

## 16. ENERGY

Data on mining, production, 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 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 methodology used in the Czech Statistical Office. This methodology balances all heat regardless of its source, while according to the international methodology heat means only the heat produced in a public producer plant and the heat sold to the third party from an autoproducer plant. The heat produced by an autoproducer plant and consumed in the own plant is not reported.

**Domestic natural resources** include the extraction of primary resources of fuels for sale (after primary treatment), generation of hydroelectricity as measured at generator terminals, heat produced in nuclear power plants for the electricity production and distribution, and heat released by exothermal chemical reactions, which is further used (e.g., heat from sulphuric acid production).

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

**Withdrawals from inventories** (decreases in inventories) increase disposable resources and are thus marked with (+), whereas **entries into inventories** (increases in inventories) reduce these resources and are designated by (-).

**Other resources (+), decreases (-)** are other increases/decreases in resources such as recycled coking coal sludge, withdrawals from or entries into inventories of liquid fuel semi-finished products.

**Primary resources, total** are the sum of natural resources, imports, consumed inventories and other resources minus exports, entries into inventories and other decreases.

**Balancing differences** occur 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.

**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 resources).

**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 sources and waste**

**Hydroelectric power plants** – production of electricity in hydroelectric power plants is also given in the Table 16-5 due to methodological incorporation into the overall energy balance of the Czech Republic. However, by its nature, it belongs to renewable energy sources – the same 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 (use of the kinetic energy of water). Production of electricity in pumped storage plants (use of potential energy of water) is not production from renewable sources.

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

**Solar power plants** produce electricity directly from the solar radiation.

**Biomass** is a part of wood substance or vegetable matter or of solid organic (plant and animal) wastes 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. **Balance of energy processes**

**Energy processes** are activities, which result in an increased in-use value of energy materials put through these processes. The energy balance of the processes quantifies their input on the one hand and output

plus losses on the other hand. As a rule, these processes also substantially change input fuels and energy to improve their in-use value. Heat production (production – output, total) includes only heat generated from fuels (not secondary heat). Table 16-1. Total energy balance includes all heat, i.e. secondary heat, too, which influences the calculation of losses in heat production.

**Table 16-5. 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 operating 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 16-6 to 16-8. 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, household consumption, and losses:

- large-scale consumption (including medium-scale consumption) – exceeding 60 001 m<sup>3</sup> a year;
- small-scale consumption – up to 60 000 m<sup>3</sup> a year excluding households.

**Table 16-9. Consumption of fuels and electricity by 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 operating consumption; at diesel oil and gasoline it is including intra-enterprise transport.

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

The sample of respondents included enterprises with 20+ employees.

**Table 16-10. 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.

**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** – usually deliveries of 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 outside the refinery sector, etc.

**Stock change** – 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 designated by (-).

**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 observed and calculated 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 (calculated)** – 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).

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

\* \* \*

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

– [www.czso.cz/csu/czso/industry\\_energy\\_ekon](http://www.czso.cz/csu/czso/industry_energy_ekon)