing level at the end of period.

Statistical difference is a category which includes the sum of unexplained statistical differences for individual fuels. It also includes the statistical differences that arise because of the variety of conversion factors.

Tonne of oil equivalent (TOE) expresses the amount of heat equivalent to the heat of combustion of one tonne of oil. TOE is an accounting unit which is used for expressing energy use in energy balances. 1000 toe = 41,868 TJ

Total primary energy supply is the quantity of energy consumed within the borders of a country. It is calculated: indigenous production + imports – exports ± stock changes – international marine bunkers.

Transformation includes fuel consumption for electricity and heat production.

Types of space heating of dwellings:

- **Local heating** is the heating type where the heat source is located in the room which is heated. It is usually intended for a single room, which can be heated independently from other areas. Rooms are heated with different fireplaces (open, closed; thermo fireplaces and place tile stoves with a warm-water exchanger are not included here), stoves (ceramic, cast iron, steel)... We also use electric heaters; these can be radiant (usually in the bathroom), convection (with or without fan) or storage.
- **Floor central heating** is the heating type where dwelling is heated by radiators or radiant heating (floor, wall heating). Heat is produced in one furnace - central heating device (regardless of the source: gas, fuel oil, etc.) for the whole dwelling. Only one dwelling or floor is heated with this system. This type of heating is used in a building with two or more dwellings.
- **Central heating** – the heat is produced in a furnace - central heating device for the whole building. Several dwellings or floors can be heated with this system or one dwelling in the detached family house. Dwelling is heated by radiators or radiant heating (floor, wall heating).
- **District heating** – the heat is produced outside of the building – in a heat plant or boiler room for several buildings.

Types of water heating:

- **Local heating** – water is heated with electric heaters, gas heaters, etc.
- **Central heating** – water is heated in the space heating system (floor central or central heating).
- **District heating** – water is heated outside of the building – in a heat plant or boiler room for several buildings.

Wood briquettes are made by compressing the bark, dry wood dust, sawdust, shavings and other unpolluted wood residues. They take various forms and are particularly suitable for small or rarely fired fireplaces, such as fireplaces, saunas and stoves.

Wood chips are pieces of chopped wood, large up to 10 cm. They are usually made from soft wood (wood with small diameter, e.g. fine wood from thinning, branches, crown), from lower quality wood or wood residues. The size of chips is adjusted to the furnace.

Wood pellets are made from pure wood. They are produced industrially by pressing the dried wood powder and sawdust. They are cylindrical in shape with

a diameter of 8 mm and length up to 5 cm.

Wood waste is branches, residues of forestry work and different waste from the wood processing (sawdust, bark, waste from wood industry, etc.).

7 EXPLANATIONS

7.1 CLASSIFICATIONS

Results of the E-PE/L and E-RES surveys are published by the Standard Classification of Activities 2008, which is published on SURS's website at the following link:

<http://www.stat.si/statweb/en/Methods/Classifications>

in the form of SKD engine or as a complete classification under the heading "Economic Classification".

7.2 DATA PROCESSING

DATA EDITING

Data in APEGG were statistically edited with the combination of systematic corrections and imputation procedures. The following imputation methods were used: logical imputations (imputed value is derived from the values of other variables) and hot-deck imputations (nearest neighbour method, in which a value of a similar unit – donor, is imputed).

Data in E-PE/L were statistically edited with the validity and consistency check. A combined approach of correction is performed, i.e. automatic and manual data editing. We also use data imputation procedures, namely methods of logical and historical imputations.

Data in E-RES were statistically edited with the validity and consistency check. Manual data editing was performed. We also used data imputation procedures, namely methods of logical imputations.

For more, see the general methodological explanations [Statistical data editing](#).

WEIGHTING

With weighting adjustment we want to achieve representativeness of the sample, so that the weighted data give us as good population estimates as possible.

Weighting is used in APEGG, E-PE/L and E-RES.

In APEGG the process of weighting is determined according to the sampling plan, unit non-response and according to the available auxiliary population

variables used for calibration (statistical regions, types of settlements and the data from the Real Estate Register – the number of occupied dwellings, age and type of building, the main way domestic heating).

In E-PE/L and E-RES the process of weighting is determined according to unit non-response.

SEASONAL ADJUSTMENT

Seasonal adjustment is not applicable.

7.3 INDICES

Indices are not published.

7.4 PRECISION

In statistical surveys different kinds of errors can occur (e.g. sampling error, non-response error, measurement error) influencing the reliability and accuracy of the statistical results. Errors deriving from the random mechanisms determine the precision and consequently the reliability of the statistical estimates. The precision of the statistical estimate is estimated by calculating the standard error (SE). The Statistical Office of the Republic of Slovenia draws attention to less reliable estimates by flagging them with a special sign.

If the table contains estimated population totals of (continuous) variables, estimated averages of continuous variables or estimated ratios of population totals of (continuous) variables, publishing limitations are determined by the relative standard errors or the coefficients of variation (CV). In such cases it holds:

If the coefficient of variation (CV) is

- 10% or below ($CV \leq 10\%$), the estimate is reliable enough and is published without limitations;
- between 10% and up to 30% ($10\% < CV \leq 30\%$) the estimate is less reliable and is flagged for caution with letter M;
- over 30% ($CV > 30\%$), the estimate is too unreliable to be published and therefore suppressed for use by letter N.

For more, see the general methodological explanations [Precision of statistical estimates](#).

7.5 OTHER EXPLANATIONS

Some totals do not add up due to rounding.

8 PUBLISHING

- SiStat Database: [Energy](#) – Energy production and consumption – Energy balance and energy indicators. Absolute data and shares are published
- SiStat Database: [Energy](#) – Energy production and consumption – Electricity. Absolute data by the item name are published
- SiStat Database: [Energy](#) – Energy production and consumption – Solid, liquid and gaseous fuels. Absolute data by the type of fuel and the item name are published
- SiStat Database: [Energy](#) – Energy production and consumption – Heat. Absolute data by the item name are published
- SiStat Database: [Energy](#) – Energy production and consumption – Renewables and wastes. Absolute data by the energy source and type of use are published
- SiStat Database: [Energy](#) – Energy production and consumption – Consumption of energents and stocks in industry. Absolute data by section and subsection of the Standard Classification of Activities and the energy source are published
- SiStat Database: [Energy](#) – Energy production and consumption – Consumption of energy products in service activities. Absolute data by section of the Standard Classification of Activities and the energy source are published
- SiStat Database: [Energy](#) – Energy production and consumption – Household energy consumption. Absolute data and shares are published at the NUTS-1 level
- First Release (Energy, Energy production and consumption): »Energy supply, Slovenia, annually«
- First Release (Energy, Energy production and consumption): »Energy statistics, Slovenia, annually«
- EUROSTAT (Statistical Office of the European Union)
- International Energy Agency (IEA)

9 REVISION OF THE DATA

9.1 PUBLISHING OF PRELIMINARY AND FINAL DATA

Some basic data are published in the First Release in May of each year and revised and detailed data are published in October of each year. With this publication the data become final.

In line with the revision of energy statistics, which the Statistical Office started to implement in 2020, we extended the time series of data on household energy consumption until 2000, and at the same time we revised the previous time series (2009–2019). The extension of the time series mainly affected data on the use of renewable energy sources in households, which have been

incomplete so far. These renewable energy sources are wood fuels (firewood, wood pellets, wood briquettes, wood chips, wood waste), solar energy (that is produced by solar collectors) and ambient heat (aerothermal, hydrothermal or geothermal energy captured by heat pumps from the environment).

As part of the revision, we also revised data on energy use in industry, where we recalculated data for 2018 and 2019 according to the methodology used before those years. By unifying the criteria for the selection of observation units, we thus achieved greater comparability of data in time series.

We also expanded the balance of final electricity consumption and included data on final consumption in agriculture.

Data on renewable energy sources were supplemented by the breakdown of industrial waste into renewable and non-renewable parts, and with this breakdown we supplemented the data for a longer time series (2003–2019).

Based on all the mentioned changes, we also revised the energy balance and energy indicators from 2000 onwards.

Publishing of provisional and final data is planned. Due to the needs of users for timely information, provisional data are published that meet the criteria of the quality of official statistical data but do not meet the quality that can be met with complete coverage. Data are revised when recent, more complete and better data can significantly contribute to the quality of data-based decision-making.

9.2 FACTORS INFLUENCING COMPARABILITY OVER TIME

There are no breaks in time series, so all points in time are comparable.

From the reference year 2022 on, the category "Final consumption - other consumers" no longer covers consumption in service activities. Since then it has been shown as a separate category.

10 OTHER METHODOLOGICAL MATERIALS

Methodological materials on SURS's website are available at <https://www.stat.si/statweb/en/Methods/QuestionnairesMethodologicalExplanationsQualityReports>.

Questionnaires (only in Slovene):

- Household energy consumption (APEGG),
- Annual questionnaire on the electricity and heat production (E1-EE/L),
- Annual questionnaire on the heat supply (E3-TOP/L),
- Annual questionnaire on the electricity transmission (E4-EEP/L),
- Annual questionnaire on the electricity distribution (E5-EED/L),
- Annual questionnaire on the petroleum products trade (E8-NPT/L),
- Annual questionnaire on the gas supply (E9-PL/L),

- Annual questionnaire on the coal extraction (E11-TG/L),
- Consumption of energy, fuels and selected oil derivatives (E-PE/L).

Theme: Energy, Sub-theme: Energy production and consumption

Standard quality report for the surveys (only in Slovene):

- Household energy consumption survey (APEGG),
- Annual and monthly survey on electricity and heat production (E1-EE/L, E1-EE/M),
- Annual and monthly survey on the heat supply (E3-TOP/L),
- Annual survey on the petroleum products trade (E8-NPT/L),
- Annual and monthly survey on the gas supply (E9-PL/L, E9-PL/M),
- Annual statistical survey on consumption of energy, fuels and selected oil derivatives (E-PE/L)

Annual quality report for the surveys:

- Household energy consumption survey (APEGG),
- Annual and monthly survey on electricity and heat production (E1-EE/L, E1-EE/M),
- Annual and monthly survey on the heat supply (E3-TOP/L),
- Annual survey on the petroleum products trade (E8-NPT/L),
- Annual and monthly survey on the gas supply (E9-PL/L, E9-PL/M),
- Annual statistical survey on consumption of energy, fuels and selected oil derivatives (E-PE/L).

Theme: Energy, sub-theme: Energy production and consumption