

Electricity information

Database documentation

July 2026 edition

International
Energy Agency

iea

INTERNATIONAL ENERGY AGENCY



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This document provides support information for the IEA *Electricity Information* database.

This document can be found online at:

<https://www.iea.org/data-and-statistics/data-product/electricity-information>

For inquiries, please contact ELEAQ@iea.org (OECD countries and regions) or WED@iea.org (other countries and regions).

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Changes from last edition

Starting from the April 2026 edition, TXT files have been discontinued. Bulk data are available in CSV format. Due to file-size limitations, imputed zero values are excluded. However, the full structure and content of the .Stat Data Explorer can be reconstructed using the dimensional mapping tables available in the documentation section of the data product webpage.

Geographical coverage

Romania became an IEA Accession country in April 2026. Accordingly, starting with the July 2026 edition, Romania is included in the IEA and Accession/Association countries (shortname: IEAFAMILY).

Viet Nam became an IEA Association country in February 2026. Accordingly, starting with the July 2026 edition, Viet Nam is included in the IEA and Accession/Association countries (shortname: IEAFAMILY).

Nigeria became an IEA Association country in July 2026. Accordingly, starting with the July 2026 publication, Nigeria is included in the IEA and Accession/Association countries (shortname: IEAFAMILY)..

Database structure

The database Electricity Information includes annual data for:

OECD and selected countries datasets (updated in July 2026)

- countries: 38 OECD countries, 14 non-OECD countries and 7 regional aggregates (see section Geographical coverage); 177 countries and regional aggregates (see section Geographical coverage)
- years: 1960-2025 (OECD countries and regions unless otherwise specified);
1960-2024 (OECD imports and exports to partner countries);

- **OECD and selected countries, Electricity and Heat Supply and Consumption (GWh, TJ)**

Electricity and heat balance (38 OECD countries + 14 non-OECD countries + 7 aggregates; 55 flows; 2 products).

- **OECD and selected countries, Electricity and Heat Generation (GWh, TJ, kt)**

Gross electricity and heat production by fuel and plant types (38 OECD countries + 14 non-OECD countries + 7 aggregates; 6 flows; 66 products; 7 plant types).

- **OECD and selected countries, Net Electricity and Heat Production by Auto-producers (GWh, TJ)**

Net electricity and heat production by Autoproducers in all plants, by sector (38 OECD countries + 14 non-OECD countries + 7 aggregates; 40 sectors; 2 products; 4 plant types).

- **OECD and selected countries, Electricity Imports by Partner (GWh)**

Electricity imports by origin (38 OECD countries + 14 non-OECD countries + 7 aggregates; 61 countries of origin).

- **OECD and selected countries, Electricity Exports by Partner (GWh)**

Electricity exports by destination (38 OECD countries + 14 non-OECD countries + 7 aggregates; 63 destinations).

- **OECD and selected countries, Net Electrical Capacity (MWe)**

Net electrical capacity by type of energy (38 OECD countries + 14 non-OECD countries + 7 aggregates; 30 sources + 2 indicators + 9 factors; 3 plant types).

World datasets (updated in July 2026)

- countries: 177 countries and regional aggregates (see section Geographical coverage);
- years: 1971-2024 (non-OECD countries and regions; world unless otherwise specified);
2025 (provisional gross production, supply and aggregated demand data);

- **World, Electricity and Heat Supply and Consumption (GWh, TJ)**

Reduced electricity and heat balance (150 countries + 27 aggregates; 8 flows).

Data for 2025 are primarily based on the official mini-questionnaire submissions of countries. However, some data have been estimated by the IEA Secretariat.

Flow definitions

Supply

Flow	Short name	Definition
Total gross production	GROSPROD	This is the total gross electricity or heat production.
Power plant own use	OWNUSE_PPLANT	This is the difference between Gross and Net production, i.e. it is the electricity and heat used by power station auxiliaries directly related to generation and including that used for fuel handling plant, cooling water plant, power station services, heating, lighting, workshops and administrative buildings directly associated with the power station during both on-load and off-load periods.
Total net production	NETPROD	This is the total net electricity or heat production.
Imports	IMPORTS	Amounts are considered as imported when they have crossed the national territorial boundaries of the country. If electricity is “wheeled” or transited through a country, the amount is shown as both an import and an export.
Exports	EXPORTS	Amounts are considered as exported when they have crossed the national territorial boundaries of the country. If electricity is “wheeled” or transited through a country, the amount is shown as both an import and an export.
Used for heat pumps	OWNUSE_HEATPUMP	This is the electricity used in heat pumps (as defined previously).
Used for electric boilers	OWNUSE_BOILER	This is the electricity used in electric boilers.
Used for pumped storage	OWNUSE_PUMPST	This is the electricity consumed by pumping in hydroelectric power plants.
Used for electricity production	OWNUSE_GEN	Heat from chemical processes used as a primary energy form, and purchased secondary waste heat consumed as input to electricity generation.
Net electricity supplied	TES_X_OWNUSE	For electricity, this is the electrical energy supplied from the plant. In the case of a national network this is equal to the sum of the net electrical energy production supplied by all power stations within the country, reduced by the amount used simultaneously for pumping as well as the amount used for heat sold using heat pumps and electric boilers. It is then reduced or increased by exports to or imports from abroad. For heat, this is equal to the sum of the net heat production for sale by all plants within a country reduced or increased by exports or imports from abroad.

Flow	Short name	Definition
Distribution losses	DISTLOSS	This comprises all losses due to transport and distribution of electrical energy and heat. For electricity, losses in transformers which are not considered as integral parts of the power plants are also included.
Total final consumption (calculated)	TFC_ENGY_CALC	This equals the Energy Supplied minus Transmission and Distribution Losses.
Statistical difference	STATDIFF_TFC_ENGY	This equals the Total Consumption (calculated) minus Total Consumption (observed).
Total final consumption (observed)	TFC_ENGY_OBS	This is the amount actually recorded in surveys of end-use sectors. It should, in principle, correspond to the total consumption (calculated).

Energy Industry

Flow	Short name	Definition
Energy industry own use	TOTENGY	All electricity and purchased heat consumed by the energy sector to support the extraction (mining, oil and gas production) and plant operation of transformation activities. It excludes Own use by plant, Used for pumped storage, Used by heat pumps and Used for electric boilers, which are reported elsewhere. Heat consumed by Autoproducers for their own use is not included. Consumption in support of the operation of pipelines (e.g. oil, gas, and coal slurry) is reported in the Transport sector. The Energy Sector covers ISIC1 Divisions 05, 06, 19 and 35, Group 091, Classes 0892 and 0721 (NACE2 Divisions 05, 06 19, and 35, Group 09.1, Classes 08.92 and 07.21). The Energy sector includes the manufacture of chemical materials for atomic fission and fusion and the products of these processes. Electricity and heat used in the manufacture of fuel briquettes and packaged fuel from coal, lignite or peat and consumption in coke ovens, gas works, blast furnaces, liquefaction plants, gasification plants, charcoal production plants and other transformation industries is also reported here.
Coal mines (Own use)	EMINES	Electricity and purchased heat consumed to support the extraction and preparation of coal within the coal mining industry.
Oil and gas extraction (Own use)	EOILGASEX	Electricity and purchased heat consumed to support the operation of oil and gas extraction facilities.
Patent fuel plants (Own use)	EPATFUEL	Electricity and purchased heat consumed at patent fuel plants.
Coke Ovens (Own use)	ECOKEOVS	Electricity and purchased heat consumed at coke ovens.
Gas works (Own use)	EGASWKS	Electricity and purchased heat consumed at gas works plants and coal gasification plants.
Blast furnaces (Own use)	EBLASTFUR	Electricity and purchased heat consumed at blast furnaces operations.
Gasification plants for Biogases (Own use)	EBIOGAS	Electricity and purchased heat consumed at biogas gasification plants.
BKB/PB plants (Own use)	EBKB	Electricity and purchased heat consumed at briquetting plants.
Oil Refineries (Own use)	EREFINER	Electricity and purchased heat consumed at oil refineries.
Coal Liquefaction Plants (Own use)	ECOALLIQ	Electricity and purchased heat consumed at coal liquefaction plants.
Liquefaction (LNG) / Regasification plants (Own use)	ELNG	Electricity and purchased heat consumed at natural gas liquefaction and regasification plants.
Gas-to-liquids (GTL) plants (Own use)	EGTL	Electricity and purchased heat consumed at gas-to-liquids plants.
Nuclear industry (Own use)	ENUC	Electricity and purchased heat consumed at nuclear power plants.

Flow	Short name	Definition
Charcoal production plants (Own use)	ECHARCOAL	Electricity and purchased heat consumed at charcoal production plants.
Not elsewhere specified - energy industry own	ENONSPEC	Electricity and purchased heat consumed for other purposes not reported above.

Final Consumption

Flow	Short name	Definition
Industry	TOTIND	Consumption of industry is specified in the following sub-sectors (energy used for transport by industry is not included here but is reported under transport):
Mining and Quarrying (excluding energy products)	MINING	[ISIC Divisions 07 and 08 + Group 099 (NACE Divisions 07 and 08 + Group 09.9)] Mining (excluding fuels) and quarrying.
Construction	CONSTRUC	[ISIC and NACE Divisions 41, 42 and 43].
Manufacturing	MANUFACT	Manufacturing refers to the sum of the following industrial sub-sectors: • Iron and Steel: • Chemical and petrochemical: • Non-ferrous metals • Non-metallic minerals • Transport equipment • Machinery • Food and tobacco • Paper, pulp and printing • Wood and wood products • Textile and leather Definitions of the sub-sectors themselves can be found under the listing for each respective sub-sector below.
Iron and steel	IRONSTL	[ISIC Group 241 + Class 2431 (NACE Groups 24.1, 24.2, 24.3, Classes 24.51 and 24.52)]. To avoid double counting, electricity used in blast furnaces is reported in the Energy sector.
Chemical and Petrochemical	CHEMICAL	[ISIC and NACE Divisions 20 and 21]
Non-ferrous metals	NONFERR	[ISIC Group 242 + Class 2432 (NACE Group 24.4, Classes 24.53 and 24.54)] Basic industries.
Non-metallic minerals	NONMET	[ISIC and NACE Division 23] Such as glass, ceramic, cement, and other building materials industries.
Transport equipment	TRANSEQ	[ISIC and NACE Divisions 29 and 30]
Machinery	MACHINE	[ISIC and NACE Divisions 25, 26, 27 and 28] Fabricated metal products, machinery and equipment other than transport equipment.
Food and Tobacco	FOODPRO	[ISIC and NACE Divisions 10, 11 and 12].
Paper, pulp and printing	PAPERPRO	[ISIC and NACE Divisions 17 and 18].
Wood and wood products	WOODPRO	[ISIC and NACE Division 16] Wood and wood products other than pulp and paper.

Flow	Short name	Definition
Textile and leather	TEXTILES	[ISIC and NACE Divisions 13, 14 and 15].
Not elsewhere specified - industry	INONSPEC	[ISIC and NACE Divisions 22, 31 and 32] Any manufacturing industry not included above. Note: Most countries have difficulties supplying an industrial breakdown for all fuels. In these cases, the <i>non-specified</i> industry row has been used. Regional aggregates of industrial consumption should therefore be used with caution.
Total transport	TOTTRANS	Electricity used for all transport activity irrespective of the economic sector, in which the activity occurs (except military fuel use, see Not elsewhere specified - Other). Electricity and purchased heat used for heating and lighting at railway and bus stations and airports is reported in Commercial and public services. [ISIC and NACE categories: Divisions 49, 50 and 51] Consumption in transport covers all transport activity and is divided into the following sub-sectors: rail, pipeline, road and non-specified transport.
Rail	RAIL	Electricity consumption for use in rail traffic, including industrial railways and consumption for use in rail transport as part of urban or suburban transport systems.
Pipeline transport	PIPELINE	Electricity consumption in support of the operations of both submarine and overland pipelines transporting gases, liquids, slurries and other commodities up to the distributors network, including the energy used for pump stations and maintenance of the pipeline. Use for pipeline distribution of natural or manufactured gas, hot water or steam (ISIC 35) from the distributor to the final users is excluded and is reported in the Energy sector while use for the final distribution of water (ISIC 36) to household, industrial, commercial and other users is included in the Commercial/public services sector.
Road	ROAD	Electricity use in road vehicles. This includes electricity consumption in road transport vehicles such as electric buses, electric cars and trolley buses when the electricity is supplied from external sources to directly generate mechanical energy or used to charge batteries. Include use by agricultural vehicles on highways. Exclude use in stationary engines (see Not elsewhere specified – Other), non-highway use in tractors (see Agriculture/forestry – Other sector), and military use (see Not elsewhere specified – Other). It is to be noted that the consumption of vehicles running on rails in urban transport (trams, metro, etc.) is included under Rail transport.
Transport - Not elsewhere specified	TRNONSPE	Electricity use for transport activities not included elsewhere.
Residential sector	RESIDENT	[ISIC and NACE Divisions 97 and 98] Includes consumption by households, excluding fuels used for transport. Includes households with employed persons.
Commercial and public services	COMMPUB	[ISIC and NACE Divisions 33, 36, 37, 38, 39, 45, 46, 47, 52, 53, 55, 56, 58, 59, 60, 61, 62, 63, 64, 65, 66, 68, 69, 70, 71, 72, 73, 74, 75, 77, 78, 79, 80, 81, 82, 84 (excluding Class 8422), 85, 86, 87, 88, 90, 91, 92, 93, 94, 95, 96 and 99]. Consumption by businesses and offices in the public and private sectors. Note that electricity and purchased heat use at railway, bus stations, shipping piers and airports is reported in this category and not shown in the Transport sector.

Flow	Short name	Definition
Agriculture and forestry	AGRI_FOREST	[ISIC and NACE Divisions 01 and 02]. Includes deliveries to users classified as agriculture, hunting and forestry by the ISIC, and therefore includes energy consumed by such users whether for traction (excluding agricultural highway use), power or heating (agricultural and domestic).
Fishing	FISHING	[ISIC and NACE Division 03]. Includes fuels used for inland, coastal and deep-sea fishing. Fishing covers fuels delivered to ships of all flags that have refuelled in the country (including international fishing) as well as energy used in the fishing industry.
Final consumption - Other - Not elsewhere specified	ONONSPEC	Includes all electricity and heat use not elsewhere specified as well as consumption in the above-designated categories for which separate figures have not been provided. This category includes military use for all mobile and stationary consumption (e.g. ships, aircraft, and energy used in living quarters) within the country regardless of whether the use is by the military of that country or by the military of another country.

Product definitions

Electricity and Heat Output

Electricity is expressed in gigawatt hours and heat is expressed in terajoules.

Direct use of geothermal and solar thermal is in terajoules on a **net calorific value** basis.

Product	Short name	Definition
Electricity	ELECTRICITY	Gross electricity production is the sum of the electrical energy production by all the generating sets concerned (including pumped storage) measured at the output terminals of the main generators. Net electricity production is equal to the gross electricity production less the electrical energy absorbed by the generating auxiliaries and the losses in the main generator transformers (Own use). Production in hydro stations includes production from pumped storage plants.
Heat	HEAT	Gross heat production is the total heat produced by the installation and includes the heat used by the installation's auxiliaries which use a hot fluid (space heating, liquid fuel heating etc.) and losses in the installation/network heat exchanges, as well as heat from chemical processes used as a primary energy form. Note that for Autoproducers, heat used by the undertaking for its own processes is not included here; only heat sold to third parties is reported. As only heat sold to third parties is reported, gross heat production for Autoproducers will be equal to net heat production. Net heat production is the heat supplied to the distribution system as determined from measurements of the outgoing and return flows.

Primary Electricity and Heat Sources

Electricity is expressed in gigawatt hours and heat is expressed in terajoules.

Direct use of geothermal and solar thermal is in terajoules on a **net calorific value** basis.

Product	Short name	Definition
Nuclear	NUCLEAR	Energy released by nuclear fission or nuclear fusion.
Hydropower	HYDRO	Potential and kinetic energy of water converted into electricity in hydroelectric plants. Electricity from pure and mixed pump storage plants is included in both the total hydro and the pumped hydro.
Pumped hydro (pure and mixed)	HYDRO_PUMP_TOTAL	Electricity produced in hydroelectric power stations from water pumped above the station.
Geothermal	GEOHERMAL	Energy available as heat emitted from within the earth's crust, usually in the form of hot water or steam. It is exploited at suitable sites: - for electricity generation using dry stream or high enthalpy brine after flashing - directly as heat for district heating, agriculture, etc.
Solar	SOLAR	Solar radiation exploited for hot water production and electricity/heat generation. It includes solar photovoltaic and solar thermal. Passive solar energy for the direct heating, cooling and lighting of dwellings or other buildings is not included.
Solar Photovoltaic	SOLAR_PV	Converts sunlight into electricity by the use of solar cells usually made of semi-conducting materials which exposed to light generate electrical current.
Solar thermal	SOLAR_THERMAL	It can consist of: - solar thermal-electric plants, or - equipment for the production of domestic/commercial hot water or for the seasonal heating of swimming pools (e.g. flat plate collectors).
Tidal, Wave, and other Ocean Energy Sources	TIDAL_WAVE_OCEAN	Mechanical energy derived from tidal movement, wave motion or ocean current and exploited for electricity generation.
Wind	WIND	Kinetic energy of wind exploited for electricity generation in wind turbines.
Wind (on-shore)	WIND_ONSHORE	Kinetic energy of wind exploited for electricity generation in wind on-shore turbines.
Wind (off-shore)	WIND_OFFSHORE	Kinetic energy of wind exploited for electricity generation in wind off-shore turbines.

Combustible Fuels

Electricity is expressed in gigawatt hours and heat is expressed in terajoules under this fuel aggregate.

Product	Short name	Definition
Combustible fuels	COMBUSTIBLE_FUELS	Refers to fuels that are capable of igniting or burning, i.e. reacting with oxygen to produce a significant rise in temperature. They are combusted directly for the production of electricity and/or heat.

Coal and Coal Derived Products

With the exception of coal gases, the fuels in this section are expressed both in thousand tonnes and terajoules.

The coal gases are expressed only in terajoules on a **gross calorific value** basis.

Product	Short name	Definition
Hard coal and patent fuel	HARDCOAL_PATFUEL	Prior to 1990, hard coal includes anthracite, coking coal, other bituminous coal, patent fuel, coke oven coke and gas coke.
Brown coal, coal tar and BKB	BROWN_CTAR_BKB	Prior to 1990, brown coal includes sub-bituminous coal, lignite, coal tar and BKB.
Ele/heat output from non-specified manufactured gases	MANUFACTURED_GASOUTPUT	Prior to 1990, coal gases include coke oven gas, blast furnace gas oxygen steel furnace gas.
Anthracite	ANTHRACITE	High rank coal normally used for industrial and residential applications. It has generally less than 10% volatile matter and a high carbon content (about 90% fixed carbon). Its gross calorific value is equal to or greater than 24 000 kJ/kg (5 732 kcal/kg) on an ash-free but moist basis.
Coking coal	COKING_COAL	Bituminous coal with a quality that allows the production of a coke suitable to support a blast furnace charge. Its gross calorific value is equal to or greater than 24 000 kJ/kg (5 732 kcal/kg) on an ash-free but moist basis.
Other bituminous coal	OTH_BITCOAL	Coal used for steam raising purposes and includes all bituminous coal that is not included under coking coal nor anthracite. It is characterised by higher volatile matter than anthracite (more than 10%) and lower carbon content (less than 90% fixed carbon). Its gross calorific value is equal to or greater than 24 000 kJ/kg (5 732 kcal/kg) on an ash-free but moist basis.
Sub-bituminous coal	SUB_BITCOAL	Non-agglomerating coal with a gross calorific value equal to or greater than 20 000 kJ/kg (4 777 kcal/kg) and less than 24 000 kJ/kg (5 732 kcal/kg) containing more than 31% volatile matter on an ash free moist basis.

Product	Short name	Definition
Lignite	LIGNITE	Non-agglomerating coal with a gross calorific value less than 20 000 kJ/kg (4 777 kcal/kg) and greater than 31% volatile matter on an ash free moist basis.
Patent fuel	PATENT_FUEL	A composition fuel manufactured from hard coal fines with the addition of a binding agent. The amount of patent fuel produced is, therefore, slightly higher than the actual amount of coal consumed in the transformation process.
Coke oven cokes	COKE_OVEN_COKE_OTH	The solid product obtained from the carbonisation of coal, principally coking coal, at high temperature. It is low in moisture content 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 (a solid product obtained from carbonisation of coal at low temperature) is included in this category. This heading also includes coke, coke breeze and semi-coke made from lignite coal.
Gas coke	GAS_COKE	By-product of hard coal used for the production of town gas in gas works. Gas coke is used for heating purposes.
Coal tar	COAL_TAR	A result of the destructive distillation of bituminous coal or of the low-temperature carbonisation of brown coal. Coal tar from bituminous coal is the liquid by-product of the distillation of coal to make coke in the coke oven process. Coal tar can be further distilled into different organic products (e.g. benzene, toluene, naphthalene), which normally would be reported as a feedstock to the petrochemical industry.
Brown coal briquettes (BKB)	BKB	A composition fuel manufactured from lignite coal, or sub-bituminous coal, produced by briquetting under high pressure without the addition of a binding agent. These figures include dried lignite fines and dust.
Gas works gas	GASWORKS_GAS	Covers all types of gases produced in public utility or private plants, whose main purpose is manufacture, transport and distribution of gas. It includes gas produced by carbonisation (including gas produced by coke ovens and transferred to gas works gas), by total gasification with or without enrichment with oil products (LPG, residual fuel oil, etc.), and by reforming and simple mixing of gases and/or air. The quantity of fuel is reported on a gross calorific value basis.
Coke oven gas	COKE_OVEN_GAS	Obtained as a by-product of the manufacture of coke oven coke for the production of iron and steel. The quantity of fuel is reported on a gross calorific value basis.

Product	Short name	Definition
Blast furnace gas	BLAST_FURNACE_GAS	Produced during the combustion of coke in blast furnaces in the iron and steel industry. It is recovered and used as a fuel partly within the plant and partly in other steel industry processes or in power stations equipped to burn it. The quantity of fuel is reported on a gross calorific value basis. In addition, off-gases from all iron-production reduction processes utilising air as the oxygen source (such as Direct reduced iron) are reported here.
Other recovered gases	OTH_RECOVGASES	By-product of the production of steel in an oxygen furnace, recovered on leaving the furnace. The gases are also known as converter gas, LD gas or BOS gas. Also covers non-specified manufactured gases not mentioned above, such as combustible gases of solid carbonaceous origin recovered from manufacturing and chemical processes not elsewhere defined. The quantity of recuperated fuel is reported on a gross calorific value basis.
Peat	PEAT	A combustible soft, porous or compressed, fossil sedimentary deposit of plant origin with high water content (up to 90% in the raw state), easily cut, of light-to-dark brown colour. Peat used for non-energy purposes is not included. Milled peat is included here.
Peat products	PEAT_PRODUCTS	Products such as peat briquettes derived directly or indirectly from sod peat and milled peat.
Oil shale and oil sands	OIL_SHALE	Oil shale and oil sands are sedimentary rock which contains organic matter in the form of kerogen. Kerogen is a waxy hydrocarbon-rich material regarded as a precursor of petroleum. Oil shale may be burned directly or processed by heating to extract shale oil. Shale oil and other products derived from liquefaction are reported under "Other oil products".

Crude, NGL and Petroleum Products

The fuels in this section are expressed in both thousand tonnes and in terajoules on a **gross calorific basis**.

Product	Short name	Definition
Liquid fuels and refinery gas	OIL_REFINGAS	Prior to 1990, liquid fuels include all petroleum products (crude oil, NGL, refinery gas, LPG, naphtha, jet fuel, other kerosene, gas/diesel oil, residual fuel oil, bitumen, petroleum coke, other oil products) and refinery gases.
Crude oil	CRUDE_OIL	A mineral oil consisting of a mixture of hydrocarbons of natural origin and associated impurities, such as sulphur. It exists in the liquid phase under normal surface temperatures and pressure and its physical characteristics (density, viscosity, etc.) are highly variable. It includes field or lease condensates (separator liquids) which are recovered from associated and non-associated gas where it is commingled with the commercial crude oil stream.

Product	Short name	Definition
Natural gas liquids	NGL	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).
Refinery gas	REFINERY_GAS	A mixture of non-condensed 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.
Liquefied petroleum gases	LPG	Are light paraffinic hydrocarbons derived from the refinery processes, crude oil stabilisation and natural gas processing plants. They consist mainly of propane (C ₃ H ₈) and butane (C ₄ H ₁₀) or a combination of the two. They could also include propylene, butylene, isobutene and isobutylene. LPG are normally liquefied under pressure for transportation and storage.
Naphtha	NAPHTHA	A feedstock destined for either the petrochemical industry (e.g. ethylene manufacture or aromatics production) or for gasoline production by reforming or isomerisation within the refinery. Naphtha comprises material in the 30°C and 210°C distillation range or part of this range.
Kerosene type jet fuel	KEROSENE_JET	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).
Kerosene	KEROSENE_OTHER	Kerosene comprises refined petroleum distillate and is used in sectors other than aircraft transport. It distills between 150°C and 300°C.
Gas/diesel oil	GAS_DIESEL_OIL	A medium distillate distilling between 180°C and 380°C. It is comprised of road diesel, heating and other gasoil.
Residual fuel oil	FUEL_OIL_RESIDUAL	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.
Bitumen	BITUMEN	A solid, semi-solid or viscous hydrocarbon with a colloidal structure that is brown to black in colour. It is obtained by vacuum distillation of oil residues from atmospheric distillation of crude oil. Bitumen is often referred to as asphalt and is primarily used for surfacing of roads and for roofing material. This category includes fluidised and cut back bitumen as well as Orimulsion.

Product	Short name	Definition
Petroleum coke	PETROLEUM_COKE	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 a 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.
Non-specified petroleum products	OTH_SEC_OIL_PRODS_ND	All products not specifically mentioned above, for example: tar, sulphur, and shale oil. Oil products not specifically mentioned above.

Gas

Natural gas is expressed in terajoules on a **gross calorific value** basis.

Product	Short name	Definition
Natural gas and gas works gas	NATURAL_GAS_GASWORKS_GAS	Prior to 1990, this aggregate includes natural gas and gas works gas.
Natural Gas	NATURAL_GAS	Consists mainly of methane occurring naturally in underground deposits. This includes colliery gas. The quantity of fuel used is reported on a gross calorific value basis.

Biofuels and Wastes

The fuels in this section are expressed in terajoules on a **net calorific value** basis, with the exception of biodiesel, liquid biofuels and non-specified combustible renewables and waste, which are in thousand tonnes.

Product	Short name	Definition
Municipal waste	WASTE_MUNICIPAL	Prior to 1990, municipal waste consists of products that are combusted directly to produce heat and/or power and comprises wastes produced by households, industry, hospitals and the tertiary sector that are collected by local authorities for incineration at specific installations. After 1989, municipal waste is split into renewable and non-renewable.
Industrial waste, non-renewable	WASTE_INDUSTRIAL_NONREN	Wastes of industrial non-renewable origin (solids or liquids) combusted directly for the production of electricity and/or heat. Renewable industrial waste is reported in the Solid biomass, Biogas and/or Liquid Biofuels categories. The quantity of fuel used is reported on a net calorific value basis.
Municipal waste, renewable	WASTE_MUNICIPAL_REN	Portion of waste produced by households, industry, hospitals and the tertiary sector which is biological material collected by local authorities and incinerated at specific installations. The quantity of fuel used is reported on a net calorific value basis.
Municipal waste, non-renewable	WASTE_MUNICIPAL_NONREN	Portion of waste produced by households, industry, hospitals and the tertiary sector which is non-biological material collected by local authorities and incinerated at specific installations. The quantity of fuel used is reported on a net calorific value basis.

Product	Short name	Definition
Solid biofuels	SOLID_BIOFUEL	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. • Fuelwood, wood residues and by-products: Fuelwood or firewood (in log, brushwood, pellet or chip form) obtained from natural or managed forests or isolated trees. Also included are wood residues used as fuel and in which the original composition of wood is retained. Charcoal and black liquor are excluded. The quantity of fuel used is reported on a net calorific value basis. • Black liquor: Energy from the alkaline-spent liquor obtained from the digesters during the production of sulphate or soda pulp required for paper manufacture. • Bagasse: Fuel obtained from the fiber which remains after juice extraction in sugar cane processing. • Animal waste: Energy from excreta of animals, meat and fish residues which, when dry, are used directly as a fuel. This excludes waste used in anaerobic fermentation plants. Fuel gases from these plants are included under biogases. • Other vegetal materials and residuals: Biofuels not specified elsewhere and including straw, vegetable husks, ground nut shells, pruning brushwood, olive pomace and other wastes arising from the maintenance, cropping and processing of plants.
Biogases	BIOGASES	A gas composed principally of methane and carbon dioxide produced by anaerobic digestion of biomass, or by thermal processes. The quantity of fuel used is reported on a net calorific value basis. It includes Landfill gas, Sewage sludge gas, Other biogases from anaerobic digestion and Biogases from thermal processes.
Landfill gas	LANDFILL_GAS	Landfill gas is formed by the digestion of landfilled wastes. Data for inputs and outputs to heat production and electricity generation are available up to 2011.
Sewage sludge gas	SEWAGE_SLUDGE_GAS	Sewage sludge gas, produced from the anaerobic fermentation of sewage sludge. Data for inputs and outputs to heat production and electricity generation are available up to 2011.
Other Biogases from anaerobic processes	BIOGASES_OTHER	Other biogases, such as biogas produced from the anaerobic fermentation of animal slurries and of wastes in abattoirs, breweries and other agro-food industries. Data for inputs and outputs to heat production and electricity generation are available up to 2011.

Product	Short name	Definition
Biodiesels	BIODIESEL	This category includes biodiesel (a methyl-ester produced from vegetable or animal oil, of diesel quality), biodimethylether (dimethylether produced from biomass), Fischer-Tropsch (Fischer-Tropsch produced from biomass), cold pressed bio-oil (oil produced from oil seed through mechanical processing only) used straight as road diesel or for electricity and heat generation.
Biogasoline	BIOGASOLINE	Biogasoline includes bioethanol (ethanol produced from biomass and/or the biodegradable fraction of waste), biomethanol (methanol produced from biomass and/or the biodegradable fraction of waste), bioETBE (ethyl-tertio-butyl-ether produced on the basis of bioethanol; the percentage by volume of bioETBE that is calculated as biofuel is 47%) and bioMTBE (methyl-tertio-butyl-ether produced on the basis of biomethanol: the percentage by volume of bioMTBE that is calculated as biofuel is 36%). Biogasoline includes the amounts that are blended into the gasoline - it does not include the total volume of gasoline into which the biogasoline is blended.
Other liquid biofuels	LIQBIOFUEL_OTHER	Liquid fuels produced from biofuels, biodegradable organic waste, used frying oils, or other organic material. This category includes liquid biofuels not included in biodiesels. Please note that the quantities of liquid biofuels reported in this category should relate to the quantities of biofuel and not to the total volume of liquids into which the biofuels are blended.
Other non-specified biofuels and waste	OTH_BIOFUELWASTE	This item is used when the detailed breakdown for primary biofuels and waste is not available.

Other Generation Sources

Electricity is expressed in gigawatt hours and heat is expressed in terajoules.

Product	Short name	Definition
Heat pumps	HEAT_PUMPS	Heat output from heat pumps only where the heat is sold to third parties (i.e. in cases where production occurs in the Transformation sector).
Electric boilers	ELEC_BOILER_OUTPUT	Heat from electric boilers where the output is sold to third parties.
Heat from chemical sources	HEAT_CHEMICAL_SOURCES_NS	Heat originating from processes without input energy, such as a chemical reaction (e.g. the treatment of zinc oxide ore with hydrochloric acid). Note that waste heat originating from energy driven processes is not considered as a primary energy source. Therefore, it is reported as heat produced from the corresponding fuel.
Other sources	NONSPEC_ELEC_HEAT	Electricity production from sources other than those listed, e.g. from fuel cells. Heat from other sources; for example, recovered waste heat from industry sold to third parties.
Memo: Batteries	BATTERY	Electricity or heat production from other sources derived from batteries.
Memo: Derived/district heat	HEAT_DERIVED_DISTRICT	Electricity or heat production from other sources derived from heat e.g. recovered heat, purchased heat, waste heat.
Heat output from non-specified comb. fuels	OTH_COMBUSTIBLE_FUELS	This item is only used if the detailed breakdown is not available.
Total sources	TOTAL	This item represents the sum of all the sources of electricity and heat generation.

Electricity and Heat Generation Flows

Flow	Short name	Definition
Fuel input (kt)	INPUT	This is the quantity of fuel used to produce electricity and heat measured in thousand metric tons.
Fuel input (TJ)	INPUT	This is the quantity of fuel used to produce electricity and heat measured in terajoules (TJ). Quantities are reported using net calorific values, except for gases which are reported in gross calorific values.
Gross electricity production	GELEPROD	Gross Electricity Production is the sum of the electrical energy production by all the generating sets concerned (including pumped storage) measured at the output terminals of the main generators.
Net electricity production	NELEPROD	Net Electricity Production is equal to the gross electricity production less the electrical energy absorbed by the generating auxiliaries and the losses in the main generator transformers.
Gross heat production	GHEATPRO	Gross Heat Production is the total heat produced by the installation and includes the heat used by the installation's auxiliaries which use a hot fluid (space heating, liquid fuel heating, etc.) and losses in the installation/network heat exchanges. Note that for autoproducers, heat used by the undertaking for its own processes is not included here; only heat sold to third parties is reported. As only heat sold to third parties is reported, gross heat production for autoproducers is equal to net heat production.
Net heat production	NHEATPRO	Net Heat Production is the heat supplied to the distribution system as determined from measurements of the outgoing and return flows.

Plant Type

Flow	Short name	Definition
Main activity producer electricity plants	MAINELEC	Refers to plants which are designed to produce electricity only. If one or more units of the plant is a CHP unit (and the inputs and outputs cannot be distinguished on a unit basis) then the whole plant is designated as a CHP plant. Main activity producers (formerly referred to as public supply undertakings) generate electricity for sale to third parties, as their primary activity. They may be privately or publicly owned. Note that the sale need not take place through the public grid.
Main activity producer CHP plants	MAINCHP	Refers to plants which are designed to produce both heat and electricity (sometimes referred to as co-generation power stations). If possible, fuel inputs and electricity/heat outputs are on a unit basis rather than on a plant basis. However, if data are not available on a unit basis, the convention for defining a CHP plant noted above is adopted. Main activity producers (formerly referred to as public supply undertakings) generate electricity and/or heat for sale to third parties, as their primary activity. They may be privately or publicly owned. Note that the sale need not take place through the public grid.
Main activity producer heat plants	MAINHEAT	Refers to plants (including heat pumps and electric boilers) designed to produce heat only and who sell heat to a third party (e.g. residential, commercial or industrial consumers) under the provisions of a contract. Main activity producers (formerly referred to as public supply undertakings) generate heat for sale to third parties, as their primary activity. They may be privately or publicly owned. Note that the sale need not take place through the public grid.
Autoproducer electricity plants	AUTOELEC	Refers to plants which are designed to produce electricity only. If one or more units of the plant is a CHP unit (and the inputs and outputs cannot be distinguished on a unit basis) then the whole plant is designated as a CHP plant. Autoproducer undertakings generate electricity wholly or partly for their own use as an activity which supports their primary activity. They may be privately or publicly owned.
Autoproducer CHP plants	AUTOCHP	Refers to plants which are designed to produce both heat and electricity (sometimes referred to as co-generation power stations). If possible, fuel inputs and electricity/heat outputs are on a unit basis rather than on a plant basis. However, if data are not available on a unit basis, the convention for defining a CHP plant noted above is adopted. Note that for Autoproducer CHP plants, all fuel inputs to electricity production are taken into account, while only the part of fuel inputs to heat sold is shown. Fuel inputs for the production of heat consumed within Autoproducers' establishments are not included here but are included with figures for the final consumption of fuels in the appropriate consuming sector. Autoproducer undertakings 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.

Flow	Short name	Definition
Autoproducer heat plants	AUTOHEAT	Refers to plants (including heat pumps and electric boilers) designed to produce heat only and who sell heat to a third party (e.g. residential, commercial or industrial consumers) under the provisions of a contract. Autoproducer undertakings generate heat, wholly or partly for their own use as an activity which supports their primary activity. They may be privately or publicly owned.
Total main activity producer plants	MAINTOT	This refers to inputs to and outputs from all main activity producer plants.
Total Autoproducer plants	AUTOTOT	This refers to inputs to and outputs from all Autoproducer plants.
Total plants	TOTAL	This refers to inputs to and outputs from all plants.

Electricity Capacity

Flow	Short name	Definition
Total capacity	TOTAL	The capacity at 31st December is reported. It includes electrical capacity of both electricity (only) and CHP plants. Data for fuel cells are reported in the row "Other fuel sources". Net Maximum Electrical Capacity: the sum of the net maximum capacities of all stations taken individually at a given period of operation. The net maximum capacity is the maximum active power that can be supplied, continuously, with all plants running, at the point of outlet to the network (i.e. after taking the power supplies for the station auxiliaries and allowing for the losses in those transformers considered integral to the station). This definition varies for Solar Photovoltaic plants, where the capacity is based on the direct current (DC) capacity of the panels. The net maximum capacity represents the sum of all individual plants' maximum capacities available to run continuously throughout a prolonged period of operation in a day. Does not include overload capacity that can only be sustained for a short period of time (e.g. internal combustion engines momentarily running above their rated capacity). It is assumed that all equipment is in full working order, that the power produced can be disposed of without any restrictions and that optimum conditions prevail as regards primary sources (i.e. flow and head in the case of hydro plant; grade and quantity of fuel in hand and water supply, temperature, and purity in the case of thermal plant, and assuming that the output and method of production in CHP plant are those which lend to maximum electricity production). Mixed (hydro) plants are hydro plants with natural inflow where part or all equipment can be used for pumping water uphill and also for producing electricity from natural inflow and pump storage. Pure pumped storage plants are plants with no natural inflow, producing electricity only from water previously pumped uphill.
Solar photovoltaic (DC capacity)	SOLAR_PV_DC	Electrical capacity of the installed solar photovoltaic panels that generate electricity in direct current (DC). The electrical capacity of the AC side of the DC-AC conversion system, i.e. the maximum AC power the inverter(s) can provide, are reported in the product solar photovoltaic (AC capacity)
Solar photovoltaic (AC capacity)	SOLAR_PV_AC	Electrical capacity of the AC side of the DC-AC conversion system of solar photovoltaic plants, i.e. the maximum AC power the inverter(s) can provide.
Solid/liquid	COMBFUEL_SOLLIQ	Refers to units capable of generating electricity using solid and liquid fuel.
Solid/natural gas	COMBFUEL_SOLGAS	Refers to units capable of generating electricity using solid fuel and natural gas.
Liquid/natural gas	COMBFUEL_LIQGAS	Refers to units capable of generating electricity using liquid fuels and natural gas.

Flow	Short name	Definition
Solid/liquid/gas	COMBFUEL_ SOLIGAS	Refers to units capable of generating electricity using solid, liquid fuels and natural gas.
Steam	COMBFUEL_ STEAM	Refers to two main types of steam turbines - non-condensing (or open cycle), also called back-pressure turbines, and condensing turbines (or closed cycle). In non-condensing turbines, the exhaust steam leaving the turbine is used either as co-generated process steam or, more rarely, released into the atmosphere. In a condensing turbine, the exhaust steam is condensed and the water thus formed supplies the feed-water for the generator. The boilers supplying steam turbines can be fuelled by all forms of fossil fuels.
Internal combustion	COMBFUEL_ INTCOMB	Refers to the engines based on the gasoline or diesel cycle, which work on the spark ignition or the compression-ignition principle. Diesel-type engines can use a variety of fuels ranging from natural gas to liquid fuels.
Gas turbine	COMBFUEL_ GASTURB	The gas turbine uses high temperature, high pressure gas as fuel, in which part of the heat supplied by the gas is converted into rotational energy. Fuel can be natural gas, coal gases or liquid fuels.
Combined cycle	COMBFUEL_ COMBCYC	The combined cycle system refers to electricity produced by coupling two heat engines in a sequence to drive generators. The heat discharged from one heat engine serves as the energy source for the next engine. The gas turbine is generally used as the first heat engine and a conventional condensing steam turbine at the second stage.
Other Type of Generation	COMBFUEL_ OTHGEN	This refers to electric generating capacity not included elsewhere.
Peak load	PEAKLOAD	This is the highest value of the power absorbed or supplied by a network or combination of networks within the country. The peak load demand is the highest simultaneous demand for electricity satisfied during the year. Note that the electricity supply at the time of peak demand may include demand satisfied by imported electricity or alternatively the demand may include exports of electricity. Total peak load on the national grid is not the sum of the peak loads during the year on every power station as they may occur at different times.
Capacity at peak	PEAKCAP	The available capacity of an installation at peak period is the maximum power at which it can be operated under the prevailing conditions at the time, assuming no external constraints. It depends on the technical state of the equipment and its ability to operate, and may differ from the <i>Net maximum capacity</i> due to lack of water for hydro capacity, plant maintenance, unanticipated shutdown, or other outages at the time of peak load.

Geographical coverage

Countries and Regions

This document is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. In this publication, 'country' refers to country or territory, as the case may be. Data start in 1960 for OECD countries and regions, and in 1971 for non-OECD countries and regions, unless otherwise specified.

Long name	Short name	Definition
Australia	AUSTRALIA	Excludes the overseas territories. Data are reported on a fiscal year basis. By convention data for the fiscal year that starts on 1 July Y-1 and ends on 30 June Y are labelled as year Y.
Austria	AUSTRIA	
Belgium	BELGIUM	
Canada	CANADA	
Chile	CHILE	Chile is currently seeking accession to full IEA membership (Accession country), therefore it is included in the IEA and Accession/Association countries aggregate (IEA Family), for the entire time series. Data start in 1971.
Colombia	COLOMBIA	Colombia joined the OECD in April 2020; data are now included in the OECD aggregates. Colombia is currently seeking accession to full IEA membership (Accession country), therefore it is included in the IEA and Accession/Association countries aggregate (IEA Family), for the entire time series. Data start in 1971.
Costa Rica	COSTARICA	Costa Rica joined the OECD in May 2021; data are now included in the applicable OECD aggregates. Costa Rica became an IEA accession country in 2024,), therefore it is included in the IEA and Accession/Association countries aggregate (IEA Family), for the entire time series.
Czech Republic	CZECH	Data start in 1971.
Denmark	DENMARK	Excludes Greenland and the Faroe Islands, except prior to 1990, where data on oil for Greenland were included with the Danish statistics.
Estonia	ESTONIA	Estonia joined the IEA in May 2014. Data start in 1990. Prior to that, they are included in Former Soviet Union in the publication of World Energy Statistics.

Long name	Short name	Definition
Finland	FINLAND	
France	FRANCE	From 2011 data onwards, France includes Monaco, and the following overseas departments (Guadeloupe; French Guiana; Martinique; Mayotte; and Réunion); and excludes the overseas collectivities (New Caledonia; French Polynesia; Saint Barthélemy; Saint Martin; Saint Pierre and Miquelon; and Wallis and Futuna). Prior to 2011, France includes Monaco and excludes the following overseas departments and collectivities: Guadeloupe; French Guiana; Martinique; Mayotte and Réunion; New Caledonia; French Polynesia; Saint Barthélemy; Saint Martin; Saint Pierre and Miquelon; and Wallis and Futuna.
Germany	GERMANY	Includes the new federal states of Germany from 1970 onwards
Greece	GREECE	
Hungary	HUNGARY	Data start in 1965.
Iceland	ICELAND	
Ireland	IRELAND	
Israel	ISRAEL	The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law. Israel is currently seeking accession to full IEA membership (Accession country), therefore it is included in the IEA and Accession/Association countries aggregate (IEA Family), for the entire time series. Data start in 1971.
Italy	ITALY	Includes San Marino and the Holy See.
Japan	JAPAN	Includes Okinawa. Starting in 1990, data are reported on a fiscal year basis. By convention data for the fiscal year that starts on 1 April Y and ends on 31 March Y+1 is labelled as year Y.
Korea	KOREA	Data start in 1971.
Latvia	LATVIA	Latvia joined the IEA in October 2024. It is included in the IEA and Accession/Association countries aggregate (IEA family), for data starting in 1990 and for the entire time series. Data start in 1990. Prior to that, they are included in Former Soviet Union in the publication of World Energy Statistics.

Long name	Short name	Definition
Lithuania	LITHUANIA	Lithuania joined the IEA in February 2022. It is included in the IEA and Accession/Association countries aggregate (IEA family), for data starting in 1990 and for the entire time series. Data start in 1990. Prior to that, they are included in Former Soviet Union in the publication of World Energy Statistics.
Luxembourg	LUXEMBOURG	
Mexico	MEXICO	Data start in 1971.
Netherlands	NETHERLANDS	Excludes Suriname, Aruba and the other former Netherlands Antilles (Bonaire, Curaçao, Saba, Saint Eustatius and Sint Maarten).
New Zealand	NEWZEALAND	
Norway	NORWAY	
Poland	POLAND	
Portugal	PORTUGAL	Includes the Azores and Madeira.
Slovak Republic	SLOVAKIA	Data start in 1971.
Slovenia	SLOVENIA	Data start in 1990. Prior to that, they are included within Former Yugoslavia in the publication of World Energy Statistics.
Spain	SPAIN	Includes the Canary Islands, the Balearic Islands, and Ceuta and Melilla.
Sweden	SWEDEN	
Switzerland	SWITZERLAND	Does not include Liechtenstein.
Republic of Turkiye	TURKIYE	
United Kingdom	UK	Does not include the Channel Islands or the Isle of Man.
United States	USA	For 2017 onwards, includes the 50 states, the District of Columbia, and Puerto Rico. Prior to 2017, includes the 50 states and the District of Columbia.

Long name	Short name	Definition
OECD Total	OECDTOT	Includes Australia, Austria, Belgium, Canada, Chile, Colombia, Costa Rica, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel,¹ Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Republic of Türkiye, the United Kingdom and the United States. Estonia, Latvia, Lithuania, and Slovenia are included starting in 1990. Prior to 1990, data for Estonia, Latvia and Lithuania are included in Former Soviet Union, and data for Slovenia in Former Yugoslavia.
OECD Americas	OECDAM	Includes Canada, Chile, Colombia, Costa Rica, Mexico, and the United States.
OECD Asia Oceania	OECDAO	Includes Australia, Israel, ¹ Japan, Korea and New Zealand.
OECD Europe	OECD EUR	Includes Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Republic of Türkiye, and the United Kingdom. Estonia, Latvia, Lithuania and Slovenia are included starting in 1990. Prior to 1990, data for Estonia, Latvia and Lithuania are included in Former Soviet Union, and data for Slovenia in Former Yugoslavia.
Total IEA	IEATOT	Includes Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden, Switzerland, the Republic of Türkiye, the United Kingdom and the United States. Estonia, Latvia and Lithuania are included starting in 1990. Prior to 1990, data for Estonia, Latvia and Lithuania are included in Former Soviet Union.

¹ The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Long name	Short name	Definition
IEA and Accession/Association countries	IEAFAMILY	Includes: IEA member countries: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden, Switzerland, the Republic of Türkiye, the United Kingdom and the United States;
		Accession countries: Brazil, Chile, Colombia, Costa Rica, Israel, and Romania;
		Association countries: Argentina, the People's Republic of China, Egypt, India, Indonesia, Kenya, Morocco, Nigeria, Singapore, Senegal, South Africa, Thailand, Ukraine and Viet Nam.
		Estonia, Latvia, Lithuania and Slovenia are included starting in 1990. Prior to 1990, data for Estonia, Latvia and Lithuania are included in Former Soviet Union and data for Slovenia in Former Yugoslavia.
European Union (28)	EU28	Includes Austria; Belgium; Bulgaria; Croatia; Cyprus;² the Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Latvia; Lithuania; Luxembourg; Malta; the Netherlands; Poland; Portugal; Romania; the Slovak Republic; Slovenia; Spain; Sweden and the United Kingdom.³ Please note that in the interest of having comparable data, all these countries are included since 1990 despite different entry dates into the European Union.

² Note by the Republic of Türkiye:

The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Türkiye recognizes the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Türkiye shall preserve its position concerning the "Cyprus issue".

Note by all the European Union member states of the OECD and the European Union:

The Republic of Cyprus is recognized by all members of the United Nations with the exception of Türkiye. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

³ As of the 1st of February 2020, the United Kingdom (UK) is no longer part of the European Union (EU) and has entered into a transition period until 31 December 2020. In this publication with data up to 2020, the UK is still included in the EU28 aggregate. However, it is excluded from the EU27_2020 aggregate.

Long name	Short name	Definition
		Refers to the EU28 aggregate with the exclusion of the United Kingdom.
European Union (27)	EU27	Namely includes Austria; Belgium; Bulgaria; Croatia; Cyprus; ² the Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Latvia; Lithuania; Luxembourg; Malta; the Netherlands; Poland; Portugal; Romania; the Slovak Republic; Slovenia; Spain and Sweden. Please note that in the interest of having comparable data, all these countries are included since 1990 despite different entry dates into the European Union.
Argentina	ARGENTINA	
Bolivia	BOLIVIA	
Brazil	BRAZIL	Brazil is currently an IEA Accession country, therefore it is included in the IEA and Accession/Association countries aggregate (IEA Family), for data starting in 1971 and for the entire time series.
Cuba	CUBA	
Netherlands Antilles/ Curaçao	CURACAO	The Netherlands Antilles was dissolved on 10 October 2010, resulting in two new constituent countries, Curaçao and Sint Maarten, with the remaining islands joining Netherlands as special municipalities. In this edition, the methodology for accounting for the energy statistics of Netherlands Antilles has been revised in order to follow the above-mentioned geographical changes. From 2012 onwards, data now account for the energy statistics of Curaçao Island only. Prior to 2012, data remain unchanged and still cover the entire territory of the former Netherlands Antilles.
Dominican Republic	DOMINICANREP	
Ecuador	ECUADOR	
El Salvador	ELSALVADOR	
Guatemala	GUATEMALA	
Guyana	GUYANA	
Haiti	HAITI	
Honduras	HONDURAS	
Jamaica	JAMAICA	
Nicaragua	NICARAGUA	
Panama	PANAMA	
Paraguay	PARAGUAY	

Long name	Short name	Definition
Peru	PERU	
Suriname	SURINAME	Data for Suriname are available starting in 2000. Prior to that, they are included in Other non-OECD Americas.
Trinidad and Tobago	TRINIDAD	
Uruguay	URUGUAY	
Bolivarian Republic of Venezuela	VENEZUELA	
Other non-OECD Americas	OTH_NON_OECDAM	Includes Anguilla, Antigua and Barbuda; Aruba; the Bahamas; Barbados; Belize; Bermuda; Bonaire (from 2012); the British Virgin Islands; the Cayman Islands; Dominica; the Falkland Islands (Malvinas); French Guiana (until 2010); Grenada; Guadeloupe (until 2010); Martinique (until 2010); Montserrat; Puerto Rico (for natural gas and – up to 2016 data, electricity); Saba (from 2012); Saint Eustatius (from 2012); Saint Kitts and Nevis; Saint Lucia; Saint Pierre and Miquelon; Saint Vincent and the Grenadines; Sint Maarten (from 2012); Suriname (until 1999); and Turks and Caicos Islands.
Non-OECD Americas	NON_OECDAM	Includes Argentina; Plurinational State of Bolivia (Bolivia); Brazil; Cuba; Curaçao; the Dominican Republic; Ecuador; El Salvador; Guatemala; Guyana; Haiti; Honduras; Jamaica; Nicaragua; Panama; Paraguay; Peru; Suriname; Trinidad and Tobago; Uruguay; Bolivarian Republic of Venezuela (Venezuela) and Other non-OECD Americas.
Albania	ALBANIA	
Bosnia and Herzegovina	BOSNIAHERZ	Data for Bosnia and Herzegovina are available starting in 1990. Prior to that, they are included in Former Yugoslavia.
Bulgaria	BULGARIA	
Croatia	CROATIA	Data for Croatia are available starting in 1990. Prior to that, they are included in Former Yugoslavia.

Long name	Short name	Definition
Cyprus	CYPRUS	Note by the Republic of Türkiye: <i>The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Türkiye recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Türkiye shall preserve its position concerning the “Cyprus issue”.</i> Note by all the European Union member states of the OECD and the European Union: <i>The Republic of Cyprus is recognised by all members of the United Nations with the exception of Türkiye. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.</i>
Gibraltar	GIBALTAR	
Kosovo	KOSOVO	Data for Kosovo are available starting in 2000. Between 1990 and 1999, data for Kosovo are included in Serbia. Prior to 1990, they are included in Former Yugoslavia. This designation is without prejudice to positions on status, and is in line with United Nations Security Council Resolution 1244/99 and the Advisory Opinion of the International Court of Justice on Kosovo's declaration of independence.
Malta	MALTA	
Montenegro	MONTENEGRO	Data for Montenegro are available starting in 2005. Between 1990 and 2004, data for Montenegro are included in Serbia. Prior to 1990, they are included in Former Yugoslavia.
Romania	ROMANIA	Romania became an Accession country in April 2026, therefore it is included in the IEA and Accession/Association countries aggregate (IEA Family), for data starting in 1971 and for the entire time series.
Republic of North Macedonia	NORTHMACED	Data for the Republic of North Macedonia are available starting in 1990. Prior to that, they are included in Former Yugoslavia.
Serbia	SERBIA	Data for Serbia are available starting in 1990. Prior to that, they are included in Former Yugoslavia. Serbia includes Montenegro until 2004 and Kosovo⁴ until 1999.
Former Yugoslavia	F_YUGOSLAVIA	Before 1990, includes Bosnia and Herzegovina; Croatia; Kosovo; Montenegro; the Republic of North Macedonia; Slovenia and Serbia.

⁴. This designation is without prejudice to positions on status, and is in line with United Nations Security Council Resolution 1244/99 and the Advisory Opinion of the International Court of Justice on Kosovo's declaration of independence.

Long name	Short name	Definition
Non-OECD Europe and Eurasia	NON_OECDEURAS	Includes Albania; Armenia; Azerbaijan; Belarus; Bosnia and Herzegovina; Bulgaria; Croatia; Cyprus; ⁵ Georgia; Gibraltar; Kazakhstan; Kosovo; Kyrgyzstan; Lithuania; Malta; Republic of Moldova (Moldova); Montenegro; Republic of North Macedonia; Romania; Russian Federation; Serbia; ⁶ Tajikistan; Turkmenistan; Ukraine; Uzbekistan; Former Soviet Union (prior to 1990) and Former Yugoslavia (prior to 1990).
Armenia	ARMENIA	Data for Armenia are available starting in 1990. Prior to that, they are included in Former Soviet Union.
Azerbaijan	AZERBAIJAN	Data for Azerbaijan are available starting in 1990. Prior to that, they are included in Former Soviet Union.
Belarus	BELARUS	Data for Belarus are available starting in 1990. Prior to that, they are included in Former Soviet Union.
Georgia	GEORGIA	Data for Georgia are available starting in 1990. Prior to that, they are included in Former Soviet Union.
Kazakhstan	KAZAKHSTAN	Data for Kazakhstan are available starting in 1990. Prior to that, they are included in Former Soviet Union.
Kyrgyzstan	KYRGYZSTAN	Data for Kyrgyzstan are available starting in 1990. Prior to that, they are included in Former Soviet Union.
Republic of Moldova	MOLDOVA	Data for Moldova are available starting in 1990. Prior to that, they are included in Former Soviet Union. Official figures on natural gas imports, natural gas inputs to power plants, electricity production, foreign trade and consumption are modified by the IEA Secretariat to include estimates for supply and demand for the districts from the left side of the river Nistru and municipality Bender. Other energy production or consumption from these districts is not included in the Moldovan data. This may lead to breaks in the time series for some products. Due to the inclusion of estimated data in the Moldova energy balance, indicators for per capita energy consumption or energy intensity may appear inconsistent with expected trends.
Russian Federation	RUSSIA	Data for Russia are available starting in 1990. Prior to that, they are included in Former Soviet Union.

⁵Note by the Republic of Türkiye:

The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Türkiye recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Türkiye shall preserve its position concerning the “Cyprus issue”.

Note by all the European Union member states of the OECD and the European Union:

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Türkiye. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

⁶ Serbia includes Montenegro until 2004 and Kosovo until 1999.

Long name	Short name	Definition
Tajikistan	TAJIKISTAN	Data for Tajikistan are available starting in 1990. Prior to that, they are included in Former Soviet Union.
Turkmenistan	TURKMENISTAN	Data for Turkmenistan are available starting in 1990. Prior to that, they are included in Former Soviet Union.
Ukraine	UKRAINE	Data for Ukraine are available starting in 1990. Prior to that, they are included in Former Soviet Union.
Uzbekistan	UZBEKISTAN	Data for Uzbekistan are available starting in 1990. Prior to that, they are included in Former Soviet Union.
Former Soviet Union	F_USSR	Before 1990, includes Armenia; Azerbaijan; Belarus; Estonia; Georgia; Kazakhstan; Kyrgyzstan; Latvia; Lithuania; Republic of Moldova; Russian Federation; Tajikistan; Turkmenistan; Ukraine and Uzbekistan.
Algeria	ALGERIA	
Angola	ANGOLA	
Benin	BENIN	
Botswana	BOTSWANA	
Cameroon	CAMEROON	
Congo	CONGO_REPUB	
Democratic Republic of the Congo	CONGO_DRC	
Côte d'Ivoire	COTEIVOIRE	
Egypt	EGYPT	Data for Egypt are reported on a fiscal year basis. By convention, data for the fiscal year that starts on 1 July Y and ends on 30 June Y+1 are labelled as year Y.
Equatorial Guinea	EQGUINEA	
Eritrea	ERITREA	Data for Eritrea are available from 1992. Prior to that, they are included in Ethiopia.
Kingdom of Eswatini	ESWATINI	Data for the Kingdom of Eswatini are available from 1971.
Ethiopia	ETHIOPIA	Ethiopia includes Eritrea prior to 1992. Data are reported on a fiscal year basis. By convention, data for the fiscal year that starts on 1 July Y and ends on 30 June Y+1 are labelled as year Y.
Gabon	GABON	
Ghana	GHANA	

Long name	Short name	Definition
Kenya	KENYA	Kenya is currently an IEA Association country, therefore it is included in the IEA and Accession/Association countries aggregate (IEA Family), for data starting in 1971 and for the entire time series. Electricity data are reported on a fiscal year basis. By convention, data for the fiscal year that starts on 1 July Y and ends on 30 June Y+1 are labelled as year Y.
Libya	LIBYA	
Madagascar	MADAGASCAR	Data for Madagascar are available from 1971.
Mauritius	MAURITIUS	
Morocco	MOROCCO	Morocco is currently an IEA Association country, therefore it is included in the IEA and Accession/Association countries aggregate (IEA Family), for data starting in 1971 and for the entire time series. The statistical data for Morocco are supplied by and under the responsibility of the relevant Moroccan authorities. The use of such data by the IEA are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.
Mozambique	MOZAMBIQUE	
Namibia	NAMIBIA	Data for Namibia are available starting in 1991. Prior to that, data are included in Other Africa. Electricity data are reported on a fiscal year basis. By convention data for the fiscal year that starts on 1 July Y and ends on 31 June Y+1 is labelled as year Y.
Niger	NIGER	
Nigeria	NIGERIA	Nigeria is currently an IEA Association country, therefore it is included in the IEA and Accession/Association countries aggregate (IEA Family), for data starting in 1971 and for the entire time series.
Rwanda	RWANDA	Data for Rwanda are available from 1971.
Senegal	SENEGAL	Senegal is currently an IEA Association country, therefore it is included in the IEA and Accession/Association countries aggregate (IEA Family), for data starting in 1971 and for the entire time series
South Africa	SOUTHAFRICA	Nuclear and Hydro electricity generation data are reported on a fiscal year basis, beginning on the 1 April Y and ending on the 31 March Y+1.

Long name	Short name	Definition
South Sudan	SSUDAN	Data for South Sudan are available from 2012. Prior to 2012, they are included in Sudan.
Sudan	SUDAN	South Sudan became an independent country on 9 July 2011. From 2012, data for South Sudan are reported separately.
United Republic of Tanzania	TANZANIA	Oil data are reported on a fiscal year basis, beginning on the 1 July Y and ending on the 30 June Y+1.
Togo	TOGO	
Tunisia	TUNISIA	
Uganda	UGANDA	Data for Uganda are available from 1971.
Zambia	ZAMBIA	
Zimbabwe	ZIMBABWE	
Other non-OECD Africa	OTH_NON_OECDAFR	Includes Burkina Faso; Burundi; Cabo Verde; Central African Republic; Chad; Comoros; Djibouti; Gambia; Guinea; Guinea-Bissau; Lesotho; Liberia; Malawi; Mali; Mauritania; Namibia (until 1990); Réunion (until 2010); Sao Tome and Principe; Seychelles; Sierra Leone; and Somalia.
NON_OECDAFR	NON_OECDAFR	Includes Algeria; Angola; Benin; Botswana; Cameroon; Republic of Congo (Congo); Côte d'Ivoire; Democratic Republic of Congo; Egypt; Equatorial Guinea; Eritrea; the Kingdom of Eswatini; Ethiopia; Gabon; Ghana; Kenya; Libya; Madagascar; Mauritius; Morocco; Mozambique; Namibia (from 1991); Niger; Nigeria; Rwanda; Senegal; South Africa; South Sudan; Sudan, United Republic of Tanzania (Tanzania); Togo; Tunisia; Uganda; Zambia; Zimbabwe and Other Africa . Note that Africa is identical to Memo: Africa (UN).
Bahrain	BAHRAIN	
Islamic Republic of Iran	IRAN	Data are reported according to the Iranian calendar year. By convention data for the year that starts on 20 March Y and ends on 19 March Y+1 is labelled as year Y.
Iraq	IRAQ	
Jordan	JORDAN	
Kuwait	KUWAIT	
Lebanon	LEBANON	
Oman	OMAN	
Qatar	QATAR	
Saudi Arabia	SAUDIARABIA	

Long name	Short name	Definition
Syrian Arab Republic	SYRIA	
United Arab Emirates	UAE	
Yemen	YEMEN	
Non-OECD Middle East	NON_OECDME	Includes Bahrain, Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates and Yemen.
Bangladesh	BANGLADESH	Data are reported on a fiscal year basis. By convention data for the fiscal year that starts on 1 July Y-1 and ends on 30 June Y are labelled as year Y.
Brunei	BRUNEI	
Cambodia	CAMBODIA	Data for Cambodia are available starting in 1995. Prior to that, they are included in Other Asia.
India	INDIA	Data are reported on a fiscal year basis. By convention data for the fiscal year that starts on 1 April Y and ends on 31 March Y+1 is labelled as year Y. This convention is different from the one used by Government of India, whereby fiscal year that starts on 1 April Y and ends on 31 March Y+1 is labelled as year Y+1.
Indonesia	INDONESIA	
Democratic People's Republic of Korea	KOREADPR	
Lao People's Democratic Republic	LAO	Data for the Lao People's Democratic Republic are available starting in 1992. Prior to that, they are included in Other Asia.
Malaysia	MALAYSIA	
Mongolia	MONGOLIA	Data for Mongolia are available starting in 1985. Prior to that, they are included in Other Asia.
Myanmar	MYANMAR	Data were reported on a fiscal year basis until 2015 data. By convention data for the fiscal year that starts on 1 April Y and ends on 31 March Y+1 is labelled as year Y.
Nepal	NEPAL	Data are reported on a fiscal year basis. By convention data for the fiscal year that starts on 1 July Y and ends on 30 June Y+1 is labelled as year Y.
Pakistan	PAKISTAN	Data are reported on a fiscal year basis. By convention fiscal year Y/Y+1 is labelled as year Y.
Philippines	PHILIPPINES	
Singapore	SINGAPORE	
Sri Lanka	SRILANKA	

Long name	Short name	Definition
Chinese Taipei	TAIPEI	
Thailand	THAILAND	
Viet Nam	VIETNAM	Viet Nam is currently an IEA Association country, therefore it is included in the IEA and Accession/Association countries aggregate (IEA Family), for data starting in 1971 and for the entire time series.
Other non-OECD Asia Oceania	OTH_NON_OECDAO	Includes Afghanistan; Bhutan; Cambodia (until 1994); Cook Islands; Fiji; French Polynesia; Kiribati; the Lao People's Democratic Republic (until 1999); Macau, China; Maldives; Mongolia (until 1984); New Caledonia; Palau (from 1994); Papua New Guinea; Samoa; the Solomon Islands; Timor-Leste; Tonga; and Vanuatu.
Non-OECD Asia Oceania (excluding China)	NON_OECDAO_X_CHINA	Includes Bangladesh; Brunei Darussalam; Cambodia (from 1995); India; Indonesia; the Democratic People's Republic of Korea; Malaysia; Mongolia (from 1985); Myanmar; Nepal; Pakistan; the Philippines; Singapore; Sri Lanka; Chinese Taipei; Thailand; Viet Nam; Other non-OECD Asia.
People's Republic of China	CHINA	
Hong Kong, China	HONGKONG	
China Region	CHINAREG	Includes the People's Republic of China and Hong Kong, China.
Non-OECD Total	NON_OECDTOT	Includes Africa; Asia (excluding China); China (People's Republic of China and Hong Kong, China); Non-OECD Americas; Middle East; and Non-OECD Europe and Eurasia.
World	WORLD	Includes OECD Total; Africa; non-OECD Asia (excluding China); China (P.R. of China and Hong Kong, China); Non-OECD Americas; Middle East; Non-OECD Europe and Eurasia; World aviation bunkers and World marine bunkers. It is also the sum of Africa (UN), Americas (UN), Asia (UN), Europe (UN), Oceania (UN), World aviation bunkers and World marine bunkers.

Long name	Short name	Definition
Africa (UN)	AFRICA_UN	Includes Algeria; Angola; Benin; Botswana; Burkina Faso; Burundi; Cabo Verde; Cameroon; Central African Republic; Chad; Comoros; the Republic of the Congo (Congo); Côte d'Ivoire; the Democratic Republic of the Congo; Djibouti; Egypt; Equatorial Guinea; Eritrea; the Kingdom of Eswatini; Ethiopia; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Liberia; Libya; Madagascar; Malawi; Mali; Mauritania; Mauritius; Morocco; Mozambique; Namibia; Niger; Nigeria; Réunion (until 2010); Rwanda; Sao Tome and Principe; Senegal; the Seychelles; Sierra Leone; Somalia; South Africa; South Sudan (from 2012); Sudan; the United Republic of Tanzania (Tanzania); Togo; Tunisia; Uganda; Zambia; Zimbabwe. Note that Memo: Africa (UN) is identical to Africa.
Americas (UN)	AMERICAS_UN	Includes Antigua and Barbuda; Argentina; Aruba; the Bahamas; Barbados; Belize; Bermuda; the Plurinational State of Bolivia (Bolivia); Bonaire (from 2012); the British Virgin Islands; Brazil; Canada; the Cayman Islands; Chile; Colombia; Costa Rica; Cuba; Curaçao; Dominica; the Dominican Republic; Ecuador; El Salvador; the Falkland Islands (Malvinas); Guatemala; French Guiana (until 2010); Grenada; Guadeloupe (until 2010); Guyana; Haiti; Honduras; Jamaica; Martinique (until 2010); Mexico; Montserrat; Nicaragua; Panama; Paraguay; Peru; Puerto Rico (for natural gas and electricity); Saba (from 2012); Saint Kitts and Nevis; Saint Lucia; Saint Pierre and Miquelon; Saint Vincent and the Grenadines; Sint Eustatius (from 2012); Sint Maarten (from 2012); Suriname; Trinidad and Tobago; the Turks and Caicos Islands; the United States; Uruguay; the Bolivarian Republic of Venezuela (Venezuela).
Asia (UN)	ASIA_UN	Includes Afghanistan; Armenia; Azerbaijan; Bahrain; Bangladesh; Bhutan; Brunei Darussalam; Cambodia; the People's Republic of China; Cyprus ⁵ ; Georgia; Hong Kong, China; India; Indonesia; the Islamic Republic of Iran; Iraq; Israel; Japan; Jordan; the Democratic People's Republic of Korea; Korea; Kazakhstan; Kuwait; Kyrgyzstan; the Lao People's Democratic Republic; Lebanon; Macau, China; Malaysia; the Maldives; Mongolia; Myanmar; Nepal; Oman; Pakistan; the Philippines; Qatar; Saudi Arabia; Singapore; Sri Lanka; the Syrian Arab Republic; Tajikistan; Chinese Taipei; Thailand; Timor-Leste; Republic of Türkiye; Turkmenistan; the United Arab Emirates; Uzbekistan; Viet Nam; and Yemen.

Long name	Short name	Definition
Europe (UN)	EUROPE_UN	Includes Albania; Austria; Belarus; Belgium; Bosnia and Herzegovina; Bulgaria; Croatia; the Czech Republic; Denmark; Estonia; Finland; France; ⁷ Germany; Gibraltar; Greece; Hungary; Iceland; Ireland; Italy; Kosovo; ⁸ Latvia; Lithuania; Luxembourg; Malta; the Republic of Moldova (Moldova); Montenegro; the Netherlands; the Republic of North Macedonia; Norway; Poland; Portugal; Romania; the Russian Federation; Serbia; ⁹ the Slovak Republic; Slovenia; Spain; Sweden; Switzerland; Ukraine; the United Kingdom.
Oceania (UN)	OCEANIA_UN	Includes Australia; New Zealand; Cook Islands; Fiji; French Polynesia; Kiribati; New Caledonia; Palau; Papua New Guinea; Samoa; the Solomon Islands; Tonga; Vanuatu.

Please note that the following countries and territories have not been considered:

- **Non-OECD Europe and Eurasia:** Andorra; Faroe Islands (after 1990); Palestinian Authority; Liechtenstein (except for oil data)¹⁰; Svalbard; Jan Mayen Islands;
- **Africa:** British Indian Ocean Territory; French Southern and Antarctic Lands; Mayotte; Saint Helena; Western Sahara;
- **Non-OECD Americas:** Bouvet Island; Saint Barthélemy; Greenland (after 1990); Saint Martin (French Part); South Georgia and the South Sandwich Islands;
- **Non-OECD Asia excluding China:** American Samoa; Cocos (Keeling) Islands; Christmas Island; Heard Island and McDonald Islands; Marshall Islands; Micronesia (Federated States of); Nauru; Niue; Norfolk Island; Northern Mariana Islands; Pitcairn; Tokelau; Tuvalu; United States Minor Outlying Islands; Wallis and Futuna Islands.

⁷ Data for the French overseas departments are included in Europe from 2011, and in other regions as appropriate (Americas or Africa) before 2011.

⁸ This designation is without prejudice to positions on status, and is in line with United Nations Security Council Resolution 1244/99 and the Advisory Opinion of the International Court of Justice on Kosovo's declaration of independence.

⁹ Serbia includes Montenegro until 2004 and Kosovo until 1999.

¹⁰ Oil data for Liechtenstein are included under Switzerland.

Fiscal years

This table lists the countries for which data are reported on a non-calendar year basis.

This document is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. In this publication, 'country' refers to country or territory, as the case may be.

Country/Region	Short name	Definition
Australia	AUSTRALIA	Data are reported on a fiscal year basis. By convention, data for the fiscal year that starts on 1 July Y-1 and ends on 30 June Y are labelled as year Y.
Bangladesh	BANGLADESH	Data are reported on a fiscal year basis. By convention data for the fiscal year that starts on 1 July Y-1 and ends on 30 June Y are labelled as year Y.
Egypt	EGYPT	Data are reported on a fiscal year basis. By convention, data for the fiscal year that starts on 1 July Y and ends on 30 June Y+1 are labelled as year Y.
Ethiopia	ETHIOPIA	Data are reported on a fiscal year basis. By convention, data for the fiscal year that starts on 1 July Y and ends on 30 June Y+1 are labelled as year Y.
India	INDIA	Data are reported on a fiscal year basis. By convention, data for the fiscal year that starts on 1 April Y and ends on 31 March Y+1 are labelled as year Y. This convention is different from the one used by Government of India, whereby fiscal year starts on 1 April Y and ends on 31 March Y+1 is labelled as year Y+1.
Islamic Republic of Iran	IRAN	Data are reported according to the Iranian calendar year. By convention data for the year that starts on 20 March Y and ends on 19 March Y+1 is labelled as year Y.
Japan	JAPAN	Starting in 1990, data are reported on a fiscal year basis. By convention, data for the fiscal year that starts on 1 April Y and ends on

		31 March Y+1 are labelled as year Y.
Kenya	KENYA	Electricity data are reported on a fiscal year basis, beginning on the 1 July Y and ending on the 30 June of Y+1.
Myanmar	MYANMAR	Data are reported on a fiscal year basis. By convention data for the fiscal year that starts on 1 April Y and ends on 31 March Y+1 is labelled as year Y.
Namibia	NAMIBIA	Electricity data are reported on a fiscal year basis. By convention data for the fiscal year that starts on 1 July Y and ends on 31 June Y+1 is labelled as year Y.
Nepal	NEPAL	Data are reported on a fiscal year basis. By convention data for the fiscal year that starts on 1 July Y and ends on 30 June Y+1 is labelled as year Y.
Pakistan	PAKISTAN	Data are reported on a fiscal year basis. By convention fiscal year Y/Y+1 is labelled as year Y.
United Republic of Tanzania	TANZANIA	Oil data are reported on a fiscal year basis, beginning on the 1 July Y and ending on the 30 June Y+1.

Country notes and sources

General notes applicable to all countries

These notes refer to data from 1960 to 2024.

As a general rule, most series show a more detailed breakdown from 1970, due to limited availability of data prior to that year. Data on inputs to and output from combined heat and power plants and from heat plants may have been estimated by the Secretariat.

Prior to 1974, there is no split available between main activity producer and Autoproducer electricity plants for any country.

In general, more detailed notes are available for data starting in 1990. Data are obtained through annual submission of five fuel questionnaires from national administrations, as indicated for each country in the section on sources.

In some instances, it has been necessary for the IEA Secretariat to estimate some data; explanations of the estimates are provided in the country notes. For more information on fuel-specific methodologies, please refer to the various IEA information books.

This section lists a few specific notes that apply to all countries, and it is followed by a time series of comprehensive country-specific notes by fuel and flow.

Prior to 1974, most fuel inputs and **electricity** and **heat** outputs for autoproducers are included in main activity producers. The figures for the quantities of fuels used for the generation of electricity and heat and the corresponding outputs in CHP and heat plants should be used with caution. Despite estimates introduced by the IEA Secretariat, inputs and outputs are not always consistent. Please refer to notes below under *Electricity and heat*.

Data for **anthracite**, **coking coal**, **other bituminous coal**, **sub-bituminous coal** and **lignite** are available separately from 1978. Prior to 1978, only data for **hard coal** and **brown coal (lignite/sub-bituminous coal)** are available.

In 1996, the IEA Secretariat extensively revised data on **coal** and **coke use in blast furnaces**, and in the iron and steel industry (for those countries with blast furnaces), based on data provided to the OECD Steel Committee and other sources. The quantities of fuels transformed into blast furnace gas have been estimated by the IEA Secretariat based on its blast furnace model.

For **biofuels and waste** (i.e. **solid biofuels**, **biogases**, **liquid biofuels**, **industrial waste** and **municipal waste**), there may be breaks in time series between 1988 and 1989, as in

1997 the IEA Secretariat extensively revised these data based on data from Eurostat (for the EU-15 member countries) and on other national sources for other OECD member countries, and data from Eurostat were generally available from 1989. Generally, data on biofuels and waste are reported in non-specified prior to 1989.

Australia

Source

Department of Industry, Science, Energy and Resources, Canberra.

General notes

Calculated calorific values of combustible fuels are reported in gross values by Australia due to the lack on determining the moisture content of the fuels.

In the 2025 edition, Australian administration revised the time series for several products and types of producers to better reflect the information provided by the underlying data sources. For **coal products** changes were made back to 2002, for **oil products**, **natural gas**, **hydro**, **wind** and **solar** generation from 2017 onwards. These revisions impacted also the **electricity** balance from 2002 onwards.

In the 2016 edition, several **combustible fuel electricity production** time series as well as some **electricity consumption** time series were revised by the Australian administration back to 2010 in order to limit the use of estimated data and are causing some breaks.

From 1992 onwards, **heat** data are not available as there is insufficient data to report what little heat is sold in Australia.

Supply

Disaggregated data on **electricity production** by autoproducers in the *residential* sector are available from 2020.

Data for production of **electricity** from **wind** are available from 1994.

Data for **electricity production** from **solar photovoltaic** start in 1992 and from **solar thermal** in 2003.

Transformation

In 2018, **electricity** output from **lignite** declined due to the closure of the Hazelwood power plant. In addition, there was no output from **BKB** due to the closure of both Hazelwood power plant, and the only briquette manufacturer in Australia.

Fuels used for generation by autoproducers represent single fuel-fired units only. The use of fuel in multi-fired units operated by autoproducers is included in industry consumption.

In the 2018 edition, new methodologies were introduced by the Australian administration for reporting **electricity production** from solar sources. First, the methodology for reporting **electricity production** from **solar photovoltaic** and **solar thermal** was changed between 2009 and 2010, resulting in a break in time series. Prior to 2010, the ratio of **electricity production** from **solar thermal** to total solar was assumed to be the same each year. After 2010, **solar photovoltaic** autoproducer **electricity production** is the residual after the main activity **solar photovoltaic** and **solar thermal** are deducted from total solar production. There is an additional break in time series between 2013 and 2014 for **solar production** when a new methodology for determining large-scale **solar photovoltaic production** was introduced for main activity **solar photovoltaic** plants.

In the 2017 edition, following an extended review of past data, the Australian administration revised **electricity** outputs of **blast furnace gas** autoproducer **electricity** plants for the period 2003-2004 and of autoproducer CHP plants fuelled by **other oil products** for 2009, resulting in more realistic efficiency rates for these plants.

In 2002, the Australian administration started to use a new survey methodology and reclassified the types of plants between main activity producers and autoproducers.

Prior to 1995, electricity production from **biogases** is included in **natural gas**.

Prior to 1986, inputs and outputs from autoproducer CHP plants are not available.

Consumption

The 2021-2023 editions incorporate successive revisions to sectoral consumption provided by the Australian administration. These affected data back to 2009 (2021-2022 editions), and 2015 (2023 edition). In particular, data for *Construction* were significantly revised in the 2022 edition. This also affected *transmission and distribution losses* which act as a balancing item. Breaks may occur between 2008 and 2009.

The significant growth in **electricity consumption** at *LNG/regasification plants* in 2016 and 2017, is due to the commencement of large-scale *production* at Australia's new east coast LNG plants.

From 1990 to 2008, **electricity** consumption in *wood and wood products* is included together with *paper, pulp and printing*.

Prior to 2006, **electricity consumption** in *mining and quarrying* includes *consumption in liquefaction/regasification plants*.

The direct use of **solar heat** (mostly domestic solar panels) is available from 1974.

Electricity consumption in *coke ovens* has been estimated by the Australian administration from 1974 to 1999.

Prior to 1974, the breakdown of **electricity consumption** in *industry and energy sub-sectors* is not available and *energy industry consumption* is included in industry.

Electricity consumption in the *not elsewhere specified - transport* sector represents transport support services, including those for air and water transport, and for transport for mining operations.

Prior to 1971, **electricity consumption** in the *commercial and public services* sector is included in industry.

Reported **electricity consumption** in the *oil and gas extraction* sector may include some *consumption in LNG/regasification plants*.

Capacity

For the 2020 edition, **solar photovoltaic** capacities were revised back to 2016, to align data to fiscal year reporting. Therefore, breaks occur between 2015 and 2016.

Due to data availability issues, **hydro** capacities for 1990-2005 have been set at 2005 levels.

A **geothermal** plant closed in 2017.

Capacity refers to net maximum capacity on 30 June.

Austria

Source

Bundesanstalt Statistik Österreich, Vienna.

General notes

Starting with the 2016 edition and following, widespread data revisions were received due to enhanced reporting from 2005 onwards as a consequence of improved Austrian Final Energy Consumption surveys. For some time series, these revisions were extrapolated back to 1990. As a consequence, there may be breaks between 2004 and 2005, and 1989 and 1990. For more details on the methodologies in the revisions in the energy balance, there is more information here:

http://www.statistik.at/wcm/idc/idcplg?IdcService=GET_PDF_FILE&RevisionSelectionMethod=LatestReleased&dDocName=036412. For more details on the methodologies related to consumption in households, there is more information here: http://www.statistik.at/wcm/idc/idcplg?IdcService=GET_PDF_FILE&RevisionSelectionMethod=LatestReleased&dDocName=078265Supply

Supply

In the 2025 edition, Austria made extensive revisions for **electricity** and **heat production** from autoproducer CHP plants (**biogases**) and main heat plants (**geothermal**, **diesel** and **natural gas**).

Amounts for both *net electricity production* and *plant own use* are calculated by the Austrian administration by applying a fixed percentage multiplier to the *gross production* of all plants in the public grid, regardless of plant type or fuel.

Electricity production from **geothermal** main electricity plants only refers to **electricity** that is fed into the grid. Total production is not known as these plants are below the reporting threshold.

Reported **heat production** by autoproducer plant category tends to vary. This is because Austria calculates output from autoproducer heat-only plants as a residual, by subtracting reported *production* by autoproducer CHP plants from total reported autoproducer heat *production*.

Transformation

For 2020, the decrease in **electricity** and **heat** output from **other bituminous coal** was in part due to the closure of a power plant.

Electricity plants data may include some CHP plants operating in **electricity** only mode. In addition, fuel inputs to and **electricity** outputs from CHP plants are re-allocated from CHP to **electricity** only plants if the implied CHP efficiency would fall below 75%.

Fluctuating efficiencies from year to year for **solid biofuel** and **industrial waste** plants are related to operational decisions which are governed by a formula described in the *Standard documentation Meta information on Energy balances for Austria and the Laender of Austria* published in June 2016 on the Statistics Austria website.

In the 2018 edition, **electricity production** from **municipal waste** main activity **electricity** plants was revised from 2003-2009. Additionally, **electricity production** from **municipal waste** main activity CHP plants was revised in 2014.

A large autoproducer **electricity** plant was reclassified as an autoproducer CHP plant and therefore creates a break in time series for **municipal waste** in 2011.

In 2009, inputs of **other oil products** to autoproducer CHP plants were reclassified as **refinery gas** and **natural gas**.

Due to a change in the survey methodology, the **heat** produced in small plants (capacity inferior to 1 MW) is not reported starting in 2002.

Heat from chemical processes used for **electricity** production is available from 2004.

Electricity generation from **geothermal** started in 2002.

Prior to 2002, data for **biogases** only include plants of 1 MW or larger.

Prior to 1981, inputs to main activity producer **electricity** plants include inputs to CHP plants. All **electricity production** by CHP plants is included in **electricity** plants, and only *production* from **combustible fuel** sources is taken into account. Autoproducer CHP **heat production** is included in main activity producer CHP plants. For **heat**, *own use* is included in *distribution losses*.

Consumption

In the 2024 edition, Austria revised transport data back to 2017 based on new information available.

In the 2020 edition, Austria revised *consumption* data back to 2013 based on a new methodology for disaggregating *consumption* across sectors.

In the 2020 edition, a large portion of **electricity consumption** in *blast furnaces* was reallocated to *iron and steel* sector from 1990 to 2004. This creates breaks

in-series in these time series between 2004 and 2005. Revisions to data for 2005 onwards are expected in a future edition.

Electricity consumption in road includes trams, trolleybuses, subways, cableways, chair- and drag-lifts, as well as 100% electric vehicles.

In the 2019 edition, Austria revised data back to 2005 in order to present international reporting as consistent as possible with the national energy balances. In addition, *consumption* figures were revised based on more recent surveys of energy *consumption* in small and medium-sized enterprises. Outliers and the extrapolation methodology will be revised following the results of the next survey.

Electricity consumption in oil refineries includes *consumption in gas works plants* prior to 1991.

From 1990 to 2009, small amounts of **electricity** used in *heat pumps* have been included in the residential sector.

Starting in 1990, consumption of **electricity** in the field of electricity supply, district heating and water supply are included in *other energy industry own use*, prior to that it was included in commercial/public services.

Prior to 1991, **electricity** consumption in the *iron and steel* industry includes consumption in coke ovens and blast furnaces.

Capacity

Only gross maximum electrical capacity is available.

The breakdown of capacity by type of generation and fuel for Autoproducer plants is not available for 1988 and 1989.

Belgium

Source

FOD Economie - SPF Economie, DG Energy, Brussels.

General notes

In the 2025 edition, Belgium revised data back to 2010 due to improved data availability.

In the 2022 edition, Belgium revised data back to 2014 due to improved data availability and improved **natural gas** data.

In the 2021 and 2020 editions, Belgium revised data back to 2010 and 2014 respectively.

Supply

In the 2023 edition, *transmission and distribution losses* of **heat** were revised back to 2014 due to new measurements of heat losses. Data before 2014 will not be revised.

In 2019, the increase in **electricity exports** is mainly due to the opening of the NEMO-Link interconnector between Belgium and the United Kingdom.

Electricity production from **other sources** mainly comprises production at a gas expansion station with heat recovery and at a hydraulic turbine in a wastewater treatment plant.

From 2013 onwards, reported **heat distribution losses** decreased due to a more precise estimation method.

Data on electricity production from **wind** are available from 1987.

Transformation

Changes in ownership resulted in production by Autoproducer CHP plants with **Municipal Waste** in 2022.

Values of **other bituminous coal** input and output for Autoproducer CHP plants were adjusted due to confidentiality reasons for 2022, 2021, 2020 and 2019.

In 2020 and 2018, electricity output from **nuclear** decreased due to outages at a number of reactors.

Langerlo, Belgium's last **coal**-fired main activity electricity producer closed permanently in March 2016.

Heat production *from chemical processes* used for electricity production is available from 2005.

In 2012, **heat** production from chemical sources has been estimated by the IEA Secretariat.

Offshore wind production in Belgium commenced in 2009. Data are available from 2010.

Prior to 2009 some unsold **heat** was reported in **natural gas** autoproducer CHP plants, together with the associated natural gas input. This causes the drop in efficiency in 2009.

In 2007 data, no information was available on heat production in main activity CHP plants for **industrial waste**.

In 2003, combustion of **municipal waste** for electricity and heat generation purposes increased significantly. However, because a large portion of the heat produced is not used (sold), plant efficiencies dropped significantly between 2002 and 2003.

In 2000, most autoproducer electricity plants using **combustible fuels** were reclassified as autoproducer CHP plants; the heat production from these plants was used for internal industrial processes and not sold to third parties until 2005.

For 1998 and 1999, **electricity** production at main activity producer CHP plants with annual heat output below 0.5 TJ is reported with main activity producer electricity only plants.

Prior to 1982, **electricity** production in main activity producer CHP plants is included in production from electricity plants. Also, inputs of fuels for electricity generation in main activity producer electricity plants include inputs for heat production in CHP plants.

Consumption

For 2022, a change in methodology by one data provider to calculate **electricity** consumption in the residential sector contributed to a drop of consumption. Prior to 2022, **solar photovoltaic production** of small-scale PV-installations (PV < 10 kW) were added to the consumption figures in the residential sector.

In 2018, the methodology used to allocate **heat** consumption between the *residential, commercial and public services*, and *agriculture and forestry* sectors by one data provider was changed, resulting in some breaks in-series.

Electricity consumption in *Road* includes some consumption by electricity vehicles (EVs), based on vehicles numbers distances travelled. However, coverage of hybrid vehicles varies across regions. In addition, not all charging is included. Therefore, some consumption by EVs is still included under *Residential*.

In the 2019 edition, revisions were implemented for the direct use of **solar thermal** in other sectors back to 2010 due to improved data availability.

For 2012, **electricity** consumption in the mining and quarrying sector has been estimated by the IEA Secretariat.

For 2012, oil refineries **electricity** consumption has been estimated by the IEA Secretariat based on refinery activity data. Part of the estimated amount has been removed from consumption in the *chemical and petrochemical* sector.

Breaks in time series may exist between 2007 and 2008 due to revisions of the Classification of the Economic Activities in the European Community (NACE) classifications.

Beginning with 2007, **heat** consumption in the *iron and steel* industry ceased to be reported because heat is no longer purchased by facilities in that sector.

Capacity

Combustible fuels electricity capacity by type of generation has been revised, accordingly to a new methodology adopted by the Belgian authorities, back to 2008 leading to breaks in the time series between 2007 and 2008.

After 2006 for main activity producers and 2005 for Autoproducers, data on **combustible fuels** electrical capacity by fuel type are not available.

Prior to 1982, data on electrical capacity by type of generation are not available.

Canada

Source

Natural Resources Canada, Ottawa.

General notes

In the 2020 edition, the Canadian administration provided revised data back to 2005 based on revised methodologies and sectoral alignments, and to incorporate additional data.

In previous editions, the Canadian administration also undertook revisions of many parts of the electricity time series back to 2005, based on the results of the Report on Energy Supply and Demand in Canada (RESO). In particular, revisions were made on the inputs and outputs of power plants fuelled by combustible fuels and on the breakdown of final electricity consumption, resulting in possible breaks in time series.

Supply

In 2019, the Annapolis Royal **tidal** power station closed.

In the 2018 edition, revisions were made to **electricity production** from **wind** back to 2013.

For 2017 onwards, fluctuations in **electricity** output from **nuclear** occur in part due to reactor refurbishment works. Staggered maintenance across various reactors is scheduled for Darlington (2017-2027) and Bruce (2020-2034) power generation stations.

Autoproducer **solar photovoltaic electricity generation** is available from 2016. Prior to 2016, data are included in main activity producers. As a result, a break in series occurs for main activity producer solar generation between 2015 and 2016.

Starting in 2009, a new source has been used for **electricity production** from **solar**, **wind**, and **tidal**. This new source covers production from **solar** and **wind** only from plants with capacity higher than 500 kW.

Heat production includes **heat** produced by **nuclear** power stations for distribution to other consumers up to 1997.

Electricity production from **other sources** mainly refers to **steam** and **waste heat**.

Transformation

For the 2022 edition, the Canadian Administration submitted revised data for **solid biofuels**, due to the incorporation of data from the Industrial Consumption of Energy survey alongside existing data from the Annual Electric Thermal Generating Stations survey.

For autoproductors generating **electricity** with process **steam produced** from **biofuels** and **waste**, the energy required to produce the initial **steam** is not taken into account by the Canadian administration and as a result the efficiencies are overstated.

In the 2016 edition of this publication, there was a reclassification from autoproductor to main activity producer for plants fuelled by **biogases** and **municipal waste**.

The breakdown of **electricity** and **heat generation** between **natural gas** and **oil products** in main activity producer CHP plants has been estimated by the Canadian administration starting in 1990. This may cause breaks in the time series between 1989 and 1990.

Net electricity production by autoproductors prior to 1990 includes *production* from **combustible fuel** sources only.

Inputs of fuels to **heat** plants are not available for 1979 to 1987.

Consumption

In the 2023 edition, the Canadian Administration used revised consumption data back to 2000, drawing on more detailed sectoral classification data available in the Industrial Consumption of Energy (ICE) survey.

Electricity consumption in *road* refers to consumption in establishments primarily engaged in truck transport services; the operation of urban, interurban and rural transport systems (including urban rail); school buses; charter and sightseeing buses, taxis and limousine services.

In the 2020 edition, data for several sectors were revised back to 2005 to improve accuracy and alignment with ISIC classifications. In particular, data previously reported under “non-specified” sectors were reallocated to specific sectors, and improvements were made to *transmission and distribution losses*. As a result, some breaks may occur between 2004 and 2005.

In 2017, the decrease in **electricity consumption** in the *chemical (incl. petrochemical)* sector is partially due to a large consumer having been rotated out of the source sample survey used to compile the data.

Prior to 2005, *transmission and distribution losses* of **electricity** could include statistical difference for certain years

Consumption of electricity in oil and gas extraction is not available prior to 1987.

Consumption of electricity in coal mines is not available between 1982 and 1986.

Breaks in the time series occur between 1973 and 1974 in *agriculture/forestry*, and between 1987 and 1988 in the *industry sector*.

Trade

Discrepancies occur between respective reported figures for **electricity** trade between the United States and Canada for 2016 onwards. Work to reconcile trade data is an ongoing aspect of the North America Trilateral.

Capacity

Only *gross maximum electrical capacity* is available.

Prior to 1981, data on **electrical capacity** by type of generation are not available.

Chile

Source

Energía Abierta, Comisión Nacional de Energía, Ministerio de Energía, Santiago.

General notes

Data are available starting in 1971.

In the 2017 edition, data for 2014 and 2015 were revised to replace figures previously estimated by the Secretariat.

From 1990, *consumption in paper, pulp and printing* includes *forestry* and *consumption in agriculture* is included in *not elsewhere specified - industry*. In general, a new methodology has been applied for data since 1990, leading to other breaks in time series between 1989 and 1990.

Other bituminous coal data includes **sub-bituminous coal** for all years, if present.

Supply

Electricity production from **geothermal** started at *Cerro Pabellón* in 2017.

In 2014, the Chilean administration applied a new methodology in the reporting of **electricity generation** from **solar photovoltaic** and **wind**, resulting in breaks in time series between 2013 and 2014. Revisions for previous years are pending.

The majority of **electricity generation** from *other sources* is from a conveyor belt transporting crushed rock from high altitude to lower altitude in a mine. A small amount from **waste heat** is also included.

Solar thermal heat production has been estimated by the IEA Secretariat using data published by Chilean ministry of energy.

Heat production from **solid biofuels** and **biogas** use in main CHP plants is not available.

Electricity production by autoproducer **hydro** is self-declared, and as such, subject to variation.

Transformation

In the 2026 edition, the IEA Secretariat estimated the input (in terajoules) and the **electricity** output from **sub-bituminous coal**, **liquified petroleum gases**, **fuel oil** and **petroleum coke** for main activity producer and autoproducer **electricity**

plants, between 2022 and 2024, to cover certain gaps in the submission of the Chilean administration.

In 2024, the inputs of **solar thermal** to the main activity producer electricity plants declined due to a temporary closure of a concentrated solar power plant.

For 2019, the increase in **electricity** output from **natural gas** and the decrease in output from **coal** were due to the closure of some coal-fired power plants, and the resumption of **natural gas imports** from Argentina.

For 2014, data on inputs to transformation processes were taken from the published energy balance, and the output was estimated based on the efficiency reported in previous years.

Electricity production from **other bituminous coal** includes **sub-bituminous coal**.

Production of **chemical heat** used for **electricity generation** started in 2013. Besides **chemical heat**, data for **heat production** in CHP and heat plants are not available.

Increases in **electricity** from **natural gas** in 2010 are due to the openings of new LNG terminals.

The split of **electricity generation** by main activity and autoproducer by fuel was estimated by the Chilean administration for the period 1990 to 2003.

The variability of **electricity** output from **oil products** is in part due to the fact that oil-fired power plants are used for backup generation.

Consumption

Electricity consumption in *agriculture/forestry and construction* are available from 2017. For prior years, data are reported under *not elsewhere specified - industry*.

Electricity consumption in *mining and quarrying* includes coal mining; *not elsewhere specified - industry* includes food, beverages, and tobacco; and *wood and wood products; commercial and public services* include gas works.

Increases in **electricity consumption** in the *road transport* sector from 2014 onwards are the result of a new estimation methodology, while electric vehicles used for the transportation of ores are reported as consumption within the *mining and quarrying industry*.

Disaggregated data on **solar thermal consumption** data are not available so all consumption data are allocated to the *not elsewhere specified - other* sector.

Prior to 2009, most statistical differences are included in *transmission and distribution losses*.

Trade

Imports of **electricity** from non-specified/others are from Argentina.

Capacity

Installed capacity by type of technology is not available prior to 2011.

Peak load data are available from 1998.

Colombia

Sources

Sources for 2019 onwards:

Ministry of Mines and Energy, Unidad de Planeación Minero Energética, Bogotá.

Sistema de Información Energética de Latinoamérica y el Caribe. Latin American Energy Organization (OLADE), Quito, accessed at: <https://sielac.olade.org/default.aspx>

Sources 1992 to 2018:

Energy Balance of Colombia (BECO), Unidad de Planeación Minero Energética (UPME) Ministerio de Minas y Energía, Bogotá, various editions up to 2024.

Energy-Economic Information System (SIEE), Latin American and Caribbean Energy Organization (OLACDE), Quito, accessed April 2020: <http://sier.olade.org/>.

Online statistics, Unidad de Planeación Minero Energética (UPME) Ministerio de Minas y Energía, Bogotá, various editions up to 2018.

Direct communication with the Ministry of Mines and Energy, Energy Information Department, Bogotá.

Statistics 1996-2018, Sistema de Información Eléctrico Colombiano, Ministry of Mines and Energy, Bogotá, online statistics, various editions up to 2018.

Sistema de Información de Petróleo y Gas Colombiano, Ministry of Mines and Energy, Bogotá, online statistics, various editions up to 2016.

Informe de Sostenibilidad 2018, Refinería de Cartagena S.A.S.

Información de mercado, IncoAsfalto, Cundinamarca, accessed in May 2020: <http://www.incoasfaltos.com/>.

Resultados Trimestrales, Ecopetrol, Bogotá, accessed in April 2020: https://www.ecopetrol.com.co_

Informe Estadístico Petrolero, Asociación Colombiana del Petróleo (ACP), Bogotá, accessed in April 2020: <https://acp.com.co/>.

IEA Secretariat estimates.

Sources up to 1991:

Boletín Minero-Energético, Ministerio de Minas y Energía, Bogotá, December 1991.

Estadísticas Minero-Energéticas 1940-1990, Ministerio de Minas y Energía, Bogotá, 1990.

Estadísticas Básicas del Sector Carbón, Carbocol, Oficina de Planeación, Bogotá, various editions from 1980 to 1988.

Colombia Estadística 1985, DANE, Bogotá, 1970 to 1983 and 1987.

Informe Anual, Empresa Colombiana de Petróleos, Bogotá, 1979, 1980, 1981 and 1985.

Estadísticas de la Industria Petrolera Colombiana Bogotá 1979-1984, Empresa Colombiana de Petróleos, Bogotá, 1985.

Informe Estadístico Sector Eléctrico Colombiano, Government of Colombia, Bogotá, 1987 and 1988.

La Electrificación en Colombia 1984-1985, Instituto Colombiano de Energía Eléctrica, Bogotá, 1986.

Balances Energéticos 1975-1986, Ministerio de Minas y Energía, Bogotá, 1987.

Energía y Minas Para el Progreso Social 1982-1986, Ministerio de Minas y Energía, Bogotá, 1987.

General notes

In the 2026 edition, the IEA Secretariat has estimated fuel inputs, corresponding **electricity generation**, and final **electricity consumption** based on the 2024 energy balance published by Colombia's Mining and Energy Planning Unit (UPME), as the data reported by the country showed efficiencies outside the normal range or were incomplete.

In the 2025 edition, most of the 2023 data are estimated by the IEA Secretariat based on the 2023 energy balance published by UPME.

In the 2025 edition, IEA Secretariat made revision to **electricity** trade in 2019, **electricity consumption** in *not elsewhere specified – energy industry own* in 2020 and **natural gas** fuel inputs and **electricity generation** by main activity and autoproducer **electricity** from 2021 onwards based on UPME energy balance.

In the 2024 edition, some 2022 data were estimated by the IEA Secretariat based on the 2022 energy balances published by the Colombian Unidad de Planeación

Minero Energética (UPME), data submitted by the Colombian Administration and other sources.

In the 2023 edition, 2021 data for fuel inputs and **electricity** outputs from combustible fuel-fired power plants have been estimated by the IEA Secretariat based on the 2021 energy balances published by the Colombian *Unidad de Planeación Minero Energética (UPME)* and data submitted by the Colombian Administration.

Colombia joined the OECD in April 2020. Colombia first submitted questionnaires with data for 2019 only starting with the 2021 edition. Therefore, some breaks in the time series appear between 2018 and 2019. Historical revisions are pending.

Data for Colombia are available starting in 1990.

Supply

From 2019 onwards, due to the lack of detailed **electricity own use** data, *net electricity generation* and **electricity own use** by source have been estimated based on the total reported net to gross ratio for each year. Revisions are pending.

Transformation

Prior to 2019, inputs of **residual fuel oil**, **gas/diesel oil**, and **other kerosene** to **electricity generation** are reported under the relevant fuel. However, the associated outputs are reported in aggregated format under **other oil products**. Historical revisions are pending.

Data for **blast furnace gas** use in autoproducer **electricity** plants have been estimated by the IEA Secretariat.

Costa Rica

Sources

Sources for 2016 onwards:

Balance Energético Nacional, Dirección de Energía, Ministerio de Ambiente y Energía (MINAE), San José

Secretaría Planificación Subsector Energía (SEPSE), San José.

Sistema de Información Energética de Latinoamérica y el Caribe. Latin American Energy Organization (OLADE), Quito, accessed at: <https://sielac.olade.org/default.aspx>

Generación y Demanda, Informe Anual, Instituto Costarricense de Electricidad, San José, various editions up to 2024.

IEA Secretariat estimates.

Sources up to 2015:

Direct communication with the Ministerio del Ambiente y Energía, San José.

Balance Energético Nacional, Secretaría Planificación Subsector Energía (SEPSE), San José, various editions.

IEA Secretariat estimates

General notes

For the 2026 edition, the country resumed reporting and submitted data from 2022 onwards, following several reporting cycles without submissions. Due to efficiencies falling outside acceptable ranges, the IEA Secretariat estimated specific inputs and outputs for **gas/diesel**, **solid biofuels**, and **biogases** for the period 2022–2024. In addition, consumption by sub-sector was estimated, as this information was not reported by the country. These estimates were based on the *Annual Report on Electricity Generation and Demand* published by the Costa Rican Institute of Electricity, as well as the *Balance Energético Nacional* prepared by the Ministerio de Ambiente y Energía.

Data for 2022 are largely estimated by the IEA secretariat.

Costa Rica joined the OECD in May 2021. Costa Rica submitted questionnaires with data for 2020 starting with the 2022 edition.

In the 2022 edition, data were largely revised across all fuels for years 2016 to 2019, leading to breaks in 2015/2016.

Supply

Due to the lack of detailed **electricity own use** data, *net electricity generation* and **electricity own use** by source have been estimated based on the total reported net-to-gross ratio for each year. Revisions are pending.

Thermal electricity generation can show variation as the majority of **electricity** output is produced hydro and wind.

Transformation

Prior to 2016, inputs of **residual fuel oil** and **gas/diesel oil** to **electricity generation** are reported under the relevant fuel. However, the associated outputs are reported in aggregated format under **other oil products**. Historical revisions are pending.

Czech Republic

Sources

Czech Statistical Office, Prague.

Ministry of Industry and Trade, Prague.

General notes

Solar photovoltaic generation was reported entirely under main activity producers until the 2025 edition. In this edition, a portion of main activity producers was reclassified as autoproducers for the year 2023, resulting in a data break. Revisions to the historical time series are expected in future editions. In the 2021 edition, there were revisions for **solar thermal** from 2006 to 2018.

In the 2017 edition, data for the Czech Republic were revised back to 2010 due to the acquisition of new administrative data, allowing access to more accurate and detailed data sources. As a result, there are breaks in several time series between 2009 and 2010.

Data from 1990 onwards have been officially submitted by the Czech administration. This may lead to breaks in time series between 1989 and 1990.

Electricity statistics from 1971 to 1989 have been estimated by the IEA Secretariat except for final consumption and trade which were submitted by the Czech administration.

For 2017, apparent declines in autoproducer **heat production** by the *chemical (incl. petroleum)* sector, and in consumption by *petroleum refineries*, occur due to the incorporation of an oil refinery into a neighbouring petrochemical enterprise.

Data are available starting in 1971.

Supply

In the 2024 edition, autoproducer **electricity** plant using “*heat from chemical sources*” was reported for the first time, thanks to data coverage improving.

Electricity from **other sources** includes output from ammonia, Styrofoam-derived liquid waste, unipetrol fuel gas, waste heat, and pressure reduction turbines on gas pipelines.

The amount of **heat** reported under **other sources** is primarily **waste heat** from the glass industry until 2009.

From 1999 onwards, small amounts of **heat** have been exported to Slovak Republic.

Transformation

For 2020 data onwards, a new method was used to allocate data between electricity-only and CHP plants. This results in some breaks between 2019 and 2020.

In the 2020 edition, a revision of the methodology for reporting the production of autoproducer plants running on **combustible fuels** removed multiple breaks in time series between 2009 and 2010 for CHP and electricity-only plants that were introduced in the 2017 edition. For 2017, *heat production* from **electric boilers** and **heat pumps** is based on new survey data, whereas data for prior years have been estimated by the Czech administration. As a result, some breaks in series may occur. Historic revisions are pending.

Electricity generated from **waste heat** in CHP plants is included with the total production from **combustible fuels**.

Data on **heat own use** and **heat imports** start in 2010 and 2009 respectively, following extensive revisions by the Czech administration in the 2017 edition due to the acquisition of new administrative data. Prior to this period, data are not available due to lack of sources.

The production of **electricity** reported in the category **other fuel sources** refers to **electricity** produced from turbines driven by the mixture of air, ammonia and other non-coal gases derived from the petrochemical industry.

From 2014, some autoproducer **heat** plants production figures became too small to appear in data collected.

From 2012 data, new autoproducer **heat** plants were added to the data collection, causing a break in time series.

In 2012, a main activity producer **electricity** plant using **solid biofuels** started to produce also **heat** and was reclassified as main activity CHP plant.

A different reporting methodology used by the Czech administration for **biofuels and waste** causes some breaks in time series between 2002 and 2003.

In 1999 and 2000, various big enterprises have been divided, sold and merged. This causes breaks in the time series of all types of plants.

Industrial waste use in main activity producer electricity plants is included with **solid biofuels** from 1996.

Data on **biogases** and **waste** used in main activity producer CHP and autoproducer **heat** plants start in 1993.

Prior to 1990, **electricity production** in main activity producer CHP and autoproducer CHP plants is included in main activity producer electricity plants.

Prior to 1990, **heat production** excludes **heat** sold by industry. In addition, **heat production** prior to 1990 is reported under main activity **heat** plants because the breakdown by producer and plant type is not available before then.

The breakdown of *net* **electricity production** by source is not available prior to 1990.

Data on **heat production**, and the corresponding fuel inputs, have been estimated from 1980 to 1989 based on consumption in *residential* and *commercial and public services*. Prior to that, inputs are included in industry.

Consumption

Data on **electricity consumption** by cable cars (reported under *not elsewhere specified - transport*) are available from 2017.

Data for direct use of **solar energy** are available from 2003.

Trade

From 1999 onwards, small amounts of **heat** have been exported to Slovak Republic.

Capacity

Starting in 2000, the peak load data reported under main activity producers includes autoproducers, which is no longer reported in its own right.

The breakdown of generating capacity is not available prior to 1990.

Denmark

Source

Danish Energy Agency, Copenhagen.

General notes

In the 2025 edition, the Danish administration revised fuel input and **electricity** and **heat** generation for several products and types of producers from 2021 onwards.

In the 2020 edition, there were revisions from 2010 to 2017 for **solid biofuels**, **biogases** and **solar thermal**.

Heat data are not available prior to 1976.

Supply

For 2019, the increase in **heat** output from **electric boilers** and **heat pumps** was due to the opening of new facilities. This also contributed to an increase in the coefficient of performance for **heat** pumps between 2018 and 2019.

For 2017, the decline in **electricity** and **heat** output from **other bituminous coal** and the corresponding increases in output from **solid biofuels** are attributable to fuel switching in co-fired plants.

The amount of **heat** reported under *other sources* is **heat** recovered from industrial processes and sold for district heating.

Heat produced for sale by **heat pumps** starts in 1994.

Geothermal and **solar heat production** for sale is available from 1989.

From 1984 onwards, small amounts of **heat** have been imported from Germany.

The production of **electricity** from **wind** is available from 1978.

Transformation

Efficiency of **solid biofuels** autoproducer **heat** plants dropped in 2022. Revisions are pending.

Fish oil used in main activity producer heat plants is included with **solid biofuels**.

Due to the high number of heating companies burning wood chips that are equipped with boilers with flue-gas condensation, the **solid biofuels** heat plants

show a high efficiency. The efficiency decline evident in 2016 was due to two less efficient plants switching to biofuels.

For some years, heat plants fired by **natural gas**, **municipal waste**, **solid biofuels**, **biogases**, and **other oil products** show efficiencies greater than 100%, on a net calorific value basis, due to the use of condensing boilers and other flue gas condensation technologies that recover the latent **heat** of vaporisation. Inclusion of small quantities of **heat** output from **oil** used alongside **municipal waste** in data for **municipal waste** may also affect efficiencies.

Biodiesels and **biogasoline consumption** for **electricity** and **heat production** are reported under **other liquid biofuels**, for confidentiality reasons.

Data for **other liquid biofuels** main activity **heat** plants are available back to 1994.

Consumption

In the 2025 edition the Danish administration revised industry consumption of **heat** by sub-sectors for the entire time series, while total industry consumption remained unchanged, due to new available information.

For 2020 data, the breakdown of **electricity** and **heat total final consumption** is estimated by the Danish administration based on 2019 data and will be revised in a future reporting cycle once their new industry survey results are released.

In the 2016 edition, the Danish administration revised **electricity** and **heat consumption** in the industry sector from 1990.

Transmission and distribution losses of **electricity** are calculated as a residual.

The direct use of **solar thermal** energy is available from 1978.

Electricity consumption in *not elsewhere specified - industry* includes consumption in district heating plants and for the distribution of electricity.

Trade

From 1984 onwards, small amounts of **heat** have been imported from Germany.

Capacity

In Denmark, **wind** accounts for a large share of installed capacity. Therefore, care should be taken when interpreting figures for available capacity at peak.

Prior to 1981 for main activity producers and to 1994 for autoproducers, data on electrical capacity by type of generation are not available.

Estonia

Source

Statistics Estonia, Tallinn.

General notes

In the April 2026 edition, a break in series is observed between 2023 and 2024 due to methodological changes in data collection in the country.

In the 2022 edition, the Estonian Administration revised historical data, in particular, for **oil shale**, **coke oven gas**, and **gas works gas**, in order to better align data with those reported by companies under the EU Emissions Trading System (ETS).

Data for Estonia are available starting in 1990. Prior to that, they are included in Former Soviet Union in the *World Energy Statistics* publication.

Transformation

In 2019, electricity output from **oil shale** decreased. This was in part due to higher carbon pricing, and the availability of low-cost electricity imports.

In the 2020 and 2021 editions, reporting methodologies were aligned with the requirements for physical energy flow accounts (PEFA). As a result, some breaks in series occur between 2015 and 2019. In particular, for **renewable municipal waste**, **coke oven gas**, and **industrial waste**.

Electricity output from **solar** is available from 2016.

Fuels reported as **coke oven coke** and **gas works gas** are the solid and gaseous by-products of **oil shale** liquefaction, and main activity **heat** and **electricity** generation from these fuels is tightly associated with liquefaction plants.

Inputs of **fuel oil** and **gas works gas** to transformation processes include **shale oil**.

In the 2018 edition, the surge in main activity heat from **solid biofuels** was related to reclassification from autoproducer heat plants, where previously *autoproducer own use* **heat** and associated fuel inputs are not reported, and the fuel consumption appears in the main economic activity of the autoproducer.

From 1990 to 1999, some of the **electricity** and **heat production** are reported under **other oil products** while the inputs are reported under the individual fuels.

Consumption

From 2021 onwards, **electricity consumption** previously reported under *not elsewhere specified - transport* is reported under *commercial and public services*.

Electricity consumption in *road* mainly refers to trolley buses.

Electricity consumption in the *not elsewhere specified – energy industry own* sector includes consumption in the Classification of the Economic Activities in the European Community (NACE) 3512 and 3513 categories.

Trade

For **electricity**, trade data are reported on the basis of commercial transactions. Therefore, data may not reflect actual physical exchanges, or include all trade partners. The Estonian Administration hopes to revise these data in a coming cycle.

Capacity

For 2021, some main activity **Wind** capacity was reallocated to autoproducer plants.

Finland

Source

Statistics Finland, Helsinki.

General notes

In 2014, a new survey system and a reclassification of the data lead to breaks in the time series between 1999 and 2000 for most products and sectors. The new survey system is more detailed and has better product coverage, especially in **electricity**, CHP and **heat production**, as well as in industry.

Supply

In the 2025 edition, **electricity** produced by combustible fuels for 2023 decreased with a new **nuclear** power plant in operation, as well as more **hydro** and **wind** capacity. CHP production of **heat** decreased since the demand for CHP **electricity** decreased given that new production from non-combustible sources became available. **Heat** production therefore shifted to heat-only plants.

In the 2025 edition, **heat pumps production** has been allocated to main activity producers and autoproducers for years 2022 and 2023 thanks to new data availability.

For the 2023 edition, **heat production** by autoproducers in NACE divisions 36-38 was reallocated from *not elsewhere specified - industry* to *commercial and public services*.

Electricity production in Finland is affected by connection to the Nord Pool power exchange. In periods of high rainfall, it is more economic to *import electricity* from other Nordic countries than to produce it. Therefore, production and trade are subject to variability.

Net and gross heat production are equal, no *own use* is reported. **Heat production** in Finland is reported as net.

Other sources include **hydrogen**, purchased **steam**, and **heat** recovered from flue gas scrubbers. For 2017, the increase in **heat production** from other sources is due to the reporting of **heat** recovered from flue gas scrubbers for the first time.

The increasing **heat production** from **heat pumps** in 2007 and 2008 is due to the opening of the Katri Vala district heating and cooling plant.

Heat from chemical processes and associated **electricity generation** are available from 2000.

Transformation

Biodiesel used in all plant types is reported under **gas/diesel**.

In the 2026 edition, several products – such as **industrial waste**, **non-renewable municipal waste**, **biogas** and some oil products – reported in different plants for 2024 out-of-range or highly variable efficiencies due to rounding small input or output values to zero decimals. The country plans to report figures with three decimal places in future cycles to avoid such distortions.

In 2022, **refinery gas** input to main activity **heat** plants was partially replaced by fuel gas produced from **naphtha** and **liquified petroleum gases**.

For 2020 onwards, data for plants containing at least one CHP unit have been reported under CHP. Prior to 2020, **electricity** plants data may include some CHP plants operating in **electricity** only mode, and **heat** plants data may include some CHP plants operating in **heat** only mode.

In the 2017 edition, fuel inputs and **heat production** from **peat** main activity heat plants have been revised from 2000 as a result of new data access for smaller **peat heat** plant units.

In the 2016 edition, the allocation of **solar photovoltaic** between main activity and autoproducer plants was revised.

From 2014 data, an autoproducer in the field of *iron and steel industry* running on **coke oven gases** and **blast furnace gases** was sold and is now reported as main-activity producer.

The increase in **heat production** from **municipal waste** in 2014 is due to the opening of a new plant.

In 2014, the new *consumption* of **other liquid biofuels** in main activity **electricity** plant corresponds to biopyrolysis oil made from wood chips.

Data on **peat products electricity** and **heat generation** are available since 2008. Prior to that, they are included in **peat**.

Heat output from autoproducer CHP plants is available starting in 1996 and from autoproducer **heat** plants starting in 2000; corresponding inputs may be under-reported.

Before 1999, all **electricity production** from autoproducers running on **fuelwood** is allocated to CHP plants.

Electricity and **heat production** from **biogases** are available from 1996.

Prior to 1992, outputs from the use of **combustible renewables and waste** to generate **electricity** and/or **heat** were included in **peat**. Therefore, the IEA Secretariat estimated the breakdown of outputs from **municipal waste** and **solid biofuels** based on reported inputs.

Inputs of **liquid fuels** and **natural gas** to CHP plants are included with the inputs of these fuels to main activity producer **electricity** only and **heat** only plants prior to 1978.

Electricity production from **biofuels and waste** is not available between 1974 and 1976.

Consumption

Electricity consumption in *road* is based on estimates by the Finnish VTT research centre, and includes all **electricity consumption** by electric vehicles, both 100% electric vehicles and plug-in hybrids.

In the 2017 edition and following, an extended review of NACE sector encoding by the Finnish administration resulted in the revision of the sectoral **heat consumption** time series back to 2007, leading to breaks in time series between 2006 and 2007 in some **heat consumption** sectors.

In 2016, the production of **heat** by autoproducers in the *oil refineries* sector ceased, following a change of ownership of some plants and their reclassification as main activity producers. This reclassification also resulted in an increase in reported heat consumption by oil refineries, as **heat** previously produced and consumed by *oil refineries* is now purchased.

Between 2013 and 2014, **heat consumption** in the *paper, pulp and printing* sector shows an apparent decline because a power plant came under the ownership of a paper, pulp and printing company.

A new survey of the *agriculture and forestry* sector leads to breaks in the **electricity consumption** between 2007 and 2008.

The split of **heat consumption** in the different *industry sectors* is available starting from 2007. Prior to that, it is aggregated in *not elsewhere specified - industry*.

Prior to 2000, consumption of **heat** in *agriculture/forestry* and *commercial/public services* is included under *not elsewhere specified - industry*.

Consumption of **electricity** in the industry sub-sector *machinery* includes consumption in *transport equipment* prior to 1995.

Capacity

Prior to 2000, capacity reported in autoproducers steam generation includes all types of generation.

Net maximum electrical capacity data are not available prior to 1974.

France

Source

Ministère de la Transition Écologique et Solidaire, Paris.

General notes

In the 2019 edition, data for France were revised back to 2011 to include the following overseas departments (Guadeloupe; French Guiana; Martinique; Mayotte; and Réunion).

In the 2018 edition, data for France were revised back to 2011 following changes in methodology and procedures used by the energy statistics sub-department (SDSE) within the Ministry for the ecological and inclusive transition. As a result, the revisions, to bring the reporting more in line with the international standards, impacted all fuels.

From 2012, the energy consumption is more detailed due to a more precise national survey.

From 2011 data onwards, France now includes Monaco, and the following overseas departments (Guadeloupe; French Guiana; Martinique; Mayotte; and Réunion); and excludes the overseas collectivities (New Caledonia; French Polynesia; Saint Barthélemy; Saint Martin; Saint Pierre and Miquelon; and Wallis and Futuna).

For 1989 to 1998, the IEA Secretariat has estimated industry consumption based on *Consumations d'Énergie dans l'Industrie*, SESSI.

Hard coal data prior to 1978 may include **sub-bituminous coal**.

In the 2018 edition, **solid biofuels'** *indigenous production* and inputs to main activity and autoproducer **heat** plants have been revised back to 2007. **Electricity production** has been revised back to 2013. This causes breaks in time series between 2006 and 2007 as well as 2012 and 2013.

In the 2018 edition, *indigenous production* and inputs to main activity **heat** plants have been revised back to 2007 for **municipal waste**. **Electricity production** has been revised back to 2011. This causes breaks in time series between 2006 and 2007 as well as 2010 and 2011.

Supply

In the 2026 edition, data on auto-production of electricity and heat by sector were revised back to 2011 to incorporate updated activity code data.

In the 2025 edition, extensive revisions for **electricity** and **heat production** from autoproducers using **biogas** were introduced. This is due to shifts in the status declaration by companies.

In the 2019 edition, **heat** supply and consumption data were revised due to improved information on **heat production** from renewables.

All **solar photovoltaic** plants with capacity above 1 MW_p are considered as main activity producers, while all plants with capacity below that value are considered autoproducers.

Electricity production from *other sources* is available starting in 2007, representing *production* of **electricity** from **purchased steam**, and from 2018, **hydrogen**. The input is shown under *not elsewhere specified - transformation*.

Data on **electricity production** from **wind** are available from 1990.

Transformation

In the 2021 edition, some main activity producers were reclassified as autoproducers.

For 2018, inputs and outputs of **coke oven gas**, and **other recovered gases** are included under **blast furnace gas** for confidentially purposes.

The methodology for reporting inputs to CHP plants is currently under review by the French administration and historical revisions are expected.

For the 2018 edition, revisions for **heat production** in all plant types were received and accepted for many fuels from 2007 onwards, with the exception of **natural gas**, where the planned revisions for 2007 and 2008 are still pending implementation by the Secretariat.

In the 2018 edition, **electricity production** from **hydro** was revised back to the year 2000, in some cases only amounting to plant reclassification.

Electricity production from the *Bouillante geothermal* main **electricity** plant in Guadeloupe is included from 2011 onwards, when data coverage for France is extended to include the overseas departments. **Electricity production** from autoproducer **geothermal** started in 2011 and stopped in 2012 due to the maintenance of the only plant. This production restarted in 2016.

Starting in 2012, separate data on main activity heat plants inputs are available for **oil products**.

The amount of **heat** not sold in autoproducer plants is included in *total heat production* up to 2007.

In 2005, autoproducer CHP efficiencies for **biogases** drop due to the opening of a larger, less efficient plant.

From 2000, several plants have been reclassified from **electricity** only to CHP plants. This causes breaks in the time series between 1999 and 2000.

Prior to 2000, inputs and outputs of **oil products** are not available separately and are reported together under **other oil products**. From 2000 to 2008, there are further classification problems for inputs and outputs of **electricity** and **heat** from **oil products**. The French administration is working to reconcile their data collection methods for the inputs and the outputs for **electricity generation**.

A new method of survey and a reclassification between main activity producer **electricity** plants and autoproducer **electricity** plants may cause breaks in the time series for **other bituminous coal** between 1998 and 1999.

There was reclassification on autoproducer plants using **municipal waste** in 1995, which leads to a break in the time series.

Net electricity production by autoproducer CHP plants is available from 1989.

Net electricity production by autoproducers prior to 1983 includes production from **combustible fuel** sources only.

Consumption

In the 2026 edition, data on **electricity used for charging batteries** for 2025p was reported under *energy sector final consumption*.

In the 2021 edition, data were revised back to 2011 by the French administration to replace data from statistical surveys with new administrative data.

In the 2019 edition, revisions for 2011 onwards were received for all **electricity consumption** flows, based on a correction to a survey. This has introduced a wider statistical difference than previously published, and is under review.

In the 2018 edition, revisions for 2011 onwards were received for all **electricity consumption** flows, based on an improved survey. This has led to breaks in time series between 2010 and 2011. Similarly, **heat consumption** from 2007 onwards was revised to account for autoproducer *own use heat* generation in its correct economic activity.

In the 2017 edition, the French administration undertook comprehensive revisions on sectoral **electricity consumption** time series, for some sectors revising back to 1990. **Electricity consumption** at railway and bus stations, shipping piers and airports is no longer included in the *transport* sector but in the *commercial and public services* sector. *Road electricity consumption* has also been revised back to 1990, following an extended review of NACE sector encoding by the administration. These revisions created breaks in time series for several sectors, which the administration anticipates to address in subsequent reporting cycles.

For the 2014 edition of this publication, the French administration revised **electricity consumption** data in the *agriculture/forestry* sector back to 2004, resulting in breaks in time series.

Electricity consumption in *road* includes consumption by 100% electric vehicles. These amounts are estimated by the French Administration based on vehicle numbers, and expected electricity usage. Consumption includes domestic charging - however, these amounts are currently subtracted from *not elsewhere specified - transport*, rather than *residential* consumption.

Consumption of **electricity** in uranium treatment plants is confidential for the period 2003 through 2010, and unavailable prior to 1980.

Data on *transmission and distribution losses* for **heat** are available only starting from 2007. Prior to that, they were included in *final consumption*.

Prior to 2005, all the **geothermal heat consumption** was reported as direct use. From 2005 data, some quantities are reported as output of **heat** plants, resulting in breaks in time series for production, transformation and consumption.

Electricity consumption in *not elsewhere specified - transport* refers to ski lifts.

Prior to 2011, **electricity consumption** in (sub)-urban and national rail is based on high-voltage electricity supply to the rail sector. From 2011 onwards, consumption in (sub)-urban rail is based on **electricity** used for propulsion by the main operator, and estimates for the other operators.

Consumption of **electricity** for *oil and gas extraction* includes that used in *oil refineries* from 1988 to 2000.

not elsewhere specified - other consumption includes exports to Monaco prior to 1992 and defence-related activities, among others.

The industry classifications used by the French administration were changed in 1986.

There are major breaks in the time series in 1965 when more detailed breakdown of data on **electricity consumption** became available.

Capacity

The main activity plants peak load includes also the peak load of autoproducers plants.

Prior to 1981 and after 1999, data on electrical capacity by type of generation and fuel are not available.

Germany

Source

Federal Ministry for Economic Affairs and Energy, Berlin.

General notes

Data starts in 1960. German data include the new federal states of Germany from 1970 onwards.

For 2024, German data reflect the complete shutdown of all nuclear power plants.

In the 2014 edition, the German administration performed some major revisions back to 2003. This led to breaks in the time series between 2002 and 2003.

The German administration has changed the methodology for reporting **heat** over time:

Starting in 2007, more information is available on main activity **heat** plants and additional inputs started to be reported for this category. This causes breaks in time series between 2006 and 2007.

Between 2003 and 2006, autoproducer **heat** output was provided, but no inputs.

Between 2002 and 2003 and between 2003 and 2004, breaks in time series occur, due to the implementation of the Energy Statistics Act, collection concerning **heat** produced in heat plants and district heating plants became more efficient and more complete.

Prior to 1970, **heat production** and **consumption** have been estimated by the Secretariat based on *Energiebilanz für die Bundesrepublik für das Jahr 1990* provided by the German Institute for Economic Research.

Supply

From 2018 onwards, *own use* of **electricity** at main electricity **geothermal** plants includes **electricity used for pumping**.

In some instances, **electricity generation** from **nuclear**, **hydro**, **solar**, **wind** and **biogases** in autoproducer electricity plants is confidential or not available and therefore is included in main activity producer **electricity** plants.

For 2017 onwards, *own use consumption* of **electricity** by **wind** plants is assumed to be 2% at on-shore and 1.5% for off-shore wind farms. For prior years, *own use* only included **electricity** drawn from the grid while the turbines were not in operation.

Since 2011, due to a reclassification of **wind** energy and **solar photovoltaic** in the official data of the German Federal Statistical Office, the production is now only reported under main activity producer plants.

Electricity production from other sources is available starting in 2003. This refers to the *production* of **electricity** from turbines which are located at pressure drops in fluid transport and from purchased waste **heat**.

Prior to 1991, **electricity** trade data includes only trade of the Former Federal Republic of Germany.

Data on **electricity production** from **wind** and **solar** are available from 1986 and 1990, respectively.

Starting in 1984, small amounts of **heat** have been exported to Denmark.

Transformation

In the 2026 edition, **solar**, **liquified petroleum gases**, **hydro**, and **biogases** show a reallocation from main activity producers to autoproducers due to new sources available from 2023 onward.

In the 2026 edition, **anthracite** fuel input (in kilotonnes and terajoules) and **heat** output to main activity producer **heat** plants in 2023 and 2024, has been estimated by the IEA Secretariat to avoid inconsistencies in efficiencies of transformation.

For 2022, the decrease in **electricity** output from **nuclear** was due to the closure of the Grohnde, Gundremmingen C and Brokdorf power plants.

For 2018, the increase in **electricity** output from **solar photovoltaic** was in part due higher than average solar radiation during that year.

For 2018, the increase in **heat** output from **biogases** was mainly due to an increase in survey coverage following an amendment to the Energy Statistics Law in 2017.

Electricity inputs to both mixed **hydro** and pure pumped storage pumping plants are reported under inputs to pure pumped storage.

Detailed data by fuel are not available for total **heat** production. The non-allocated part is reported as heat production from **non-specified combustible fuels**.

Weather conditions were not favourable for **wind** and **solar** generation in 2016.

In 2015, a reclassification of some main activity producer **electricity** and CHP plants to autoproducer CHP plants powered by **coke oven gas** results in a break in time series for this period. Similarly, a reclassification of **blast furnace gas** main

activity **electricity plants** into autoproducer plants results in a break in time series for the same period.

From 2003 onwards, all **heat production** in autoproducers is considered as non-sold (i.e. for self-use) and, therefore, not reported. Inputs for this **heat** production are no longer reported in the transformation sector.

For 2002 and 2003, the German administration did not submit the breakdown of **electricity** and **heat** production from **combustible fuels**. The data were estimated as follows: renewables and waste were taken from the Renewables and Waste Questionnaire and the other combustible fuels were estimated pro rata based on 2001 estimates.

Prior to 2003, **electricity production** in **electricity** plants includes production from CHP plants and **heat production** in CHP plants includes production from **heat** plants.

Due to the implementation of the Energy Statistics Act, collection concerning **heat** produced in **heat** plants and district heating plants became more efficient and more complete. This leads to breaks in time series between 2002 and 2003 and between 2003 and 2004.

A new survey for the renewable products can cause breaks in the time series between 1998 and 1999.

Prior to 1993, all heat production from **BKB/peat briquettes** is included in main activity producer CHP plants.

Consumption

In 2016, increases in **electricity generation** by autoproducers within the *transport equipment* sector are due to reclassifications from main activity generation, rather than the development of new plant.

More information on district **heat** became available, causing breaks in the time series between 2006 and 2007.

Data on **geothermal heat production** and direct *consumption* are only available starting in 2003.

Data for **electricity consumption** in the *commercial and public* services sector include the *construction* and *agriculture/forestry* sectors (prior to 2010), as well as the *fishing sector* (all years). In 2000, revisions from the German administration to the **electricity consumption** data may cause breaks in the time series.

In 1995, the German Federal Statistics Office reclassified some industrial branches which may cause a break in time series in industry sub-sectors.

Between 1971 and 1980, **electricity consumption** in *coal mines* includes consumption in *coke ovens* and *BKB plants*.

Trade

Electricity trade with Denmark, Sweden, Switzerland, Luxembourg and Norway is Confidential, respectively since 2013 for the first three countries, 2018 for Luxembourg and 2020 for Norway.

Prior to 1991, **electricity** trade data includes only trade of the Former Federal Republic of Germany.

Starting in 1984, small amounts of **heat** have been exported to Denmark.

Electricity trade with Denmark, Luxembourg, Norway, Sweden, and Switzerland are reported under *not elsewhere specified - other* for some years for confidentiality reasons.

Capacity

Electricity generating capacity before 1991 covers the Former Federal Republic of Germany, and excludes the absorbed states of the Former German Democratic Republic.

Prior to 1974 and after 2001, data on electrical capacity by type of generation are not available.

On 31 Dec 2017, the Gundremmingen B nuclear power plant shut down.

Greece

Source

Ministry for Environment and Energy, Athens.

Supply

In the 2020 edition, revisions for 1998-2017 of the indigenous production of **solar thermal** are the result of a revision of the latest data on **solar thermal** efficiency.

For 2016, *gross electricity generation* from **combustible fuels** in main activity **electricity** and autoproducer CHP units was estimated by the IEA Secretariat, based upon the gross to net ratio for **combustible fuels** for these plant types in 2015. This increase in production was assigned to **lignite**-fired and **natural gas**-fired plant.

Transformation

Prior to 2020, use of **gas/diesel oil** to support operations (rather than generate power) at **lignite**-fired Main CHP plant operations was reported as a transformation input.

Data on **heat** outputs from **natural gas**-fired autoproducer CHP plants are available from 2020.

In 2008 a new plant using **refinery gas** started operating in an experimental phase, causing a low efficiency.

Production and consumption of distributed **heat** (heat sold) that is produced from **lignite** is available from 1997.

Data for **biofuels and waste** input and output to transformation are available from 1992.

Consumption

In 2018, breaks in consumption occur across several sectors due to improved disaggregation. This allowed consumption previously reported under *not elsewhere specified - industry* to be reported in the appropriate subsectors.

In 2018, the increase in efficiency at **industrial waste**-fired autoproducer CHP plants was due to increased generation of unsold heat.

Prior to 2018, **electricity consumption** in the *fishing* sector was included in *agriculture and forestry*, and/or *not elsewhere specified - industry*.

Transmission and distribution losses of **electricity** increased from 2013 onwards due to growth in non-technical losses. Reported losses for 2017 deviate from this trend, showing a noticeable decline compared with adjacent year however, data for 2017 are under review.

Electricity consumption in *road* is available from 2013. This refers to consumption by public transport vehicles (e.g. trolley buses). **Electricity consumption** by private electric vehicles is insignificant and not included.

A break in time series exists between 1991 and 1992 for **electricity consumption** in *transport*.

Direct use of **geothermal** heat in *residential* is available starting in 2004.

Electricity consumption in *iron and steel* and in the *non-ferrous metals* industry prior to 1971 has been estimated by the Secretariat.

Capacity

Prior to 1981, data on electrical capacity by type of generation are not available.

Hungary

Source

Hungarian Energy and Public Utility Regulatory Authority, Budapest.

General notes

Data are available starting in 1965.

The Hungarian administration submitted questionnaires to the IEA Secretariat for the first time with 1993 data.

Supply

For 2017 onwards, inputs and outputs from power plants are reported at a unit level, while for prior years, data are reported at a plant level. As a result, breaks in series are observed between 2016 and 2017. In particular, for **electricity** output from main activity producer CHP and main activity producer **nuclear** power plants, and for heat output from **industrial waste** at autoproducer CHP and autoproducer heat plants.

In 2017, a main activity producer CHP plant was reclassified as an autoproducer. As a result, declines are observed in **heat production from other bituminous coal** and **industrial waste**, as **heat** previously sold may now be used onsite.

Other sources **electricity** and **heat** production is available from 2013 and represents generation from residual tail gases from the manufacturing of soot as well as from **hydrogen**.

Geothermal heat production from main activity producer **heat** plants is available from 1995.

Nuclear electricity production in main activity producer **electricity** plants is available from 1983.

Transformation

In 2022, the decrease in **electricity** output from **geothermal** was due to the plant not being in operation for several months.

In 2020, the efficiency of **blast furnace gas-** and **coke oven gas-**fired main **heat** plants was revised downwards back to 2017 to better reflect trade of coal gases and hot air between adjacent facilities.

In 2019, some breaks in series occur for plants fired by **biogas** and **solid biofuels** due to changes in plant classifications, and CHP methodologies.

In late 2017, a new **geothermal** power plant began operations.

For 2017, the decline in **heat production** from **industrial waste** is partly due to the reclassification of a main activity producer as an autoproducer.

Heat and **electricity consumption** by military services is reported under *not elsewhere specified - other* sector for the first time in 2015. The change is due to the recent authorisation to disseminate these data. Previously they were included under *Commercial and public services*.

From 2014 data onwards, more data suppliers were involved in submitting energy data to the national administration, causing new autoproducer time series to appear for **geothermal** and **industrial waste** plants.

In 2014 data, some CHP plants running on **solid biofuels** produced only **heat** and were reclassified as **heat** plants.

The Hungarian administration reclassified some of their plants between 1996 and 2000, which may lead to breaks in the time series.

Prior to 2000, **electricity** output from **sub-bituminous coal** is included with **lignite**.

Autoproducer **heat** and power plants using **coke oven gas** and **blast furnace gas** were reclassified in 1998 as main activity power plants.

Consumption

For 2020 onwards, **electricity consumption** in *road* also includes plug-in hybrid electric vehicles (PHEV).

Data for direct use of **solar thermal heat** are available from 2001 and from 1990 for **geothermal heat**.

Trade

For 2022, the increase in **electricity** trade was partially due to the opening of an interconnector between Slovenia and Hungary.

Iceland

Source

Icelandic Environment and Energy Agency, Reykjavik.

General notes

For the 2022 and 2021 editions, the Icelandic Administration revised data back to 2007 due to improved methodologies.

Prior to 1970, final consumption includes inputs and outputs to **heat production**.

The industrial classifications used by the Icelandic administration were changed in 1987.

Supply

In the 2022 and 2023 edition, **geothermal** data related to the demand side of the commodity balance were revised starting from 2007. Therefore, data breaks might appear between 2006 and 2007.

The rise in **heat supply** in 2018 is due to an increase in the number of residential and commercial connections to new and existing district heating networks.

The increase in **hydro** and **geothermal electricity production** from 2007 is due to the expansion of the aluminium industry.

The increase in **geothermal electricity production** in 2018 is due to a new 90 MW power plant, half of which came online in 2017, and half in 2018.

From 2016 onwards, the decline in **electricity production** from **wind** is due to a combination of lower wind speeds and lower installed capacity.

Transformation

In the 2026 edition, electric boilers show efficiencies within an acceptable range for 2024. A revision for earlier years is planned in upcoming cycles

For 2016, access to improved data revealed considerably better **heat** plant efficiencies than previously inferred, with increases in **heat production** seen during this period.

From 2013 data, the *Hellisheidi* **geothermal** power plant, previously reported under main activity **electricity** plant, was categorised as main activity CHP plant.

Heat production from **municipal waste** is available from 1993 and stops in 2010.

In 1998, 60 MW of generating capacity was installed in the **geothermal** CHP plant at *Nesjavellir*. Since the plant was inoperable for four months, production of **geothermal heat** decreased compared to 1997. The extra electricity capacity caused **electricity production** from **geothermal** to almost double over the same period.

Electricity production from **geothermal** sources in main activity producer CHP plants is available from 1992.

For **geothermal** autoproducer heat, data for 2022 and 2023 were estimated by the IEA Secretariat. For 2024, **geothermal** autoproducer **heat** and **geothermal** main activity producer heat data were estimated by the IEA Secretariat to ensure consistency of efficiencies across the time series.

Consumption

The increase in **electricity consumption** in the *non-metallic minerals* sector from 2017 onwards is due to the opening of a silicon production facility, PCC Bakki.

The significant increase in **electricity consumption** in the *commercial and public services* sector from 2015 onwards is due to the growth of cryptocurrency mining.

In the 2015 edition, the **heat consumption** breakdown by sector for the years 1990 onwards has become available following reviews by the Icelandic administration. In addition, **heat consumption** was revised significantly upwards as more information became available. This has caused large breaks in time series across the heat balance between 1989 and 1990.

Direct use **geothermal consumption** in the *industrial sector* is reported under *not elsewhere specified - industry*, as the Icelandic administration decided not to estimate the allocation amongst the sub-sectors of industry.

Revisions in direct use of **geothermal heat** starting in 2013 create breaks in time series between 2012 and 2013.

Electricity consumption in *not elsewhere specified - transport* includes consumption for ferries and cruise lines.

Non-specified consumption of **electricity** within the energy sector refers mainly to the use of **electricity** by the **geothermal** industry to pump hot water from underground sources, and from 1991, also includes **electricity** used for the transport by pipeline of hot water from Nesjavellir to Reykjavik.

The increase of **electricity consumption** in the construction sector from 2004 to 2007 is due to the drilling of tunnels for the *Kárahnjúkar* power plant.

The *consumption* of **electricity** reported in *not elsewhere specified - other* corresponds to a NATO base at Keflavik airport which closed in 2005.

Prior to 1990, all **heat** for space heating was reported in *residential*.

The *residential sector* includes agriculture prior to 1983.

Prior to 1970, total final consumption includes inputs to and outputs from **heat production** and *non-energy use*. After 1970, data on inputs and outputs in CHP plants and in main activity producer **heat** plants (district **heat** plants) and for *non-energy use* are separately specified.

Ireland

Sources

Department of Communications, Energy and Natural Resources, Dublin.

Sustainable Energy Authority of Ireland, Cork.

General note

Data for **solid biofuels** and **biogases** are available from 1990.

Supply

In the 2025 edition, revisions were introduced from 2009 in the **electricity production** from autoproducers – *residential and commercial sectors*, due to new data available.

In the 2019 edition, revisions were made by the Irish administration for the *indigenous production* of **solar thermal** for the years 2011 – 2016.

Electricity production from **wind** begins in 1992 and from **biogases** in 1996. For **wind**, data for autoproducers are included in main activity producers prior to 2002 for confidentiality reasons.

Transformation

In 2018 and 2019, **electricity** output from **other bituminous coal** declined due to shutdowns at Moneypoint power station.

In 2017, a new **municipal waste**-fired main activity producer **electricity** plant (Dublin waste-to-energy) began operations.

In the 2016 edition, revisions were introduced in the **electricity generation by fuel** from 2010 due to improved data available from the transmission system operator.

In 2015, a new combined cycle **gas** turbine plant began commercial operations at Great Island power station, replacing the existing **heavy fuel oil** power plant.

In 2012, a new **municipal waste**-fired main activity producer **electricity** plant (Meath waste-to-energy) began operations.

In 2011, very little **electricity** was produced from **pumped hydro** following Turlough Hill, Ireland's pumped storage station, being taken offline in late 2010 up until February 2012. The 2011 values appear as zero due to rounding.

From 1984 to 1989, inputs of **hard coal** in autoproducer CHP plants have been estimated by the Secretariat.

Consumption

Not elsewhere specified in industry refers to Other Manufacturing (NACE 31-33, 12 & 15) and Rubber and Plastic Products (NACE 22).

In the 2024 edition, **electricity consumption** data were revised back to 1990 thanks to the Central Statistics Office of Ireland gaining access to the metered **electricity** data, which allowed them to reweight a number of categories.

In the 2021 edition, **electricity consumption** data were revised back to 1990 to incorporate the results of the Business Energy Use Survey (BEUS), which provided a level of detail not previously available.

In 2004, the increase of **electricity consumption** is due to the new light rail transit system in Dublin.

The decrease of **electricity consumption** in the *iron and steel* sector from 2001 onwards is due to Ireland's main steel plant ceasing production.

Prior to 1990, **electricity consumption** in *agriculture/forestry* is included with *residential*.

Electricity consumption in the *iron and steel* industry includes consumption in the *non-ferrous metals* industry prior to 1990.

Data for direct use of **geothermal heat** and **solar thermal heat** are available from 1989 and 1990, respectively.

Capacity

The **natural gas**-fired steam turbine at the Aghada main activity power plant closed in late 2018.

Capacity for the Edenderry co-fired (**peat** and **solid biomass**) power plant has been reported under single fuel-fired (peat).

Capacity reported under *other sources* corresponds to cross-border transmission capacity with Northern Ireland.

Prior to 1981, data on electrical capacity by type of generation are not available for main activity producers.

Israel

Source

Israel Central Bureau of Statistics, Jerusalem.

General notes

Data are available starting in 1971.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli administration. The use of such data by the OECD and/or the IEA is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Due to the unavailability of data for certain fuels, some data for Israel have been estimated by the IEA secretariat. In particular, some **oil** data in 2014 and 2015, **natural gas** data from 2012 onwards, and **renewables and waste** data in 2013.

Supply

Electricity production from **wind** begins in 2001.

Autoproducer **electricity generation** from **chemical heat** (production of sulphuric acid) occurs, but is not reported separately or included elsewhere in national totals, prior to 2017.

For 2020 onwards, *transmissions and distribution losses* for **electricity** include losses incurred during the operation of **pumped hydro** facilities.

Transformation

For the 2018 reporting cycle, Israel revised their methodology to better reflect actual plant classifications. As a result, breaks in series occur between 2017 and 2018 for output from all plant types.

Prior to 2018, inputs to autoproducer CHP plants (then reported under auto **electricity** plants) included inputs used to generate unsold **heat**. As a result, there is an apparent increase in efficiency for some fuels between 2017 and 2018.

For 2017 data onwards, due to confidentiality concerns, **electricity production** reported under autoproducer **wind** includes generation from main activity **wind**, total **hydro**, and autoproducer **biogases**. Similarly, for 2016 data, reported autoproducer **solar photovoltaic** generation includes *total generation* from **hydro** and **wind**.

For 2013 and 2014, **other oil products** inputs to autoproducer **electricity** plants were estimated by the IEA Secretariat.

Data on **heat production** from main CHP plants are not available.

Consumption

For 2022, **electricity transmission and distribution losses** were estimated by the IEA Secretariat.

Solar thermal indigenous production and direct consumption have been estimated by the IEA Secretariat from 2012 to 2017, using data published in the IEA Solar Heating and Cooling Programme Annual Report. These estimations may create breaks in time series between 2011 and 2012, and 2017 and 2018.

For 2013 onwards, for reasons of confidentiality, **electricity consumption** in *non-metallic minerals* is included under *mining and quarrying*, and *consumption in chemical (including petrochemical)* and *construction* is included under *not elsewhere specified (industry)*.

For 2013, and 2015 onwards, the split of **electricity consumption in industry** has been estimated by the IEA Secretariat. In addition, **electricity consumption in agriculture/forestry** for 2015 onwards has also been estimated by the IEA Secretariat.

Electricity own use, as well as *transmission and distribution losses* were estimated by the IEA Secretariat from 2010 to 2012.

Capacity

In the 2014 edition, main activity plants net **electricity** capacities by type of generation have been revised back to 2008 by the Israeli administration and capacities by fuel have been estimated by the IEA Secretariat for the same period. This leads to breaks between 2007 and 2008.

From 2013 onwards, the split of **combustible fuels** autoproducer electrical capacity by fuel type is unavailable.

Italy

Sources

Ministry of Environment and Energy Security (MASE), Rome

Gestore dei Servizi Energetici GSE S.p.A., Rome

Acquirente Unico S.p.A., Rome

Terna S.p.A., Rome.

General notes

As of 2021, an alignment with international energy statistics in the definition of main activity producer and autoproducer caused a shift of production from main activity producer to autoproducer and vice versa. This leads to breaks in time series.

Prior to 2021, heat produced by autoproducer includes all **heat** produced and auto consumed. As of 2021, **heat** sold only by autoproducers is reported. Breaks may occur in time series.

A change in methodology lead to breaks in time series for industry and transformation between 2003 and 2004.

Supply

In the 2026 edition, **electricity generation** from *Other sources* increased significantly due to the rapid deployment of battery storage systems.

In the 2026 edition, the IEA secretariat has adjusted the value for *used for heat pumps* in 2024 and 2025p using the value from the Renewable Questionnaire due to out-of-range values reported by the country in the Electricity and Heat Questionnaire.

Prior to 2021, **electricity generated** by autoproducers using **solar photovoltaic** is included under main activity producers.

Prior to 2021, data on *transmission and distribution losses* of **heat** consisted of **heat** units only. As of 2021, also *transmission and distribution losses* from CHP units are included. This leads to breaks in time series between 2020 and 2021.

For 2020, **electricity** output from autoproducer **wind** was reported for the first time in several years due to a reclassification of the producer type.

For 2017, more information became available on **fossil fuel** use in heat plants allowing additional inputs to be reported for this category. This causes breaks in time series between 2016 and 2017.

The *production of electricity* reported in the category *other fuel sources* refers to **electricity** produced from turbines which are located at pressure drops in fluid transport.

The methodology of data collection for **solar photovoltaic electricity production** changed in 2009 and the distinction between main activity and autoproducer plants could not be determined, causing a break in the time series.

Due to the aggregation of rounded values, from 2007-2016, total **electricity** output may differ slightly from the sum of the output from the individual fuels.

Transformation

For 2018, the decrease in **electricity** output from **solar photovoltaic** was due to lower-than-normal solar radiation.

Prior to 2000, **electricity used for pumped storage** (mixed plants) is included under *used for pumped storage* (pure hydro pumping plants).

In 2016, the decline in autoproducer **electricity** generation and sold **heat production** by oil refineries is partly due to the activities of these units being split off and reclassified as main activity enterprises.

The methodology of data collection for the **geothermal** sector changed in 2010, causing a break in time series between 2009 and 2010.

Prior to 2009, **sub-bituminous coal** used in main activity **electricity** plants was included under **other bituminous coal**.

With the introduction of a new survey in 2008, amounts of **naphtha** and **other kerosene** that were previously included in *other oil products* have been reported separately in autoproducer CHP plants.

Prior to 2004, **electricity production** from **orimulsion** is confidential and is included with **fuel oil**.

Heat production is reported starting in 2004 and includes self-generation in industry.

From 2000 onwards, the Italian administration defines **electricity** and **heat** production from autoproducers as generation from producers that consume more than 70% of their own **electricity production**. However, for the 2000 to 2002

period, all **electricity production** from autoproducers is reported with main activity producers.

The breakdown of **renewables** and **waste** inputs into **electricity**, **heat** and CHP plants is available from 1989 only. Prior to that year, the total of the different fuels involved is reported as non-specified renewables.

Prior to 1984, net **electricity production** by autoproducers includes *production from combustible fuel* sources only.

Consumption

Prior to 2021, **heat** consumed by autoproducer includes **heat** which is auto consumed. As of 2021, purchased **heat** only is reported.

For the 2021 edition, the Italian Administration changed system of reporting used to categorise consumption based on economic activity (from ATECUE95 to ATECO2007). As a result, breaks in series occur between 2018 and 2019. Historical revisions are pending.

Some breaks in-series for **heat consumption** are observed between 2017 and 2018. This is because some large **heat** producers reported *consumption of heat* in 2018 in sectors different to those they had reported in previous years.

not elsewhere specified - energy industry own use includes **electricity consumption** for blast furnaces. From 2000, it also includes consumption for the distribution of **gas** and prior to 1989 consumption for uranium extraction.

The breakdown of **heat consumption** by sector is estimated by the Italian administration.

Revisions of the *final consumption of heat* by the Italian administration led to breaks between 2010 and 2011.

From 1981, *consumption of electricity in transport* includes **electricity** used for pumping in oil pipelines.

Trade

Electricity trade with Malta started in 2015, following the opening of the Malta-Sicily interconnector submarine power cable in the same year.

Capacity

Prior to 1981, data on electrical capacity by type of generation are not available.

Japan

Source

The Institute of Energy Economics Japan, Tokyo.

General notes

In the 2019 edition, data for Japan were revised back to 1990 based on new methodology.

From 1990, data are reported on a fiscal year basis (e.g. April 2015 to March 2016 for 2015).

Consumption data for *commercial and public services* may include consumption in small and medium-sized industries. The Japanese administration expects that this shortcoming will be corrected in the near future.

Supply

In the 2019 edition, **electricity** data were revised back to 1990 to include additional autoproducer production previously excluded.

Due to the liberalisation of the **electricity** market in April 2016, some generation previously reported under autoproducer plants is reported as main activity producer from 2016 onwards. As a result, breaks in series occur between 2015 and 2016. In particular, for **solar photovoltaic** and **wind**.

In the 2019 edition, the methodology used to estimate **heat production** from other sources was revised.

Generation of electricity and **heat** from **combustible fuels** is calculated by removing **electricity** and **heat generation** from other sources, such as **wind**, **solar** and **nuclear**, making it a residual item. Splits between combustible fuel types and consumption flows are also calculated.

Due to the events related to the March 2011 tsunami, the Japanese administration decided to scale back the level of their **nuclear** programme. As a consequence, there was no **nuclear electricity generation** in 2014. The **nuclear electricity generation** started again at a greatly reduced scale in 2015, while significant increases were observed in 2017 and 2018, with generation resuming at several facilities (2017: Takahama 3 and 4, Ooi 3, and Genkai 3; 2018: Genkai 4, Ikata 3, Ooi 4). In 2020, output decreased due to inspections at some plants.

Other sources electricity represents **electricity generated** with purchased steam. **Other sources heat** represents heat derived from **waste heat**.

Gross and net electricity generation from autoproducers are equal, as no information is collected concerning autoproducer *own use*.

Own use at main **electricity** plants has been constant since 2015, as data are no longer available following liberalisation.

Data for **electric boilers** include **heat pumps**. For this reason, calculated efficiencies exceed 100% for some years.

Data on electricity production from **wind** began in 1992.

Heat produced for sale in main activity producer **heat** plants from **waste heat** and from **electric boilers** is available from 1977 and 1983, respectively.

Transformation

In the 2025 edition, the Japanese administration made revisions of autoproducer **electricity** from 2006 onwards and for other types of producers from 2016, due to new available information and corrections of statistics reported by utility companies. It is likely that additional changes will be implemented in the next cycle.

The Japanese Administrations attributes **heat** outputs (with the exception of **heat from electric boilers**) to individual fuels based on their share of inputs, assuming efficiencies are 100% or less. As a result, fuel-specific transformation efficiencies may not reflect actual efficiencies.

Data on **heat produced** for sale by autoproducer **heat** plants are not available.

Fuels used and corresponding **electricity** and **heat** produced in CHP plants are not included in the CHP data time series, but instead are reported as separate **electricity** or **heat** components, leading to some plant efficiency figures not to be accurately calculated. Inputs of **biofuels** and **waste** for **electricity production** and related outputs are available from 1982.

Net electricity production by autoproducers prior to 1982 includes *production from combustible fuel* sources only.

Between 1972 and 1976, the use of **combustible fuels** in main activity producer **heat** plants is included in *non-specified*.

Consumption

In the 2025 edition, the Japanese administration revised **heat** final consumption from *commercial and public services* to *not elsewhere specified (Other)* to better reflect the lack of information of the underlying data.

In the 2020 edition, there are revisions in the *consumption of solar thermal* in the *commercial and public services* and *residential* sectors in 1990 - 2004.

Consumption of electricity in *not elsewhere specified - industry* includes *wood and wood products* and *construction* prior to 1982.

Capacity

In mid-2018, some autoproducer **wind** capacity was reclassified as main activity producer. As a result, a higher utilisation rate is observed for autoproducer wind in 2018.

Autoproducers **solar photovoltaic** capacity is derived from data from the Japanese administration as well as the IEA Photovoltaic Power Systems Programme (IEA-PVPS) national survey reports, published yearly, and IRENA data.

In the 2025 edition, the IEA Secretariat revised **solar photovoltaic** capacity values for 2022 showing the AC total capacity from IRENA and the DC total capacity from the IEA PVPS. Data on electricity production from **wind** began in 1992.

Electricity generation capacity for **nuclear** power increased in 1997 due to the commissioning of two nuclear plants.

Autoproducer capacities do not include autoproducer plants with capacities less than 1 000 MW. Therefore, capacity factors may appear to be higher than expected. In particular, capacity factors for **geothermal** generation may exceed 100%.

From 2010 onwards, the breakdown of **combustible fuel**-fired electrical capacity by type is no longer available.

Prior to 1981, data on electrical capacity by type of generation are not available for main activity producer plants.

Prior to 1974, data on electrical capacity by type of fuel are not available for autoproducer plants.

Korea

Sources

Korea Energy Economics Institute, Ulsan.

Korea National Oil Corporation, Ulsan.

General notes

Data are available starting in 1971.

Heat data are available starting in 1993.

In the 2026 edition, the Korean administration implemented major revisions to both the electricity and heat balances. These changes affected *supply*, *consumption*, and the reallocation of *generation by plant type*. Due to the inconsistencies observed in the revised values, the IEA Secretariat estimated inputs and outputs by fuel, primarily for **oil** and **renewable** products. The Korean administration plans to revise the data in the next reporting cycle.

In the 2024 edition, **heat production** data were revised for all years starting from 1990. The revised data shows considerably higher levels of **heat production** compared to previous records. **Heat production** for numerous products was back calculated using fuel input as a basis. These revisions may have established fixed efficiencies that resemble default values in the calculations. The Korean administration continues its efforts to enhance data quality, and revisions may be made in upcoming cycles.

The significant increase in **heat production**, *supply* and consequently *consumption* from 2016 and 2017 can primarily be attributed to the uncertain data situation of **heat production** and **heat** sold from autoproducer plants. These figures are estimated by the Korean administration, as pointed out above, mainly by taking fuel input as a basis.

Electricity statistics from 1971 to 1993 have been estimated by the IEA Secretariat based on the Korean National Statistics. Data from 1994 have been submitted by the Korean administration. This leads to breaks in time series between 1993 and 1994.

Supply

In the 2024 edition, portions of **electricity production** from **combustible fuels** in autoproducer CHP plants were reallocated to autoproducer **electricity** plants for all years beginning in 1990.

The own use of **heat** in **heat** plants is very irregular due to a lack of data.

Electricity generation reported under *other sources* is from fuel cells.

Production of **tidal electricity** began in 2013.

Data for **heat from chemical processes** that is sold are available from 2008.

Data for **electricity production** using **heat from chemical processes** in copper and zinc plants are available from 2005. The corresponding **heat** inputs were estimated until 2013 data. In 2014, the company concerned switched to **diesel oil** for **electricity generation**.

Transformation

In the 2025 edition, the IEA Secretariat estimated **liquified petroleum gases** and **kerosene** input in terajoules and the **electricity** and **heat generation** for main activity producers in 2022 and 2023, in order to ensure consistency for these products between the oil and electricity questionnaires.

For 2020, the increase in **electricity** output from **nuclear** was due to the 1.4 GW reactor (Singori #4) coming online, as well as higher utilisation rates. For 2018, the decrease in **electricity** output from **nuclear** was due to a combination of shutdowns for maintenance, and the closure of the Kori and Wolsong nuclear power plants in June 2017 and June 2018 respectively.

For 2018, the increase in **heat production from natural gas** was in part due to the commencement and expansion of operations at two CHP plants (Hwaseong Dongtan and Anyang).

For 2017, the decrease in **electricity production from residual fuel oil** is due to the closure of two main activity producer plants.

Some discrepancies exist between data reported for **residual fuel oil**, in the **oil** databases and the **electricity** and **heat** databases. The Korean administration hopes to remedy this situation in a coming cycle.

Data for **electricity** and **heat production** by autoproducers using **natural gas** and **liquid fuels** are available from 2000.

In 2000, the Korean administration started to report **heat** statistics for some **heat** plants which were not reported before.

Between 1993 and 1999, the breakdown of **heat** output by type of fuel was estimated by the IEA Secretariat.

Consumption

Data for direct use of **geothermal heat** are available from 2002. **Geothermal** direct use data are overstated as it refers to **heat production** by **geothermal heat pumps**, which include inputs of **electricity** and/or **gas** in the transformation process.

Heat consumption by subsector was reclassified in 2010 due to new information available on heat sales from autoproducers to end-users by sector.

Prior to 2008, sales of **electricity** by Korea's main **electricity** distributor, KEPCO, to the *non-ferrous metals sector* are included in *iron and steel consumption*.

Data on *production and consumption of electricity* and **heat** in *oil refineries and LNG liquefaction/regasification plants* are included in the *industry sector*. From 2007, *oil refinery electricity* and **heat production and consumption** started to be reported under the correct energy sector.

Data for **heat consumption** by sector are available from 2000.

Data for **electricity consumption** in the transport equipment sector are included in *machinery* from 1994 to 1999.

Capacity

The breakdown of generating capacity by fuel is not available prior to 1994.

In the 2024 edition, the Korean administration revised the capacity of **hydro** and **wind** for their entire time series, due to new available information.

Latvia

Source

Central Statistical Bureau, Riga.

General notes

Data for Latvia are available starting in 1990. Prior to that, they are included in Former Soviet Union in the *World Energy Statistics* publication.

Breaks in the time series appear for inputs to and outputs from **electricity** and **heat generation** between 2016 and 2017 due to a change in methodology. This is most notable for main activity producer CHP and **heat** plants. Data for 2017 onwards are reported on a unit basis, whereas data for previous years are reported on a plant basis.

Supply

In 2019, the first large-scale main activity **solar thermal** district heating plant opened in Latvia.

For 2017, higher rainfall resulted in a significant increase in **electricity** output from **hydro** and a decrease both imports of **electricity** and output from **combustible fuels**.

Heat production from other sources represents **waste heat** recovered from industry, and **heat produced** by condensing economisers.

Transformation

From 2012 onwards, the increase in **electricity production** from **solid biofuels** is due to the deployment of six new main activity producer CHP plants running on wood chips.

Consumption

Prior to 2020 data, all **electricity consumption** in the *energy sector* was included in *own use* of **electricity** in power plants.

Prior to 2015 data, **electricity** consumed by trams at one of Latvia's three tram operators was included under *road*.

For 2012, the increase in **electricity consumption in the iron and steel** sector is due to a facility switching from an open-hearth furnace to an electric arc furnace.

Lithuania

Source

Statistics Lithuania, Vilnius.

General notes

Data for Lithuania are available starting in 1990. Prior to that, they are included in Former Soviet Union in the *World Energy Statistics* publication.

Supply

For 2021, there is an increase of **electricity** and **heat production** from **industrial and municipal wastes**. This is due to the Vilnius CHP plant becoming operative.

For 2021, **heat production from natural gas** and **fuel oil** increased due to some **heat** plants using significantly more these fuels.

In 2020, there is a spike of **heat production** from autoproducers **heat** plants in *commercial and public services sector*. This is due to Forest Investment plant that changed NACE classification.

Transformation

For 2022, the decrease of **heat** output from **chemical heat** and **electricity production from chemical heat** is due to the disruption of raw materials supply for the chemical industry.

In 2009, the Ignalina nuclear power plant, the only **nuclear** plant in Lithuania, closed down.

In March 2017, the *Geoterma* geothermal heat plant, the only **geothermal** heat plant in Lithuania, closed down.

Luxembourg

Source

STATEC, Institut national de la statistique et des études économiques du Grand-Duché du Luxembourg, Luxembourg.

General notes

In the 2024 edition, several values for 2021 were revised thanks to new information available.

Data for **solar thermal** are available starting in 2001 and for **solar photovoltaic** starting in 2000.

A revision in the classification of power plants by type and the production and consumption data for both **electricity** and **heat** back to 2000 causes breaks in the time series.

Supply

In the 2025 edition, inputs to heat pumps were reported for the first time. Outputs were estimated using standard efficiencies.

Most of the **hydro production** shown for Luxembourg is from the Vianden pumped storage plant and is exported directly to Germany.

There were some repairs on the upper basin of the **pumped storage** site at Vianden in 2019 leading to a reduction in **electricity production**. The full storage capacity was not available during this period.

In the 2017 edition, following plant reclassification, **heat production** by main activity plants were revised from 2011 onwards.

Starting in 2005, data for **electricity transmission and distribution losses** are obtained from the network operator. Prior to that, they were estimated by the Luxembourgian administration.

For main CHP, own use data are not available for **solid biofuels-** or **natural gas-fired** plants.

Transformation

A **natural gas-fired**, main activity **electricity** plant (TGV Twinerg) closed in 2016.

The *production of electricity* from **solid biofuels** from 2013 corresponds to the opening of a new plant burning wood wastes.

Data on **electricity production** from **biogases** are available from 1998 and heat production from 2010.

In 2002, the increase in **electricity production** is due to a new **natural gas** combined cycle power plant.

At the end of 1997, the *iron and steel industry* stopped *production* of **electricity**.

Electricity data for **natural gas** autoproducer CHP plants are available starting in 1995, and for main activity CHP plants starting in 1996.

Prior to 1990, *net electricity production* by autoproducers includes production from **combustible fuel** sources only.

Consumption

Heat consumption in *industry*, and *commercial and public services* sectors is estimated based on National Accounts. When not available, **heat consumption** figures for the most recent year reported are estimated based on data for the preceding year.

In 2015, the observed declines in the **heat** used in the *textiles and leather* sector and the *chemical and petrochemical* sector are due to the closure of two industrial main CHP plants. The heating needs of these sectors were met through direct purchase of **natural gas**, due in part to attractive pricing during this period.

In 2015, following the procurement of new information, data for **heat** distribution losses and **heat consumption in industry** and *energy* sectors were revised from 2000 onwards.

A change in the data source caused some breaks in the industry **electricity consumption** time series between 2010 and 2011.

The breakdown of **electricity consumption** in industry is not available from 1990 to 1999.

Capacity

Production of **electricity** in the *iron and steel industry* ceased at the end of 1997. Therefore, autoproducer electrical capacity for **combustible fuels** declined.

Prior to 1995, data on electrical capacity by type of generation are not available for autoproducers.

Mexico

Source

Secretaría de Energía, Mexico City.

General notes

Data are available starting in 1971.

In the 2026 edition, the IEA Secretariat estimated all the values for 2024 based on [Balance Nacional de Energía](#) of the Secretaría de Energía, and other sources.

Since the 2023 edition, some 2021, 2022 and 2023 data were estimated by the IEA Secretariat based on various edition of the [Balance Nacional de Energía](#) of the Secretaría de Energía, and other sources.

In the 2023 edition, data for 2018-2020 were revised based on new data provided by the Mexican administration.

For the 2022 edition, due to data availability issues, some data provided by the Mexican administration for 2020 were equal to the values for previous years.

For the 2021 edition, new data supplied by the Mexican administration for 2018 and 2019 were incorporated in place of previous estimates.

In the 2016 edition, the Mexican administration completed a major work on revisions of the time series back to 1990. More revisions to historical data are pending.

The Mexican administration is currently undertaking revisions of the **electricity** time series back to 1996. Revisions include changes on inputs and outputs on power plants fuelled mainly by **combustible fuels** and the reclassification of main **electricity** plants previously reporting **sub-bituminous coal** as fuel to **other bituminous coal** for the period 2003-2015.

Supply

Electricity generation from **other sources** mainly represents generation from recovered **waste heat** from *industry*, and also a small amount of **electricity production** from regenerative braking in suburban trains.

The decrease in **electricity** produced from **wind** in 2017 is due to an earthquake which damaged infrastructure in the south of the country.

Production of main activity producer **electricity** plants from **wind** is available from 1994.

Electricity production from **wind** and **solar photovoltaic** is available from 1990.

Discrepancies occur between respective reported figures for **electricity** trade between the US and Mexico from 2013 onwards.

Transformation

New autoproducer **electricity** plants fuelled with **coke oven gases** were put on-line in 1999.

Electricity production from **solid biofuels** and **biogases** data are available respectively from 1991 and 1997.

Consumption

Some **electricity consumption in energy industry** is included in the *industry* sub-sector where it was generated (e.g. the chemical industry, as well as in *not elsewhere specified - industry*).

Direct use of **solar thermal heat** is available from 1990.

Capacity

In the 2022 edition, **solar photovoltaic** capacity data for 2019 and 2020 and **wind** capacity for 2020 were estimated by the IEA Secretariat.

In 2012, **nuclear** capacity increased due to the replacement of the turbines in the only nuclear plant.

The capacity factor for **wind** appears high for 2011 as the capacity of plants on test was not reported.

The breakdown of generating capacity for main activity producer **electricity** plants by **combustible fuels** is not available prior to 1982.

Net maximum electrical capacity for autoproducers is not available prior to 1974.

Netherlands

Source

The Netherlands Central Bureau of Statistics, The Hague.

General notes

The Netherlands Central Bureau of Statistics has conducted reviews and revisions of their energy balance on several occasions; including, 2005, 2011, 2015 and 2016. The 2005 revisions were to improve basic energy statistics, particularly with respect to carbon and CO₂ reporting, while the 2011 revisions were part of a harmonisation program with international energy statistics. The 2015 revisions were the result of increased data collection, availability of new source information, and further alignment with international energy definitions. In the 2016 and 2017 editions, data for the years 1990-2013 were revised by the Dutch administration following an extended review of old national publications and new data obtained from grid operators. More details are available here: www.cbs.nl.

Supply

In 2019, the Dutch administration revised *transmission and distribution losses* of **heat** back to 2015 to incorporate improved data. As a result, there is a break between 2014 and 2015. Historical revisions are pending.

For 2018, the increase in **electricity** output from **solar photovoltaic** autoproducer **electricity** plants is in part due to the inclusion of solar on industry surveys. As a result, autoproduction in various industries was captured for the first time.

For 2018, the declines in **heat generation** from **municipal waste**, and **heat** used for **electricity generation**, and the increase in **electricity** output from **municipal waste**, are due to a change in ownership of a company which sold **heat**.

Data on **heat production** from chemical sources are available from 2017.

The decrease in **electricity production** from **nuclear** power in 1997, 2013, and 2017 is due to maintenance shutdowns at the Netherlands' only nuclear power plant.

Electricity from *other sources* represents generation from **expansion gases** and **chemical waste gases** (the latter up to 2007).

The large increase in **electricity** trade in 1999 is due to the liberalisation of the Dutch **electricity** market. Until 2003, trade data are based on contracted quantities instead of physical flows.

The increase of **heat** produced in main heat plants in 1995 is due to a change in ownership of one large installation, resulting in its reclassification from an autoproducer to a main activity plant.

Electricity production from **solar photovoltaic** is available from 1990.

Transformation

For 2019, the increases in **electricity** output from **other sources**, and **heat** output from **chemical heat** are in part due to improved data availability.

Data on **electricity** and **heat** output from **industrial waste** are available from 2015.

In mid-2017, two **other bituminous coal**-fired power stations closed, as a result output from **other bituminous coal** declined in 2018. Another plant closed in-late 2019.

The efficiency of **blast furnace gas**-fired autoproducer CHP plants increases between 2015 and 2016 due to improved methods for allocating inputs between sold and unsold **heat**.

Heat output from **chemical heat**, and **other sources** is available from 2015.

Electricity output from **other sources** refers to production from expansion gases and recovered heat.

Heat used for **electricity production** represents **waste heat** bought from other industries that was *generated* from **combustible fuels**. The corresponding **electricity** output is included with that of **natural gas**.

Autoproducer **heat** plants using **refinery gases** are included with autoproducer CHP plants because data are considered confidential for 1990.

Heat production in *commercial and public services* includes production in *agriculture*.

All **municipal waste** autoproducer **electricity** and **heat** only plants have been reclassified by Statistics Netherlands as autoproducer CHP from 2012, causing breaks in the time series.

Prior to 2008, a few small autoproducer **electricity** plants using **solid biofuels** were included with main activity plants for reasons of confidentiality.

In 2006, some **municipal waste** plants changed ownership and were reclassified from **electricity** only to CHP plants as they started heat projects.

A new main activity producer CHP plant fuelled by **refinery gas** started up in 1999 and there was a fuel reclassification in 2000.

For **natural gas**, all **electricity production** prior to 1998 is included in CHP plants.

For **biofuels and waste**, all **electricity** and **heat** produced prior to 1995 is included in CHP plants.

Data for **heat** produced from **biofuels** and **waste** are available from 1990.

Prior to 1990, all **electricity** and **heat** produced from **coal** is included in CHP plants.

Inputs of **hard coal** for **electricity production** from 1981 to 1989 in terajoules (TJ) are estimated by the Secretariat based on data submitted in kilotonnes (kt) by the Dutch administration.

Net electricity production by autoproducers prior to 1988 includes production from **combustible fuel** sources only.

Data for **heat production by fuel** in **heat** plants prior to 1987 are estimated by the Secretariat based on fuel inputs submitted by the Dutch administration.

Data for **heat production** from main activity producer CHP plants and heat plants are available from 1982.

Prior to 1982, **electricity production** from and inputs to main activity producer CHP plants are included with main activity producer **electricity** plants.

For 1970 to 1973, **electricity** output from autoproducer CHP plants has been included with main activity producer CHP plants.

Consumption

In the 2023 edition, the Dutch Administration revised data for **electricity consumption** in the *blast furnace* and *iron and steel* sectors for the period 1990-2014. This followed revisions to data for 2015-2019 in the 2022 edition.

In 2018, the decrease in **heat** used for **electricity generation** was due to the closure of a large installation.

In 2018, there were four new **geothermal** installations producing **heat** which warmed greenhouses. As in the past, these would be categorised in the *agriculture and forestry* sector.

For data from 2015 onwards, there is improved data availability for **heat**. This causes breaks in series for *transmission and distribution losses*, and **heat consumption** in the *non-ferrous metals* sectors.

Increasing **electricity consumption** in *agriculture/forestry* is due to expansion of greenhouse farming.

Direct use of geothermal heat in *agriculture/forestry* starting in 2008 is due to a new project extracting deep **geothermal heat**. The **heat produced** has been used for heating greenhouses.

Prior to 1979, **electricity consumption** in *agriculture* is included in *commercial and public services*.

Capacity

Prior to 1981 for main activity producer plants and 1982 for autoproducers, data on electrical capacity by type of generation are not available.

New Zealand

Source

Ministry of Business, Innovation and Employment, Wellington.

General notes

For the 2020 and 2019 editions, the New Zealand administration submitted extensive revisions back to 1990 following an internal review of systems and methodologies. Additional revisions were submitted for the 2020 edition. For **solar photovoltaic**, the source data, Electricity Market Information, changed their entire time series. Data may be further revised in a future edition. Prior to 1994, data refer to fiscal year (April 1993 to March 1994 for 1993). From 1994, data refer to calendar year.

There are several breaks in the time series between 1987 and 1988 due to a reorganisation of government departments during 1987.

Supply

In the 2026 edition, revisions were made to **hydro**, **solar photovoltaic**, and **geothermal production** following a review of plant-level **electricity generation**. Revisions also apply to **solar photovoltaic** installed capacity.

Heat outputs from main activity and autoproducer CHP plants are not available.

Electricity and **heat production** from **other sources** represents **waste heat** recovered and used for **electricity production**. This includes **heat** recovered from chemical processes at acid plants in the fertiliser industry, where sulphur is the main input.

Only *net electricity production* is collected for some plants such as **combustible fuels** autoproducer CHP and **electricity** plants. As a result, **electricity own use** in these plants is estimated by the New Zealand administration.

Transformation

For 2018, a shortage of **natural gas** resulted in decreased *use* of **natural gas** for **electricity generation**, and increased use of **sub-bituminous coal**.

In late 2015, two **natural gas**-fired power stations used for baseload demand closed. As the remaining **natural gas**-fired plants are used more for peak demand, there is a reduction in generation efficiency between 2015 and 2016.

Stable efficiencies are reported for a range of fuels and plant types based on historical estimates by the New Zealand administration including **biogas** autoproducer CHP and **electricity** plants, **gas/diesel oil** main activity producer CHP and autoproducer CHP plants as well as **natural gas** autoproducer **electricity** plants.

In 1999, a reclassification of autoproducer plants causes some breaks in the time series.

Data for **geothermal electricity production** by autoproducers are available from 1990.

The New Zealand administration has updated efficiencies for **electricity production** from **geothermal heat** from 10% to 15% from 1990 onwards; this causes a break in the time series between 1989 and 1990.

In the 2018 edition, **electricity production** in **hydro** plants was revised back to 2002 due to a change in methodology. This results in a break in time series between 2001 and 2002.

The large 1998 increase in **natural gas** input to autoproducer CHP plants is due to two new autoproducer CHP plants.

Electricity production by autoproducers from **natural gas** and from **oil** has been estimated by the Secretariat from 1970 to 1973.

Consumption

The only remaining oil refinery closed during 2022.

A new survey starting with the 2013 data can cause breaks in data for final *consumption* of **electricity**.

The *consumption* of **electricity** by the transport sector is collected under the Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006 system's "Transport, Postal and Warehousing" category. As this covers commercial services as well as transport, MBIE estimates the amount of this that can be allocated to transport. At present this data does not allow for the disaggregation by *transport* sub-sector.

Beginning in 2013, the falling **electricity consumption** in the *pulp, paper and printing* sector follows with the permanent closure of a paper machine in one of New Zealand's larger energy users, following decreased demand for newsprint.

Data on *direct use* of **geothermal heat** are available from 1990 and *direct use* of **solar thermal heat** from 2002.

From 1974 to 1993, *transmission and distribution losses* include the statistical differences.

The classifications used by the administration of New Zealand were changed in 1991.

Electricity consumption in *pulp, paper, and printing* is included in *wood and wood products* prior to 1990.

Capacity

Generating capacity for autoproducers is available from 1994.

Prior to 1981, data on electrical capacity by type of generation are not available.

Norway

Source

Statistics Norway, Oslo.

General Notes

In the 2018 edition, data for Norway were revised back to 2010, following the introduction of a new system for energy balances and energy accounts. Breaks in series may appear between 2009 and 2010 as a result. For more detailed information regarding the methodological changes, please refer to the documentation of statistics production since statistics year 2010 on the Statistics Norway website. At the time of writing, the document was available in Norwegian as “*Dokumentasjon av statistikkproduksjonen fra statistikkår 2010 og fremover*”.

Supply

In the 2023 edition, the Norwegian Administration revised **heat production** from **heat pumps** and **other sources**, for the years 2010-2017, to remove amounts used for district cooling.

Solar electricity production in the *residential* sector is available from 2018. However, it only refers to **electricity** sold – it does not include **electricity** generated and consumed by households themselves.

The **electricity generated** from *other sources* represents **electricity** from **waste heat**.

Prior to 2009, *transmission and distribution losses* include statistical differences.

Heat produced by autoproducer **heat** plants from *chemical processes* and from *other sources* and used for **electricity production** has been estimated by the IEA Secretariat for the period 1990 to 2006.

Electricity production from **wind** is available from 1993.

Data for **heat production** from heat pumps and electric boilers (including the **electricity** used for this production) are available from 1989.

Data for **heat production** are not available prior to 1983.

Transformation

Biogases efficiency for main activity producers is unstable and may be revised by the country in future submissions.

In September 2020, a fire occurred at a **natural gas**-fired power plant. As a result, lower **electricity** output from **natural gas** was observed in 2021 and early 2022.

Prior to 2018, **heat** output from heat pumps included district cooling. **Electricity** inputs to **heat** pumps run in cooling mode is included for all years. Revisions are pending.

Increased **heat production** from **biogases** and **other liquid biofuels** in 2018 is related to replacing fossil fuels.

For 2017, the apparent increase in **heat** output from **solid biofuel**-fired main CHP plants is due to a plant reclassification.

In the 2016 edition, Norway corrected the **industrial waste consumption** in **heat** plants, and reclassified some the corresponding **heat** output under *other sources*.

Starting in 2007, data for **natural gas electricity** and CHP plants are aggregated in autoproducer **electricity** plants for confidentiality reasons. The revisions received for the 2018 edition partially altered these data for the period 2010 to 2016, but no explanations were given.

Breaks in the time series between 1996 and 1997 and between 2001 and 2002 and now 2009 and 2010 are due to a reclassification of main activity producers and autoproducers. This includes the apparent cessation of autoproducer **pumped hydro** and **hydro electricity generation** since 2010, where this generation has been reclassified as main activity.

Data for **heat production** from **biogases** are available from 1995.

Prior to 1991, *net electricity production* by autoproducers by *industry* sub-sector was estimated by the Secretariat based on data submitted by the Norwegian administration.

Data on inputs and outputs in **heat** plants are not available prior to 1983 for main activity **heat** plants and prior to 1988 for autoproducer **heat** plants.

Consumption

Electricity consumption in *road* refers to calculated consumption for fully electric vehicles and hybrids. This consumption is removed from *residential* and *commercial and public services* consumption where relevant.

For the 2019 edition, **heat consumption** in the *chemical (incl. petrochemical)* and *commercial and public services* sectors was revised back to 2007. Historical revisions for other sectors are pending. As a result, breaks in series occur for **heat consumption** in some sectors between 2016 and 2017.

Consumption of **electricity** for *pipeline transport* is included in *oil and gas extraction*.

The breakdown of **heat consumption** by the *industry* sub-sector was expanded in 1992, reclassified in 1994 and collected by a new reporting system in 1997.

Trade

Electricity trade with the Netherlands, Germany, and the UK, are available from the date of completion of subsea interconnectors with these countries (Netherlands: 2008; Germany/UK: 2021). Capacity

The increase in **gas**-fired generating capacity and the associated production of **electricity** in 2007 is due to the opening of a new plant at Kårstø in late 2007.

Net maximum electrical capacity of **pumped storage** plants is not available from 1970 to 1972.

Poland

Source

Central Statistical Office, Warsaw.

General note

In the 2025 edition, several data related to **combustible fuels** are rounded to one decimal point, due to statistical confidentiality.

Prior to 2010, **heat supply** and *consumption* can include autoproducers unsold **heat**. Previous attempts to address such issue may have caused breaks for **heat production** and fuel in autoproducer **heat** plants (1993) and in autoproducer CHP plants, and for **heat consumption** in *industry* subsectors.

Supply

Electricity and **heat** from *chemical heat* and *other sources* are available from 2011. Prior to that, these amounts could be included under different categories.

Heat distribution losses are available from 2010 and prior to that they are included in consumption.

Heat production from heat pumps is available from 2009.

Transformation

In the 2026 edition, several products present unstable efficiencies due the statistical confidentiality implemented during the 2025 edition.

For 2019, the increase in **electricity** output from **industrial waste** was in part due to the opening of a new waste-to-energy plant in late 2018.

In 2019, **electricity** output from **solid biofuels** increased following the introduction of a new state support scheme. In 2016, output declined following a reduction in state support for biomass co-firing.

For the 2017 edition, the Polish administration revised **electricity production** data from power plants run by **combustible fuels**, reclassifying those that were previously reported as main activity CHP as main activity **electricity** plants. These revisions mainly affected **coal**-fired power plants and created breaks in time series from 2004 onwards.

Due to a reclassification of plant types, there is a break in time series in 2015 for the generation of **heat** in autoproducer CHP plants in the *iron and steel* sector.

In 2014 and 2008, several CHP plants were reclassified from autoproducer to main activity producer due to an industry re-organisation.

Prior to 2013, **electricity** used for *pumped storage* (mixed plants) is included under *used for pumped storage* (pure hydro pumping plants).

Data for *direct use* of **geothermal heat** are available from 2000 and *direct use* of **solar thermal heat** in *commercial and public services* from 2002 and in *residential* from 2009.

Heat consumption in *energy industry own use* includes process **heat** not sold before 1995.

Data for **electricity** production in autoproducer **electricity** plants are available from 1986.

Consumption

Electricity consumption in *road* refers to consumption in designated public charging spots. Charging of vehicles in a residential setting is included in *residential consumption*.

Portugal

Source

Direcção Geral de Energia e Geologia, Lisbon.

Supply

Data for *production* of **electricity** from **solar photovoltaic** and **wind** are available from 1989.

The large decrease in **electricity** output from **hydro** for 2017 is due to decreased rainfall.

Transformation

Biodiesel inputs to **electricity generation** are included under **gas/diesel oil** and are expected to be reported separately in future cycles.

In 2019 and 2020, one of the two **other bituminous coal**-fired plants in Portugal operated with reduced output. The plant permanently closed in late 2020.

In the 2017 edition, the data for production of **electricity** by autoproducer **hydro** plants were revised between 1990 and 1999, according to a new national methodology.

For 2016 data onwards, **heat** and **electricity production from chemical sources** have been reclassified as autoproducer CHP production from **industrial waste**, causing cessation of the **heat** and **electricity** generated from **heat from chemical processes** time series, and causing breaks in the industrial **waste** time series between 2015 and 2016.

In 2007, some power plants that were previously reported as main activity CHP have been reclassified as autoproducer CHP.

In 2007, the power station that burns **industrial waste** started to work as a CHP plant, whereas previously it was only producing **electricity**.

New plants fuelled by **solid biofuels** and by **municipal waste** started in 1999.

Prior to 1992, data for *net electricity production* by autoproducers include *production* from **combustible fuel** sources only.

Electricity production from **other oil products** refers to methanol.

Data for *production* of **electricity** in main activity producer CHP plants and the associated fuel inputs are not available prior to 1980.

Consumption

As of the 2025 edition, the vast majority of **heat** reported as sold by autoproducers CHP plants is actually autoconsumed by the primary activity of the autoproducers, although the economic activities might have different owners and legal status on paper. The topic is being discussed with the Portuguese administration and data might be revised in future reporting cycles.

In April 2021, an oil refinery shut down which led to a decrease in **heat consumption** in 2021 and 2022.

In the 2017 edition, the Portuguese administration reclassified some amounts of **heat consumption** from the *residential* to the *commercial and public services* sector for the period 1998 to 2014 following a new national methodology. Data for *direct use* of **solar thermal heat** is available from 1989 and *direct use* of **geothermal heat** from 1994.

Capacity

Peak load for main activity producer plants includes the autoproducers data and is not available prior to 1986.

Slovak Republic

Source

Statistical Office of the Slovak Republic, Bratislava.

General notes

Data are available starting in 1971.

The Slovak Republic became a separate state in 1993 and harmonised its statistics to EU standards in 2000. These two facts lead to several breaks in time series between 1992 and 1993, and between 2000 and 2001.

Data for **solar photovoltaic** are available from 2010.

Supply

For 2018, heat supply declined due to the closure of a large producer in January 2018.

Electricity and **heat** from *other sources* refer to waste heat (flue gases).

Transformation

In the 2023 edition, **heat** supply from main activity **nuclear** CHP plants was reclassified to main activity **nuclear heat** plants for all years starting from 2001.

In the 2023 edition, **electricity** supply from main activity **nuclear** CHP plants was reclassified to main activity **nuclear electricity** plants for all years starting from 2001.

For 2020, no **municipal waste** use is reported at autoproducer **electricity** plants or autoproducer **heat** plants, as the plants reported the production under autoproducer CHP.

For 2020, the efficiency of production using **other bituminous coal** at main activity CHP plants is above the expected range. Conversely, for 2021, 2020 and 2019, the efficiency of **heat production** using **biogas** at main activity plants is far below the expected range. The Slovak Administration is investigating these issues. Revisions are pending.

For 2018, opposing trends in **residual fuel oil** use at autoproducer and main CHP plants are due to changes in plant classifications following a merger.

For 1990 to 2003, **electricity** and **heat production** from **combustible fuels** have been estimated based on the data on fuel inputs to **electricity** and **heat** plants reported in the annual fuel questionnaires.

Prior to 2001, **electricity generation** from primary **solid biofuels**, **municipal waste** and **biogases** are included with **industrial waste**.

Consumption

For 2018, the apparent decline in **heat consumption** in the *oil refineries* and *chemical (incl. petrochemical)* sectors is due to a merger between companies in those sectors and a CHP plant.

For 2018, the increase in **electricity consumption** in the *mining and quarrying* sector is because a larger consumer was reclassified.

The low **electricity consumption** in *oil refineries* in 2003 and 2004 is due to a change in ownership and work carried out on a refinery.

Data for *direct use* of **geothermal heat** are available from 2001 and *direct use* of **solar thermal heat** from 2005.

Trade

The breakdown of trade by origin and destination is available from 1993.

Capacity

The breakdown of installed capacity by type of generation/fuel is available from 2001.

Peak load data for main activity producer plants have been estimated by the IEA Secretariat based on the SEPS annual reports and include data for autoproducer plants. Data are available back to 2000.

Data for main activity generating capacity are not available prior to 1995, and for autoproducers prior to 2001.

Slovenia

Source

Statistical Office of the Republic of Slovenia, Ljubljana.

General notes

Breaks in the time series appear for inputs to and outputs from **electricity generation** between 2017 and 2018 due to a change in methodology. This is most notable for **lignite-fired main activity producer CHP** and **electricity** only plants. Data for 2018 onwards are reported on a unit basis, whereas data for previous years are reported on a plant basis.

A new energy data collection system was implemented in January 2001, causing some breaks in time series between 1999 and 2000.

Data for Slovenia are available starting in 1990. Prior to that, they are included in Former Yugoslavia.

Supply

In the 2025 edition, following a grand data project in Slovenia, reallocations of main activity and autoproducers were made to 2022 and 2023 data.

Solar photovoltaic autoproducer **electricity production** in Slovenia contains from 2019 onwards the share of self-consumption from *residential* and *commercial and public services*. This has not been the case between 2015 and 2018.

Transformation

In 2018, Slovenia began gradually changing the sources of data for main **heat** plants from questionnaires to administrative sources. This change has resulted in some variation in reported efficiencies, in particular, for **natural gas**.

Consumption

In the 2025 edition, data for *commercial and public services* were corrected for 2022 and 2023.

Electricity consumption before 2022 that could not be allocated to a specific sector was reported under *commercial and public services*. New surveys were able to allocate parts of the **electricity consumption** to additional sectors. Starting from 2022, all **electricity consumption** that could not be allocated is reported under *not elsewhere specified (other)*.

Breaks occur between 2017 and 2018 for **electricity consumption** data (in particular, for *machinery* and *construction*) due to a change in the sample frames and sample sizes used in surveys.

Data on **electricity consumption** in *road* are available from 2017.

In 2017, the apparent increase in **electricity consumption** in *rail* is due to improved data provided by a new survey launched by the Ministry of Infrastructure in 2018.

Direct use of **solar thermal** and **geothermal heat** is available from 2009.

Surveys for data on **heat consumption** are available from 2003 onwards for the *residential*, *industry* and *energy* sectors. Prior to 2003, the data have been estimated by the Slovenian administration.

Spain

Source

Ministerio para la Transición Ecológica y el Reto Demográfico, Madrid

General notes

In the 2026 edition, **heat production** and **consumption** data for 2024 were included for the first time. This addition has affected the total final consumption figures for **natural gas**, **gas/diesel**, and **solid biofuels**, as part of this consumption is now allocated to the transformation sector—particularly to autoproducer CHP and **heat** plants.

Spain is currently working on improving its data collection system. Therefore, breaks in time series are present in the data and historical revisions are expected in the future editions.

Supply

As a result of the National Energy and Climate Plan, **electricity production** from **wind** and **solar photovoltaic** increased significantly from 2018 onwards. Moreover, in the last years, **electricity production** from autoproducers **solar** increased due to implementation of a new regulation incentivising prosumption.

Electricity reported under *other sources* is from **waste heat** and **hydrogen**.

Transmission and distribution losses are estimated by the Spanish administration.

Data on **electricity production** from **solar thermal** plants are available from 2007.

Starting in 2006, a new method was used to estimate the losses from final consumption, resulting in a break in time series between 2005 and 2006.

From 2005, residential rooftop **solar photovoltaic electricity production** data, previously reported under autoproducer, are included in main activity electricity plants according to the Spanish administration classification.

Electricity production from **wind** and **solar** are reported from 1989 when data became available.

New reporting systems were implemented in 2000 and again in 2006, and a further revision was introduced in 2024, which resulted in a reclassification of many plants from main activity to autoproducer and vice versa. This leads to breaks in the time series for the transformation sector, final consumption sectors and **electricity**

production between 1999 and 2000, between 2005 and 2006, and between 2023 and 2024.

In the 2026 edition, **electricity generation** for main activity producer **solar photovoltaic** was revised from 2021 – 2023 due to improved data and estimation methods.

Starting in 2024, data for **hydro** and **solar photovoltaic** reflect a reclassification between autoproducer and main activity producer plants, as well as improved data availability.

Transformation

In the 2020 edition, **electricity generation** for **wind** was revised from 1998-2017.

From 2017 onwards, more accurate data on inputs and outputs for **pumped hydro** are available. This improvement in data quality leads to an apparent increase in efficiency.

Prior to 2018, some **industrial waste** and **other liquid biofuels** used for **electricity** and **heat generation** was reported under **solid biofuels**.

In the 2017 edition, a change in reporting methodology resulting in reclassification of plants from autoproducer **electricity** to autoproducer CHP has led to breaks in **electricity production** in autoproducer **electricity** plants between 2012 and 2013 and 2014 and 2015. The administration anticipates further revisions to the time series in subsequent cycles.

The National Energy Commission reclassified plants that consume **biogases**, leading to breaks in time series between 2007 and 2008.

In 2000 and 2006, many plants were reclassified from main activity producer to autoproducer or vice versa.

For 2004 and 2005, **electricity production** from **gas/diesel oil** is included with **fuel oil**.

The large increase in **electricity** output from main activity producer **electricity** plants fuelled by **natural gas** in 1997 is due to the opening of a new plant.

Prior to 1989, inputs and outputs from the use of **biofuels and waste** to generate **electricity** and/or **heat** (i.e. comprising **solid** and **liquid biofuels**, **industrial waste**, **municipal waste** and **biogases**) are reported under non-specified **biofuels and waste**.

Prior to 1987, **electricity production** in main activity producer CHP plants is included with production from main activity producer **electricity** plants.

From 1983, *net electricity production* by autoproducers has been estimated by the Spanish administration, and includes production from **combustible fuel** sources only and *net electricity production* by autoproducer CHP plants is included in **electricity** plants.

Consumption

For 2022, the **electricity consumption** in *non-ferrous metals* sector fell to almost half, due to the contraction of the aluminium sector (the main company closed).

For 2021 data, all the sectors had their **electricity consumptions** increased after COVID-19 pandemics which reduced the economic activities in 2020. *Residential* sector is the main exception since it did not change much compared to 2020. *Iron and steel, non-metallic minerals, food, beverages and tobacco, paper, pulp and printing* and *construction* showed the highest increases with respect to 2019 data.

Electricity consumption on *non-ferrous metals* was affected by the contraction of the aluminium sector. In the *transport* sector, *road* continued to increase due to the growth in the number of electric vehicles.

For 2019 data, some **electricity consumption** was reallocated from *not elsewhere specified - industry* to other sectors. As a result, apparent increases are observed for sectors such as *textiles and leather* and *wood and wood products*.

Electricity consumption by electric road transport vehicles includes battery and electric plug-ins, and is modelled based on vehicle registrations.

For 2012, the **electricity consumption** data are estimated by the Spanish administration.

Data for *direct use* of **geothermal** and **solar thermal heat** are available from 1990.

Electricity consumption under the *not elsewhere specified - industry* category includes the consumption for the manufacture of rubber and plastic products, furniture, repair and installation of machinery and equipment (except repair and maintenance of ships and boats) and other manufacturing. This aligns with the Classification of the Economic Activities in the European Community (NACE) group code 22 and 31 to 33 (excluding class 33.15).

Capacity

Prior to 1980, data on electrical capacity by type of generation are not available. In addition, from 2003 to 2017, no breakdown of capacity by type of fuel and generation type is available.

Sweden

Sources

Statistics Sweden, Örebro.

Swedish Energy Agency (*Energimyndigheten*), Eskilstuna.

Supply

In the 2026 edition, 2025 provisional data are based on quarterly survey submissions and are therefore not fully comparable with the 2024 values reported through the annual questionnaire. Differences in coverage, sampling methodology and reporting schedules may result in breaks in the time series between 2024 and 2025.

In the 2026 edition, 2023 and 2024 data for **batteries** are confidential.

For 2020, the cessation in **electricity** output from autoproducer **hydro** was due to the plant no longer being classified in that category.

In the 2021 edition, upward revisions were applied to **heat production** and **consumption** back to 1997, to incorporate new data on recovered flue gas **heat**. Production is reported under **heat** from **other sources**.

For 2017 onwards, **electricity** inputs to and outputs from *pumped **hydro** storage* plants are based on a revised methodology. As a result, breaks occur between 2016 and 2017. Prior to 2017, **electricity** inputs to *mixed **hydro** storage* plants are reported under pure pumped plants.

Inputs to **heat pumps** include **heat** recovered from industry and from ambient sources (including sewage and seawater).

Ambient heat is shown as the *indigenous production* of **heat**.

Information on **heat** for sale produced in **heat** pumps and electric boilers is available starting in 1992.

Data on *gross electricity production* are sourced from an annual survey, while *net production* is sourced from monthly surveys. As a result, implied *own use* may vary.

Transformation

In the 2025 edition and from 2023 data, the Swedish administration started reporting inputs and outputs of power plants at a unit level, while in previous years

data were reported at a plant level. As a result, breaks in series are observed between 2022 and 2023 for the **heat** output from main activity producer CHP and **heat** plants, especially for **biofuels** and **wastes**.

For 2020, the decrease in **electricity** output from **other bituminous coal** was due to a plant closure.

For 2020 onwards, the decrease in **electricity** output from **nuclear** plants is due to the closure of two reactors, one in late 2019, and another in late 2020.

In Sweden, **heat** produced in **heat pumps** is sold to third parties (as district heat) and is therefore included in transformation.

Heat production from **solid biofuels** in autoproducer CHP includes **waste heat** and **chemical heat**.

For 2012 and 2013, small quantities of bio-methanol used to produce **electricity** are included in **other liquid biofuels**, under production, as well as input and output of autoproducer CHP.

For 1997 and 1998, **heat production** from **liquid fuels** in main activity producer CHP plants includes **heat** recovered from flue-gas condensing.

Prior to 1992, data on **electricity production** from **biogases** are included with **solid biofuels**.

Heat produced for sale by autoproducer CHP plants is reported starting in 1992.

From 1987, the breakdown of *net electricity production by industry* for autoproducer **electricity** plants is available.

Prior to 1987, *net electricity production* by autoproducer plants includes data for CHP plants only.

Prior to 1980, **heat** produced in main activity producer heat plants is not available.

Prior to 1974, **heat** produced in main activity producer CHP plants is not available.

Consumption

Both for **heat** and **electricity**, the consumption of some industrial subsectors is confidential, and it is incorporated under the *not elsewhere specified - industry* sector. For **heat**, the confidential uses are in *non-ferrous metals* since 2020 and *non-metallic minerals* for 2023. In the 2026 edition, only energy own use for oil refineries has been set confidential in 2024. For **electricity**, in the 2025 edition the Swedish administration set as confidential consumption in *paper, pulp and*

printing and in *wood and wood products* for 2022; in the 2026 edition, *iron and steel* and *non-ferrous metals* have been set confidential for 2024.

Consumption of **electricity** in *not elsewhere specified (Energy)* refers to **electricity** used for operating **heat** plants other than boilers and **heat** pumps.

Prior to 2022, **electricity** *consumption* in *road* includes all energy consumption by hybrid vehicles. The Swedish Administration revised historic data in the 2025 edition.

Disaggregated data for industrial **heat** demand became available from 2020, due to a change of underlying data source. This led to an increase in reported demand compared with previous years. The Swedish Administration hopes to revise the historical time series in a future cycle.

Consumption of **electricity** for distribution of district heat is included with *other energy industry own use*.

In 2014, *consumption* of **electricity** in the *mining and quarrying* and the *paper, pulp and printing* sectors are confidential and were incorporated under the *not elsewhere specified - industry* sector.

Data on *direct use* of **solar thermal** are available from 1989.

Consumption of **heat** in *industry* and other sectors is available from 1984.

Capacity

In the 2021 edition, Sweden altered the methodology used to apportion capacity between single and multi-fired plant types, as a result some breaks in-series may occur for solid- and **gas**-fired plants.

In the 2017 edition, following improved access to generating companies' information on **hydroelectric** plants, Sweden's **pure pump hydroelectric** capacities were reclassified to mixed plant **hydroelectricity** from 1990 onwards.

The breakdown of generating capacity of main activity producer and autoproducer **electricity** plants by fuel is not available from 1990 to 2003 and from 2006 to 2013 and is confidential from 2014 onwards.

Peak load data for main activity producer plants includes data for autoproducer plants from 1992.

Generating capacity of main activity producer **electricity** plants includes autoproducer plants prior to 1984.

Prior to 1981, data on electrical capacity by type of generation are not available for main activity producer plants.

Switzerland

Sources

Swiss Federal Office of Energy (SFOE), Ittigen.

Carbura – Swiss Organisation for Stockpiling of Oil Products, Zurich.

General note

From 1999, data on consumption result from a new survey and are not comparable with data for previous years.

Supply

Heat production includes **heat** produced by **nuclear** power stations and distributed to other consumers.

Data for **electricity production** from **wind** are available from 1996.

Data for **solar electricity production** by autoproducers are available from 1990.

Transformation

In the 2026 edition, a major methodological revision was introduced from 2020 onwards, together with other data-driven revisions in the transformation sector from 2015 onwards, resulting in revisions to the time series.

In the 2023 edition, the Swiss Administration revised data back to 2013 to incorporate updated plant-level data.

For 2021, the decrease in **electricity** output from **nuclear** was mainly due to maintenance works at the Leibstadt power plant.

In the 2020 edition, some significant revisions were made to input of **industrial waste (non-renewable)** to autoproducer CHP plants, for 2013 to 2015, because one plant operator corrected its fuel input.

For 2019, gross **heat production** from **heat pumps** ceased, following a decline in 2018. Two such facilities existed in Switzerland, the larger of which closed in 2018, followed by the smaller in 2019.

For 2016 and 2017, **electricity** output from **nuclear** sources declined due to shutdowns at two of Switzerland's five nuclear power plants (Beznau 1 and Leibstadt). For 2018, output increased due to higher availability at these two plants.

Electricity used for pumped storage (pure hydro pumping plants) is included under *used for pumped storage* (mixed plants).

In 2016, two new pumped **hydropower** plants went into operation.

For 2015, the large decline in **electricity** and **heat production** from **industrial waste** is due to one large main activity CHP plant significantly reducing its activity. This plant eventually closed in 2016, further lowering **electricity** and **heat generation** for this fuel.

From 2012, the **municipal waste** autoproducer plant previously reported as **electricity** plant met the CHP requirements and was reclassified as such.

Biogas is no longer being used for **heat production** as of 2011.

The decrease in the use of **natural gas** in main activity CHP plants in 2007 is caused by the reduced operation of one plant after the start-up of a new **waste-incineration** plant and the closure of another plant. Use increases again in 2008 due to the re-starting of a district heating plant.

The autoproducer **heat** plant that produced **heat** for sale using **municipal waste** was closed in 2006.

The breakdown of **electricity** and **heat generation** from autoproducers by sector is only partially available from 1990-1999, and is not available from 2000-2018.

Prior to 1978, data for **heat** output from CHP plants are not available.

The allocation of **electricity production** in main activity producer **electricity-only** and CHP plants between 1967 and 1973, and in main activity producer CHP and autoproducer CHP plants in 1974 are Secretariat estimates.

All **hydro electricity production** is reported under large scale **hydro** (> 10 MW) due to the fact that production data are not being collected by different size capacity categories.

Consumption

In the 2024 edition, modelling of electromobility was revised leading to changes in the sectoral breakdown. Additionally, the sectoral breakdown within the industry sector has been revised according to the latest information from the corresponding survey.

In the 2023 edition, the Swiss Administration revised the breakdown of industrial consumption data back to 2000 to incorporate data from the latest surveys. In addition, **electricity consumption** by electric vehicles previous reported under the

industry, residential, and commercial and public services sectors was reallocated to *Road*.

Consumption in the *transport equipment* industry is included with *machinery*.

Geothermal direct use is overstated as it refers to **heat production** by **geothermal heat pumps**, which include inputs from **electricity** and/or **gas** in the transformation process.

The breakdown of *final consumption* of **electricity** in the *industry* sector from 2000 to 2001 was estimated by the Secretariat.

Data for *direct use* of **geothermal heat** and **solar thermal heat** are available from 1990.

Trade

Electricity trade to and from non-specified/others represents trade with Liechtenstein.

Capacity

For 1990 to 2005, the split of **hydro** and **pumped hydro** capacity between main activity producers and autoproducers is estimated based on the split of capacity at peak load.

Electricity generating capacity for **liquid fuels** in main activity producer plants includes all **combustible fuels** prior to 1990.

Republic of Türkiye

Sources

Ministry of Energy and Natural Resources (*Enerji ve Tabii Kaynaklar Bakanlığı*), Ankara.

Petrol İşleri Genel Müdürlüğü, Ankara.

General notes

In the 2018 edition, revisions were conducted by the Turkish administration back to 1990 impacting the transformation and industrial sector. The revisions in the transformation sector were the result of new data submitted by the Turkish Electricity Transmission Company (TECT).

In the middle of 2014, most autoproducer **electricity**, **heat** and CHP plants in Türkiye were reclassified as main activity producer due to a change in the legislation. Although the licences of these plants changed, the Administration decided to restore the affected plants' classification back to autoproducer in 2017 to harmonise with plant definitions in the IEA questionnaire.

Calorific values for fuels used for **electricity**, CHP and **heat** plants are obtained from data submitted to the Ministry of Energy and Natural Resources (MENR) by the Turkish Electricity Transmission Company, and these values may differ significantly from production and import values provided by MENR, causing imbalances for some years.

Supply

Other sources **heat** production represents recovered **waste heat** (steam) from *industry*, mainly from cement and glass manufacturing, while *other sources* **electricity** is the proportion of generation by plant obtained from this heat.

Electricity production from **wind** is available starting in 1998.

Transformation

In 2021, the decrease in **electricity generation** from autoproducer **hydro** plants was the result of a power plant being reclassified as a main activity producer.

In 2020, the decline in **electricity production** from **lignite** was due to temporary plant closures for environmental refits.

In 2017, the increase in **electricity production** from **solar photovoltaic** main activity producers is related to new plants coming online, mostly unlicensed.

In the 2006 edition, the Turkish Statistical Office started providing **electricity** and **heat** output on the basis of a new survey that revised time series back to 2000. This causes breaks in the time series between 1999 and 2000. Not all of the input time series have been revised.

A new **gas**-fired main activity producer CHP plant was put into operation in 1999 and a new autoproducer **electricity** plant fuelled with **coking coal** started in 2000.

Data for **blast furnace gas** for **electricity** and **heat generation** are available from 1995.

Data on **electricity** generated from **biofuels** are available from 1991.

In 1995, the Turkish administration reclassified autoproducer plants by type and source to be consistent with IEA definitions. This causes breaks between 1994 and 1995 for **electricity production**, most notably in plants fuelled by **biogases**.

Consumption

Prior to 2014, consumption data in the *machinery* sector includes transport equipment.

Comprehensive data on **electricity consumption** are available from 1973. This causes a break in the time series between 1972 and 1973.

In the 2024 edition, data for **solar thermal consumption** in the *industrial* sector were surveyed for the year 2022, deviating from the previous method of estimation up to 2021. This adjustment leads to break in series between 2021 and 2022. Additional inconsistencies are observed for 2023 and 2024. Time series revisions are expected in future publications.

Trade

Exports of **electricity** to Iraq are included under non-specified/others.

Trade of **electricity** with Albania and Romania are contractual rather than physical quantities.

Capacity

In 2021, the decrease in autoproducer **hydro** capacity is the result of one power plant being reclassified as a main activity producer.

Generating capacity reported in other type of generation corresponds to **gas** engines.

Net **electricity** generating capacity by type of generation for both main activity producers and autoproducers is not available prior to 1999.

United Kingdom

Source

Department for Energy Security and Net Zero, London.

General notes

All coal-fired power plants in the United Kingdom closed in 2024.

For the United Kingdom, it is necessary to combine figures for main activity producers and autoproducers in order to prevent the disclosure of information relating to less than three **electricity** generating companies, since this information is considered confidential. For this reason, data for main activity producer CHP plants have been included with autoproducer CHP plants from 1988. Prior to 1988, **electricity** output from CHP plants was included with autoproducer **electricity** plants.

The re-organisation and subsequent privatisation of the **electricity** supply industry in 1990 has resulted in some breaks in time series.

Supply

In the 2025 edition, revisions were made by the secretariat from years 2020 to 2022 to align with the DUKES publications regarding the **electricity** output of various main activity producers and autoproducers of renewables and wastes energy products.

Data for **off-grid solar photovoltaic** are currently not available in the United Kingdom but the addition of these data is expected in the future.

Large declines in **electricity generation** from **coal**-fired power since 2013 are due to concrete plans to phase out **coal** use for **electricity generation** entirely by 2025. Alternative generation has been supplied by increases from other sources, including **biomass**, **natural gas**, **nuclear**, **solar** and **wind generation**, and increases in *imports* through undersea HVDC interconnectors.

Electricity production data for **solar photovoltaic** are available from 1999.

The launch of a feed-in-tariff scheme in April 2010 resulted in a rapid increase of capacity and corresponding **electricity production** growth from **solar photovoltaic** in the following years.

In 1996, the break in **electricity production** from **nuclear** is due to a reclassification of plants from autoproducer to main activity producer plants.

Data on **electricity production** from **wind** are available from 1989.

Transformation

In the 2023 edition, data on production from CHP plants were revised. As a result, breaks in time series (in particular for coal gases) may occur between 2018 and 2019. In the 2024 edition, *gross* and *net electricity production* from **combustible fuels** in autoproducer **electricity** plants was revised back to 2018. Breaks in time series – also for the **electricity own use** – may occur.

In the 2022 edition, **electricity generation** from autoproducer **wind** plants was revised between 2018 and 2019. In 2019, a peak is visible because a large plant was recorded as an autoproducer and in 2020 it was classified as a main activity producer. The reason for this is that the plant was not covered by the survey of major power producers until 2020, therefore administrative data were used in 2019.

For 2021, the decrease in **electricity** output from **nuclear** was due to a high number of outages, and the commencement of defuelling at Dungeness B.

For 2019 onwards, the decline in output from **other bituminous coal** was due to plant closures (Fiddlers Ferry, Cottam, and Aberthaw).

For 2018-2020, the decrease in **electricity** output from **nuclear** was due to plant outages for maintenance.

Electricity used for pumped storage (mixed plants) is included under *used for pumped storage* (pure hydro pumping plants) for confidentiality reasons.

In 2007, outputs of **electricity** from **petroleum coke** are included in **fuel oil**.

Prior to 2003, all outputs of **electricity** and **heat** from **oil products** are reported in the other oil products category.

Heat production from autoproducers is available starting in 1999.

Inputs and output from **natural gas** for main activity producer **electricity production** are included in autoproducer **electricity** for 1990 (for reasons of confidentiality).

Consumption

In the 2026 edition, there are significant revisions to **electricity production** from **run-of-river hydro** and **solar PV**. In addition, efficiencies of **electricity production** from **industrial waste** are volatile, due to the small number of plants with varying levels of operation.

For the 2019 edition, a change in methodology was applied for **heat** consumption figures from 2015 onwards. Due to new information regarding the purchasing and reselling of **heat**, consumption previously included under the *commercial and public services* sector was reallocated to the *residential* sector.

For 2017, the decrease in **electricity** consumption in *mining and quarrying* is due to omission of one company from dataset.

Prior to 2010, consumption in *mining and quarrying* is included in the *non-metallic minerals* sector.

Electricity consumption in *coal mines* includes consumption in *patent fuel plants*.

Data for **electricity** consumption in *transport* was classified by sub-sector only starting from 2004 resulting in a break in time series between 2003 and 2004. Prior to 2004, *not elsewhere specified - transport* includes consumption for traction by urban rails and road vehicles, and consumption for non-traction by railways and bus stations and airports. From 2004 onwards, road vehicles consumption is included under *road* transport. Prior to 2004, **electricity** consumption in rail refers to industrial rail only. From 2004 onwards it includes both industrial and urban rail.

Consumption in the *machinery* sub-sector includes that of the *transport equipment* industry before 1996.

Starting in 1990, small amounts of **electricity** used in *heat pumps* have been included in *residential*.

From 1984 onwards, the **electricity** consumption in the *not elsewhere specified - industry* sector includes that of the *wood and wood products* sub-sector (except 2010-2014, when estimates were supplied by the UK) and unallocated consumption. The unallocated consumption comes from data reported as 'Other industries' by companies and includes Standard Industrial Classification (SIC) codes 7, 22, 31, 32, 33.19, 36, 38.3.

Electricity consumption in energy non-specified sub-sector is primarily made up of '**gas** and **electricity** supply' and includes Standard Industrial Classification (SIC) codes 24.46 and 35. However, prior to 1990, consumption in **gas** works includes **electricity** use in the transmission/distribution of public supply gas.

For autoproducers, due to data availability constraints, **heat** is assumed to be consumed within the same sector as it is generated.

Capacity

Breaks occur between 2016 and 2017 for combustible fuel-fired autoproducer plants.

Prior to 1981 for main activity producer plants and prior to 1983 for autoproducers, data on electrical capacity by type of generation are not available.

United States

Source

US Energy Information Administration, Washington D.C.

General notes

Starting with 2017 data, inputs to and outputs from **electricity** and **heat** generation include Puerto Rico.

End-use energy consumption data for the United States present a break in time series with historical data due to a change in methodology in 2014. The break in time series occurs between 2011 and 2012 for **oil**; and between 2001 and 2002 for **electricity** and **natural gas**. The new methodology is based on the last historical year of the most recent Annual Energy Outlook (AEO) publication. Changes occur primarily in reported end-use energy consumption in the *industrial* sector and its subsectors, including the non-manufacturing industries of *mining*, *construction* and *agriculture*. Historical revisions are pending. Due to other changes in reporting methodologies, there are numerous breaks in time series for the US data, particularly in 1992, 1999, 2001, 2002 and 2013. Care should be taken when evaluating consumption by sector since inputs of fuel to autoproducers are included in final consumption for some years. No data are available for most energy products in the *construction* and *mining and quarrying* industries.

Geothermal supply and inputs to transformation data are estimated by the IEA Secretariat starting in 2009 because of efficiency discrepancies.

Between 2001 and 2002, there are breaks in time series concerning the total production of **electricity** and **heat** in the United States. Comprehensive data on **electricity** and **heat production** and **consumption** in main activity producer **electricity**, CHP and **heat** plants and autoproducer **electricity** and CHP plants are not available for all years.

Supply

In the 2025 edition, **electricity production** from *batteries* has been reported for the first time. As a result, there is a break between 2022 and 2023 **electricity production** from *other sources*.

There is a break in series for **geothermal** and **solar thermal direct use** data between 2017 and 2018 as a new methodology for reporting these data was adopted with 2018 data.

The IEA Secretariat estimated US **solar photovoltaic electricity generation** from autoproducers starting in 1999 by multiplying the dispersed and distributed PV

capacity estimated by the US administration by an average capacity factor of 12%. The capacity factor was based on a report published in 2007 by the IEA Photovoltaic Power Systems Programme, Cost and Performance Trends in Grid-Connected Photovoltaic Systems and Case Studies. The corresponding consumption of electricity has been included under *not elsewhere specified - other*.

Data for **electricity** inputs to and outputs from **pumped storage hydro** plants became available starting in 1987.

Discrepancies occur between respective reported figures for **electricity** trade between the US and Mexico from 2013 onwards, and between the US and Canada from 2016 onwards. This is in part due to a change in data source for US **electricity** trade figures, which creates a break in series between 2015 and 2016.

Transformation

Electricity inputs to both mixed **hydro** and pure pumped storage plants are reported under inputs to pure pumped storage.

Offshore wind production began in 2016.

Beginning with 2016 data, the calculation for **heat production** in CHP plants has changed, resulting in breaks in time series. The United States administration is currently unable to apply this methodology to historic years, so will only cover **heat** data for 2016 onwards. As a result of this methodology change, several **combustible fuel** power plants have their overall efficiency values increased, recording increased **heat production**. The previous methodology existed for the years 2006 to 2015, so further breaks exist between 2005 and 2006.

In 2016, **electricity** and **heat generation** from some types of **coal**, for some plant types were estimated by the IEA Secretariat, based on an initial submission from the US Administration and subsequent reclassification of portions of this **coal** between **coal** types.

Accurate accounting of **coke oven gas** and **refinery gas** inputs is not always possible, which can lead to efficiencies of over 100% in main activity producer CHP plants.

Other sources electricity production represents purchased **steam** and **waste heat** from *industries*.

The low efficiencies from 2011 for **other bituminous coal** autoproducer **electricity** plants are due to the fact that one unit; the Albany Brewery Power Plant only produces unsold **heat**, and is reported in the wrong category of plant.

From 2007 to 2009, **heat** from **industrial waste** includes recovered **heat** from industrial processes. From 2010, the **electricity** produced from recovered **heat** is reported under *other sources*.

The decline in **patent fuel** used for **electricity production** in 2008 and subsequent cessation in 2009 is a result of the termination of the “synthetic fuel from **coal**” tax credit in 2008, which had been in the order of USD 20 to USD 25 per tonne, and while intended to deal with coal liquefaction and similar technologies, it had spawned an industry of cosmetic upgrading as a tax minimisation vehicle.

From 2004 to 2013, the EIA reported **electricity** and **heat production** from **anthracite** under **other bituminous coal**. The Secretariat estimated the split of generation output by fuel type based on the assumption that the plant efficiencies of the aggregate are equal to that of each part.

Starting in 2002, autoproducer **electricity** output for **oil** includes generation from **refinery gases** with a low average calorific value. Prior to 2002, this output was not accounted for.

Prior to 2001, some data on plants consuming **sub-bituminous coal** and **lignite** have been estimated by the Secretariat using information provided in the EIA’s Annual Electricity Generator Report – Utility.

Data for **peat** are confidential between 1994 and 1998 and from 2000 are not reported.

Prior to 2000, autoproducers include small and independent power producers which under IEA definitions are considered as main activity producers. Production from these small and independent power producers accounts for about 25% of reported production of **electricity** by autoproducers in the United States. This reclassification causes breaks between 1999 and 2000.

In the 2003 edition, the United States administration reclassified some plants to autoproducers. This reclassification causes more breaks between 1998 and 1999.

Data for **heat** produced in main activity producer heat plants are available from 1992 to 1999, and for autoproducer CHP plants for 1989 to 1999.

From 1999 onwards, the fuel used in **heat production** by autoproducers is included in final consumption because the US administration cannot distinguish between the **heat** used directly on-site and the **heat** sold. Therefore, this may underestimate the **heat** sold to third parties.

Prior to 1999, **solar thermal electricity production** includes generation from **natural gas** because some **natural gas** units are attached to **solar thermal** plants and their production could not be separated.

Prior to 1991, some of the fuel inputs to **electricity** and **heat production** reported for autoproducer plants are reported as final consumption in the particular economic sector in which the autoproducer is operating.

Since 1989 for **natural gas**, consumption by autoproducer CHP plants is available, while consumption by autoproducer **electricity** and main activity producer CHP plants is available since 1991. Prior to these years, these consumptions are included with *industry* and *commerce and public services*.

Prior to 1989, there are no generation data available from autoproducers.

Sub-bituminous coal inputs for **electricity** and **heat production** are included in **hard coal** before 1983.

Consumption

In the 2026 edition, **solar thermal residential** and *commercial and public services* were estimated by the IEA secretariat, for years 2024 and 2025, based on EIA consumption reports.

Consumption breakdown data for **electricity** are modelled based on data obtained from the Annual Energy Outlook and conversion factors. These data are based on fiscal values rather than physical tonnage, so if commodity prices increase or decrease between AEO versions and the conversion factors are not updated, derived changes in consumption may appear that are not supported by physical changes in production, or actual changes in consumption. For example, in 2016, production of steel in electric arc furnaces increased by 6%, however consumption of electricity in the *iron and steel* sector was reported as declining by 17%. In addition, as the AEO models are revised annually, but the historical data are not necessarily revised, regular breaks in-series can occur.

For the 2019 edition, the breakdown of final **electricity** consumption for 2017 was based on the results of the Annual Energy Outlook (AEO) of 2018. The model used in the 2018 edition of the Outlook was updated to incorporate the results of the 2014 Manufacturing Energy Consumption Survey (MECS). The MECS values were last updated in 2010, and in the intervening period, several industries had changed significantly. For industry sub-sectors where disaggregated AEO2018 values are unavailable e.g. *non-ferrous metals*, *textiles*, and *non-metallic minerals*, consumption was extrapolated from the MECS 2014 values at the same rate as shipments in that industry. Breaks in time series occur across several sectors between 2016 and 2017.

Similarly, the breakdown of final **electricity consumption** for 2015 was based on the results of the Annual Energy Outlook (AEO) of 2016. Breaks in time series appear in the *mining* and *agricultural electricity consumption* sectors as a result of introduction of individual industry benchmarking for 2015 results. Changes in

iron and steel, and *paper, pulp and printing* data from 2014 to 2015 are the result of fundamental revisions of the *iron and steel* and *paper, pulp and printing* models between AEO2014 and AEO2016 as well as the use of individual industry benchmarking for AEO2016. These changes are a few notable examples of series changes, and any series can change between AEO releases because of data updates and methodology changes.

Electricity consumption in *road* includes all estimated consumption by electric vehicles (both 100% and plug-in hybrids).

Prior to 1991, total *consumption* of **heat** sold referred to consumption in *commercial and public services*.

No data are available for **heat** sold that is consumed in the *residential* and *agriculture/forestry* sectors for any years.

Data for direct use of **solar thermal heat** in *residential* are available from 1999.

Since 1995, **heat consumption** data by sector are no longer collected, and have been estimated by the Secretariat, resulting in breaks in time series between 1994 and 1995, and 1999 and 2000.

Data for *consumption* of **heat** sold in industry are available from 1991 and in *energy industry own use* from 1992.

Capacity

Capacity is net summer capacity.

In the 2015 edition, revised data for **hydroelectricity**, **pumped hydro** and mixed plants capacity have been submitted back to 1995 data. This can cause breaks in the time series between 1994 and 1995.

Data on electrical capacity for autoproducers are available from 1989.

The breakdown of capacity by fuel type for 1989 is a Secretariat estimate.

Capacity by type of generation is not reported prior to 1981.

Units and conversions

Conversions (to toe)

All units in this publication are metric units. Most IEA publications showing inter-fuel relations and projections present such information in a common energy unit, the tonne of oil equivalent (toe). A tonne of oil equivalent is defined as 10^7 kcal (41.868 GJ), a convenient measure because it is approximately the net heat content of one tonne of average crude oil. This unit is used by the IEA in its energy balances. Note also that totals may not be the sum of their components due to independent rounding.

The change from using the original unit to tonne of oil equivalent implies choosing coefficients of equivalence between different forms and sources of energy. This problem can be approached in many different ways. For example, one could adopt a single equivalence for each major primary energy source in all countries, e.g. 29 307 kJ/kg (7 000 kcal/kg) for hard coal, 41 868 kJ/kg (10 000 kcal/kg) for oil.

The main objection to this method is that it results in distortions since there is a wide spread in calorific values between types of coal and individual coal products, and between calorific values of these fuels in different countries.

The Secretariat has therefore adopted specific calorific factors supplied by the national administrations for the main categories of each quality of coal and for each flow or use (i.e. production, imports, exports, electricity generation, coke ovens, blast furnaces and industry). For crude oil, specific factors have been used based on consultations with experts from the national administrations, while for petroleum products regional conversion factors have been used.

The balances are expressed in terms of “net” calorific value. The difference between the “net” and the “gross” calorific value for each fuel is the latent heat of vaporisation of the water produced during combustion of the fuel. For coal and oil, net calorific value is usually around 5% less than gross, for most forms of natural and manufactured gas the difference is 9-10%, while for electricity there is no difference as the concept has no meaning in this case. The use of the net calorific value is consistent with the practice of the Statistical Offices of the European Communities and the United Nations.

Electricity data are converted from original units of gigawatt hours to million tonnes of oil equivalent using the relationship:

$$1 \text{ TWh} = 0.086 \text{ Mtoe.}$$

Complete listings of net calorific values to convert energy sources from basic units to tonne of oil equivalent are reported in section IV and can be found at the end of this Chapter.

Electricity

All electricity data are reported to the IEA in GWh (for generation) or MW (for capacity).

Figures for electricity production, trade, and final consumption are calculated using the energy content of the electricity (i.e. at a rate of 1 TWh = 86 ktoe).

Hydro-electricity production (excluding pumped storage) and electricity produced by other non-thermal means (wind, tidal/wave/ocean, solar PV, etc.) are accounted for similarly using 1 TWh = 86 ktoe.

The primary energy equivalent of nuclear electricity is calculated from the gross generation by assuming a 33% conversion efficiency, i.e. 1 TWh = $(86 \div 0.33)$ ktoe.

For geothermal and solar thermal, if no country-specific information is reported, the primary energy equivalent is calculated as follows:

10% for geothermal electricity

1 TWh = $(86 \div 0.1)$ ktoe

33% for solar thermal electricity

1 TWh = $(86 \div 0.33)$ ktoe

Heat

Information on heat is supplied in terajoules and 1 terajoule = 0.02388 ktoe.

For geothermal and solar, if no country-specific information is reported, the primary energy equivalent is calculated as follows:

$$\begin{array}{l} 50\% \text{ for geothermal heat} \\ 1 \text{ TJ} = (0.02388 \div 0.5) \text{ ktoe.} \end{array}$$

$$100\% \text{ for solar}$$

For direct use of geothermal and solar heat, all the heat consumed is accounted for production and consumption.

Natural gas

In this publication, natural gas excludes natural gas liquids. For the net heat content of a natural gas, its gross heat content is multiplied by 0.9.

Oil

The IEA applies regional conversion factors (in conjunction with Eurostat for the European countries) for the petroleum products:

Regional net calorific values for petroleum products

Petroleum products	Europe	Americas	Asia Oceania
	kJ/kg	kJ/kg	kJ/kg
Refinery gas	49 500	48 100	48 100
Ethane	49 500	49 400	49 400
Liquefied petroleum gases	46 000	47 300	47 700
Motor gasoline	44 000	44 800	44 600
Aviation gasoline	44 000	44 800	44 600
Gasoline type jet fuel	43 000	44 800	44 600
Kerosene type jet fuel	43 000	44 600	44 500
Kerosene	43 000	43 800	42 900
Gas/diesel oil		42 600	
Residual fuel oil	40 000	40 200	42 600
Naphtha	44 000	45 000	43 200
White spirit	43 600	43 000	43 000
Lubricants	42 000	42 000	42 900
Bitumen	39 000	40 000	38 800
Paraffin waxes		40 000	
Petroleum coke	32 000	32 000	33 800
Non-specified petroleum products		40 000	

General conversion factors for energy

To	TJ	Gcal	Mtoe	MBtu	GWh
From:	multiply by:				
terajoule (TJ)	1	2.388x10 ²	2.388x10 ⁻⁵	9.478x10 ²	2.778x10 ⁻¹
gigacalorie (Gcal)	4.187x10 ⁻³	1	1.000x10 ⁻⁷	3.968	1.163x10 ⁻³
million tonnes of oil equivalent (Mtoe)	4.187x10 ⁴	1.000x10 ⁷	1	3.968x10 ⁷	1.163x10 ⁴
million British thermal units (MBtu)	1.055x10 ⁻³	2.520x10 ⁻¹	2.520x10 ⁻⁸	1	2.931x10 ⁻⁴
gigawatt hour (GWh)	3.600	8.598x10 ²	8.598x10 ⁻⁵	3.412x10 ³	1

Conversion factors for mass

To	kg	t	lt	st	lb
From:	multiply by:				
kilogramme (kg)	1	1.000x10 ⁻³	9.842x10 ⁻⁴	1.102x10 ⁻³	2.205
tonne (t)	1.000x10 ³	1	9.842x10 ⁻¹	1.102	2.205x10 ³
long ton (lt)	1.016x10 ³	1.016	1	1.120	2.240x10 ³
short ton (st)	9.072x10 ²	9.072x10 ⁻¹	8.929x10 ⁻¹	1	2.000x10 ³
pound (lb)	4.536x10 ⁻¹	4.536x10 ⁻⁴	4.464x10 ⁻⁴	5.000x10 ⁻⁴	1

Conversion factors for volume

To	gal U.S.	gal U.K.	bbl	ft ³	l	m ³
From:	multiply by:					
U.S. gallon (gal U.S.)	1	8.327x10 ⁻¹	2.381x10 ⁻²	1.337x10 ⁻¹	3.785	3.785x10 ⁻³
U.K. gallon (gal U.K.)	1.201	1	2.859x10 ⁻²	1.605x10 ⁻¹	4.546	4.546x10 ⁻³
barrel (bbl)	4.200x10 ¹	3.497x10 ¹	1	5.615	1.590x10 ²	1.590x10 ⁻¹
cubic foot (ft ³)	7.481	6.229	1.781x10 ⁻¹	1	2.832x10 ¹	2.832x10 ⁻²
litre (l)	2.642x10 ⁻¹	2.200x10 ⁻¹	6.290x10 ⁻³	3.531x10 ⁻²	1	1.000x10 ⁻³
cubic metre (m ³)	2.642x10 ²	2.200x10 ²	6.290	3.531x10 ¹	1.000x10 ³	1

Decimal prefixes

10 ¹	deca (da)	10 ⁻¹	deci (d)
10 ²	hecto (h)	10 ⁻²	centi (c)
10 ³	kilo (k)	10 ⁻³	milli (m)
10 ⁶	mega (M)	10 ⁻⁶	micro (μ)
10 ⁹	giga (G)	10 ⁻⁹	nano (n)
10 ¹²	tera (T)	10 ⁻¹²	pico (p)
10 ¹⁵	peta (P)	10 ⁻¹⁵	femto (f)
10 ¹⁸	exa (E)	10 ⁻¹⁸	atto (a)

Qualifiers

Starting from the 2025 edition, the IEA applies the following qualifiers to label records available through the .Stat Data Explorer. These qualifiers indicate the status and nature of the data.

Code	Name	Description
A	Normal Value	Real observed value.
I	Imputed Value	A data point refers to any calculation produced by the IEA Secretariat, including aggregations (across energy products, energy flows, geographical areas or any other dimension), conversions using non-universal factors (such as the computation of energy values based on calorific values), as well as estimates.
O	Missing Value	Data point is missing.
M	Missing Value; Data cannot exist	Data point is not applicable.
P	Provisional Value	Data point is preliminary and likely to be revised.
C	Confidential Value	Data point is confidential (displayed in the CONF_STATUS column of the CSV file).
D	Definition Differs	Definition of measurement differs from the dataset definition and therefore is not comparable to other measures.
N	Not Qualified	Qualification is not available.

For non-OECD countries that do not submit annual questionnaires to the IEA Secretariat, more detailed qualification information is available starting from 2019 onwards. Information related to countries submitting annual questionnaires are available in the country notes.

Abbreviations

GJ	:	gigajoule (10^9 joules)
GW	:	gigawatt
GWh	:	gigawatt hour = 3.6 Terajoules
kW	:	kilowatt
kWh	:	kilowatt hour
MW _e	:	megawatt (electric)
MWh	:	megawatt hour
MW _{th}	:	megawatt (thermal)
m ²	:	square meter
t	:	metric ton = tonne
TJ	:	terajoule (10^{12} joules)
toe	:	tonne of oil equivalent = 41.868 GJ = 10^7 kcal
TWh	:	terawatt hour
GDP	:	gross domestic product
RES	:	renewable energy sources
TES	:	total energy supply

International Energy Agency (IEA).

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