Environment and energy

Current definitions

Acidification
The main atmospheric emissions which contribute to the formation of acid rain are of nitrogen oxides (NO_x), sulphur oxides (SO_x) and ammonia (NH_3). In order to aggregate the emissions of the various pollutants which contribute to the phenomenon of "acidification" the different potential of each must be taken into consideration (Potential acid equivalent – PAE), thereby creating a common unit of measurement. Measurement in "PAE" tonnes is obtained by taking account of the quantity of hydrogen ions which would be formed for each gas if its deposition was complete. The following coefficients are used: 1/46 for NO_x; 1/32 for SO_x; 1/17 for NH_3.

Air temperature
The existing atmospheric temperature level at a site and at a given time represents the air energy level, i.e. the average kinetic energy associated to air molecules for the effect of heating by solar radiation.

Apparent consumption of material resources -Total
Also known as "Direct material consumption", this aggregate represents that part of the total use of material resources (or Direct material input) necessary to meet domestic end demand. In fact, this covers all uses of materials extracted from the Italian territory or from abroad, while materials incorporated in the goods exported or purchased by non-residents in the country are excluded. The final result is expressed in terms of weight, without counting the air and water used. The figure is different from that resulting from the difference between *Total use of material resources* and *Financial flows abroad.*

Atmospheric pollutants *(see also Heavy Metals)*

- CO_2 – *Carbon dioxide.* Human activities which cause most of the release of carbon dioxide are those involving the combustion of fossil fuels. Carbon dioxide is one of the main "greenhouse gases".
- CH_4 – *Methane.* The main sources of methane emission are the decomposition of organic waste in landfill sites, the combustion of agricultural waste, the extraction and transport of fossil fuels, the process of digestion of animals and fertilisation using organic compounds. Methane emissions contribute to the formation of "greenhouse gases" and tropospheric ozone.
- N_2O – *Nitrous oxide.* Nitrous oxide is essentially produced from the use of nitrates in fertiliser, by some processes typically used in organic and inorganic chemical industry and by some combustion processes. Nitrous oxide contributes to the formation of "greenhouse gases".
- NO_x – *Nitrogen oxides.* Nitrogen oxides (nitric oxide NO and nitrogen dioxide NO_2) are produced mainly during the course of high temperature combustion processes and contribute to the formation of acid rain and the formation of tropospheric ozone.
- SO_x – *Sulphur oxides.* Sulphur dioxide, the main cause of acid rain, derives from the oxidation of sulphur during the combustion of substances containing this element. The main sources are transport, the production of electricity and heat and, to a lesser degree, industrial activities.
- NH_3 – *Ammonia.* Ammonia is a compound of nitrogen and is mainly derived from the degradation of organic substances. It can cause (when spread over the soil or transformed by certain types of bacteria) to soil acidification and, by consequence, groundwater.
- *COVNM (NMVOC) – Non-methane volatile organic compounds.* Non-methane volatile organic compounds are a class of organic compounds that includes: aliphatic hydrocarbons, aromatic hydrocarbons (petrol, toluene, xylene), oxygenated hydrocarbons (aldehydes, ketones), etc. They originate from the evaporation of fuel during replenishment operations in service stations, fuel stocking, the emission of uncombusted products from vehicles and from dry cleaning and dyeing activities. The effects on man and the environment vary widely according to the

compound. Petrol is the most dangerous of the aromatic volatile hydrocarbons because it has been found to be carcinogenic. COVNM emissions contribute to the formation of tropospheric ozone.

-*CO – Carbon monoxide.* Carbon monoxide is a gas formed by the incomplete combustion of the hydrocarbons present in fuels and combustibles. It mainly comes from vehicle exhaust fumes and increases in relation to the condition of intense and slowed traffic. It is also emitted by heating systems and by certain industrial processes. CO emissions contribute to the formation of tropospheric ozone.

-*PM_{10} – Fine particles with a diameter of less than 10 microns (or particulates)*. Microscopic particles and drops of organic and inorganic material suspended in the air. These have a very varied composition: metals, asbestos fibres, sand, ashes, sulphates, nitrates, carbon and cement dust or vegetable substances. The main anthropic sources are heating plants and vehicle traffic.

-*$PM_{2.5}$ – Fine particles with a diameter of less than 2.5 microns (or fine particulates).*
Particles of $PM_{2.5}$, caused, as for PM_{10}, mainly by combustion engines and by certain industrial processes, are particularly dangerous for human health as they are capable of penetrating deep into the respiratory system. The especially small dimension of the particles means that they remain in the air for a much longer time than PM_{10}.

Atmospheric pollution
Any modification to the normal composition or physical state of the atmosphere, due to the presence of one or more substances in such a quantity and with such features as to: alter the normal environmental conditions and air quality; form a direct or indirect danger or threat to human health; compromise recreational activities and other legitimate uses of the environment; alter the biological resources, ecosystems and public or private assets.

Average temperature
The average of maximum and minimum temperatures at the site over a period of time.

Average maximum temperature
The average of maximum daily temperatures at the site over a period of time.

Average minimum temperature
The average of minimum daily temperatures at the site over a period of time.

Bioliquids
Liquid fuels for energy purposes other than for transport, including electricity, heating and cooling, produced from biomass. (Legislative Decree 28/2011).

Biomass
They include the whole of the forest or agricultural origin products (especially wood and wood pellets) that are used for energy purposes for heating rooms, for producing hot water or even for cooking.

Cogeneration
Indicates the production and the simultaneous consumption of different forms of secondary energy (electrical, mechanical, thermal) made in a particular thermoelectric power station with an integrated system using a single source of renewable or non-renewable). It has the goal of improving the overall energy efficiency and energy savings compared with separate production of electricity (via power plant) and of thermal energy (generated by traditional thermal plants).

Calorific
The heat of combustion or calorific value expresses the maximum amount of heat that can be derived from the complete combustion of 1 kg of fuel substance (or 1 m^3 of gas) at 0 ° C and 1 atm. Conventionally, lower calorific value (lower heating value) is defined as "the gross calorific value decreased by heat of condensation of water vapor during combustion."

Coppice with standards
A wooded area covered by a mix of high forest and simple coppiced areas.

Day with hydrometeor
A day when at least one millimeter of precipitation was recorded.

Domestic extraction of material resources unused
Also known as “unused material from domestic extraction”, this aggregate includes all materials, measured in terms of weight, which are intentionally extracted from the natural environment, but not for use. These are materials that are not incorporated in products, whose movement depends on the extraction of useful material or as a result of human activities (typically, construction activities). As for used materials, these figures do not include air and water. This aggregate does include biomass material (waste from agricultural activities, forestry and fishing) in addition to non-valorised minerals deriving from mining and quarrying activities (discarded materials from the extraction of fossil fuels and non-energy producing materials) and from excavations (soil and rock that is not reused, resulting from the construction of buildings, roads and railways).

Domestic extraction of material resources used
Also known as “domestic extraction of used materials”, this aggregate includes all the materials, with the exception of air and water, extracted from the natural environment of the Country to be incorporated in products, measured in terms of weight. For example, the aggregate includes all the ferrous mineral extracted from mines, including the parts or components which are subsequently discarded in the refining process. The earth removed, however, is not included, although it is moved in the course of the economic activity. Within domestic extraction of used material, a first level of disaggregation includes the following types of material: biomasses, energy and non-energy producing minerals.

Electricity consumption
The energy supplied to the end user (industry, service sector, household sector, and so on) for all energy uses, net of consumption and losses in the energy sector and the transformation from several sources into electricity.

Electricity demand over a network in a given period
Energy production for consumption, minus the exported and plus the imported electricity. The electrical energy required is also equal to the sum of the electrical energy consumption by end users and the transmission and distribution losses.

Electricity losses of a network in a given period
Difference between the required energy and consumption, including the electricity sector consumption.

Electricity used for pumping
Electric power used for the lifting of water by means of pumps, with the only aim of using water for producing electric power.

Emission
Release into the atmosphere of substances produced by specific or general sources.

Emissions from energy use with combustion (per cent)
For a given economic activity:
- *greenhouse effect resulting from energy use with combustion (per cent)* is obtained by dividing greenhouse gases generated by the combustion of the energy products out of total greenhouse gases produced by the economic activity in question (expressed in tonnes of CO_2 equivalent); the result is multiplied by one hundred;
- *acidification resulting from energy use with combustion (per cent)* is obtained by dividing the acidifying emissions generated by the combustion of the energy products out of total acidifying emissions produced by the economic activity in question (expressed in tonnes of potential acidification equivalent); the result is multiplied by one hundred;
- *tropospheric ozone resulting from energy use with combustion (per cent)* is obtained by dividing the photochemical smog created by the combustion of the energy products out of total photochemical smog generated by the economic activity in question (expressed in tonnes of potential tropospheric ozone formation); the result is multiplied by one hundred.

Energy
Energy is defined as the capacity of a body or system to perform *work.* The unit of measurement for energy is defined as the ability of a body or of a system to perform work. The unit of measurement for energy and the work is the joule (J), which expresses the amount of energy used (i.e. the work done) to exert the force of one newton on a 1-meter distance. Each system contains or stores or consists of a given quantity of energy that has many forms (mechanical, chemical, nuclear, power, light, heat, biochemical) that can be converted into each other. Energy transformations comply with the laws of thermodynamics. The first law of thermodynamics states that energy can be transformed from one form to another, but can neither be created nor destroyed. In all energy transformations, however, a part of the energy is converted into heat and dissipated in this form, and therefore cannot be used to perform work. In general, the energy dissipated as heat in an energy transformation is not destroyed as it is still present in the environment, but is no longer available to perform useful work. In this case it is called degraded. The second law of thermodynamics states that in all transformations and in all energy exchanges that occur in a closed system, the potential energy (e.g. the energy that has not yet been used) present at the end will always be less than that present at 'beginning. The processes in accordance with the second law of thermodynamics are said “esoergonici” and can spontaneously occur. However, there are also processes, said “endoergonici”, in which the potential energy, in the end, is greater than the initial one. These can’t occur spontaneously because they require an external energy input.

Energy industries
The energy industries are the economic units whose *primary activity* is the production, transformation and distribution of energy products (for example, electricity and heating plants, petrol and gas extraction, carbon mines, petrol refineries, etc.)

Energy products
Energy products are those products exclusively or mainly used as energy sources. These include:

- *fuels* which are produced/generated by an economic unit (including households) and are used or can be used as energy sources. Conventions:
  - all *fossil fuels* (coal, crude oil and natural gas) are included independently of whether they are used as energy sources or not;
  - *fossil fuel derivatives* are included if used (or intended for use) as *fuel*;[1]
  - *fossil fuel derivatives* which are used for *non-energy uses* are included if they represent an output from an *energy industry* (these are included because they account for how much of the apparent energy resource is used for non-energy purposes, and also allow for a complete overview of the industry in question);
  - *non-fossil fuels* (waste, agricultural waste and other biomasses) are included only if burned to produce electricity or heat;
- the *electricity* which is produced/generated by an economic unit (including households);
- the *heat* produced/generated and sold to third parties by an economic unit.

Energy required by a network in a set period
Production destined for consumption less the electricity exported plus the electricity imported. Demand for electricity is also equal to the sum of electricity consumption by end users and losses during transmission and distribution.

Environmental tax
A tax - i.e. a compulsory payment to the General Government (GG), not directly linked to the benefits which the individual taxpayer receives from its activities, is defined as environmental if the base of the tax is ‘a physical unit (possibly substituted by a proxy) of something which has a proven, specific negative impact on the environment’. Environmental taxes cover the following categories:

- energy, that includes all taxes on energy products - used for both transport and stationary purposes – and emission permits;

[1] For example: *lubricant oils* produced by an oil refinery, the production and use of which, even if normally used for non-energy uses, is recorded in energy statistics in order to monitor the various products derived by refinery and the amount of oil used for non-energy producing purposes; *plastic,* the use of which is not recorded as it does not represent an energy industry output, although derived from a fossil fuel (crude oil).

- transport, mainly taxes related to the ownership and use of motor vehicles;
- pollution, mainly taxes on air emissions (except for emission permits) or water emissions, management of solid waste and noise.

Financial flows abroad (exports and other domestic purchases by non-residents)
This aggregate includes all exports in addition to purchases made directly in Italy by foreign residents, all expressed in terms of weight. Within the category, an initial distinction is made between the following types of material: products derived from biomasses, products derived from energy producing minerals, products derived from nonenergy producing minerals, composite products.

Financial flows from abroad (imports and other foreign purchases by residents)
This aggregate includes all imports in addition to purchases made directly abroad by Italian residents, all expressed in terms of weight. Within the category an initial distinction is made between the following types of material: products derived from biomasses, products derived from energy producing minerals, products derived from non-energy producing minerals, composite products.

Forest area
The total wooded and unwooded forest area.

Forest fires
Fire with susceptibility to expand into bushy or arboreal wooded areas, including any anthropic structures and infrastructures placed within these areas, or on cultivated land or uncultivated and neighboring pastures (Framework Regulation no. 353/2000, art. 2).

Fossil fuels
Any hydrocarbon which can be used to generate heat or power. They derive from the transformation of organic substance into more stable forms and carbon-rich. They are non-renewable resources, since their use at current rates affects their availability for future generations. Examples include: oil (and other natural hydrocarbons), coal (in all its forms, from peat to anthracite) and natural gas.

Fuel
Primary or secondary energy source, that has to undergo combustion or fission in order to release the energy stored in it and enable its use.

Geothermal energy
Energy generated by means of geological sources of heat. It can be considered a form of renewable energy, as for short-term evaluation. It is based on the earth natural heat (geothermal) powered by the thermal energy released in the nuclear decay processes of radioactive elements such as uranium, thorium and potassium naturally contained within earth.

Greenhouse gases
Gases present in the atmosphere, of natural and anthropogenic origin, which absorb and emit infrared radiation at specific wavelengths, causing a phenomenon known as the “greenhouse effect”. These gases mainly include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulphur hexafluoride (SF_6). The “greenhouse gases” allow solar radiation to pass through the atmosphere and impede infrared radiation from the Earth from passing into space, thereby contributing to global warming. Each of these gases has a specific potential warming power. In order to calculate total emissions of greenhouse gases, the quantity of emissions from each single pollutant is converted into “equivalent tonnes of CO_2”, obtained by multiplying the emissions of each gas by its Global warming potential (GWP), expressed in relation to the GWP of carbon dioxide. To this end, the following coefficients are applied: 1 for CO_2; 298 for N_2O; 25 for CH_4.

Gross domestic consumption of electricity
It is equal to the gross production of electricity net of the production from pumped storage, plus the balance of foreign trade (or between regions). It is equivalent to the gross final consumption of electricity introduced by the European Directive 28/2009 / EC.

Gross domestic consumption of energy
Energy balance, resulting from the sum of quantities produced by primary sources, imports of primary and secondary sources and manufacturers and importers' changes in stocks of primary and secondary sources, net of the exported primary and secondary sources.

Gross final consumption of energy
The set of energy commodities provided for energy purposes to industry, transport, households, services -public services included-, agriculture forestry and fisheries, including the consumption of electricity and heat for the electricity sector the production of electricity and heat production. Losses of electricity and heat during distribution and transmission are included as well. (Legislative Decree 28/2011)

Gross production of electricity
Process for converting an energy source into electric power. Sum of the amount of electricity produced, measured as flowing out from plants, including the electricity intended for the production auxiliary services.

Gross electricity production of renewable energy plants (Fer)
Energy from renewable non-fossil sources namely, wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, residual gas from sewage treatment plants and biogases. (Legislative Decree 28/2011)

Greenhouse effect
The natural phenomenon that occurs each time a semi-transparent membrane completely occludes a semi-reflective surface. As a result, as the sun's rays penetrate the semi-transparent membrane they lose a quota of energy and, therefore, become longer. The lengthened rays reach the semi-reflective surface which, while absorbing another quota of energy, reflects them and extends them even further. The reflected solar rays return to the semi-transparent membrane which once more allows only the lower frequency light rays to pass.

Heavy metals *(see also Air Pollutants)*
The term heavy metal refers to all metallic chemical elements with a relatively high density and which are toxic in low concentrations. Heavy metals are natural components of the earth's surface. A small amount enters the human body through food, water and air. Like trace elements, some heavy metals are essential for maintaining the metabolism of the human body – however, at higher concentrations they can cause poisoning.

- *As – Arsenic.* Large quantities of arsenic are used in the glass-making industry to eliminate the green colour caused by the presence of impurities. It is sometimes added to lead to harden it, and it is used inthe preparation of toxic gases for military use. Some compounds, such as gallium arsenide are, on the other hand, used in the production of semi-conductors and laser materials. Arsenic sulphide (As2S2), also known as red orpiment, is used as a pigment in the preparation of fireworks and paints.
- *Cd – Cadmium.* Cadmium is used to protect iron sheeting and for manufacturing negative plates for nickel-cadmium accumulators. It is also present in many low-temperature melting alloys used in manufacturing electric cables. Given its high absorption of neutrons, cadmium is used in the measurement bars in atomic batteries.
- *Cr – Chromium.* Chromium is used in the production of special alloys and in the paint, dyes and leather tanning industries. Alloys with a high chromium content are also used in manufacturing steel and cast iron. Certain nickel-chromium alloys are used for the construction of electric resistances and wires for thermoelectric coupling.
- *Cu – Copper.* Copper has the highest electric conduction properties of all the metals for industrial use. It is used in the production of electric wires and cables, electronic devices (engine parts, switches, metres, etc.). Thanks to its excellent heat-conducting properties, it is also used to construct boilers, alembic stills, heat exchangers, etc. Its characteristic resistance to atmospheric corruption also makes it useful for the construction of tubes and external building surfaces.
- *Hg – Mercury.* In its pure state mercury is used for its high specific weight and its high electric and thermal conductive properties. In its liquid state it is used in electronic equipment and physics instruments (metres, rectifiers, pressure metres, etc.).
- *Ni – Nickel.* Thanks to its inalterability in air, nickel is used for galvanic coatings (galvanising) and, carefully divided, as a catalyser in hydrogenation processes for organic substances. It is often used for the preparation of stainless steel and special alloys for covers for precision instruments.

It is also used for coins and electric cabling.

-*Pb – Lead*. Lead is used in batteries and as a coating for electric cables, tubes, tanks and in X-ray machines. Thanks to its high density and wide capture section, lead is used as a shielding substance for radioactive material. Numerous alloys with a high lead content are used for welding, printing and gears. A considerable quantity of lead is also used in paint and pigments. Furthermore, as lead is resistant to sulphuric acid, it is used for equipment in the chemical industry (lead rooms) and in the manufacturing process for accumulators. Lead compounds can be used as fuel additives.

-*Se – Selenium.* Selenium conducts heat and electricity and its resistance decreases when illuminated, leading to its use in some photoelectric cells.

-*Zn – Zinc.* Thanks to its inalterability in air, zinc is used in roof sheeting or tiling. In the form of sheets or plates, it is also used in graphic arts and dry batteries. In its melted form it is used in the manufacturing of various objects to be electroplated with a special alloy which lends objects a bronzed appearance. Zinc has an efficient protective action on iron and steel exposed in certain environments, such as water, steam, organic substances, petrol or chlorine solvents. This protection is created using various processes. Zinc is also included in numerous copper alloys.

High forest

A wooded area in which plants are destined to be grown as high plants and prevalently renew themselves naturally (by seed) or artificially (by cuttings). Regarding species of tree, high forests are divided into conifer forests (or resinous trees), hardwood trees or mixed species.

Hydroelectric power

Energy using the gravitational potential energy transformation (owned by water masses at high altitude) into kinetic energy to overcome a drop. This kinetic energy is transformed thanks to a generator coupled with a turbine into electric power.

Hydropower plants

The set of hydraulic works, machinery, equipment, buildings and facilities for processing hydraulic into electric power.

Implicit subsidies

Implicit subsidies are a balancing item that offsets a negative net operating surplus by general government producers of environmental services. A negative net operating surplus would indicate that specialist producers belonging to general government provide environmental services at economically significant prices that do not cover 100% of production costs. The covering of incurred losses is regarded as an implicit subsidy that lowers the price of the environmental protection services paid by users who, therefore, benefit from an implicit transfer in their own favour.

kW (kilowatt)

It's a unit of power. In the bill the used power and the available power are expressed in kW.

kWh (kilowatt hours)

Electricity metering unit; it is the power absorbed in one hour by a 1 kW-power device. The power consumption is counted in kWh in the bill.

Macroseismic intensity

A numeric value representing the effects of an earthquake felt in a certain place. This value is assigned by comparing the real effects of a given scenario with those described in various scales of intensity commonly used. The intensity in a certain point depends not only on the magnitude of the earthquake but also on the distance from its centre, the local geological conditions and the type of buildings. The scales of macroseismic intensity therefore have the task of classifying earthquakes according to the damage done to people, buildings and the environment. The scale of intensity most often used in Italy is the Mercalli Cancani Sieberg (Mcs) scale. Since the 90s a European macroseismic scale (Ems-98) has been created.

Magnitude

In 1935, Charles Francis Richter introduced the "magnitude" as a measure of an earthquake intensity, it represents an estimate of the quantity of energy released, based on the amplitude and duration of seismic waves.

Material resource requirements for domestic consumption
Also known as “Total consumption of material resources”, this aggregate takes account of all the material flows necessary on a global level to meet only domestic final demand for national and foreign products, accounting for the movement of both used and unused material in the Country or abroad in order to allow for the Country’s consumption and investment processes. This is equal to *Overall material resource requirements* less *Financial flows abroad* and *Material resources requirements for export production.*

Material resources requirements for export production
Also known as “Indirect flows associated with exports”, this aggregate is entirely analogous to *Material resource requirements for imported production,* and is formed of the used and unused materials that it was necessary to mobilitate on a global level in order to produce the goods exported, but which are not incorporated in the goods themselves.

Material resource requirements for imported production
Also known as “Indirect flows associated with imports”, this aggregate is formed of the materials, used or otherwise, that had to be mobilised on a global level in order to produce the imported goods, but which were not incorporated in the goods themselves. These include both used and unused materials. Unused materials were transformed, during the course of production abroad, into waste products and emissions. Taking account of indirect flows connected with importations therefore means also referring to the phases of the product life cycle which are performed abroad, i.e. the transformation of materials upstream of importation. All the emissions and waste products generated abroad during the production of the goods and services in question are therefore included.

Namea
A national accounting matrix including environmental accounts, developed in the ‘90s, which represents the interaction between the economy and the environment in such a way as to guarantee the comparability of economic and social data (output, income, employment, etc.) with those relating to the stress posed by human activities on the natural environment (environmental pressure). Although the regular compilation of full Namea matrices is not widespread, the acronym is still used to identify environmental accounts by activity (production activities and households), like air emission accounts, revenue from environmental taxes and physical energy flow accounts.

National environmental expenditure
National expenditure for environmental protection is defined as the sum of uses of environmental protection services by resident units, gross fixed capital formation for environmental protection activities, and transfers for environmental protection which are not a counterpart of previous items, net of financing by the rest of the world.

National parks
According to Law no. 394/1991, national parks are formed by land, river, lake or sea areas with one or more ecosystems, both intact or partially altered; one or more physical, geological, geomorphological or biological aspects which have an international or national importance for their natural, scientific, aesthetic, cultural, educational or recreational value that require State intervention to preserve them for posterity and to safeguard their ecosystem.

Net production for consumption
Net production minus the amount of electricity used for pumping.

Net electricity production (reference to a set of power plants, in a given period)
Total amount of electric power produced, measured in output by the plants, i.e. by deducting the amount of electric power for the production of auxiliary services (plant auxiliary services and losses in Central transformers).

Overall material resource requirements
Also known as “Overall material requirements”, this aggregate gives an overall account of all the material flows necessary on a global level in order to meet final demand, both domestic and foreign, for national and foreign products, accounting for the movement of both used and unused material in the Country and abroad in order to allow for the Country’s production and comsumption processes to take place. This includes:

domestic extractions of material used, imports, domestic extractions of unused material and indirect flows associated with imports, and is the result of the sum of the *Total use of material resources* and *Material resources for import production.*

Photovoltaics
The energy, heat or electric power, produced directly using sun radiated energy (renewable energy) to earth.

Primary energy
Power source present in nature, that is not derived from the processing of any other form of energy.
Fall into this classification:
- Renewable sources: solar, wind, hydro, geothermal, biomass;
- Exhaustible sources: fuels (e.g. crude oil, natural gas, coal) or nuclear energy.

Pollutant
Any substance directly or indirectly released by man into the air or environment which may have a damaging effect on human health or the environment as a whole.

Precipitation
Precipitation is the water released from clouds in the form of rain, freezing rain, sleet, snow, or hail.

Producers of environmental services: specialist, secondary and ancillary producers
Specialist producers include those institutional units which produce environmental services as their principal activity. These services are sold at economically significant prices or provided to other units for free, or at prices that are not economically significant. Specialist producers belong to private corporations as well as to general government and non-profit institutions serving households; general government offices responsible for administration and regulation activities of environmental services are included.
Secondary producers include those institutional units which produce environmental services, sold at economically significant prices or provided to other units for free, or at prices that are not economically significant, in addition to the principal activity. In the context of the satellite accounts released here, secondary producers belong to private corporations.
Ancillary producers include those institutional units which produce environmental services for their own uses in order to manage their own environmental pressures (waste, wastewater, etc.….), sometimes replacing the same service provided by private or public units. Ancillary producers are private corporations that may belong to almost all economic sectors.

Rainfall
Any form of atmospheric water which reaches the earth's surface either in a liquid or solid state. Forms include: rain, drizzle, dew, fog, snow, ice, hail and frost. The measurement of rainfall takes place using *totalising rain gauges, recording rain gauges* or *electronic precipitation sensors.* Both solid and liquid rainfall is a discontinuous phenomenon, for which it is important to measure the quality, quantity, intensity, duration and distribution over time. Due to the range of details, rainfall analysis and statistics are very complex and do not always effectively represent the amount of rainfall in question, with reference to the actual representation of average rainfall and its practical utility. It is important to consider that, while for some measurements such as temperature and pressure, the average measurement and variance from it are capable of providing a good representation of the measurements taken, other meteorological phenomena, such as rainfall (and cloud cover) are harder to represent as the distribution of the data measured cannot be compared to normal values.

Renewables:
Sources used for the production of energy, which are regenerated due to their intrinsic characteristics. They include sun, wind, water resources, geothermal resources, tides, waves and transformation into electricity of vegetable products or organic waste.

Renewable source plants
The set of machines, equipment, buildings and facilities for processing wind power, geothermal, hydro, biomass and solar energy into electricity.

Residence principle
According to the residence principle a resident unit of a country is considered as such when it has a centre of predominant economic interest on the economic territory of that country — that is, when it engages for an extended period (one year or more) economic activities on this territory". (Esa2010 § 1.61).

River discharge
Volume of water moving down a river, it is usually expressed in the number of cubic meters per second passing in a channel cross section of a river in a given time span.

Simple coppice
A wooded area where plants, exclusively or prevalently born from gem, are destined to naturally renew themselves through asexual reproduction (budding).

Thermoelectric plants
The set of conventional thermal power plants, both geothermal and nuclear-thermoelectric plants. The traditional plants include both steam groups, internal combustion, gas turbine, combined cycle, turbo expanders (using the pressure energy of the process gas), including the groups that do not burn fuels but use heat resulting from processes or plants.

Types of energy products
Energy products are those products exclusively or mainly used as energy sources. They are aggregated by type of product as follows:

- "solid" (coal, lignite, coke oven coke, non-energy coal products, fuel wood, charcoal, and waste incinerated used as fuel for the production of electricity or heat);
- "gaseous" (natural gas, coke oven gas, refinery gas, blast furnace gas, gas work gas, by-products);
- "crude oil and refined petroleum products" (crude oil, semi-finished oil products, motor gasoline, jet fuels, light and medium petroleum oils products, kerosene, diesel oil, fuel oil – low sulphur content, fuel oil – high sulphur content, lpg, petroleum coke, bitumen, lubricants, other refined petroleum derivatives n.e.c.
- "electricity" (both fossil and renewable source)

Ton oil equivalent (TOE)
Universal unit of measurement for all kinds of energy source. It is used to compare different energy amounts, such as those obtained from petroleum, coal, natural gas, from the fall or from the movement of water (hydro), wind, sun radiation, etc. By definition 1 toe is equivalent to 11,628 kWh.

Total energy use / Output (TJ / M€)
For any given economic activity, *Total energy use / Output (TJ / M€)* is obtained by dividing total energy uses (with or without combustion) of energy products (expressed in terajoules) and output value (expressed in millions of euros at basic prices – chained values – year of reference 2000) of the production activity considered. The ratio represents the energy efficiency of the productive activity: the higher the value of the indicator, the less efficient the production activity is from an energy point of view.

Total extraction of resources
Also known as "Overall domestic material requirements", this aggregate includes all the material extracted in Italy, used or otherwise, with the exception of air and water, expressed in terms of weight.

Transmission
The transport and transformation of electricity via the interconnected high and maximum tension network, in order to deliver energy to clients, distributors and the end-users of self-produced energy

Tropospheric ozone
The formation of tropospheric ozone is a phenomenon with damaging effects on human health, agricultural cultivations and forestry and for historical-artistic heritage. The main atmospheric emissions that contribute to the phenomenon include methane (CH_4), nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOCs) and carbon monoxide (CO). These emissions are expressed in tonnes of "potential tropospheric ozone formation", calculated using the following coefficients: 0.014 for CH_4; 1.22 for NO_x; 1 for COVNM; 0.11 for CO.

Unwooded forest area
An area of land formed by non-productive areas which are nonetheless necessary for production (forest roads, fire prevention courses, timber warehouses) and by other small areas such as rocky soil, bogs, streams, forest nurseries grown in woodland and destined for its own replenishment, in addition to the homes of forest personnel with annexed land and forest management offices.

Use and management of water resources
According to the Classification of Resource Use and Management Activities and Expenditure, the following activities are included: activities and actions aiming at minimising the intake of water resources; reduction of water losses and leaks, water savings; abstraction and distribution of water resources; monitoring and regulation activities; administration, training, information and education activities related to use and management of water resources.

Use of energy products
- *energy use with combustion*: includes energy contained in the energy products burnt for the following reasons:
  - •*heating*: includes the energy contained in the energy products used to heat homes, shops, offices, plants, enterprises, etc.;
  - •*transport*: includes the energy contained in energy products used for road and off-road transport (i.e. by rail, air or sea in addition to all the operations of ships, boats, tractors, construction machinery, lawnmowers, military and other equipment); for households, private transport is considered; for production activities, transport performed as a primary, secondary or ancillary activity is considered;
  - •*transformation in electricity*: includes the energy contained in energy products transformed via combustion into electricity;
  - •*other energy use with combustion*: includes energy in energy products transformed via combustion into energy products other than electricity (for example, coke transformed into blast furnace gas), energy in energy products used by production activities in production processes in a strict sense (therefore excluding heating, transport and transformation) and energy in energy products used by households for cooking and producing hot water;
- *energy use without combustion*: includes the energy contained in energy products transformed without combustion into other energy products (for example, crude oil transformed into petrol) and the energy included in the electricity used by households and production activities for any purpose;
- *non-energy use*: includes the energy contained in energy products transformed into non-energy products (for example, crude oil transformed into plastic) and the energy included in energy products used for non-energy producing purposes (degreasing, dry cleaning, lubrication, etc.).

Use of material resources -Total
Also known as “Direct material input”, this aggregate includes all extractions in Italy, with the exception of air and water, expressed in terms of weight and all imports in addition to purchases made directly abroad by Italian residents. The figure is the total of the *Domestic extraction of material resources unused* and *Financial flows from abroad* aggregates.

Waste management
According to the Classification of Environmental Protection Activities and Expenditure (CEPA 2000), the following activities are included: activities and measures aimed at the prevention of the generation of waste; collection, transport and treatment of waste; monitoring and regulation activities; administration, training, information and education activities related to waste management.

Wastewater management
According to the Classification of Environmental Protection Activities and Expenditure (CEPA 2000), the following activities are included: activities and measures aimed at the prevention of pollution of surface water; collection and treatment of wastewater; monitoring and regulation activities; administration, training, information and education activities related to wastewater management.

Wind energy
Wind power is the product of the conversion of kinetic energy of the wind into other forms of energy (electrical or mechanical) via a wind farm.

Wooded forest area
An area of land not less than half a hectare covered by trees, bushes or grassy forest plants which produce timber or other forest products, covering, when mature, at least 50 per cent of the surface and capable of having an indirect impact on climate and water management.