Renewable Energy Glossary

Acetogen

A microorganism involved in anaerobic respiration during biogas production.

AGC

Automatic Generation Control, the ability of a system operator to remotely ramp a unit up or down in response to changes in load.

Amorphous silicon

Silicon that has a disordered atomic structure and can be deposited onto large substrates to create thin film photovoltaic cells manufactured in long sheets.

Anaerobic digestion

A process where micro-organisms break down substances in the absence of oxygen. The process can be used in the production of biogas.

Baseload generation

Electric generation units that typically run all 24 hours in a day.

Binary power plant

A power plant that transfers heat from hot water to a working fluid that vaporizes at lower temperatures than water.

Biomass

Fuels derived from recently living organisms; sometimes also includes fuels derived from municipal solid waste.

Cadmium telluride

A polycrystalline thin-film photovoltaic material made up of cadmium and telluride cells.

Capacity

The maximum electric power capability of a generating unit or transmission line measured in MW.

Capacity factor

The actual output of a generating unit over a specific period of time divided by the unit's total capacity multiplied by the total number of hours in the period.

Capital costs

Initial one-time costs of planning, designing, and constructing a facility. Also refers to additional costs of long-term investment in facilities maintenance or upgrade (typically investments involving components with a life of greater than one year).

Carbon neutral

A process that has no net emissions of greenhouse gases into the atmosphere.

Co-firing

Simultaneous use of multiple fuels to create thermal energy.

Combined Heat and Power (CHP)

A process that uses fuel to create both useable heat and electricity.

Combined-cycle turbine

A device that uses both a gas turbine and a steam turbine to convert thermal energy to kinetic energy.

Combustor

The component of a power plant where fuel is burned.

Concentrator PV

A photovoltaic module that includes optical components such as lenses to direct and concentrate sunlight onto multiple PV cells.

Conventional reservoir

A natural collection of hot water or steam trapped underground in cracks and porous rock by a layer of impermeable rock. Often used as a source for geothermal power.

Copper indium diselenide

A polycrystalline thin-film photovoltaic material made up of copper, indium, and diselenide cells.

CSP

Concentrated Solar Power, a means of electricity generation by concentrating sunlight to create heat that is in turn converted to electricity.

Demonstration power plant

A pre-commercial project used to demonstrate the viability of a new technology.

Direct combustion

Combustion of a material without first converting the material to another form.

Dispatch stack

The list of supply sources, in order of value to the system, that are dispatched to serve a specific level of load.

Dispatchability

The capability for a system operator or plant operator to control the output of a generating unit.

Dry rock formation

An underground location where rocks are heated to high temperatures by the heat of the earth but where little or no water exists within the rock.

Dry steam

Steam that does not contain much, if any, liquid.

EGS

Enhanced Geothermal Systems - geothermal power plants that use dry rock as the heat source.

Energy

A quantity of electricity; often measured in MWh.

External combustion engine

An engine that converts thermal energy to kinetic energy with combustion occurring outside the chamber (cylinder or turbine).

Feedstock

Raw material to supply or fuel a power plant, machine or industrial process.

Flash steam

Steam that is created by spraying hot water into a vessel where the inside of the vessel is held at lower-than-atmospheric pressure, causing some of the water to vaporize into steam.

Flash tank

A vessel used for creating and separating steam from hot water by maintaining a low-pressure environment.

Fluidized bed boiler

A combustor/boiler device that uses jets of turbulent hot air and a bed of free-flowing granular matter such as sand or limestone to suspend fuel particles in mid-air.

Francis turbine

A propeller-type water turbine where the blades are curved so that water strikes the outside of the blade and is directed toward the center of the blade, causing the turbine to spin.

Fresnel linear concentrator

A linear concentrator that focuses the sun's energy on a receiver tube positioned above several mirrors.

Fumarole

A hole in the earth in a volcanic area from which hot gases or smoke escape.

Gas turbine

A device that converts the thermal energy of hot air and hot fuel to kinetic energy of a spinning shaft.

Gasification

The process of converting a liquid or solid substance into a gas through heating with a controlled amount of oxygen or steam.

Geopressure

An unusually high underground pressure caused by a subsurface formation.

Gross head

The vertical distance from the water source to the spot where the water discharges from a water turbine.

Head

A measure (in feet) of the pressure of falling water.

Heat engine

A device that converts thermal energy to kinetic energy.

Heat exchanger

A device that transfers heat between two substances.

Hydrocarbon reservoir

A natural collection of hydrocarbons trapped underground in cracks and porous rock.

Hydrothermal fluid

Water or steam that has been heated underground by the heat of the earth.

Hydrothermal reservoir

A natural collection of hot water or steam trapped underground in cracks and porous rock.

Impoundment

Storing of water behind a dam.

Integration

The process of utilizing sources of power on the grid in a safe and reliable manner while maintaining acceptable levels of power quality.

Internal combustion engine

An engine that converts thermal energy to kinetic energy with combustion occurring inside the chamber (cylinder or turbine).

Inverter

An electrical device that converts direct current (DC) electricity to (AC) electricity.

Isobutane

(CH3)2CHCH3 - a gas used as a refrigerant and a fuel.

Kaplan turbine

A propeller-type water turbine that has adjustable blades.

Landfill gas

A gas consisting mostly of methane that is created by anaerobic digestion occurring in landfills.

Large hydro

A hydro plant with a capacity of greater than 30 MW. Definitions sometimes vary based on regulatory rules or legislative statutes. In some regions, the cut-off is as low 5 MW and in others it is as high as 50 MW.

Levelized costs

The present value of the total cost of building and operating a generating plant over its economic life divided by the expected lifetime output of that unit.

Linear concentrator

A system of collectors that capture the sun's energy with large mirrors that reflect and focus the sunlight onto a linear receiver tube.

Magma

Molten material beneath or within the earth's crust.

Methanogens

Microorganisms that produce methane under certain conditions.

Micro hydro

A hydro plant with a capacity below 100 kW.

Molten salts

Substances that are similar to natural salt (sodium chloride); these salts become liquid at high temperatures and have a high capacity for storing heat.

Municipal Solid Waste (MSW) generation

A biopower generator that uses garbage as fuel for direct combustion.

Nameplate rating

The maximum rated output of a generation unit in MW under specific conditions designated by the manufacturer.

Net head

A measure in feet of the pressure of falling water that adjusts the gross head for the friction caused by the channel or penstock directing the water.

Net meter

A meter that measures the difference between electricity delivered from the grid and electricity put onto the grid at a facility that both consumes and generates electricity.

O&M costs

Ongoing operations and maintenance costs associated with running a facility.

Parabolic dish

A concentrator that uses a bowl-shaped device to reflect and focus sunlight.

Parabolic trough

A linear concentrator that uses a parabola-shaped tube to reflect and focus sunlight.

Peak load

The highest demand placed on the grid by a load or group of loads over a specified period of time.

Peaking unit

A unit that runs only during hours where loads are at their highest point in the day or year.

Pelton turbine

A type of water turbine in which specially shaped buckets mounted on the perimeter of a wheel are struck by a fast-flowing water jet.

Penetration

The percentage of the total generation mix accounted for by a specific generation source.

Penstock

A channel or pipe used to convey water to a water turbine in a hydropower facility.

Pentane

C5H12 - a gas used as a refrigerant, fuel and solvent.

Phase-change materials

Materials that absorb a large amount of heat when going from solid to liquid and release a large amount of heat when going from liquid to solid.

Photovoltaic cell

A solid-state electronic device that converts light directly into electricity.

Pile burner

A device that utilizes a separate furnace and a boiler to burn fuel to heat water in a two-stage process.

Pondage

A device for storing water that does not materially impact the flow in the primary waterway.

Power

The rate of producing, transferring, or using electricity expressed in watts, kilowatts, or megawatts.

Predictability

The ability to accurately forecast the output of specific generation units or groups of generation units.

Propeller turbine

A water turbine shaped like a boat propeller with multiple blades that are all constantly contacted by water.

PV

Photovoltaic cell, a solid-state electronic device that converts light directly into electricity.

Reciprocating engine

An internal combustion engine that converts thermal energy to the kinetic energy of a crankshaft turned by pistons moving up and down in cylinders.

Run-of-the-river

A hydroelectric project that does not use impoundment to store water.

Semiconductor

A substance that can conduct electricity under some conditions but not others.

Small hydro

A hydro plant with a capacity between 100 kW and 30 MW. Definitions sometimes vary. In some regions the top cutoff is considered to be 5 MW; in others it is 50 MW.

Steam turbine

A device that converts the thermal energy of steam to the kinetic energy of a spinning shaft.

Stirling engine

An external combustion engine that converts thermal energy to the kinetic energy of a crankshaft turned by pistons moving up and down in cylinders.

Stoker boilers

A mechanical system that feeds solid fuel into the furnace of a steam boiler.

Synthetic gas

A gas consisting of hydrogen, carbon monoxide, and often carbon dioxide that is produced through a human-controlled process. Also called synthesis gas.

Thermal energy

Also known as heat energy, thermal energy is the energy associated with atomic and molecular vibration within a substance.

Thermal storage

Technology that stores thermal (heat) energy in a reservoir.

Transformer

A device used to change voltage on an AC electrical system.

Transmission system

The set of devices that deliver electricity over high voltage lines from generators to the interconnection with the distribution system.

Turgo turbine

A variation of the Pelton turbine, which contains only one blade to capture the kinetic energy of water.

Utility-scale power plant

A unit that generates power delivered into the transmission grid.

Variability

Fluctuation in the output of a generating unit over time due to conditions outside the control of an operator.

Wild AC

Alternating current that varies in frequency.

Wind power density

A measure of the effective force of wind; measured in watts per square meter at a specified height.