

# GLOSSARY

**3C Combat Climate Change.** A global initiative, launched by Vattenfall, aimed at creating a global alliance of companies that are willing to take the lead in demanding integration of climate issues into the world market and facilitate trading through a global framework that will come into force in 2013. Vattenfall is responsible for co-ordinating the 3C initiative.

**Annual full load** Annual full load is the number of hours a plant would operate at maximum capacity to generate the plant's annual energy output. (Annual full load x Capacity = Energy generation.) Full load hours differ from actual hours of operation since plants do not operate at full capacity at all times during the year.

**Base load** A term that describes electricity or district heating demand that exists irrespective of load fluctuations. This constant demand is met by power plants that operate 24 hours a day, 365 days a year. (See also peak load.)

**Bioenergy** Bioenergy is generated by the use of biomass fuels.

**Biogenic** The term means something generated by living organisms and is used to differentiate between waste fractions that are biogenic compounds (such as food residues, paper, etc.) and fossil compounds (such as plastic etc.).

**Biomass** Biomass refers to products, waste and residues from agriculture, forestry and related industries, as well as the biogenic fraction of industrial and municipal waste.

**Biomass fuel** Biomass fuels are solid, liquid or gaseous fuels with biomass origin, which are used for energy purposes. (This is contrary to biofuel, which predominantly refers to gaseous and liquid fuels used for transportation.)

**Business Group (BG)** Vattenfall is organised into three Business Groups: Vattenfall Central Europe, Vattenfall Nordic and Vattenfall Pan-European. The Business Groups comprise Business Units and Shared Service Centres.

**Business Unit (BU)** Vattenfall's business operations are conducted through Business Units with full responsibility for accounting, controlling, profitability and value creation.

**Capacity** Capacity is the maximum ability of for example a power plant to generate electricity or an electricity distribution grid to transfer electricity. It is usually measured in megawatt (MW). It can refer to input (fuel or thermal capacity, MWth) or output (electric capacity, MWe or heat capacity).

**Carbon dioxide (CO<sub>2</sub>)** Carbon dioxide is naturally present in the atmosphere and involved in photosynthesis, but is also formed during combustion. The chemical formula is CO<sub>2</sub>. Carbon dioxide is necessary for life on earth to exist. It is a greenhouse gas in the atmosphere, see GHG.

**CCS** Carbon Capture and Storage involves technologies for isolating carbon dioxide from flue gas (at combustion plants) and storing it. This means that a significantly lower amount of CO<sub>2</sub> is emitted into the atmosphere.

**CHP** Combined Heat and Power. CHP plants generate both electricity and heat.

**Climate change** Increase of the global temperature caused by a higher concentration of greenhouse gases in the atmosphere, adding to the natural greenhouse effect.

**CSR** Corporate Social Responsibility. A concept whereby companies integrate economical, social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis.

**Deregulate** Abolishing monopoly rights and obligations to open up for competition. Used in this report as a synonym for liberalisation.

**District heating** A method for distributing heat energy for heating a number of buildings from a central location. To achieve this, hot water is circulated through a system of pipes, usually underground.

**EEX** European Energy Exchange, the German electricity exchange.

**Efficiency** The efficiency of a power plant denotes the percentage of the input energy that is converted into electricity and/or heat.

**EMAS** Eco Management and Audit Scheme. European Commission regulations for environmental management and auditing.

**Energy** Several different forms of energy exist, for example potential energy, kinetic energy, thermal energy, and electromagnetic energy. Energy is measured in joule (J) or watt-hours (Wh), meaning power (watt) multiplied by time. It is common practice to use an appropriate prefix, such as kilo for 1,000, mega (M) for 10<sup>6</sup> (1,000,000), giga (G) for 10<sup>9</sup> or tera (T) for 10<sup>12</sup> (1,000,000,000,000).

**EPD** Environmental Product Declaration. An ISO standard for certified environmental product declarations (see [www.environdec.com](http://www.environdec.com)).

**ESP** Electrostatic Precipitator. Cleaning device that removes particles in the flue gas from combustion power plants using electrostatic charge.

**ETS** EU ETS, the European Union Emissions Trading Scheme. Emission trading is a market-based approach to provide economic incentives for achieving reductions in the emissions of pollutants. EU ETS is the largest multi-national emissions trading scheme in the world and is a major pillar of EU's climate policy. The first trading period was 2005–2007 and the second current trading period is 2008–2012.

**Fabric filter** Cleaning device that removes particles from the flue gas on combustion plants using a fine mesh textile filter.

**Fossil fuels** Fossil fuels are originally formed from vegetation and microorganisms that have been transformed into coal, oil and natural gas over the course of millions of years. Today, fossil fuels are the world's biggest source of energy, supplying some 80% of all used energy.

**FGD** Flue gas desulphurisation. Technology to remove sulphur dioxide in flue gas from combustion power plants, often using lime (calcium oxide) or limestone (calcium carbonate). A common by-product from FGD is gypsum.

**Gas** Natural gas is a fossil fuel consisting mainly of methane. Natural gas is commercially produced from oil fields and natural gas fields. It is used in power generation, transportation etc. and is most often transported in pipelines. Biogas is formed when organic matter decays.

**Generation** Generation of electricity. (Usage: generation of electricity, production of heat)

**GHG** Greenhouse gases — gases in the atmosphere that contribute to the greenhouse effect, such as carbon dioxide, methane and nitrous dioxide (N<sub>2</sub>O).

**Global Compact** The UN Global Compact is an initiative to encourage businesses worldwide to adopt sustainable business practices and comprises of ten principles in the areas of human rights, labour, environment and anti-corruption.

**GWh** A measurement of energy. Abbreviation of gigawatt-hour, or 10<sup>9</sup> (1,000,000,000) watt-hours.

**Hard Coal** Hard coal is a black, sedimentary rock type with a carbon content of 84–91%. See also fossil fuel.

**Hydro power** Hydro power plants use the gravitational force of running water to generate electricity. In reservoir plants, water is kept in dams to be able to regulate the generation. In run-off river plants, turbines are placed directly in the water stream. Pumped storage plants are used to store energy generated from other sources. In Europe, 75% of potential hydropower has been exploited.

**IAEA** International Atomic Energy Agency. UN's centre of cooperation in the nuclear field. IAEA works with its member states and multiple partners worldwide to promote safe, secure and peaceful nuclear technologies ([www.iaea.org](http://www.iaea.org)).

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**IEA** International Energy Agency. An independent energy-related organisation connected to the OECD. The IEA has 23 members, all of which are industrialised countries. The organisation works to reduce dependency on oil via energy conservation and the development of renewable energy systems.

**ISO14001** An international standard to certify environmental management systems.

**Joule** Unit of work or energy. 1 joule = 1 watt second =  $2.7778 \times 10^{-4}$  watt-hour. Since joule is a small unit, giga joule (GJ) is often used,  $10^9$  Joules, which is equivalent to 278 kWh.

**KWh** Unit of energy. Abbreviation of kilowatt-hour, or 1,000 watt-hours.

**Lignite** Lignite is a soft brown type of coal, with characteristics that places it somewhere between hard coal and peat. Lignite has a lower energy content and different characteristics than the longer-compacted hard coal.

**MW, MW<sub>e</sub>, MW<sub>th</sub>** A unit of power (energy per unit of time). See also capacity.

**MWh** Unit of energy. Abbreviation of megawatt-hour, or  $10^6$  watt-hours.

**MyOpinion** Vattenfall's annual employee survey.

**N<sub>2</sub>O** Nitrous oxide. A greenhouse gas.

**NordPool** The Nordic electricity exchange.

**NO<sub>x</sub>** Nitrogen oxides (NO and NO<sub>2</sub>) are formed when nitrogen reacts with oxygen during combustion. NO<sub>x</sub> have many adverse effects on the environment such as causing ground-level ozone that triggers respiratory problems, and contributing to acidification and eutrophication.

**Nuclear power** In nuclear reactors, uranium is used to heat water to generate electricity. Nuclear reactors are normally reloaded with new fuel every 12–24 months, during a stop when maintenance also is done. Nuclear power is used as a base load power in many energy systems.

**Ocean energy** Energy in waves, currents and tidal streams is used to generate electricity. For example, surface buoys may be used to absorb wave energy. Wave power is predicted to be the next commercial renewable energy source after wind power. Many potential pilot projects are on-going and technology development is expected to reduce costs over time.

**Oil** A mixture of different hydrocarbons usually called crude oil. Crude oil cannot be used directly, but is a raw material that is refined at an oil refinery into a range of products. See also fossil fuel.

**OSART** Operational Safety Review Team, an IAEA programme under which international teams of experts conduct in-depth reviews of operational safety performance at nuclear power plants

**Oxyfuel combustion** A type of CCS technology. The Oxyfuel combustion process eliminates nitrogen from the flue gas by combusting the fuel in a mixture of oxygen and recycled flue gases. After combustion, the flue gas is cleaned. The cleaned flue gas primarily consists of CO<sub>2</sub> and water vapour. By cooling the flue gas, the water vapour condenses thereby creating an almost pure CO<sub>2</sub> stream. The CO<sub>2</sub> can be compressed, dried and further purified before being transported to a storage site.

**Peak load** Short term peak demand of electricity or district heating is called peak load (see also base load).

**Peat** Peat is an accumulation of partially decayed vegetation matter and forms in wetlands or peat lands, variously called bogs, moors, muskegs, pocosins, mires, and peat swamp forests. Peat is not classified as biomass or as fossil fuel according to IPCC, although it could be defined as slowly renewable.

**Renewable energy** Energy from natural resources that are renewable, or naturally replenished. For example wind, solar, geothermal, wave, tidal, hydropower, biomass and biogas.

**SCR** Selective catalytic reduction. Technology to reduce nitrogen oxides in flue gas by converting it into nitrogen (N<sub>2</sub>) and water using a catalyst.

**Scram** A non-planned shut-down of a nuclear reactor.

**SNCR** Selective non-catalytic reduction. Technology to reduce nitrogen oxides in flue gas by injecting ammonia or urea into the furnace.

**SKB** Svensk Kärnbränslehantering AB. Swedish Nuclear Fuel and Waste Management Company, tasked with managing Swedish nuclear and radioactive waste in a safe way. Partly owned by Vattenfall.

**SO<sub>2</sub>** Sulphur dioxide is formed when fuels containing sulphur compounds, such as coal and oil, are combusted. When SO<sub>2</sub> is emitted to the air, it causes acidification of water and soil.

**Sustainable development** Defined by the Brundtland commission (UN's commission on environment and development) in 1987. "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

**Thermal power** Electricity generated via a heating process, such as a gas turbine or a steam cycle in a coal-fired or nuclear power plant (compare CHP plant).

**TWh** Unit of energy. Abbreviation of terawatt-hour, or  $10^{12}$  watt-hours.

**UN** United Nations

**Unbundling** Unbundling rules form part of national legislation, based on EU directives, and state that transmission and distribution business must be separated (for instance placed in separate legal entities) from other businesses, especially the electricity generation and sales businesses. Accordingly, the regulated monopoly business is separated from the businesses under free competition.

**Uranium** A silvery-gray metallic chemical element with the highest atomic weight of the naturally occurring elements, it is approximately 70% denser than lead. Uranium is weakly radioactive and occurs naturally in low concentrations (a few parts per million) in soil, rock and water. It is commercially extracted from uranium-bearing minerals such as uraninite. When used in nuclear reactors, uranium is enriched which means that the content of the isotope U235 has been increased.

**Value chain** Process for creating value. Within the power industry this includes the generation, transmission, distribution and selling of electricity.

**Waste incineration** Waste incineration plants generate heat and/or electricity. As combustible waste mainly consists of organic (biogenic) material waste is considered to mainly generate bioenergy.

**Wind power** Electricity is generated in wind turbines, often built in clusters called wind farms. Power generation depend on wind conditions. Offshore locations generally have stronger winds, but construction and maintenance is more difficult. Therefore, offshore wind power is more expensive than land-based wind power.