

Annex II

Glossary, acronyms and abbreviations

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Note: the definitions in this Annex refer to the use of the terms in the context of this report. It provides an explanation of specific terms as the authors intend them to be interpreted in this report.

Abatement

Reduction in the degree or intensity of emissions or other pollutants.

Absorption

Chemical or physical take-up of molecules into the bulk of a solid or liquid, forming either a solution or compound.

Acid gas

Any gas mixture that turns to an acid when dissolved in water (normally refers to $\text{H}_2\text{S} + \text{CO}_2$ from sour gas (q.v.)).

Adiabatic

A process in which no heat is gained or lost by the system.

Adsorption

The uptake of molecules on the surface of a solid or a liquid.

Afforestation

Planting of new forests on lands that historically have not contained forests.

Aluminium silicate mineral

Natural mineral – such as feldspar, clays, micas, amphiboles – composed of Al_2O_3 and SiO_2 plus other cations.

Amine

Organic chemical compound containing one or more nitrogens in $-\text{NH}_2$, $-\text{NH}$ or $-\text{N}$ groups.

Anaerobic condition

Reducing condition that only supports life which does not require free oxygen.

Anhydrite

Calcium sulphate: the common hydrous form is called gypsum.

Antarctic Treaty

Applies to the area south of 60 degrees South, and declares that Antarctica shall be used for peaceful purposes only.

Anthracite

Coal with the highest carbon content and therefore the highest rank (q.v.).

Anthropogenic source

Source which is man-made as opposed to natural.

Anticline

Folded geological strata that is convex upwards.

API

American Petroleum Institute; degree API is a measure of oil density given by $(141.5/\text{specific gravity}) - 131.5$.

Aquifer

Geological structure containing water and with significant permeability to allow flow; it is bound by seals.

Assessment unit

A geological province with high petroleum potential.

Assigned amount

The amount by which a Party listed in Annex B of the Kyoto Protocol agrees to reduce its anthropogenic emissions.

ATR

Auto thermal reforming: a process in which the heat for the reaction of CH_4 with steam is generated by partial oxidation of CH_4 .

Autoproduction

The production of electricity for own use.

Basalt

A type of basic igneous rock which is typically erupted from a volcano.

Basel Convention

UN Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, which was adopted at Basel on 22 March 1989.

Baseline

The datum against which change is measured.

Basin

A geological region with strata dipping towards a common axis or centre.

Bathymetric

Pertaining to the depth of water.

Benthic

Pertaining to conditions at depth in bodies of water.

Bicarbonate ion

The anion formed by dissolving carbon dioxide in water, HCO_3^- .

Biomass

Matter derived recently from the biosphere.

Biomass-based CCS

Carbon capture and storage in which the feedstock (q.v.) is biomass

Bituminous coal

An intermediate rank of coal falling between the extremes of peat and anthracite, and closer to anthracite.

Blow-out

Refers to catastrophic failure of a well when the petroleum fluids or water flow unrestricted to the surface.

Bohr effect

The *pH*-dependent change in the oxygen affinity of blood.

Bottom-up model

A model that includes technological and engineering details in the analysis.

Boundary

In GHG accounting, the separation between accounting units, be they national, organizational, operational, business units or sectors.

Break-even price

The price necessary at a given level of production to cover all costs.

Buoyancy

Tendency of a fluid or solid to rise through a fluid of higher density.

Cap rock

Rock of very low permeability that acts as an upper seal to prevent fluid flow out of a reservoir.

Capillary entry pressure

Additional pressure needed for a liquid or gas to enter a pore and overcome surface tension.

Capture efficiency

The fraction of CO₂ separated from the gas stream of a source

Carbon credit

A convertible and transferable instrument that allows an organization to benefit financially from an emission reduction.

Carbon trading

A market-based approach that allows those with excess emissions to trade that excess for reduced emissions elsewhere.

Carbonate

Natural minerals composed of various anions bonded to a CO₃²⁻ cation (e.g. calcite, dolomite, siderite, limestone).

Carbonate neutralization

A method for storing carbon in the ocean based upon the reaction of CO₂ with a mineral carbonate such as limestone to produce bicarbonate anions and soluble cations.

Casing

A pipe which is inserted to stabilize the borehole of a well after it is drilled.

CBM

Coal bed methane

CCS

Carbon dioxide capture and storage

CDM

Clean development mechanism: a Kyoto Protocol mechanism to assist non-Annex 1 countries to contribute to the objectives of the Protocol and help Annex I countries to meet their commitments.

Certification

In the context of carbon trading, certifying that a project achieves a quantified reduction in emissions over a given period.

Chemical looping combustion

A process in which combustion of a hydrocarbon fuel is split into separate oxidation and reduction reactions by using a metal oxide as an oxygen carrier between the two reactors.

Chlorite

A magnesium-iron aluminosilicate sheet silicate clay mineral.

Class “x” well

A regulatory classification for wells used for the injection of fluids into the ground.

Claus plant

A plant that transforms H₂S into elemental sulphur.

Cleats

The system of joints, cleavage planes, or planes of weakness found in coal seams along which the coal fractures.

CO₂ avoided

The difference between CO₂ captured, transmitted and/or stored, and the amount of CO₂ generated by a system without capture, net of the emissions not captured by a system with CO₂ capture.

CO₂ equivalent

A measure used to compare emissions of different greenhouse gases based on their global warming potential.

Co-benefit

The additional benefits generated by policies that are implemented for a specific reason.

COE

Cost of electricity, value as calculated by Equation 1 in Section 3.7.

Co-firing

The simultaneous use of more than one fuel in a power plant or industrial process.

Completion of a well

Refers to the cementing and perforating of casing and stimulation to connect a well bore to reservoir.

Congruence

The quality of agreement between two entities.

Conservative values

Parameter values selected so that a parameter, such as CO₂ leakage, is over-estimated.

Containment

Restriction of movement of a fluid to a designated volume (e.g. reservoir).

Continental shelf

The extension of the continental mass beneath the ocean.

COREX

A process for producing iron.

Cryogenic

Pertaining to low temperatures, usually under about -100°C.

D, Darcy

A non-SI unit of permeability, abbreviated D, and approximately = 1 μm².

Dawsonite

A mineral: dihydroxide sodium aluminium carbonate.

Deep saline aquifer

A deep underground rock formation composed of permeable materials and containing highly saline fluids.

Deep sea

The sea below 1000m depth.

Default emissions factor

An approximate emission factor that may be used in the absence of precise or measured values of an Emissions Factor.

Demonstration phase

Demonstration phase means that the technology is implemented in a pilot project or on a small scale, but not yet economically feasible at full scale.

Dense phase

A gas compressed to a density approaching that of the liquid.

Dense fluid

A gas compressed to a density approaching that of the liquid.

Depleted

Of a reservoir: one where production is significantly reduced.

Diagenesis

Processes that cause changes in sediment after it has been deposited and buried under another layer.

DIC

Dissolved Inorganic Carbon.

Dip

In geology, the angle below the horizontal taken by rock strata.

Discharge

The amount of water issuing from a spring or in a stream that passes a specific point in a given period of time.

Discordant sequence

In geology, sequence of rock strata that is markedly different from strata above or below.

Dolomite

A magnesium-rich carbonate sedimentary rock. Also, a magnesium-rich carbonate mineral (CaMgCO₃).

Double-grip packer

A device used to seal a drill string equipped with two gripping mechanisms.

Down-hole log

Record of conditions in a borehole.

Drill cuttings

The solid particles recovered during the drilling of a well.

Drill string

The assembly of drilling rods that leads from the surface to the drilling tool.

Drive

Fluid flow created in formations by pressure differences arising from borehole operations.

Dry ice

Solid carbon dioxide

Dynamic miscibility

The attainment of mixing following the prolonged injection of gas into an oilfield.

ECBM

Enhanced coal bed methane recovery; the use of CO₂ to enhance the recovery of the methane present in unminable coal beds through the preferential adsorption of CO₂ on coal.

Economic potential

The amount of greenhouse gas emissions reductions from a specific option that could be achieved cost-effectively, given prevailing circumstances (i.e. a market value of CO₂ reductions and costs of other options).

Economically feasible under specific conditions

A technology that is well understood and used in selected commercial applications, such as in a favourable tax regime or a niche market, processing at least 0.1 MtCO₂/yr, with a few (less than 5) replications of the technology.

EGR

Enhanced gas recovery: the recovery of gas additional to that produced naturally by fluid injection or other means.

Emission factor

A normalized measure of GHG emissions in terms of activity, e.g., tonnes of GHG emitted per tonne of fuel consumed.

Emissions credit

A commodity giving its holder the right to emit a certain quantity of GHGs (q.v.).

Emissions trading

A trading scheme that allows permits for the release of a specified number of tonnes of a pollutant to be sold and bought.

Endothermic

Concerning a chemical reaction that absorbs heat, or requires heat to drive it.

Enhanced gas recovery

See EGR.

Enhanced oil recovery

See EOR

Entrained flow

Flow in which a solid or liquid, in the form of fine particles, is transported in diluted form by high velocity gas.

Entrainment gas

The gas employed in entrained flow (q.v.).

EOR

Enhanced oil recovery: the recovery of oil additional to that produced naturally by fluid injection or other means.

Euphotic zone

The zone of the ocean reached by sunlight.

Evaporite

A rock formed by evaporation.

Exothermic

Concerning a chemical reaction that releases heat, such as combustion.

Ex-situ mineralization

A process where minerals are mined, transferred to an industrial facility, reacted with carbon dioxide and processed.

Exsolution

The formation of different phases during the cooling of a homogeneous fluid.

Extended reach well

Borehole that is diverted into a more horizontal direction to extend its reach.

Extremophile

Microbe living in environments where life was previously considered impossible.

Far field

A region remote from a signal source.

Fault

In geology, a surface at which strata are no longer continuous, but displaced.

Fault reactivation

The tendency for a fault to become active, i.e. for movement to occur.

Fault slip

The extent to which a fault has slipped in past times.

FBC

Fluidized bed combustion: – combustion in a fluidized bed (q.v.).

Feldspar

A group of aluminosilicate minerals that makes up much of the Earth's crust.

Feedstock

The material that is fed to a process

FGD

Flue gas desulphurization.

Fischer-Tropsch

A process that transforms a gas mixture of CO and H₂ into liquid hydrocarbons and water.

Fixation

The immobilization of CO₂ by its reaction with another material to produce a stable compound

Fixed bed

A gas-solid contactor or reactor formed by a bed of stationary solid particles that allows the passage of gas between the particles.

Flood

The injection of a fluid into an underground reservoir.

Flue gas

Gases produced by combustion of a fuel that are normally emitted to the atmosphere.

Fluidized bed

A gas-solid contactor or reactor comprising a bed of fine solid particles suspended by passing a gas through the bed at sufficiently high velocity.

Folding

In geology, the bending of rock strata from the plane in which they were formed.

Formation

A body of rock of considerable extent with distinctive characteristics that allow geologists to map, describe, and name it.

Formation water

Water that occurs naturally within the pores of rock formations.

Fouling

Deposition of a solid on the surface of heat or mass transfer equipment that has the effect of reducing the heat or mass transfer.

Fracture

Any break in rock along which no significant movement has occurred.

Fuel cell

Electrochemical device in which a fuel is oxidized in a controlled manner to produce an electric current and heat directly.

Fugitive emission

Any releases of gases or vapours from anthropogenic activities such as the processing or transportation of gas or petroleum.

FutureGen Project

US Government initiative for a new power station with low CO₂ emissions.

Gas turbine

A machine in which a fuel is burned with compressed air or oxygen and mechanical work is recovered by the expansion of the hot products.

Gasification

Process by which a carbon-containing solid fuel is transformed into a carbon- and hydrogen-containing gaseous fuel by reaction with air or oxygen and steam.

Geochemical trapping

The retention of injected CO₂ by geochemical reactions.

Geological setting

The geological environment of various locations.

Geological time

The time over which geological processes have taken place.

Geomechanics

The science of the movement of the Earth's crust.

Geosphere

The earth, its rocks and minerals, and its waters.

Geothermal

Concerning heat flowing from deep in the earth.

GHG

Greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆).

Hazardous and non-hazardous waste

Potentially harmful and non-harmful substances that have been released or discarded into the environment.

Hazardous waste directive

European directive in force to regulate definitions of waste classes and to regulate the handling of the waste classes.

HAZOP

HAZard and OPerability, a process used to assess the risks of operating potentially hazardous equipment.

Helsinki Convention

International legal convention protecting the Baltic water against pollution.

Henry's Law

States that the solubility of a gas in a liquid is proportional to the partial pressure of the gas in contact with the liquid.

HHV

Higher heating value: the energy released from the combustion of a fuel that includes the latent heat of water.

Host rock

In geology, the rock formation that contains a foreign material.

Hybrid vehicle

Vehicle that combines a fossil fuel internal combustion engine and an alternative energy source, typically batteries.

Hydrate

An ice-like compound formed by the reaction of water and CO₂, CH₄ or similar gases.

Hydrodynamic trap

A geological structure in which fluids are retained by low levels of porosity in the surrounding rocks.

Hydrogeological

Concerning water in the geological environment.

Hydrostatic

Pertaining to the properties of a stationary body of water.

Hypercapnia

Excessively high CO₂ levels in the blood.

Hypoxia

Having low rates of oxygen transfer in living tissue.

Hysteresis

The phenomenon of a lagging recovery from deformation or other disturbance.

IEA GHG

International Energy Agency – Greenhouse Gas R&D Programme.

IGCC

Integrated gasification combined cycle: power generation in which hydrocarbons or coal are gasified (q.v.) and the gas is used as a fuel to drive both a gas and a steam turbine.

Igneous

Rock formed when molten rock (magma) has cooled and solidified (crystallized).

Immature basin

A basin in which the processes leading to oil or gas formation have started but are incomplete.

Infrared spectroscopy

Chemical analysis using infrared spectroscope method.

Injection

The process of using pressure to force fluids down wells.

Injection well

A well in which fluids are injected rather than produced.

Injectivity

A measure of the rate at which a quantity of fluid can be injected into a well.

***In-situ* mineralization**

A process where minerals are not mined: carbon dioxide is injected in the silicate formation where it reacts with the minerals, forming carbonates and silica.

International Seabed Authority

An organization established under the 1982 UN Convention on the Law of the Sea, headquartered in Kingston, Jamaica.

Ion

An atom or molecule that has acquired a charge by either gaining or losing electrons.

IPCC

Intergovernmental Panel on Climate Change

JI

Joint Implementation: under the Kyoto Protocol, it allows a Party with a GHG emission target to receive credits from other Annex 1 Parties.

Kyoto Protocol

Protocol to the United Nations Framework Convention on Climate Change, which was adopted at Kyoto on 11 December 1997.

Leach

To dissolve a substance from a solid.

Leakage

In respect of carbon trading, the change of anthropogenic emissions by sources or removals by sinks which occurs outside the project boundary.

Leakage

In respect of carbon storage, the escape of injected fluid from storage.

Levelling cost

The future values of an input or product that would make the NPV (q.v.) of a project equal to zero.

LHV

Lower heating value: energy released from the combustion of a fuel that excludes the latent heat of water.

Lignite/sub-bituminous coal

Relatively young coal of low rank with a relatively high hydrogen and oxygen content.

Limestone

A sedimentary rock made mostly of the mineral calcite (calcium carbonate), usually formed from shells of dead organisms.

LNG

Liquefied natural gas

Lithology

Science of the nature and composition of rocks

Lithosphere

The outer layer of the Earth, made of solid rock, which includes the crust and uppermost mantle up to 100 km thick.

Log

Records taken during or after the drilling of a well.

London Convention

On the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, which was adopted at London, Mexico City, Moscow and Washington on 29 December 1972.

London Protocol

Protocol to the Convention adopted in London on 2 November 1996 but which had not entered into force at the time of writing.

Low-carbon energy carrier

Fuel that provides low fuel-cycle-wide emissions of CO₂, such as methanol.

Macro-invertebrate

Small creature living in the seabed and subsoil, like earthworms, snails and beetles.

Madrid Protocol

A protocol to the 11th Antarctic Treaty to provide for Antarctica's environmental protection.

Mafic

Term used for silicate minerals, magmas, and rocks, which are relatively high in the heavier elements.

Magmatic activity

The flow of magma (lava).

Marginal cost

Additional cost that arises from the expansion of activity. For example, emission reduction by one additional unit.

Maturation

The geological process of changing with time. For example, the alteration of peat into lignite, then into sub-bituminous and bituminous coal, and then into anthracite.

Mature sedimentary basins

Geological provinces formed by the deposition of particulate matter under water when the deposits have matured into hydrocarbon reserves.

MEA

Mono-ethanolamine

Medium-gravity oil

Oil with a density of between about 850 and 925kg/m³ (between 20 and 30 API).

Membrane

A sheet or block of material that selectively separates the components of a fluid mixture.

Metamorphic

Of rocks that have been altered by heat or pressure.

Mica

Class of silicate minerals with internal plate structure.

Microseismicity

Small-scale seismic tremors.

Migration

The movement of fluids in reservoir rocks.

Mineral trap

A geological structure in which fluids are retained by the reaction of the fluid to form a stable mineral.

Miscible displacement

Injection process that introduces miscible gases into the reservoir, thereby maintaining reservoir pressure and improving oil displacement.

Mitigation

The process of reducing the impact of any failure.

Monitoring

The process of measuring the quantity of carbon dioxide stored and its location.

Monte Carlo

A modelling technique in which the statistical properties of outcomes are tested by random inputs.

Mudstone

A very fine-grained sedimentary rock formed from mud.

MWh

Megawatt-hour

National Greenhouse Gas Inventory

An inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases prepared by Parties to the UNFCCC.

Natural analogue

A natural occurrence that mirrors in most essential elements an intended or actual human activity.

Natural underground trap

A geological structure in which fluids are retained by natural processes.

Navier-Stokes equations

The general equations describing the flow of fluids.

Near-field

The region close to a signal source.

NGCC

Natural gas combined cycle: natural-gas-fired power plant with gas and steam turbines.

Non-hazardous waste

Non-harmful substances that have been released or discarded into the environment.

NPV

Net present value: the value of future cash flows discounted to the present at a defined rate of interest.

Numerical approximation

Representation of physico-mathematical laws through linear approximations.

Observation well

A well installed to permit the observation of subsurface conditions.

OECD

Organization for Economic Co-operation and Development

OSPAR

Convention for the Protection of the Marine Environment of the North-East Atlantic, which was adopted at Paris on 22 September 1992.

Outcrop

The point at which a particular stratum reaches the earth's surface.

Overburden

Rocks and sediments above any particular stratum.

Overpressure

Pressure created in a reservoir that exceeds the pressure inherent at the reservoir's depth.

Oxidation

The loss of one or more electrons by an atom, molecule, or ion.

Oxyfuel combustion

Combustion of a fuel with pure oxygen or a mixture of oxygen, water and carbon dioxide.

Packer

A device for sealing off a section of a borehole or part of a borehole.

Partial oxidation

The oxidation of a carbon-containing fuel under conditions that produce a large fraction of CO and hydrogen.

Partial pressure

The pressure that would be exerted by a particular gas in a mixture of gases if the other gases were not present.

 $p\text{CO}_2$

The partial pressure (q.v.) of CO_2 .

PC

Pulverized coal: usually used in connection with boilers fed with finely ground coal.

Pejus level

The level in the ocean below which the functioning of animals deteriorates significantly.

Pelagic

Relating to, or occurring, or living in, or frequenting, the open ocean.

Perfluorocarbon

Synthetically produced halocarbons containing only carbon and fluorine atoms. They are characterized by extreme stability, non-flammability, low toxicity and high global warming potential.

Permeability

Ability to flow or transmit fluids through a porous solid such as rock.

Permian

A geological age between 290 and 248 million years ago.

Phytotoxic

Poisonous to plants.

Piezo-electric transducer

Crystals or films that are able to convert mechanical energy in electrical energy or vice-versa.

Pig

A device that is driven down pipelines to inspect and/or clean them.

Point source

An emission source that is confined to a single small location

Polygeneration

Production of more than one form of energy, for example synthetic liquid fuels plus electricity.

Pore space

Space between rock or sediment grains that can contain fluids.

Poroelastic

Elastic behaviour of porous media.

Porosity

Measure for the amount of pore space in a rock.

Post-combustion capture

The capture of carbon dioxide after combustion.

POX

Partial oxidation (q.v.)

Pre-combustion capture

The capture of carbon dioxide following the processing of the fuel before combustion.

Primary legal source

Legal source not depending on authority given by others.

Probability density function

Function that describes the probability for a series of parameter values.

Prospectivity

A qualitative assessment of the likelihood that a suitable storage location is present in a given area based on the available information

Proven reserve

For oil declared by operator to be economical; for gas about which a decision has been taken to proceed with development and production; see Resource.

Province

An area with separate but similar geological formations.

PSA

Pressure swing adsorption: a method of separating gases using the physical adsorption of one gas at high pressure and releasing it at low pressure.

Rank

Quality criterion for coal.

Reduction

The gain of one or more electrons by an atom, molecule, or ion

Reduction commitment

A commitment by a Party to the Kyoto Protocol to meet its quantified emission limit.

Reforestation

Planting of forests on lands that have previously contained forests but that have been converted to some other use.

Regional scale

A geological feature that crosses an entire basin.

Remediation

The process of correcting any source of failure.

Renewables

Energy sources that are inherently renewable such as solar energy, hydropower, wind, and biomass.

Rep. Value

Representative value

Reproductive dysfunction

Inability to reproduce.

Reserve

A resource (q.v.) from which it is generally economic to produce valuable minerals or hydrocarbons.

Reservoir

A subsurface body of rock with sufficient porosity and permeability to store and transmit fluids.

Residual saturation

The fraction of the injected CO₂ that is trapped in pores by capillary forces.

Resource

A body of a potentially valuable mineral or hydrocarbon.

Retrofit

A modification of the existing equipment to upgrade and incorporate changes after installation.

Risk assessment

Part of a risk-management system.

Root anoxia

Lack, or deficiency, of oxygen in root zone.

Root zone

Part of the soil in which plants have their roots.

Safe Drinking Water Act

An Act of the US Congress originally passed in 1974. It regulates, among other things, the possible contamination of underground water.

Saline formation

Sediment or rock body containing brackish water or brine.

Saline groundwater

Groundwater in which salts are dissolved.

Sandstone

Sand that has turned into a rock due to geological processes.

Saturated zone

Part of the subsurface that is totally saturated with groundwater.

Scenario

A plausible description of the future based on an internally consistent set of assumptions about key relationships and driving forces. Note that scenarios are neither predictions nor forecasts.

SCR

Selective catalytic reduction

Scrubber

A gas-liquid contacting device for the purification of gases or capture of a gaseous component.

Seabed

Borderline between the free water and the top of the bottom sediment.

Seal

An impermeable rock that forms a barrier above and around a reservoir such that fluids are held in the reservoir.

Secondary recovery

Recovery of oil by artificial means, after natural production mechanisms like overpressure have ceased.

Sedimentary basin

Natural large-scale depression in the earth's surface that is filled with sediments.

Seismic profile

A two-dimensional seismic image of the subsurface.

Seismic technique

Measurement of the properties of rocks by the speed of sound waves generated artificially or naturally.

Seismicity

The episodic occurrence of natural or man-induced earthquakes.

Selexol

A commercial physical absorption process to remove CO₂ using glycol dimethylethers.

Shale

Clay that has changed into a rock due to geological processes.

Shift convertor

A reactor in which the water-gas shift reaction, $\text{CO} + \text{H}_2\text{O} = \text{CO}_2 + \text{H}_2$, takes place.

Simplex orifice fitting

An apparatus for measuring the flow rate of gases or liquids.

Sink

The natural uptake of CO₂ from the atmosphere, typically in soils, forests or the oceans.

SMR

Steam methane reforming: a catalytic process in which methane reacts with steam to produce a mixture of H₂, CO and CO₂.

SNG

Synthetic natural gas: fuel gas with a high concentration of methane produced from coal or heavy hydrocarbons.

SOFC

Solid oxide fuel cell: a fuel cell (q.v.) in which the electrolyte is a solid ceramic composed of calcium- or yttrium-stabilized zirconium oxides.

Soil gas

Gas contained in the space between soil grains

Solubility trapping

A process in which fluids are retained by dissolution in liquids naturally present.

Sour gas

Natural gas containing significant quantities of acid gases like H₂S and CO₂.

Source

Any process, activity or mechanism that releases a greenhouse gas, an aerosol, or a precursor thereof into the atmosphere.

Speciation

The determination of the number of species into which a single species will divide over time.

Spill point

The structurally lowest point in a structural trap (q.v.) that can retain fluids lighter than background fluids.

Spoil pile

Heap of waste material derived from mining or processing operations.

SRES

Special Report on Emissions Scenarios; used as a basis for the climate projections in the TAR (q.v.).

Stabilization

Relating to the stabilization atmospheric concentrations of greenhouse gases.

Stable geological formation

A formation (q.v.) that has not recently been disturbed by tectonic movement.

Steam reforming

A catalytic process in which a hydrocarbon is reacted with steam to produce a mixture of H₂, CO and CO₂.

Storage

A process for retaining captured CO₂ so that it does not reach the atmosphere.

Strain gauge

Gauge to determine the deformation of an object subjected to stress.

Stratigraphic

The order and relative position of strata.

Stratigraphic column

A column showing the sequence of different strata.

Stratigraphic trap

A sealed geological container capable of retaining fluids, formed by changes in rock type, structure or facies.

Stimulation

The enhancement of the ability to inject fluids into, or recover fluids from, a well.

Stripper

A gas-liquid contacting device, in which a component is transferred from liquid phase to the gas phase.

Structural trap

Geological structure capable of retaining hydrocarbons, sealed structurally by a fault or fold.

Structure

Geological feature produced by the deformation of the Earth's crust, such as a fold or a fault; a feature within a rock such as a fracture; or, more generally, the spatial arrangement of rocks.

Structure contour map

Map showing the contours of geological structures.

Subsoil

Term used in London and OSPAR conventions, meaning the sediments below the seabed.

Sub-bituminous coal

Coal of a rank between lignite (q.v.) and bituminous (q.v.) coal.

Sustainable

Of development, that which is sustainable in ecological, social and economic areas.

Supercritical

At a temperature and pressure above the critical temperature and pressure of the substance concerned. The critical point represents the highest temperature and pressure at which the substance can exist as a vapour and liquid in equilibrium

Syngas

Synthesis gas (q.v.)

Synthesis gas

A gas mixture containing a suitable proportion of CO and H₂ for the synthesis of organic compounds or combustion.

Synfuel

Fuel, typically liquid fuel, produced by processing fossil fuel.

Tail gas

Effluent gas at the end of a process.

Tailing

The waste resulting from the extraction of value from ore.

TAR

Third Assessment Report of the Intergovernmental Panel on Climate Change

TCR

Total capital requirement

Technical Potential

The amount by which it is possible to reduce greenhouse gas emissions by implementing a technology or practice that has reached the demonstration phase.

Tectonically active area

Area of the Earth where deformation is presently causing structural changes.

Tertiary

Geological age about 65 to 2 million years ago.

Tertiary recovery

Oil generated by a third method; the first is by pressure release or depletion, and the second by oil driven out by the injection of water.

Thermocline

The ocean phenomenon characterized by a sharp change in temperature with depth.

Thermohaline

The vertical overturning of water masses due to seasonal heating, evaporation, and cooling.

Top-down model

A model based on applying macro-economic theory and econometric techniques to historical data about consumption, prices, etc.

Toxemia

Poisoning, usually of the blood.

Toxicology

Scientific study of poisons and their effects.

Tracer

A chemical compound or isotope added in small quantities to trace flow patterns.

Transaction cost

The full cost of transferring property or rights between parties.

Trap

A geological structure that physically retains fluids that are lighter than the background fluids, e.g. an inverted cup.

Ultramafic rocks

An igneous rock consisting almost entirely of iron- and magnesium-rich minerals with a silica content typically less than 45%.

UNCLOS

United Nations Convention on the Law of the Sea, which was adopted at Montego Bay on 10 December 1982.

Unconformity

A geological surface separating older from younger rocks and representing a gap in the geological record.

Under-saturated

A solution that could contain more solute than is presently dissolved in it.

UNFCCC

United Nations Framework Convention on Climate Change, which was adopted at New York on 9 May 1992.

Unminable

Extremely unlikely to be mined under current or foreseeable economic conditions

Updip

Inclining upwards following a structural contour of strata.

Upper ocean

The ocean above 1000m depth.

Vacuum residue

The heavy hydrocarbon mixture that is produced at the bottom of vacuum distillation columns in oil refineries.

Vadose zone

Region from the water table to the ground surface, also called the unsaturated zone because it is partially water-saturated.

Validation

In the context of CDM (q.v.), the process of the independent evaluation of a project by a designated operational entity on the basis of set requirements.

Ventilation

The exchange of gases dissolved in sea-water with the atmosphere, or gas exchange between an animal and the environment.

Verification

The proving, to a standard still to be decided, of the results of monitoring (q.v.). In the context of CDM, the independent review by a designated operational entity of monitored reductions in anthropogenic emissions.

Viscous fingering

Flow phenomenon arising from the flow of two largely immiscible fluids through a porous medium.

Well

Manmade hole drilled into the earth to produce liquids or gases, or to allow the injection of fluids.

Well with multiple completions

Well drilled with multiple branching holes and more than one hole being made ready for use.

Well-bore annulus

The annulus between the rock and the well casing.

Wellhead pressure

Pressure developed on surface at the top of the well.

Wettability

Surface with properties allowing water to contact the surface intimately.

Zero-carbon energy carrier

Carbon-free energy carrier, typically electricity or hydrogen.

