

16. ENERGY

Data on mining, production, stock, inventories, and consumption of fuels and energy were obtained from enterprises with 20+ employees through statistical forms (reports), using a combination of a 100% survey and a sample survey. Data on external trade (exports and imports) in fuels and energy were completed by data of external trade statistics (according to the Intrastat and Extrastat data collection systems).

Notes on Tables

Tables 16-1 Total energy balance and 16-2 Balance of electricity

Energy balance is compiled in line with the Eurostat methodology. It is balancing heat produced in a public producer plant and heat sold to a third party from an autoproducer plant. Produced heat used in the own plant is not included in the balance; fuel used for production of that heat is reported in the final consumption sector.

Primary resources include the extraction of primary resources of fuels for sale (after primary treatment), sources of renewable fuels, electricity from water power, from the wind, solar installations and the like measured at generator terminals, production of electricity and heat in nuclear power plants.

Other sources – other recorded increases in fuels (e.g. coking coal sludge) and withdrawals from (or entries into) stock of liquid fuel feedstocks.

Exports/imports comprise all kinds of fuels and energy, including intermediate products, brought to the country from abroad in accordance with legislation and regulations in force. They include enterprise data confronted with external trade statistics. Transit deliveries of fuels and energy are excluded.

Stock changes: withdrawals (+), entries (-) – a decrease in stock increases disposable sources and thus it is marked with (+), whereas an increase in stock reduces these sources and therefore it is marked with (-).

Gross inland consumption is the sum of primary resources, other sources, recycled products, imports, stock withdrawals/entries, and direct uses minus exports.

Statistical difference occurs as a result of time difference between the records of the manufacturer and trading organizations and consumers. Besides, figures expressed in energy equivalent show differences due to different heating values of fuels (solid fuels in particular) reported by the manufacturer (supplier) and the consumer. It is a difference between resources and uses.

Transformation input – an amount of fuels entering the transformation process (e.g. the amount of crude oil entering the refinery).

Transformation output – an amount of fuel materials produced in a transformation process (e.g. crude oil products – gasoline, diesel oil, fuel oils, etc.).

Final non-energy consumption – final consumption of fuels for non-energy purposes (e.g. natural gas used for production of ammonia).

Final consumption is the consumption of fuels and energy as measured immediately before they enter a device to generate the final effect, but not to produce any other type of energy in the device (with the exception of secondary energy sources).

High-voltage consumption – customers connected to the extra high (over 52 kV) or the high voltage (1 to 52 kV) network.

Low-voltage consumption – customers connected to the low voltage (up to 1 kV) network.

Table 16-3 Production of electricity and heat from renewable energy sources and from wastes

Hydroelectric power plants – production of electricity in hydroelectric power plants is also included in the Table 16-4 due to methodological incorporation into the total energy balance of the Czech Republic. However, it belongs to renewable energy sources by its nature (as well as production of electricity in wind and solar power plants).

Production of electricity in hydroelectric power plants mostly takes place in large and small run-of-river plants (where the kinetic energy of water is used). Production of electricity in pumped storage plants (where the potential energy of water is used) is not production from renewable energy sources.

Wind power plants produce electricity using the kinetic energy of the wind.

Solar power plants (photovoltaic) produce electricity directly from the solar radiation.

Biomass is a fraction of wood substance or vegetable matter or of solid organic wastes (vegetal and animal substances) that can be used for energy production.

Industrial wastes are non-recyclable mostly solid and liquid inorganic and organic technological wastes burnt directly.

Municipal wastes are mostly solid unsorted (non-recyclable) town wastes burnt directly.

Biogas is a mixture of methane and carbon dioxide formed by anaerobic fermentation of biomass. In principle it is split into landfill gas, sewage sludge gas (from waste water treatment plants), and other biogas, such as biogas produced by fermentation of waste from food-processing plants (abattoirs, breweries, etc.).

Table 16-4 **Production of electricity and other energy sources**

Electricity production, total – gross electricity output measured at generator terminals.

Installed capacity, total – the highest active output a power generating plant can achieve and maintain under typical working conditions.

Heat production, total (heat supply for distribution – net output) – heat produced by steam generators excluding heat used for electricity production, own consumption, and heat losses in the boiler plant.

Tables 16-5 to 16-7 **Balance of natural gas, coking coal / other bituminous coal and coke-oven coke, lignite / brown coal and brown coal briquettes**

The balances are part of the energy balance and are governed by the same methodology. The balance of natural gas is presented in heat and volume units.

Final consumption includes large-scale consumption, small-scale consumption, residential consumption, and losses:

- large-scale consumption (including medium-scale consumption) – exceeding 60 001 m³ a year;
- small-scale consumption – up to 60 000 m³ a year excluding residential consumption.

Table 16-8 **Consumption of fuels and electricity by economic activity**

Consumption of liquid, solid, and gaseous fuels is given in energy units. The figures refer to production and non-production consumption in electricity and heat production processes and fuel upgrading processes, including input and working consumption; at diesel oil and gasoline it is including transport within the plant.

Consumption of electricity also includes own consumption for the production of electricity.

The sample of respondents included enterprises with 20+ employees.

Table 16-9 **Energy balance of crude oil refinery processing (by IEA methodology)**

This energy balance has been compiled according to the international methodology for OECD/IEA/EU/Eurostat.

In 2015 the international methodology was changed; in 2016, an occasional data revision for the 2010 to 2015 reference years was made, which was retroactively implemented back in the time series observed.

Indigenous production and other sources (extraction, purchases) – all production in the country. They include also amounts of additives/oxygenates and other hydrocarbons supplied to refineries from other sectors of industry.

Backflows from petrochemical industry to refineries – deliveries of (usually) by-products (refinery feedstock) from petrochemical processing to refineries for further processing or blending.

Products transferred (reclassified) – amounts of crude oil products reclassified to raw materials (feedstock) for further processing in refineries.

Exports (inputs and outputs) – refer to amounts of goods dispatched abroad that crossed the state border for the purpose of being left abroad, permanently or temporarily. Total exports thus consist of goods dispatched to the EU Member States and goods exported to third countries (according to the Intrastat and Extrastat data collection systems).

Imports (inputs and outputs) – refer to amounts of goods received from abroad that crossed the state border for the purpose of being left in the Czech Republic, permanently or temporarily. Total imports thus consist of goods received from the EU Member States and goods imported from third countries (according to the Intrastat and Extrastat data collection systems).

Direct use of resources – amounts used directly without any processing in refineries, e.g. amounts of crude oil serving as fuel to produce electricity, heat, amounts of biofuels used for motor fuel mixtures in the refinery and outside the refinery sector, etc.

Stock changes: withdrawals (+), entries (-) – a decrease in stock increases disposable sources and thus it is marked with (+), whereas an increase in stock reduces these sources and therefore it is marked with (-).

Refinery intake (calculated) – quantities of crude oil, refinery feedstocks, and products that entered the refinery process defined and calculated as follows: indigenous production (extraction) plus other sources (e.g. additives/oxygenates, biofuels for blending to motor fuels) plus backflows from petrochemical industry to refineries plus transferred (reclassified) products minus exports plus imports minus direct use of resources plus stock change.

Statistical difference – the difference between calculated and observed refinery intakes, which may occur due to different reasons, e.g. rounding-off, conversion of cubic metres into metric tonnes, compression in crude oil pipelines, etc.

Refinery intake (observed) – actual quantities of crude oil, refinery feedstocks, and products that entered the refinery process.

Refinery losses – the difference between the refinery intake (observed) and refinery output.

Refinery output – total production of basic refinery products in domestic refineries.

Other sources (+), decreases (-) – other recorded increases or decreases in resources, e.g. refinery fuel (-), transfers of feedstocks (blending) (-,+), transferred (reclassified) products (-,+).

Gross inland deliveries – deliveries of basic refinery products to the domestic market.

Motor gasolines – unleaded and leaded motor gasolines including biofuels (e.g. E85 and E95).

Kerosene-type jet fuel – the indicator includes kerosene-type jet fuel.

Diesel oil – the indicator includes diesel oil for propulsion including biofuels, mixed diesel oil, and the like.

Fuel oils – fuel oils low in sulphur (<1% S) and high in sulphur (>1% S).

Other – refinery gas, liquefied petroleum gas (propane/butane), naphtha, aviation gasoline, other kerosene, heating and other gas oils, industrial spirit, white spirit, lubricants, asphalts (bitumens), paraffins and waxes, petroleum coke, and other products.

Tables 16-10 to 16-13 ENERGO 2015 survey

Data in tables come from the ENERGO 2015 survey (a sample survey on energy consumption in households), which was carried out by the Czech Statistical Office pursuant to the Act No 89/1995 Sb, on the State Statistical Service, as amended. Collection of data from households took place from 7 July 2015 to 15 January 2016. The survey was carried out on the territory of the entire Czech Republic in about 20 000 households.

Shares of fuels in respective groups:

Solid fuels comprise lignite / brown coal, coking coal / other bituminous coal, coke-oven coke, and briquettes. The consumption is measured most often in weight units (kg, q, t); it can be converted (based on heating values) to energy units (joule).

Renewable energy sources comprise fuelwood, wood briquettes, wood pellets, plant-based fuels and agrofuels. Similarly as for solid fuels, their consumption is measured most often in weight units (kg, q, t); as for wood, other units of measure are used (scm = solid cubic meter; 1 stere = stacked cubic meter; bcm = bulk cubic meter). Based on heating values, the consumption is then converted to energy units (joule). Regarding fuelwood consumption, also length of storage has to be taken into account when converting to energy units. Further, this category includes utilisation of heat pumps, photovoltaic systems, and solar thermal systems.

Liquid fuels consist of propane/butane, gas oil, and fuel oil. Their consumption is mostly measured in litres and then it is converted to tonnes and via the heating value further to joule.

Other fuels are the rest of the fuels (e.g. kerosene, gasoline), which cannot be classified to the previous categories. As for households, the utilisation is only marginal (usually for the purpose of other end-use). Their consumption is not converted to energy units.

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Further data can be found on the website of the Czech Statistical Office at:

– www.czso.cz/csu/czso/industry_energy_ekon