



InterEnerStat

Harmonisation of Definitions
of Energy Products and Flows

Flows: Transformation



Transformation sector

The transformation sector contains those production activities in which primary or secondary fuels are transformed into fuel products which are better suited to their uses than the fuel from which they are made, or in which fuels are combusted to produce heat for electricity generation or for sale. The transformation sector also includes blending and separation activities in fuel treatment plants.

A few activities are included in the transformation sector, notably within the iron and steel industry, where the transformation into a fuel for combustion is not the principal purpose of the process. They are, however, included in the transformation sector because the by-products of the process are used for combustion and the energy balance would be incomplete without them.

The flow quantities used for each of the sub headings within the transformation sector are the amounts of fuels transformed. If any input fuel is used for combustion to support the transformation activity (but not for transformation itself) this should be considered 'Energy Sector' use (*see below*).



Electricity, CHP and Heat plants

Electricity plants

Electricity plants produce electricity only and generate it from steam heated by the combustion of fuels or nuclear fission, or from gas turbine units. If one or more of the generating units in the plant is a CHP unit then the whole plant is designated a CHP plant (*see below*).

Combined heat and power plants

Combined heat and power plants produce both heat and electricity from the fuel input. They are sometimes referred to as 'co-generation' power stations. If possible, fuel inputs and electricity/heat outputs are on a generating unit basis rather than on a plant basis as this permits greater accuracy when reporting the fuel used for electricity and heat separately.

Heat plants

Heat plants refers to plants (including heat pumps and electric boilers) designed to produce heat only and which sell heat to a third party (e.g. residential, commercial or industrial consumers) under the provisions of a contract. Heat generated within an industrial establishment entirely for its own use is not a transformation sector activity.



Blast furnaces/Gas works

Blast furnaces are for the production of pig iron from iron ore. Carbon is added (largely in the form of coke) to support and reduce the iron oxide and provide heat.

In order to reduce the demand for coke, pulverised coal and other carbon-rich materials (used lubricants, plastics) may be injected into the blast furnace.

Almost all of the carbon in the blast furnace is partly or completely oxidised and leaves it in the form of large quantities of blast furnace gas (BFG). This gas, by virtue of its partly oxidised carbon, is burned to heat the air blown into the furnace or used as a fuel elsewhere on site, or sold to third parties.

Some carbon is retained in the iron produced. Where this iron is converted to steel on site in a basic oxygen steel furnace (BOSF) most of the carbon in the iron is partly or completely oxidised and collected as BOSF gas. In large, integrated iron and steel plants the gas collection system combines BOSF gas and BFG for dust removal and for use in the plant.

Gas Works produce town gas/gas works gas for distribution to consumers. The plants may do this by carbonisation of coal or gasification of oil products and reforming of petroleum or natural gases.



Coke/Patent fuel/BKB-PB plants

Coke Ovens carbonise coal, principally coking coal, at high temperature. The transformation process produces coke and by-products such as coke oven gas and coal tars and oils.

Patent Fuel Plants manufacture a composition fuel made of hard coal fines with the addition of a binding agent.

BKB (Brown Coal Briquettes) Plants manufacture a composition fuel made of lignite/brown coal (including dried lignite fines and dust) produced by briquetting under high pressure without the addition of a binding agent. This includes Peat Briquettes (PB) Plants which produce a similar composition fuel using peat.



Petroleum refineries

Petroleum refineries and petrochemical plants are the two main branches of fluid hydrocarbon processing. The activities are often situated close to each other as the petrochemical plant obtains the majority of its hydrocarbon feedstock from the refinery and may return to the refinery by-products from its processing which it does not need.

Petroleum refineries are industrial plants which convert (transform) the feedstock of crude oil and other hydrocarbons into finished petroleum products. They may also produce basic organic chemicals as by-products of their refining activities which are incorporated in finished petroleum products or sold as chemicals.



Petrochemical plants

Petrochemical plants are a branch of the chemicals industry and convert hydrocarbon feedstock in organic chemicals, intermediate compounds and finished products such as plastics, fibres, solvents and surfactants etc.

Feedstock used by the plant is usually obtained from the refinery and includes naphtha, ethane, propane and middle distillate oils (for example, gas oil). The carbon and hydrogen in the feedstock is largely transferred to the basic chemicals and products subsequently made from them. However, certain by-products are also created and returned to the refinery (such as pyrolysis gasoline) or burned for fuel to provide the heat and electricity required for the cracking and other processes in the petrochemical plant.



Liquefaction plants

Liquefaction plants cover diverse liquefaction processes, such as coal liquefaction plants and gas-to-liquid plants.

Coal Liquefaction plants are facilities where coal is used to produce liquid fuels suitable for transportation applications by the removal of carbon or addition of hydrogen, either directly or indirectly.

Note that the gas-to-liquid plants convert natural gas to products and are not LNG plants which convert gaseous natural gas into liquid natural gas.



Natural gas blending plants

Plants where the calorific value of natural gas for distribution is adjusted through blending with gases from oil and/or coal. Report quantities of coal and coal products blended with natural gas and the natural gas treated.



Gas treatment/separation plants

In treatment plants, natural or associated gas is processed for the primary purpose of recovering compound liquid hydrocarbons such as gasoline and naphthas, pure hydrocarbons such as butane, propane, ethane or a combination thereof, through a process of physical separation of gas components.



Biomass conversion plants

Plants where vegetal material is converted to fuels in a form better suited to their uses. The processes include carbonisation (charcoal), distillation (ethanol), anaerobic digesters (methane rich gas) or more complex processes such as transesterification (diester).



Other

Transformation, treatment or blending processes not specified above.



Energy sector

Consumption by the energy sector is the amount of fuel or energy used to support their extraction, production, manufacturing or transformation processes. It is *not* the amount of fuel transformed into other fuel or energy forms. Fuels or energy used to operate pipelines (oil, gas or coal slurries) should be reported as part of the transport sector.



Distribution losses

Distribution losses includes losses during gas distribution, electricity transmission, coal and pipeline transport. Losses may also include theft by consumers.