



Words to Know

A

acid rain: Rain with a high concentration of sulfuric acid, which can damage cars, buildings, plants, and water supplies where it falls.

adobe: Bricks that are made from clay or earth, water, and straw, and dried in the sun.

alkane: A kind of hydrocarbon in which the molecules have the maximum possible number of hydrogen atoms and no double bonds.

anaerobic: Without air; in the absence of air or oxygen.

anemometer: A device used to measure wind speed.

anthracite: A hard, black coal that burns with little smoke.

aquaculture: The formal cultivation of fish or other aquatic life forms.

atomic number: The number of protons in the nucleus of an atom.

atomic weight: The combined number of an atom's protons and neutrons.

attenuator: A device that reduces the strength of an energy wave, such as sunlight.

B

balneology: The science of bathing in hot water.

barrel: A common unit of measurement of crude oil, equivalent to 42 U.S. gallons; barrels of oil per day, or BOPD, is a standard measurement of how much crude oil a well produces.

- biodiesel:** Diesel fuel made from vegetable oil.
- bioenergy:** Energy produced through the combustion of organic materials that are constantly being created, such as plants.
- biofuel:** A fuel made from organic materials that are constantly being created.
- biomass:** Organic materials that are constantly being created, such as plants.
- bitumen:** A black, viscous (oily) hydrocarbon substance left over from petroleum refining, often used to pave roads.
- bituminous coal:** Mid-grade coal that burns with a relatively high flame and smoke.
- brine:** Water that is very salty, such as the water found in the ocean.
- British thermal unit (Btu or BTU):** A measure of heat energy, equivalent to the amount of energy it takes to raise the temperature of one pound of water by one degree Fahrenheit.
- butyl rubber:** A synthetic rubber that does not easily tear. It is often used in hoses and inner tubes.

C

- carbon sequestration:** Storing the carbon emissions produced by coal-burning power plants so that pollutants are not released in the atmosphere.
- catalyst:** A substance that speeds up a chemical reaction or allows it to occur under different conditions than otherwise possible.
- cauldron:** A large metal pot.
- CFC (chlorofluorocarbon):** A chemical compound used as a refrigerant and propellant before being banned for fear it was destroying the ozone layer.
- Clean Air Act:** A U.S. law intended to reduce and control air pollution by setting emissions limits for utilities.
- climate-responsive building:** A building, or the process of constructing a building, using materials and techniques that take advantage of natural conditions to heat, cool, and light the building.
- coal:** A solid hydrocarbon found in the ground and formed from plant matter compressed for millions of years.
- coke:** A solid organic fuel made by burning off the volatile components of coal in the absence of air.

WORDS TO KNOW

cold fusion: Nuclear fusion that occurs without high heat; also referred to as low energy nuclear reactions.

combustion: Burning.

compact fluorescent bulb: A lightbulb that saves energy as conventional fluorescent bulbs do, but that can be used in fixtures that normally take incandescent lightbulbs.

compressed: To make more dense so that a substance takes up less space.

conductive: A material that can transmit electrical energy.

convection: The circulation movement of a substance resulting from areas of different temperatures and/or densities.

core: The center of the Earth.

coriolis force: The movement of air currents to the right or left caused by Earth's rotation.

corrugated steel: Steel pieces that have parallel ridges and troughs.

critical mass: An amount of fissile material needed to produce an ongoing nuclear chain reaction.

criticality: The point at which a nuclear fission reaction is in controlled balance.

crude oil: The unrefined petroleum removed from an oil well.

crust: The outermost layer of the Earth.

curie: A unit of measurement that measures an amount of radiation.

current: The flow of electricity.

D

decay: The breakdown of a radioactive substance over time as its atoms spontaneously give off neutrons.

deciduous trees: Trees that shed their leaves in the fall and grow them in the spring. Such trees include maples and oaks.

decommission: To take a nuclear power plant out of operation.

dependent: To be reliant on something.

distillation: A process of separating or purifying a liquid by boiling the substance and then condensing the product.

distiller's grain: Grain left over from the process of distilling ethanol, which can be used as inexpensive high-protein animal feed.

drag: The slowing force of the wind as it strikes an object.

drag coefficient: A measurement of the drag produced when an object such as a car pushes its way through the air.

E

E85: A blend of 15 percent ethanol and 85 percent gasoline.

efficient: To get a task done without much waste.

electrolysis: A method of producing chemical energy by passing an electric current through a type of liquid.

electromagnetism: Magnetism developed by a current of electricity.

electron: A negatively charged particle that revolves around the nucleus in an atom.

embargo: Preventing the trade of a certain type of commodity.

emission: The release of substances into the atmosphere. These substances can be gases or particles.

emulsion: A liquid that contains many small droplets of a substance that cannot dissolve in the liquid, such as oil and water shaken together.

enrichment: The process of increasing the purity of a radioactive element such as uranium to make it suitable as nuclear fuel.

ethanol: An alcohol made from plant materials such as corn or sugar cane that can be used as fuel.

experimentation: Scientific tests, sometimes of a new idea.

F

feasible: To be possible; able to be accomplished or brought about.

feedstock: A substance used as a raw material in the creation of another substance.

field: An area that contains many underground reservoirs of petroleum or natural gas.

fissile: Term used to describe any radioactive material that can be used as fuel because its atoms can be split.

fission: Splitting of an atom.

flexible fuel vehicle (FFV): A vehicle that can run on a variety of fuel types without modification of the engine.

WORDS TO KNOW

flow: The volume of water in a river or stream, usually expressed as gallons or cubic meters per unit of time, such as a minute or second.

fluorescent lightbulb: A lightbulb that produces light not with intense heat but by exciting the atoms in a phosphor coating inside the bulb.

fossil fuel: An organic fuel made through the compression and heating of plant matter over millions of years, such as coal, petroleum, and natural gas.

fusion: The process by which the nuclei of light atoms join, releasing energy.

G

gas: An air-like substance that expands to fill whatever container holds it, including natural gas and other gases commonly found with liquid petroleum.

gasification: A process of converting the energy from a solid, such as coal, into gas.

gasohol: A blend of gasoline and ethanol.

gasoline: Refined liquid petroleum most commonly used as fuel in internal combustion engines.

geothermal: Describing energy that is found in the hot spots under the Earth; describing energy that is made from heat.

geothermal reservoir: A pocket of hot water contained within the Earth's mantle.

global warming: A phenomenon in which the average temperature of the Earth rises, melting icecaps, raising sea levels, and causing other environmental problems.

gradient: A gradual change in something over a specific distance.

green building: Any building constructed with materials that require less energy to produce and that save energy during the building's operation.

greenhouse effect: A phenomenon in which gases in the Earth's atmosphere prevent the sun's radiation from being reflected back into space, raising the surface temperature of the Earth.

greenhouse gas: A gas, such as carbon dioxide or methane, that is added to the Earth's atmosphere by human actions. These gases trap heat and contribute to global warming.

H

halogen lamp: An incandescent lightbulb that produces more light because it produces more heat, but lasts longer because the filament is enclosed in quartz.

Heisenberg uncertainty principle: The principle that it is impossible to know simultaneously both the location and momentum of a subatomic particle.

heliostat: A mirror that reflects the sun in a constant direction.

hybrid vehicle: Any vehicle that is powered in a combination of two ways; usually refers to vehicles powered by an internal combustion engine and an electric motor.

hybridized: The bringing together of two different types of technology.

hydraulic energy: The kinetic energy contained in water.

hydrocarbon: A substance composed of the elements hydrogen and carbon, such as coal, petroleum, and natural gas.

hydroelectric: Describing electric energy made by the movement of water.

hydropower: Any form of power derived from water.

I

implement: To put something into practice.

incandescent lightbulb: A conventional lightbulb that produces light by heating a filament to high temperatures.

infrastructure: The framework that is necessary to the functioning of a structure; for example, roads and power lines form part of the infrastructure of a city.

inlet: An opening through which liquid enters a device, or place.

internal combustion engine: The type of engine in which the burning that generates power takes place inside the engine.

isotope: A “species” of an element whose nucleus contains more neutrons than other species of the same element.

K

kilowatt-hour: One kilowatt of electricity consumed over a one-hour period.

kinetic energy: The energy associated with movement, such as water that is in motion.

Kyoto Protocol: An international agreement among many nations setting limits on emissions of greenhouse gases; intended to slow or prevent global warming.

L

lava: Molten rock contained within the Earth that emerges from cracks in the Earth's crust, such as volcanoes.

lift: The aerodynamic force that operates perpendicular to the wind, owing to differences in air pressure on either side of a turbine blade.

lignite: A soft brown coal with visible traces of plant matter in it that burns with a great deal of smoke and produces less heat than anthracite or bituminous coal.

liquefaction: The process of turning a gas or solid into a liquid.

LNG (liquefied natural gas): Gas that has been turned into liquid through the application of pressure and cold.

LPG (liquefied petroleum gas): A gas, mainly propane or butane, that has been turned into liquid through the use of pressure and cold.

lumen: A measure of the amount of light, defined as the amount of light produced by one candle.

M

magma: Liquid rock within the mantle.

magnetic levitation: The process of using the attractive and repulsive forces of magnetism to move objects such as trains.

mantle: The layer of the Earth between the core and the crust.

mechanical energy: The energy output of tools or machinery.

meltdown: Term used to refer to the possibility that a nuclear reactor could become so overheated that it would melt into the earth below.

mica: A type of shiny silica mineral usually found in certain types of rocks.

modular: An object which can be easily arranged, rearranged, replaced, or interchanged with similar objects.

mousse: A frothy mixture of oil and seawater in the area where an oil spill has occurred.

N

nacelle: The part of a wind turbine that houses the gearbox, generator, and other components.

natural gas: A gaseous hydrocarbon commonly found with petroleum.

negligible: To be so small as to be insignificant.

neutron: A particle with no electrical charge found in the nucleus of most atoms.

NGL (natural gas liquid): The liquid form of gases commonly found with natural gas, such as propane, butane, and ethane.

nonrenewable: To be limited in quantity and unable to be replaced.

nucleus: The center of an atom, containing protons and in the case of most elements, neutrons.

O

ocean thermal energy conversion (OTEC): The process of converting the heat contained in the oceans' water into electrical energy.

octane rating: The measure of how much a fuel can be compressed before it spontaneously ignites.

off-peak: Describing period of time when energy is being delivered at well below the maximum amount of demand, often nighttime.

oil: Liquid petroleum; a substance refined from petroleum used as a lubricant.

organic: Related to or derived from living matter, such as plants or animals; composed mainly of carbon atoms.

overburden: The dirt and rocks covering a deposit of coal or other fossil fuel.

oxygenate: A substance that increases the oxygen level in another substance.

ozone: A molecule consisting of three atoms of oxygen, naturally produced in the Earth's atmosphere; ozone is toxic to humans.

P

parabolic: Shaped like a parabola, which is a certain type of curve.

paraffin: A kind of alkane hydrocarbon that exists as a white, waxy solid at room temperature and can be used as fuel or as a wax for purposes such as sealing jars or making candles.

passive: A device that takes advantage of the sun's heat but does not use an additional source of energy.

peat: A brown substance composed of compressed plant matter and found in boggy areas; peat can be used as fuel itself, or turns into coal if compressed for long enough.

perpetual motion: The power of a machine to run indefinitely without any energy input.

petrochemicals: Chemical compounds that form in rocks, such as petroleum and coal.

petrodiesel: Diesel fuel made from petroleum.

petroleum: Liquid hydrocarbon found underground that can be refined into gasoline, diesel fuel, oils, kerosene, and other products.

pile: A mass of radioactive material in a nuclear reactor.

plutonium: A highly toxic element that can be used as fuel in nuclear reactors.

polymer: A compound, either synthetic or natural, that is made of many large molecules. These molecules are made from smaller, identical molecules that are chemically bonded.

pristine: Not changed by human hands; in its original condition.

productivity: The output of labor per amount of work.

proponent: Someone who supports an idea or cause.

proton: A positively charged particle found in the nucleus of an atom.

R

radioactive: Term used to describe any substance that decays over time by giving off subatomic particles such as neutrons.

RFG (reformulated gasoline): Gasoline that has an oxygenate or other additive added to it to decrease emissions and improve performance.

rem: An abbreviation for “roentgen equivalent man,” referring to a dose of radiation that will cause the same biological effect (on a “man”) as one roentgen of X-rays or gamma rays.

reservoir: A geologic formation that can contain liquid petroleum and natural gas.

reservoir rock: Porous rock, such as limestone or sandstone, that can hold accumulations of petroleum or natural gas.

retrofit: To change something, like a home, after it is built.

rotor: The hub to which the blades of a wind turbine are connected; sometimes used to refer to the rotor itself and the blades as a single unit.

S

scupper: An opening that allows a liquid to drain.

seam: A deposit of coal in the ground.

sedimentary rock: A rock formed through years of minerals accumulating and being compressed.

seismology: The study of movement within the earth, such as earthquakes and the eruption of volcanoes.

sick building syndrome: The tendency of buildings that are poorly ventilated, lighted, and humidified, and that are made with certain synthetic materials to cause the occupants to feel ill.

smog: Air pollution composed of particles mixed with smoke, fog, or haze in the air.

stall: The loss of lift that occurs when a wing presents too steep an angle to the wind and low pressure along the upper surface of the wing decreases.

strip mining: A form of mining that involves removing earth and rocks by bulldozer to retrieve the minerals beneath them.

stored energy: The energy contained in water that is stored in a tank or held back behind a dam in a reservoir.

subsidence: The collapse of earth above an empty mine, resulting in a damaged landscape.

surcharge: An additional charge over and above the original cost.

superconductivity: The disappearance of electrical resistance in a substance such as some metals at very low temperatures.

T

thermal energy: Any form of energy in the form of heat; used in reference to heat in the oceans' waters.

thermal gradient: The differences in temperature between different layers of the oceans.

thermal mass: The measure of the amount of heat a substance can hold.

thermodynamics: The branch of physics that deals with the mechanical actions or relations of heat.

WORDS TO KNOW

tokamak: An acronym for the Russian-built toroidal magnetic chamber, a device for containing a fusion reaction.

transitioning: Changing from one position or state to another.

transparent: So clear that light can pass through without distortion.

trap: A reservoir or area within Earth's crust made of nonporous rock that can contain liquids or gases, such as water, petroleum, and natural gas.

trawler: A large commercial fishing boat.

Tromb  wall: An exterior wall that conserves energy by trapping heat between glazing and a thermal mass, then venting it into the living area.

turbine: A device that spins to produce electricity.

U

uranium: A heavy element that is the chief source of fuel for nuclear reactors.

V

viable: To be possible; to be able to grow or develop.

voltage: Electric potential that is measured in volts.

W

wind farm: A group of wind turbines that provide electricity for commercial uses.

work: The conversion of one form of energy into another, such as the conversion of the kinetic energy of water into mechanical energy used to perform a task.

Z

zero point energy: The energy contained in electromagnetic fluctuations that remains in a vacuum, even when the temperature has been reduced to very low levels.