

# Glossary

## *Energy*

**Energy:** The capacity to do work. Energy cannot be created or destroyed; it can merely be converted from one form to another.

**Renewable Energy:** Derived from naturally generated and replenished energy resources with minimal impact on the environment, such as the sun and wind.

**Non-Renewable Energy:** Derived from energy sources that cannot be replenished, such as oil and natural gas.

**Greenhouse Effect:** The warming of the earth's atmosphere caused by gases that allow sunlight to pass through, but absorb the heat radiated back from the earth's surface.

**Greenhouse Gas:** Any of the atmospheric gases that contribute to the greenhouse effect, including water vapour, carbon dioxide (CO<sub>2</sub>), methane, nitrous oxide and ozone.

**Global Warming:** An increase in the average temperature of the earth's atmosphere that will eventually lead to a change in climatic conditions.

**Climate Change:** Any long-term significant change in the prevailing weather of a region, or the earth as a whole. 'Prevailing weather' may include average temperature, precipitation and wind patterns. It involves changes in the variability or average state of the atmosphere over durations ranging from decades to millions of years. In recent usage, especially in the context of environmental policy, the term 'climate change' usually refers to changes in modern climate.

**Fossil Fuels:** Hydrocarbons that are formed from the decomposition of plants and animals over millions of years and which are found in the earth's crust.

## *Solar Energy*

**Solar Energy:** The solar energy radiated from the sun. It is typically converted into electricity through photovoltaic panels or concentrated solar thermal plants.

**Solar Panel:** Consists of a group of solar cells which convert the sun's radiant energy into heat or electricity.

**Photovoltaic Cell / Solar Cell:** Converts light energy directly into electrical energy.

**Photovoltaic Panel:** Consists of a group of photovoltaic cells which convert light energy directly into electrical energy.

**Photovoltaic Effect:** The basic physical process through which a solar cell converts sunlight into electricity.

**Solar Thermal Collectors:** Devices designed to collect the heat energy from the sun and convert it into electricity.

**Evacuated Tube System:** Consists of multiple evacuated glass tubes with solar absorbers that collect the heat energy from the sun.

**Solar Flat Panel:** A box with a glass cover containing piping, usually painted black, that uses the heat energy of the sun to heat up water as it passes through.

**Solar-Assisted Cooling:** Solar chillers use thermal energy to cool down and/or dehumidify the air in a similar way to a refrigerator or conventional air conditioner.

### *Wind Energy*

**Wind:** Air moving from a high-pressure to a low-pressure system.

**Wind Power:** Kinetic energy of air which can be converted into mechanical energy.

**Wind Turbine:** A rotating device converting the kinetic energy of wind into mechanical energy.

**Windmill:** A rotating device converting the kinetic energy of wind into mechanical energy, which is used directly to power machinery such as a pump or grinding stone.

**Wind Generator, Wind Turbine, Wind-Power Unit (WPU), Wind-Energy Converter (WEC), or Aero Generator:** A rotating device converting the kinetic energy of the wind into mechanical energy, which is then converted into electricity.

**Wind Farm:** A power plant consisting of wind-powered devices to convert the kinetic energy of wind into electricity.

### *Hydro Energy*

**Hydro Power:** Kinetic energy of water used to generate electrical energy.

**Hydroelectricity:** Electricity generated by hydro power, i.e. by harnessing the gravitational force of falling or flowing water in order to drive turbines.

**Hydroelectric Power Plant:** Utilises the energy of water to generate electricity. In the case of a **dam** a pressure head is created by constructing a dam wall. The potential energy of the water is then used to drive a turbine. A **run-off-river system** utilises the kinetic energy of the water by diverting part of the stream through a turbine, which is then returned back to the river further downstream.

**Pumped Storage Plant:** During off-peak times surplus electricity is used to pump water to a mountain-top reservoir. The water is then utilised for generating electricity on demand during peak loads. Currently it is the only practical way of storing 'electricity' on a large scale.

### *Biomass Energy*

**Biomass Energy:** Stored solar energy from material of recent biological origin that can be converted into electricity, fuel, heat and fertiliser. This energy is the result of photosynthesis which converts light energy from the sun into chemical energy, which is stored in plants.

**Biofuel:** Solid, liquid or gaseous fuel derived from relatively recently dead biological material, as opposed to fossil fuels, which are derived from long dead biological material. Theoretically, biofuels can be produced from any (biological) carbon source, although the most common sources are photosynthesising plants. Various plants and plant-derived materials are used for biofuel manufacturing.

### *Geothermal Energy and Ocean Energy*

**Geothermal Energy:** Heat derived from deep underneath the earth's crust.

**Geothermal Power Plant:** Uses the earth's natural heat to vaporise water or an organic medium. The steam then powers a turbine which produces electricity.

**Geothermal Heat Plant:** Uses the earth's natural heat directly for heating homes, buildings and water supplies.

**Wave Energy:** Kinetic energy from incoming waves, converted into electricity through a hydraulic, mechanical or pneumatic power take-off system.

**Tidal Energy:** Kinetic energy of tidal streams that are used to power turbines to generate electricity. These devices operate on a similar concept to a wind turbine in an air medium.

### *Energy Efficiency*

**Energy Efficiency:** Using less energy to provide the same level of energy service, e.g. insulating a home to use less heating and cooling energy to achieve the same temperature, or installing fluorescent lights and/or skylights instead of incandescent lights to attain the same level of illumination.