Short methodological explanations

The State Statistical Committee of Azerbaijan Republic had worked out resource balance by main types of fuel-energy, raw, material and products in kind. Fuel-energy balance is a source of information for analyze and forecasting, as well as regulation of power economy of the country. The gross energy and fuel balance was calculated on the base of provisional fuel, oil equivalent ratio and joule.

Fuel-energy balance scheme consists of "Resources" and "Distribution".
In the "resources" section it is indicated generation sources of fuel and energy resources, and in the section of "distribution" - its use for main purposes.

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Item 1. "Resources" section consists of items characterized generation sources of fuel and energy - extraction (production), import and surplus at the beginning of year.

Item 1.1. "extraction (production)" It is indicated quantity of the each extracted or produced fuel and energy inside of the country and this item is calculated on the base of industry statistics reporting.

Item 1.2. "import" includes quantity of fuel and energy resources imported from foreign states.

Item 1.3 and 2.4 includes surplus of all types of energy at the beginning and at the end of year, which are saved in storehouses, reservoirs and all saving objects of producers, consumers and wholesale enterprises.

"Distribution" section of the balance reflects items characterized practical use of fuel and energy resources, losses (excluding technological losses), export and surplus at the end of year.

Item 2.1. "Consumption inside of the country" indicates fuel and energy consumption by all economic activity types. This item is divided into 2 groups by use destination.
Item 2.1.1. "Conversion into other type of energy" indicates fuel and energy quantity used for receiving of other kind of energy (electricity and heating). It is included losses on conversion of fuel and energy into other types of energy.

Item 2.1.2. "Production - technological and other needs" includes fuel and energy quantity used for production-technological (including losses during technological processes), agriculture, construction, transport, communal-general and other needs, directly as fuel, i.e. quantity of used fuel and energy not converted into other types of energy. This item also covers energy consumption in industry, heating stoves, apparatus and other technological installations, material-working machinery, mechanisms and different transport means, lifting equipments, as well as heating of administration buildings, ventilation system, hot water supply, communal needs. This indicator includes energy consumption in electric power stations and boilers.

Item 2.2. "Losses" reflects losses during transportation of fuel and energy (on long-distance pipeline, losses of energy in gross electrical supply network) and it is also taken into account some shortage indicated in corresponding documents.

Item 2.3. "Export" includes fuel and energy quantity exported nearest and long-distance countries.

"Import" and "Export" is defined on the base of the State Custom Committee and fuel-energy and material statistics report's information.

Domestic consumption, surplus at the beginning and at the end of year, losses are calculated on the base of reports of fuel-energy and material balances statistics.

On calculation of final fuel-energy balance some deviation is connected with rounding of indicators and multiplication of measure unit by conversion ratio.
Brief methodological instructions on compilation of the energy balance

Structure of the balance. Energy balance is constructed from the commodity balances of different energy products such as crude oil, natural gas, electric power and etc., which expresses tons of oil equivalent for their balances. One tone oil is equivalent to 41,868 gigajoule, or 0,041868 terajoules, one terajoule is equal to 1000 gigajoule. Commodity balances of all energy products included in balance are compiled before compilation of the energy balances. Energy balance consists of 50 lines and 28 rows. Lines include information on flows, rows – energy products. Taking into account available energy features of Azerbaijan, the national energy balances include 23 product types and 5 product groups (1, 5, 18, 20 and 26 rows). The model of the National Energy Balance of Azerbaijan is based on the recommendations of UN “International Recommendations for Energy Statistics” taking into account the national peculiarities.

“Top block” part of Energy balance.

Line 1.1 – “Primary productions”. All energy products divide into primary and secondary products. Energy commodities extracted or captured directly from natural resources (crude oil, natural gas, electric power produced in wind, solar, hydroelectric power station and etc.) are termed primary products and all energy commodities which are not primary but produced from primary commodities (oil products, electric power produced in thermoelectric power station and etc.) are termed secondary commodities. The production of primary fossil fuels is usually measured close to the point of extraction from the reserves. The level of production measures by the suitability criteria of fuels to the market. Quantity of fuel not ready for sale and use is not considered in the production volumes. For example, some part of the gas extracted from gas or oil field may be returned to the field to maintain pressure flared or released into the atmosphere. The rest of the gas than the heavy gases (gas condensate) for the purpose of the separation can be further processed. Thus, the volume of gases re injected to the layers, thrown to the air and burned as well as gas condensates not taken into account in determining the volume of gas available for sale. This rule is concern to secondary commodities too.

Lines 1.2-1.3 – “Import” and “Export”. The volume of import and export is a quantity of products that are imported to the country and exported from the country in the result of activities realized by entities living in Azerbaijan or enterprises functioned in the country. Import-export operations are carried out in the national borders of the country in spite of the fact that cargo was officially registered by custom agencies or not. The energy products passed from the country by transit (excluding electric power) are not considered in the import-export indicators. The export data in the balance is indicated by «- - ».
Line 1.4 – “International bunkers”. This data includes quantity of fuel filled in Azerbaijan for ships (1.4.1 lines) and civil aircrafts (1.4.2 lines) realized international travel irrespective of the country of registration. Fuel used by sea vessels is not considered as part of cargo transported by these vessels. Fuel used by fishing vessels is not included in this line. Indicators of this line is shown by « - ».

Line 1.5 – “Stock changes”. Differ from elements of the complete energy balance for the reporting period (production, consumption, imports, etc.) as opposed to the level of resources is measured by a certain time. Changing of stocks is calculated by means of deducting of resources at the beginning of reporting period from resources at the end of the reporting period. A stock draw is an addition to supply and so will be entered with a « - » sign. Information on energy products resources is provided by producers, importers of these products as well as by enterprises engaged with transformation, distribution, trade of energy products and final energy consumers (enterprises and organizations and households).

Line 1 – “Total energy supply” is forming by multiplying of the data of 1.1-1.5 lines of the balance.

Line 2 – “Statistical difference” In the energy balance, the statistical difference is the numerical difference between the total supply of a fuel/energy and the total use of it. It is the difference when the sum of energy transfers (Line 3), the processes of transformation sector (Line 4), consumption within the energy sector(Line 5), losses (Line 6) and final consumption (Line 7) is deducted from the amount of total energy supply (Line 1). The price of Statistical difference can indicate with the sign “-”. The data of “statistical difference” row is the main criteria for evaluation of quality of balance data. Thus, for major supplies, like natural gas or electricity, efforts should be made to keep the statistical differences below 1%. On the other hand, for a minor commodity it could be 10%.

The middle block in energy balance

Line 3– “Transfer”. Transfers, the first line of the middle block, is essentially a statistical device to move energy between columns to overcome practical classification and presentation issues resulting from changes in use or identity of an energy product. Transfers cover, for example, the renaming of petroleum products which is necessary when finished petroleum products are imported as feedstock in refineries and the renaming of products which no longer meet their original specifications.

Line 4 – “Transformation processes”. This line as well as sub-lines 4.1-4.8 reflects the amount of spent fuel in the fuel production and the amount of second energy products generated from the result of transformation (conversion) including burned fuel for the production of heating and electric power. Transformed primary energy products is shown with the “-“sign.
Line 5 – “Domestic consumption of the energy sector”. This part of the balance reflects quantity of the energy products consumed by fuel-energy enterprises or special consumption. Consumed energy products are taken off the books without transformation into other energy products. Energy products consumed in fuel-energy enterprises are used for provision of the activities of these enterprises, and energy products don’t participate in transformation processes.

Line 6 – “Losses”: this line reflects the losses of energy commodities during their distribution to the points of use. Losses occurred at transformer is also included in this line. The transmission and distribution losses associated with the electricity and gas networks provide simple examples but there are cases related to the distribution of blast-furnace and coke-oven gases and oil products by pipeline. Losses during oil processing – happens in the result of decrease mostly naturally of the oil products with consisting of difference between production of general ready product by whole volume of product which has entered the oil refinery plant. Such losses concerning to “other losses”.

The bottom block – “Final consumption”

Line 7 – “Final consumption” is energy products given to final consumption of energy. Fuels used for the production of electricity and heat for sale, as well as the quantities of energy produced, are excluded from final consumption. Final consumption of different fuels intends use of heating and non-energy. Energy products in the final consumption sector completely go out from calculation, i.e. not transforming to this or other energy product. These products not included to the process of energy transformation and it is used for to provide different activities of households. The final consumption of energy products consists of the (line 7.1) final energy consumption, that is deliveries of energy products to the users located in the territory of reference for their energy needs such as for heat raising, transportation and electricity, and (line 7.2) non-energy use that is deliveries of energy products for use as chemical feedstock or for use as raw materials.

Line 7.1 – “Final energy consumption” is formed from data on final consumption of energy based on 3 groups: industry, transport, and other branches of economy.
Branches of **industry and construction** are indicated based on classification of economic activity types (lines 7.1.1.1-7.1.1.13). Energy industries are not registered in this part of balance as they are considered in transformation sector. Industrial enterprises use energy commodities for heat-raising for own use, for non-energy purposes, transport, electricity generation, and production of heat for sale. Fuel used for transport by enterprises, as well as for production of electricity and thermal energy for sale is not final consumption of energy, so it is not reflected in this sector of balance.

If industrial enterprise produces electricity and thermal energy for sale purposes, then quantity of fuel products used for production of electricity and thermal energy should be excluded from data of industrial sector (line 7.1) and included in “transformation processes” sector (line 4). Quantity of fuel used for transportation by vehicles by motor roads in common use is reflected as final consumption of transport in line 7.1.2.1.

Five main modes of **transport** (line 7.1.2) – road, railway, domestic aviation, domestic navigation and pipeline are indicated. Under transportation of passengers, as well as quantity of all oil products and electricity used for movement of the locomotives during maneuvers of the staff. It is common for all road transport fuels are shown as supporting the transport activity (7.1.2.1), railway activity (7.1.2.2) we mean transportation of cargo and passengers, under other transport activity (subway, tram and trolleybus). The line 7.1.2.3 reflects used fuel in the internal air transport. Military aviation fuel is included in domestic consumption within the country. Fuel filled to fuel tanks of air transport means moving on international trips is shown in the line 1.4.2 on “fuel tanks of planes”. The next landing point or another flight from a foreign airport is considered international flights. Amount of fuel used in internal shipping, i.e. contact coasting vessels in the Caspian Sea is shown line 7.1.2.4. In the line 7.1.2.5 is shown consumed fuel and amount of electric power used in the pipeline transport.

In the line 7.1.2.6 “other kinds of transport” is shown amount of spent fuel to sub conveyer and additional transport activities- bus, railway and loading stations; sign making and communication sections; air and sea ports and terminals; port and piers; bunkers, refrigerator warehouses, activities of highways; bridges, tunnels, car stops, or the use of car parks, etc.
Followings are included in “Other fields of economy” (line 7.1.3):

Quantity of energy products consumed for provision of main activity (including fish-breeding, deep-sea fishing) of enterprises engaged in agriculture, forestry and fishing is indicated in line 7.1.3.1.

The line 7.1.3.2 shows quantity of energy products consumed for provision of main activity of enterprises engaged in “Commercial and public services” activity.

Quantity of energy products consumed by households for everyday life is shown in the line 7.1.3.3.

Line 7.1.3.4 reflects information on quantity of energy products consumed for provision of main activity of enterprises engaged in other branches.

**Line 7.2 – “Final non-energy consumption”**. A number of fuels may be used for non-energy purposes. For example, lubricants and greases are used in engines for their “slippery” qualities, and bitumen on roofs and roads for its waterproofing and wear qualities; white spirit and other industrial spirits are used as diluents in paint manufacture and for industrial cleaning purposes.

The petrochemical industry is an important user of fuels for non-energy purposes. It converts fossil fuels (oil, natural gas and etc) and biomass carbon to synthetic organic products. Most of oil products in chemistry industry are used as raw materials; they are crude naphtha, compressed oil gas and ethane. Methane in the composition of the natural gas for several technological processes in the chemical industry is a main source of carbon and hydrogen. If methane is used for receiving of ethylene, propylene, butylenes, butadiene and other non-energy crude products, then this is non-energy consumption. If methane is used for production of ammonia and methanol as well as steam cracking, then here methane is used for energy purposes and this information is indicated in line of 7.1.1.2 of balance. Electric power and heat energy is not used for non-energy purposes.

**Part of “Products” of energy balance**

**Row 1 ‘all products, total’** is formed by means of adding of the data of 2-5, 19-21 and 27-29 rows.

**Row 2 “Crude oil”**: Crude oil is a mineral oil of natural origin comprising a mixture of hydrocarbons and associated impurities, such as sulphur. It exists in the liquid phase under normal surface temperature and pressure and its physical characteristics (density, viscosity, etc.) are highly variable. This category includes field or lease condensate recovered from associated
and non-associated gas where it is commingled with the commercial crude oil stream.

**Row 3 “Natural bitumen and asphalt”** is a solid, semi-solid or viscous hydrocarbon with a colloidal structure, being brown to black in colour, obtained as a residue in the distillation of crude oil, by vacuum distillation of oil residues from atmospheric distillation. Bitumen is often referred to as asphalt and is primarily used for construction of roads and for roofing material. This category includes fluidized and cut back bitumen.

**Row 4 “Refinery feed-stocks”**. A refinery feedstock is a processed oil destined for further processing (e.g. straight run fuel oil or vacuum gas oil) excluding blending. With further processing, it will be transformed into one or more components and/or finished products. This definition also covers returns from the petrochemical industry to the refining industry (e.g. pyrolysis gasoline, $C_4$ fractions, gasoil and fuel oil fractions).

**Row 5 “Oil products, total”** is a total of data of the row 6-18.

**Row 6 “Refinery gas (not liquefied)”**. Refinery gas includes a mixture of non-condensable gases mainly consisting of hydrogen, methane, ethane and olefins obtained during distillation of crude oil or treatment of oil products (e.g. cracking) in refineries. This also includes gases which are returned from the petrochemical industry.

**Row 7 “Liquefied petroleum gases (LPG)”**. LPG are light paraffinic hydrocarbons derived from the refinery processes, crude oil stabilization and natural gas processing plants. They consist mainly of propane ($C_3H_8$) and butane ($C_4H_{10}$) or a combination of the two. They could also include propylene, butylene, isobutene and isobutylene. LPG is normally liquefied under pressure for transportation and storage.

**Row 8 “Motor gasoline”**. Motor gasoline consists of a mixture of light hydrocarbons distilling between 35°C and 215°C. It is used as a fuel for land-based spark ignition engines. Motor gasoline may include additives, oxygenates and octane enhancers, including lead compounds such as TEL (Tetraethyl lead) and TML (tetramethyl lead). Motor gasoline can be divided into two groups:

- Unleaded motor gasoline: motor gasoline where lead compounds have not been added to enhance octane rating. It may contain traces of organic lead.

- Leaded motor gasoline: motor gasoline with TEL (tetraethyl lead) and/or TML (tetramethyl lead) added to enhance octane rating. This category includes motor gasoline blending components (excluding additives/oxygenates), e.g. alkylates, isomerate, reformate, cracked gasoline destined for use as finished motor gasoline.

**Row 9 “Kerosene - type jet fuel”**: This is a distillate used for aviation turbine power units. It has the same distillation characteristics between 150°C and 300°C (generally not above 250°C) and flash point as kerosene. In addition, it has particular specifications (such as freezing point) which are established by the International Air Transport Association (IATA). This category includes kerosene blending components.

**Row 10 “Naphtha”**: Naphtha is a feedstock destined for either the petrochemical industry (e.g.
ethylene manufacture or aromatics production). Naphtha comprises material in the 30°C and 210°C distillation range or part of this range.

**Row 11 “Gas/diesel oil (distillate fuel oil)”:** Gas/diesel oil is primarily a medium distillate distilling between 180°C and 380°C. Several grades are available depending on uses:

- Transport diesel: on road diesel oil for diesel compression ignition (cars, trucks, etc.), usually of low sulphur content.
- Heating and other gas oil:
- Light heating oil for industrial and commercial uses.
- Marine diesel and diesel used in rail traffic.
- Other gas oil including heavy gas oils which distil between 380°C and 540°C and which are used as petrochemical feedstocks.’

**Row 12-13 “Fuel oil”:** This covers all residual (heavy) fuel oils (including those obtained by blending). Kinematic viscosity is above 10 cSt at 80°C. The flash point is always above 50°C and density is always more than 0.90 kg/l. Low sulphur content: heavy fuel oil with sulphur content lower than 1%. High sulphur content: heavy fuel oil with sulphur content of 1% or higher.’

**Row 14 “Other kerosene”:** Kerosene comprises refined petroleum distillate and is used in sectors other than aircraft transport. It distils between 150°C and 300°C.

**Row 15 “Petroleum coke”:** Petroleum coke is a black solid by-product, obtained mainly by cracking and carbonising petroleum-derived feedstock, vacuum bottoms, tar and pitches in processes such as delayed coking or fluid coking. It consists mainly of carbon (90% to 95%) and has low ash content. It is used as a feedstock in coke ovens for the steel industry, for heating purposes, for electrode manufacture and for production of chemicals. The two most important qualities are “green coke” and “calcinated coke”. This category also includes “catalyst coke” deposited on the catalyst during refining processes; this coke is not recoverable and is usually burned as refinery fuel.

**Row 16 “Bitumen”** is a solid, semi-solid or viscous hydrocarbon with a colloidal structure, being brown to black in colour, obtained as a residue in the distillation of crude oil, by vacuum distillation of oil residues from atmospheric distillation. Bitumen is often referred to as asphalt and is primarily used for construction of roads and for roofing material.

**Row 17 “Lubricants”** are hydrocarbons produced from distillate by-products; they are mainly used to reduce friction between bearing surfaces. This category includes all finished grades of
lubricating oil, from spindle oil to cylinder oil, and those used in greases, including motor oils and all grades of lubricating oil base stocks.

Row 18 “Other petroleum products” covers information following petroleum products:

**Aviation gasoline:** This is motor spirit prepared especially for aviation piston engines, with an octane number suited to the engine, a freezing point of –60°C and a distillation range usually within the limits of 30°C and 180°C.

**White spirit and specific boiling point (SBP) spirits:** White spirit and SBP are defined as refined distillate intermediates with a distillation in the naphtha/kerosene range. They are subdivided as:

**White spirit:** Industrial spirit with a flash point above 30°C. The distillation range of white spirit is 135°C to 200°C.

Industrial Spirit (SBP): Light oils distilling between 30°C and 200°C. There are 7 or 8 grades of industrial spirit, depending on the position of the cut in the distillation range. The grades are defined according to the temperature difference between the 5% volume and 90% volume distillation points (which is not more than 60°C).

**Gasoline type jet fuel (naphtha type jet fuel or JP4):** This includes all light hydrocarbon oils for use in aviation turbine power units, distilling between 100°C and 250°C. It is obtained by blending kerosenes and gasoline or naphthas in such a way that the aromatic content does not exceed 25% in volume, and the vapour pressure is between 13.7kPa and 20.6kPa.

**Additives/oxygenates:** Additives are non-hydrocarbon compounds added to or blended with a product to modify fuel properties (octane, cetane, cold properties, etc.):

- Oxygenates, such as alcohols (methanol, ethanol), ethers such as MTBE (methyl tertiary butyl ether), ETBE (ethyl tertiary butyl ether), TAME (tertiary amyl methyl ether).

- Esters (e.g. rapeseed or dimethylester, etc.).

- Chemical compounds (such as tetramethyl lead, tetraethyl lead and detergents).

**Paraffin waxes:** These are saturated aliphatic hydrocarbons. These waxes are residues extracted when dewaxing lubricant oils. They have a crystalline structure which is more or less fine according to the grade. Their main characteristics are as follows: they are colourless, odourless and translucent, with a melting point above 45°C.

**Ethane:** A naturally gaseous straight-chain hydrocarbon (C₂H₆) extracted from natural gas and refinery gas streams.

**Natural gas liquids (NGL):** Natural gas liquids are liquid or liquefied hydrocarbons recovered from natural gas in separation facilities or gas processing plants. Natural gas liquids include
ethane, propane, butane (normal and iso-), (iso)pentane and pentanes plus (sometimes referred to as natural gasoline or plant condensate).

The natural gas may be extracted with crude oil (associated gas) or from a gas field without crude oil. The NGL may be removed from the natural gas stream close to the well-head or transported to a distant gas processing plant (row 7).

**Row 19 “Natural gas”:** It comprises gases, occurring in underground deposits, whether liquefied or gaseous, consisting mainly of methane (CH\(_4\)). It includes both “nonassociated” gas originating from fields producing hydrocarbons only in gaseous form, and “associated” gas produced in association with crude oil as well as methane recovered from coal mines (colliery gas). Liquefied natural gas (LNG): natural gas cooled to approximately –160°C under atmospheric pressure condenses to its liquid form called LNG. LNG is odourless, colourless, non-corrosive and non-toxic.’

**Row 20** includes following information on following types of gas:

**Blast-furnace gas:** Obtained as a by-product in operating blast furnaces; it is recovered on leaving the furnaces and used partly within the plant and partly in other steel industry processes or in power stations equipped to burn it. The quantity of fuel should be reported on a gross calorific value.

**Gas-works gas:** Covers all types of gases including substitute natural gas produced in public utility or private plants, whose main purpose is manufacture, transport and distribution of gas. It includes gas produced by carbonization (including gas produced by coke ovens and transferred to gas-works gas) reported under the “Production” row, by total gasification with or without enrichment with oil products (LPG, residual fuel oil, etc.), by cracking of natural gas, and by reforming and simple mixing of gases and/or air.

**Substitute natural gas:** This is a high calorific value gas, manufactured by chemical conversion of a hydrocarbon fossil fuel. It is chemically and physically interchangeable with natural gas and is usually distributed through the natural gas grid. The main raw materials for manufacture of substitute natural gas are: coal, oil and oil shales. Substitute natural gas is distinguished from other manufactured gases by its high heat value (above 8 000 kcal/m\(^3\)) and by its high methane content (above 85%). Substitute natural gas produced by synthesis from fuels other than coal-based should also come under From other sources. The quantity of fuel should be reported on a gross calorific value.

**Oxygen steel-furnace gas:** Obtained as a by-product of the production of steel in an oxygen furnace; it is recovered on leaving the furnace. The gas is also known as converter gas, BOS (basic oxygen steel) or LD gas. The quantity of fuel should be reported on a gross calorific value.

**Coke-oven gas:** Obtained as a by-product of solid fuel carbonisation and gasification operations carried out by coke producers and iron and steel plants which are not connected with gas works and municipal gas plants. The quantity of fuel should be reported on a gross calorific value.
Row 21 “Restored energy and wastes” includes information on lines 22-26:

- energy from hydroelectric power stations
- wind energy
- tide, wave, ocean energy
- solar energy
- geothermal energy
- solar thermal energy
- industrial wastes
- solid municipal wastes
- solid biomass
- biogas
- biofuel

Row 22 “Solar energy”: Solar radiation exploited for hot water production and electricity generation, by:

- Flat plate collectors, mainly of the thermosyphon type, for domestic hot water or for the seasonal heating of swimming pools
- Photovoltaic cells.
- Solar thermal electric plants.

Row 23 “Geothermal energy”: Energy available as heat emitted from within the earth's crust, usually in the form of hot water or steam.

Row 24 “Hydropower”: Potential and kinetic energy of water converted into electricity in hydroelectric plants. Pumped storage should be included. Detailed plant sizes should be reported net of pumped storage.

Row 25 “Wind energy”: Kinetic energy of wind exploited for electricity generation in wind turbines.

Row 26 “Biomass and Wastes”:

Industrial wastes: Wastes of industrial non-renewable origin (solids or liquids) combusted directly for the production of electricity and/or heat. The quantity of fuel used should be reported on a net calorific value basis. Renewable industrial waste should be reported in the Solid biomass, Biogas and/or Liquid biofuels categories.

Municipal solid waste may be renewable and non-renewable: Renewable waste produced by households, industry, hospitals and the tertiary sector which contains biodegradable materials that are incinerated at specific installations. Non-renewable waste produced by households, industry, hospitals and the tertiary sector that contains non-biodegradable materials that are incinerated at specific installations.

Solid biomass: Covers organic, non-fossil material of biological origin which may be used as
fuel for heat production or electricity generation. It comprises:

- Charcoal: Covers the solid residue of the destructive distillation and pyrolysis of wood and other vegetal material.

- Wood, wood wastes, other solid wastes: Covers purpose-grown energy crops (poplar, willow, etc.), a multitude of woody materials generated by an industrial process (wood/paper industry in particular) or provided directly by forestry and agriculture (firewood, wood chips, bark, sawdust, shavings, chips, black liquor, etc.) as well as wastes such as straw, rice husks, nut shells, poultry litter, crushed grape dregs, etc. Combustion is the preferred technology for these solid wastes. The quantity of fuel used should be reported on a net calorific value basis.

**Biogas:** A gas composed principally of methane and carbon dioxide produced by anaerobic digestion of biomass, comprising:

- Landfill gas, formed by the digestion of landfilled wastes.

- Sewage sludge gas, produced from the anaerobic fermentation of sewage sludge.

- Other biogas, such as biogas produced from the anaerobic fermentation of animal slurries and of wastes in abattoirs, breweries and other agro-food industries.

**Biofuels:** Biofuels cover bioethanol, biodiesel, biomethanol, biodimethylether, biooil. Liquid biofuels are mainly biodiesel and bioethanol/ETBE used as transport fuels. They can be made from new or used vegetable oils and may be blended with or replace petroleum-based fuels. The natural plant feedstock includes soya, sunflower and oil seed rape oils. Under some circumstances, used vegetable oils may also be used as feedstock for the process.

Row 27 “Other fuel types” includes information on energy products that are not indicated in balance separately and not widely used in Azerbaijan.

**Other hydrocarbons:** This category includes synthetic crude oil from tar sands, shale oil, etc., liquids from coal liquefaction, output of liquids from natural gas conversion into gasoline, hydrogen and emulsified oils (e.g. orimulsion).

**Hard coal:** Hard coal refers to coal of gross calorific value greater than 23 865 kJ/kg (5 700 kcal/kg) on an ash-free but moist basis and with a mean random reflectance of vitrinite of at least 0.6. Hard coal comprises: (i) coking coal: coal with a quality that allows the production of a coke suitable to support a blast furnace charge. Other bituminous coal and anthracite (steam coal): steam coal is coal used for steam raising and space heating purposes and includes all anthracite coals and bituminous coals not included under coking coal.

BKB (includes peat briquettes): A composition fuel manufactured from lignite/brown coal. The lignite/brown coal is crushed, dried and moulded under high pressure into an even-shaped briquette without the addition of binders.

**Coke-oven coke:** The solid product obtained from carbonisation of coal, principally coking coal, at high temperature; it is low in moisture and volatile matter. Coke-oven coke is used mainly in
the iron and steel industry acting as energy source and chemical agent. Coke breeze and foundry coke are included in this category. Semi-coke, the solid product obtained from carbonisation of coal at low temperature, should be included in this category. Semi-coke is used as a domestic fuel or by the transformation plant itself. This heading also includes coke, coke breeze and semi-coke made from lignite/brown coal.

**Row 28** - "Heat energy". This column reflects the heat energy generated by combustion of fuels such as source and waste of coal, natural gas, petroleum products and renewable energy, as well as heat energy generated by the conversion of electrical energy into electric water heaters or heat pumps.

**Row 29** – “Electricity” is widely used energy carrier. Electricity of hydroelectric power stations in row 23 is indicated as primary energy, so the quantity of secondary electricity produced by means of small generators and thermoelectric power stations is also indicated in this row.

The model of balance is attached.  
[Structure of energy balances in Azerbaijan (model)](https://example.com)  
[Average conversion rate of ton oil equivalent by different energy products for using in official statistics](https://example.com)