

## List of abbreviations and units

<b>CCS</b>	Carbon Capture and Storage
<b>CHP</b>	Combined heat and power
<b>CSP</b>	Concentrated solar power
<b>DSO</b>	Distribution system operator
<b>EU28</b>	The 28 Member States of the European Union in 2019, including the United Kingdom of Great Britain and Northern Ireland.
<b>EU ETS</b>	European Emission Trading System
<b>GDP</b>	Gross domestic product
<b>Gt</b>	Gigatonnes; unit to measure mass, equalling 1,000,000,000 tonnes, 1 tonne = 1,000 kilograms
<b>GW</b>	Gigawatt; unit to measure the installed capacity of electricity or heat generators; 1,000 kW equals 1 Megawatt (MW); 1,000 MW equals 1 gigawatt (GW).
<b>kWh</b>	Kilowatt-hour; unit to measure energy; 1,000 kWh equals 1 Megawatt-hour (MWh); 1 billion kWh equals 1 terawatt-hour (TWh).
<b>kW</b>	Kilowatt; unit to measure the installed capacity of electricity or heat generators; 1,000 kW equals 1 Megawatt (MW); 1,000 MW equals 1 gigawatt (GW).
<b>LCOE</b>	Levelised cost of energy
<b>MW</b>	Megawatt; unit to measure the installed capacity of electricity or heat generators. 1 MW = 1,000 kilowatt.
<b>MWh</b>	Megawatt-hour; unit to measure energy; 1,000 kWh equals 1 Megawatt-hour (MWh); 1 billion kWh equals 1 terawatt-hour (TWh).
<b>Mtoe</b>	Million tonnes of oil equivalent; unit to measure energy; 1 Mtoe equals 11,630 kWh.
<b>Mt</b>	Megatonnes; unit to measure mass, equalling 1,000,000 tonnes, 1 tonne = 1,000 kilograms.
<b>PV</b>	Photovoltaic
<b>TSO</b>	Transmission system operator
<b>TWh</b>	Terawatt-hour; unit to measure energy; 1,000 kWh equals 1 Megawatt-hour (MWh); 1 billion kWh equals 1 terawatt-hour (TWh).

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## Glossary

### Ambient energy

Heat source of the ambient environment (aerothermal or shallow geothermal energy) that is captured by heat pumps to increase its temperature level for the purpose of supplying space heat, hot water or process heat.

### Agriculture sector

The agriculture sector covers all energy demand of farms including farming machinery, pumping devices and electricity.

### Biogas

Biogas is produced when biomass, which is cut off from light and oxygen in a digester of a biogas plant, is broken down by certain bacteria. Raw biogas consists of methane, carbon dioxide and oxygen, nitrogen and trace gases (including hydrogen sulphide). The main component, methane, can be used as a source of energy. Biogas can be produced from energy crops (e.g. maize, grain) as well as from residual materials such as organic waste, crop residues and straw, and from animal excrements such as slurry and manure. The biogas produced in a biogas plant can be turned into electricity and heat in a cogeneration unit.

### Biomethane

Upgraded biogas that has been treated and purified to be physically identical with fossil gas and synthetic methane (CH<sub>4</sub>). In contrast to raw biogas, it can also be fed directly into the existing fossil gas network and blended with fossil gas.

### Carbon Capture and Storage (CCS)

Carbon Capture and Storage, a technology that strives to remove carbon dioxide emissions before or after combustion of fossil fuels to store them in the underground.

### Coal

The term in this document covers the primary energy carriers of hard coal and lignite as well as oil shale in Estonia.

### Combined heat and power (CHP)

See: Cogeneration

### Cogeneration

Cogeneration is the combined production of electricity and heat. Power generation through burning of fossil or renewable fuels in thermal power plants always releases heat. While stand-alone thermal power plants dissipate the waste heat of the power generation process through a cooling tower, combined heat and power (CHP) units feed the heat into a dwelling's central heating, into a district heating network or provide it as process heat in the industry. By using a part of the primary energy input in a heat sink, the combustion efficiency of the whole process increases compared to the single use of a fuel for electricity production only.

### Concentrated solar power (CSP)

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Solar thermal energy is concentrated with mirrors or lenses to reach higher temperatures for driving turbines for electricity production.

### **Delivered energy**

Unlike the use of a primary energy carrier for direct heating, e.g. burning solid biomass in a wood stove, delivered energy is distributed to end consumers through a district heat network or through other infrastructure. Solid biomass that is burnt in cogeneration can supply electricity and in parallel heat as delivered energy to a district heat network or to another final customer.

### **Distribution system operator (DSO)**

Distribution system operators (DSOs) are responsible for transporting and delivering electricity or gas to final customers through the networks on the local level. While the transmission system can be compared with a motorway for electricity or gas, the distribution system more resembles to the ramifications of rural roads or residential streets.

### **District heat network**

Infrastructure of insulated pipes that transports thermal energy to end consumers. The energy is used for heating buildings or industry processes and mostly comes from heating or cogeneration plants.

### **European Emission Trading System (EU ETS)**

Cap-and-trade system that puts a limit on the emissions of several thousands of manufacturing plants and fossil fuel-fired power plants in the EU. The limit is reduced annually. Emitters need a sufficient number emission allowances equalling their annual emissions. Emission allowances can be traded amongst emitters at varying prices.

### **Final energy demand**

Final energy is all energy that is delivered to the door of an end consumer, e.g. electricity used in a building, fossil gas that is sent to a household's kettle or delivered energy through a district heat network. Losses from transmission and distribution as well as from conversion of primary energy carriers are deducted.

### **Fossil gas**

Methane of fossil origin, used for producing heat or electricity or driving an internal combustion engine of a vehicle, also called natural gas, including refinery gas and liquefied petroleum gas.

### **Fossil oil products**

All liquid fossil oil products such as heating oil, residual fuel oil, diesel oil and kerosene.

### **Geothermal energy**

Renewable thermal energy from below the earth's surface that is used in geothermal power plants, in heating stations or heat pumps.

### **Gross final energy consumption**

Includes final energy demand, transmission and distribution grid losses from gross final energy output to end consumers.

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**Heat pump**

Heating system that captures geothermal energy or the heat source of the ambient environment to raise their temperature level to a higher level. To do so, it makes use of the effect that gases heat up under pressure, e.g. as in the case of a bicycle pump.

**Individual heating**

Heating system used by single end consumers on premises, e.g. a heat pump, kettle, boiler or stove, in contrast to a district heat network that supplies delivered energy from a distant heat source through a dedicated infrastructure to end consumers at another place.

**Industrial excess heat**

Heat from industrial production processes that is not needed for the production process but distributed to other end consumers as waste heat to cover their heat demand.

**Industry sector**

The industry sector comprises the energy demand of thirteen industries (steel, chemicals, cement, ceramics, glass, non-ferrous metals, pulp, paper and printing, food and beverages, transport equipment, machinery equipment, textiles and leather, wood and wood products and other industries).

**Levelised cost of energy (LCOE)**

LCOE is defined as the revenue required (from whatever source) to earn a rate of return on investment equal to the discount rate (also referred to as weighted average cost of capital, WACC) over the life of the wind farm. Tax and inflation are not modelled.

**Liquid biofuels**

Fuel produced from biomass that can be used to power internal combustion engines (e.g. in vehicles or cogeneration units) or in heating systems. So-called first generation liquid biofuels include biodiesel and bioethanol. Biofuels produced from organic waste and residues as well as synthetic biofuels often are referred to as so-called second generation biofuels.

**Liquid synthetic fuels**

Comprises fuels identical to fossil diesel or kerosene derived from renewable hydrogen.

**Non-fossil gases**

Gaseous energy carriers that are either produced with renewable electricity through electrolysis (renewable hydrogen, renewable ammonia, synthetic methane) or produced with sustainably sourced biomass such as organic waste, residues and manure (biogas, biomethane).

**Primary energy supply**

In contrast to the final energy arriving at the door step of the end consumer, losses from later conversion into other energy carriers such as heat or electricity are not yet deducted, neither losses of transmission and distribution, e.g. through a district heat network or a gas pipeline.

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**PRIMES**

EU energy system model simulating energy consumption and supply.

**Renewable ammonia**

Gaseous or liquid carrier of converted renewable hydrogen.

**Renewable hydrogen**

Chemical element that is produced by splitting water into its component parts, oxygen and hydrogen (H<sub>2</sub>), in an electrolyser that uses renewable electricity. It is the base for producing renewable ammonia, synthetic methane and liquid synthetic fuels.

**Residential sector**

Comprises the energy demand of private households, including space heating and cooling, hot water and electricity.

**Self-consumption**

Self-consumption is the activity of using a certain share of power and/or heat generation from self-generation on the premises of a consumer directly to cover the consumer's energy demand. Self-consumption is a central, but not the unique activity within the concept of self-generation. Self-generators normally also feed excess electricity into the public grid.

**Solar thermal energy**

Solar energy's heat is absorbed by solar thermal collectors, in which water or another heat carrier is heated and used for heating rooms or to supply hot water. Concentrated solar power (CSP) also uses solar thermal energy for electricity generation.

**Solid biomass**

Wood that is used as a primary energy source such as residual wood from forestry or landscape maintenance, industrial wood residues, e.g. by-products of sawmills or waste wood. Typical solid biomass energy carriers are wood logs, wood pellets and wood chips.

**Synthetic methane**

Gaseous energy carrier that is produced on the base of renewable hydrogen transformed into methane by adding carbon dioxide using the Sabatier process. Physically, it is identical with fossil gas and biomethane (CH<sub>4</sub>).

**Tertiary sector**

Comprises the energy demand in public and private buildings, i.e. offices, wholesale and trade, hotels, gastronomy, education, health care and other building facilities for services. It includes space heating and cooling, hot water and electricity demand, as well as public lighting.

**Transmission system operator (TSO)**

A company running the high-voltage electricity transmission grid or the fossil gas transmission grid. In contrast to the distribution system operators (DSO), they are responsible for the stability of the interregional and cross-border “motorways” of energy.

**Transport sector**

Comprises the energy demand of motorised passengers (motorbikes, passenger cars, vans, buses, trains, freight covered by trucks and trains, shipping and aviation).

**Waste**

Solid primary energy source that is either used for direct heating in industry or as municipal solid waste in waste incinerators that produce electricity and heat in cogeneration. Per definition, 43% of municipal solid waste statistically is classified as renewable energy source, taking into account its biomass share.

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