

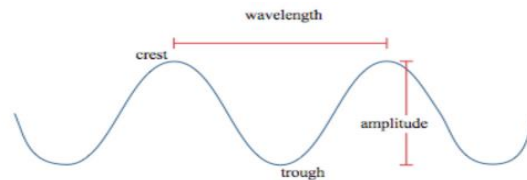
## OREEP VOCABULARY

### A

**Alternating current** - An electric current that reverses its direction many times a second at regular intervals, typically used in power supplies.



**Amplitude** - Height of the wave.



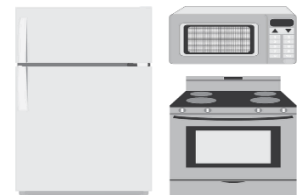
**Amps** - How current is measured. One ampere is  $6.25 \times 10^{18}$  electrons per second passing through a circuit.



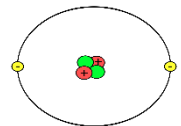
**Anemometer** - Instrument used measure wind speed.



**Appliance** - A device or piece of equipment designed to perform a specific task.

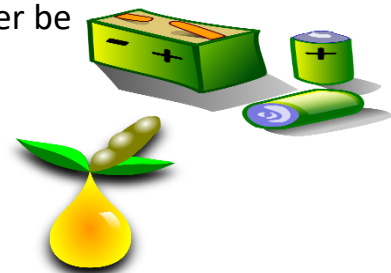


**Atom** - Smallest part of matter; made of electrons, protons, and neutrons.



### B

**Battery** - A device that stores chemical energy that can later be transformed into electrical energy.



**Biodiesel** - A biofuel intended as a substitute for diesel.

**Biomass** - Any living material, or material that was once was alive or came from a living organism; crops, animal waste.



**Bituminous coal** - Black coal having a relatively high volatile content. It burns with a characteristically bright smoky flame.



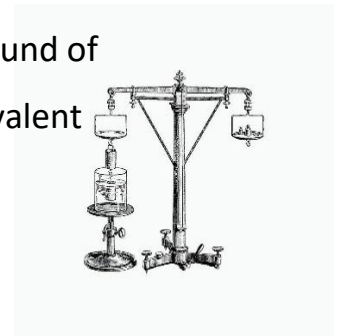
**Blades** - Lift and rotate when wind is blown over them, causing the rotor to spin on a wind turbine.



**Brake** - Stops the rotor mechanically, electrically, or hydraulically in emergencies on a wind turbine.



**British thermal unit** - The amount of heat needed to raise one pound of water at maximum density through one-degree Fahrenheit, equivalent to  $1.055 \times 10^3$  joules.



**C**

**Carbon footprint** - The amount of carbon dioxide and other carbon compounds emitted due to the use of fossil fuels by an individual, company, country, etc.



**Carbon tax** - A tax on fossil fuels, especially those used by motor

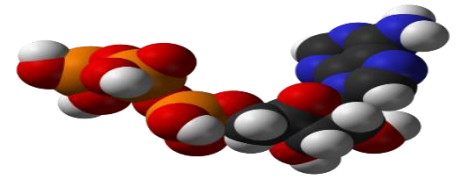
vehicles, intended to reduce the emission of carbon dioxide.



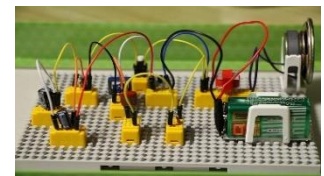
**Charcoal** - A porous black solid, consisting of an amorphous form of carbon, obtained as a residue when wood, bone, or other organic matter is heated in the absence of air.



**Chemical energy** - Energy stored in the bonds of atoms and molecules; gasoline and a piece of pizza are examples; chemical energy is a potential energy.



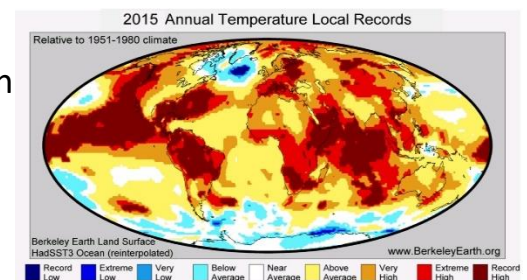
**Circuit(s)** - A conductor or a system of conductors through which electric current flows.



**Clean energy** - Energy derived from renewable, zero-emissions sources (“renewables”), as well as energy saved through energy efficiency (“EE”) measures.



**Climate change** - A change in the statistical distribution of weather patterns over an extended period of time.



**Coal** - A combustible black or dark brown rock consisting mainly of carbonized plant matter, found mainly in underground deposits

and widely used as fuel.



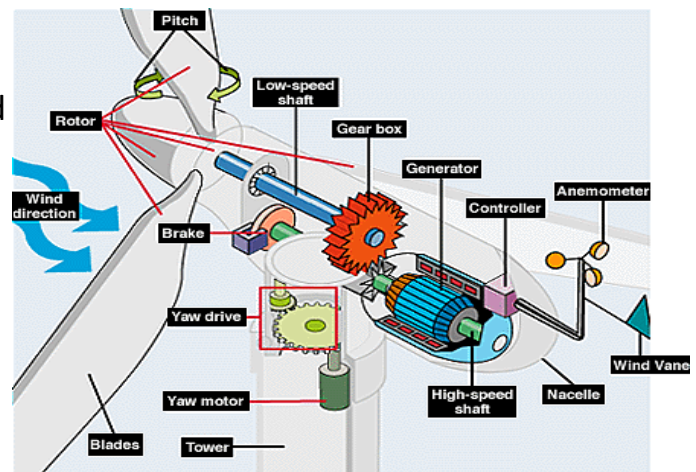
**Combustion** - The process of burning something in oxygen, producing heat and light.



**Conservation** - Prevention of wasteful use of a resource.



**Controller** - Starts up the wind turbine at wind speeds of about 8 - 16 mph and shuts off the wind turbine at 55 mph.

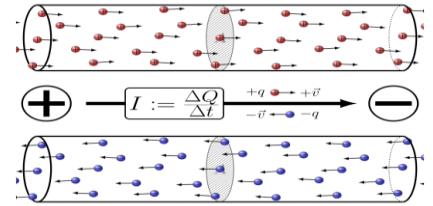


**Crude oil** – Unrefined petroleum.



**Current** - A flow of electricity which results from the ordered

directional movement of electrically charged particles.



**D**

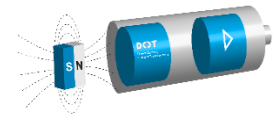
**Dam** - A barrier constructed to hold back water and raise its level, forming a reservoir used to generate electricity or as a water supply.



**Diesel** - An internal combustion engine in which heat produced by the compression of air in the cylinder is used to ignite the fuel.



**Direct current** - An electric current flowing in one direction only.

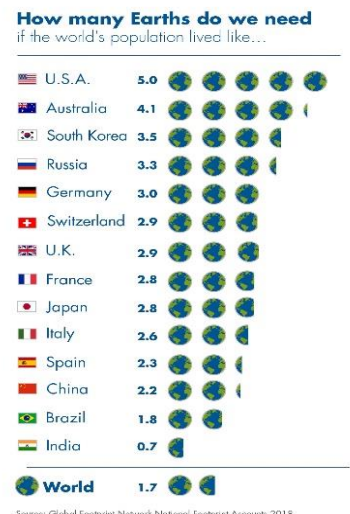


**Distribution lines** - Power lines that carry electricity at a safer voltage to consumers.



**E**

**Ecological footprint** - A measurement of how fast we consume resources and generate waste.





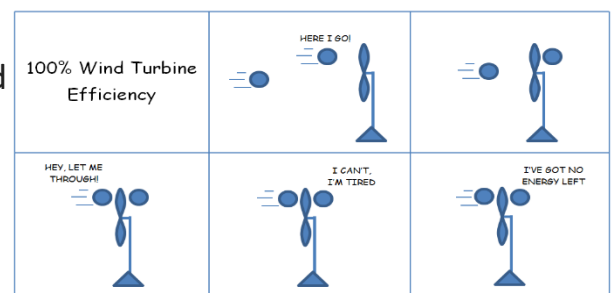
**Ecology** - The branch of science studying the interrelationships between organisms and environment.



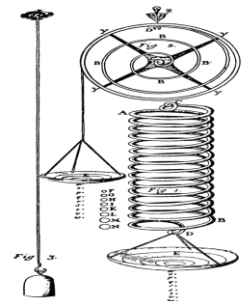
**Ecosystem** - An interdependent community made up of living organisms and their environment including land, air, water, and minerals.



**Efficiency** - The ratio of the useful work performed by a machine or in a process to the total energy expended or heat taken in.



**Elastic energy** - Energy stored in objects by the application of a force. Compressed springs and rubber bands are examples.



**Electric charge** - Can be either positive or negative; determines how atoms act around other atoms and produces electromagnetic fields.



**Electric current** - Electrons flowing between two points having a difference in voltage.



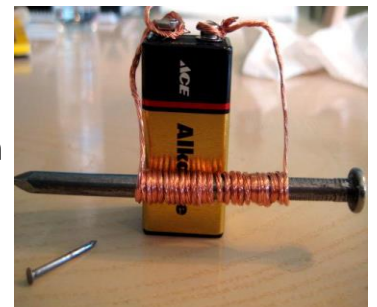
**Electric power** - The amount of electric current flowing due to an applied voltage.



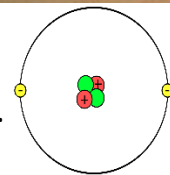
**Electricity** - Electrons in motion.



**Electromagnetism** - Having to do with magnetism produced by an electric current.



**Electrons** - The tiny, energetic pieces of atoms with a negative charge.



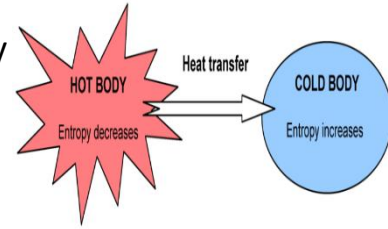
**Energy** - Ability to do work, produce change, or move an object.



**Engineer** - A person who designs, builds, or maintains engines, machines, or public works.



**Entropy** - A thermodynamic quantity representing the unavailability of a system's thermal energy for conversion into mechanical work, often interpreted as the degree of disorder or randomness in the system.



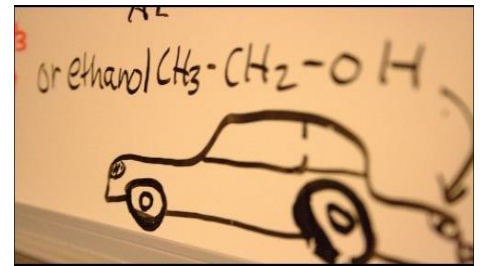
**Environment** - The complex of physical, chemical, and biotic factors that act upon an organism or an ecological community and ultimately determine its form and survival.



**Erg** - A unit of work or energy. Work done by a force of one dyne when its point of application moves 1 cm in the direction of action of the force or approximately the amount of work done (or energy consumed) by one common house fly performing one "push up".

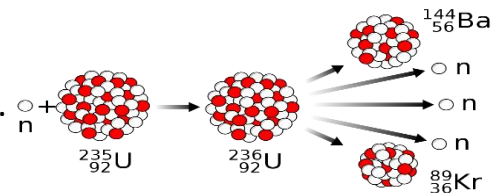


**Ethanol** - A colorless volatile flammable liquid which is produced by the natural fermentation of sugars; alcohol.

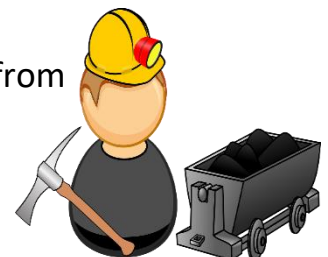


**F**

**Fission** - A nuclear reaction that breaks apart an atom.



**Fossil fuels** - Fuels that formed hundreds of millions of years ago from heat and pressure on plant and animal remains.



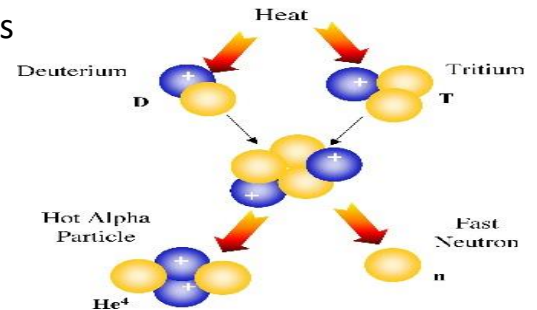


**Fuel** - material such as coal, gas, or oil that is burned to produce heat or power.



**Fusion Reaction**

**Fusion** - A nuclear reaction that combines two atoms together to make another larger atom.

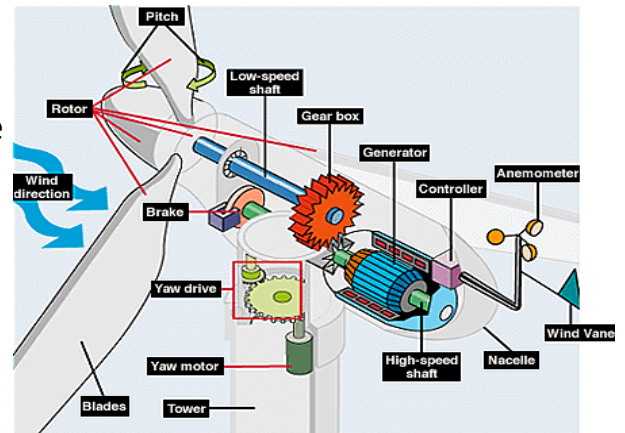


**G**

**Gasoline** - Refined petroleum used as fuel for internal combustion engines.



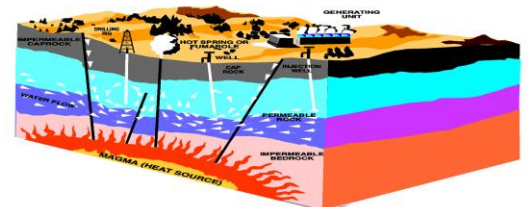
**Gear box** - Device on a wind turbine that connects and controls the low speed shaft with the high-speed shaft.



**Generator** - A device that changes motion energy into electricity.



**Geothermal** - Heat energy that is created by the earth.



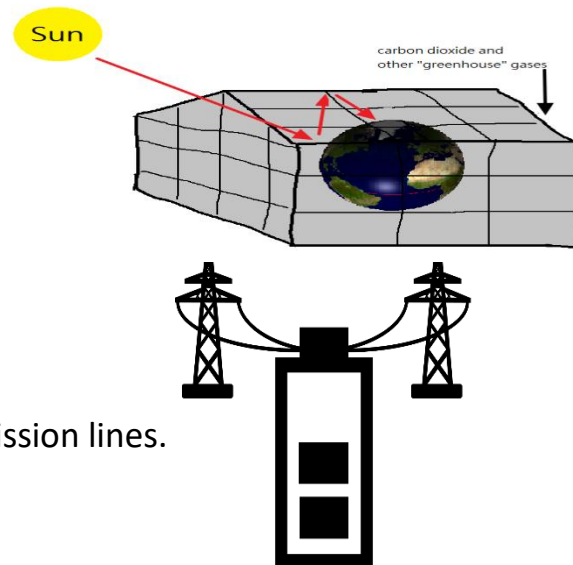
**Global warming** - A gradual increase in the overall temperature of the earth's atmosphere generally attributed to the greenhouse effect caused by increased levels of carbon dioxide, chlorofluorocarbons, and other pollutants.



**Green energy** - Green energy comes from natural sources such as sunlight, wind, rain, tides, plants, algae and geothermal heat.



**Greenhouse effect** - The trapping of the sun's warmth in a planet's lower atmosphere.



**Grid** - A nationwide network of transmission lines.

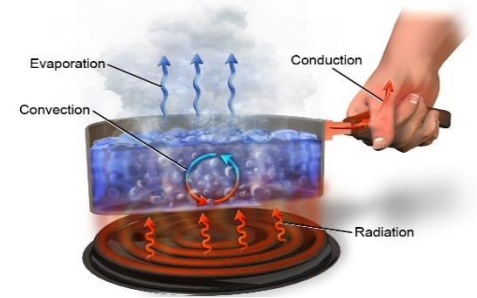
**H**

**Habitat** - The natural environment in which a particular organism lives.

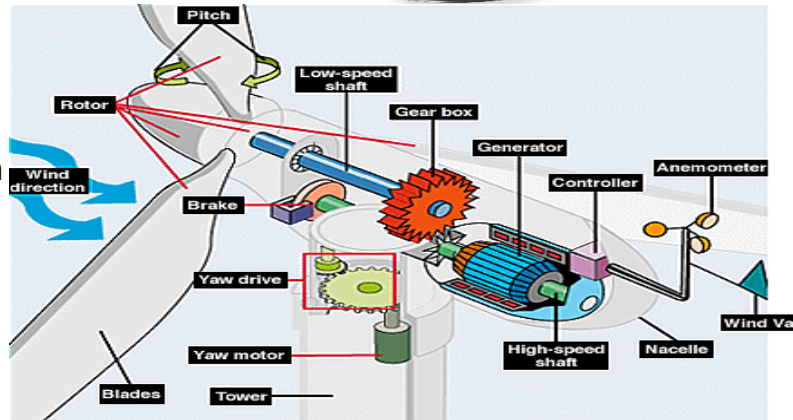


**Heat** - A form of energy arising from the random motion of the molecules of bodies, which may be transferred by conduction, convection, or radiation.

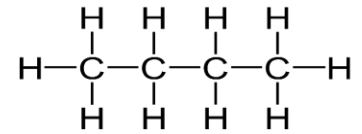
**Mechanisms of Heat Transfer**



**High speed shaft** - Drives the generator on a wind turbine.



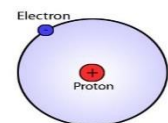
**Hydrocarbon** - A compound of hydrogen and carbon, such as any of those which are the chief components of petroleum and natural gas.



**Hydroelectric** - Relating to or denoting the generation of electricity using flowing water (typically, from a reservoir held behind a dam or other barrier) to drive a turbine that powers a generator.



**Hydrogen** - A colorless, odorless, highly flammable gas, the chemical element of atomic number 1.



**Hydropower energy** - Energy that comes from moving water.





## I

**Industry** - Economic activity concerned with the processing of raw materials and manufacture of goods in factories.



**Internal combustion engine** - An engine that generates motive power by the burning of gasoline, oil, or other fuel with air inside the engine, the hot gases produced being used to drive a piston or do other work as they expand.



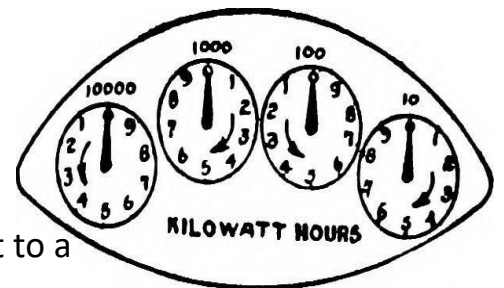
## J

**Joules** - A unit of energy equal to one watt of power for one second.



## K

**Kilowatt** - A measure of 1,000 watts of electrical power.



**Kilowatt hour** - A measure of electrical energy equivalent to a power consumption of 1,000 watts for 1 hour.

**Kinetic energy** - The energy of motion.

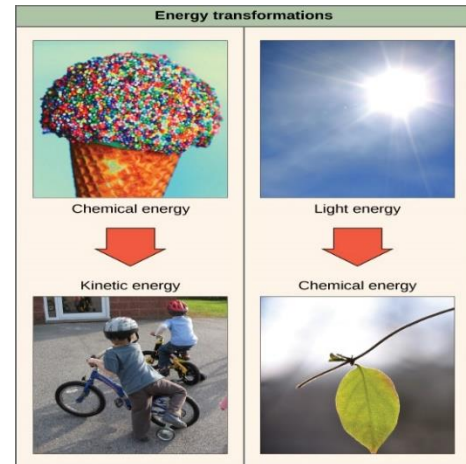
***Kinetic Energy***

*Kinetic Energy is the energy from an object's motion. A parked car has no kinetic energy, while a car driving down the free way has a lot of energy.*



L

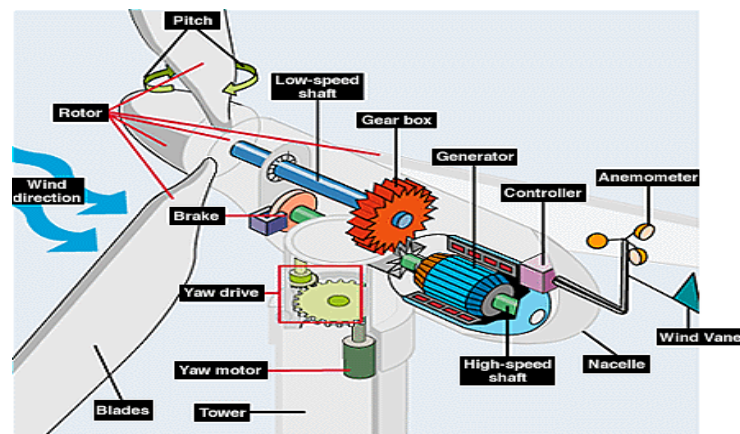
**Law of Conservation of Energy** - States that energy and matter cannot be created or destroyed, it can only change form or be transferred.



**Light** - The natural agent that stimulates sight and makes things visible.



**Low speed shaft** - Turns the low speed shaft on a wind turbine.



M

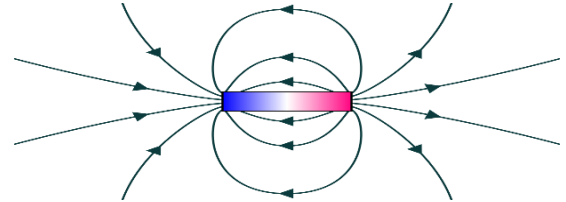
**Magnet** - Any piece of iron or other ferrous material that has its component



atoms so ordered that the material exhibits properties of magnetism.



**Magnetic field** - The region of magnetic force around a magnet.



**Megawatt** - A unit of power equal to one million watts, especially as a measure of the output of a power station.



**Methane** - A colorless, odorless flammable gas which is the main constituent of natural gas.



**Mindful consumption** - Intentionally thinking about the ecological footprint and/or carbon footprint of the products and services we consume in order to be more sustainable.



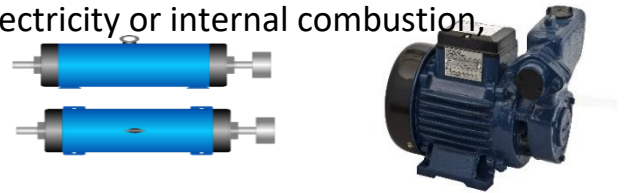
**Mining** - The process or industry of obtaining coal or other minerals from a mine.



**Motion** - The movement of a substance from one place to another.



**Motor** - A machine, especially one powered by electricity or internal combustion, that supplies motive power for a vehicle or for some other device with moving parts.



**Multimeter** – A device used to measure the current, resistance, and voltage, of electricity and displays the reading numerically.



**N**

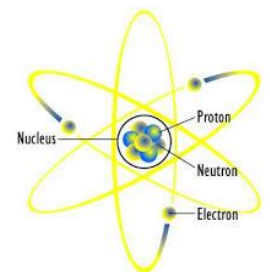
**Nacelle** - Sits atop the wind tower and contains the gear box, low and high-speed shafts, generator, controller, and brake.



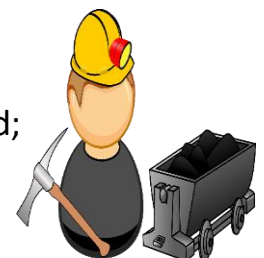
**Natural gas** - Flammable gas, consisting largely of methane and other hydrocarbons, occurring naturally underground (often in association with petroleum) and used as fuel.



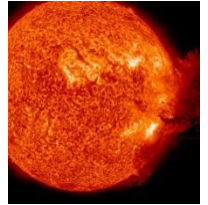
**Neutrons** - Neutrally charged particles within the nucleus of an atom.



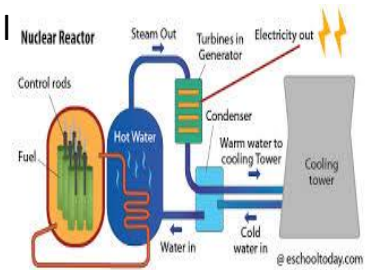
**Nonrenewable energy** - Fuels that cannot be easily made or replenished; we can use up nonrenewable fuels.



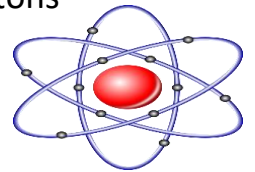
**Nuclear energy** - Energy stored in the nucleus of an atom that is released by the joining or splitting of the nuclei.



**Nuclear reactor** - An apparatus or structure in which fissile material can be made to undergo a controlled, self-sustaining nuclear reaction with the consequent release of energy.

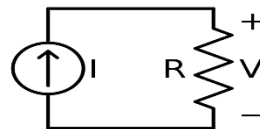


**Nucleus** - The positively charged central core of an atom, consisting of protons and neutrons and containing nearly all its mass.



**O**

**Ohms** - Measurement of resistance in electricity.



**Oil** – Another name for petroleum, a black, liquid fossil fuel found deep in the Earth; gasoline and most plastics are made from oil.



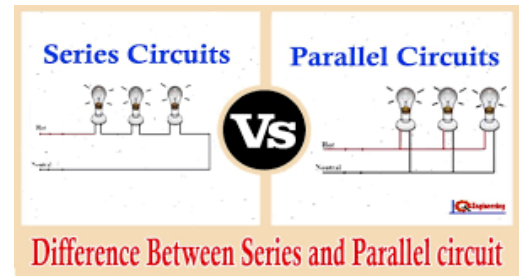
**Oil rig** - A structure with equipment for drilling and servicing an oil well.



**P**

**Parallel Circuit** - Used to obtain higher electric current,

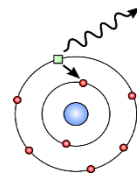
obtained when positive terminals are connected together and their negative terminals are also connected together.



**Petroleum** - A liquid mixture of hydrocarbons that is present in certain rock strata and can be extracted and refined to produce fuels including gasoline, kerosene, and diesel oil; oil.



**Photon** - A photon is the smallest discrete amount or quantum of electromagnetic radiation.



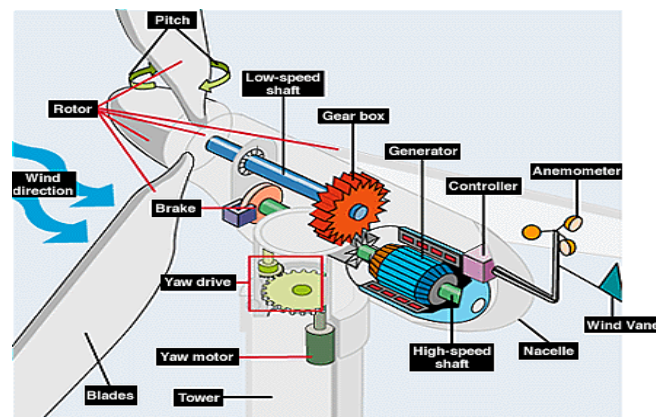
**Photovoltaic cell** - A device composed of silicon and other substances used to generate electricity from sunlight.



**Pinwheel** - A toy that spins around when the wind blows.



**Pitch** - Turns blades out of the wind to control the rotor speed and to keep the rotor from turning in winds that are too high or too low.





**Pollution** - The presence in or introduction into the environment of a substance or thing that has harmful or poisonous effects.



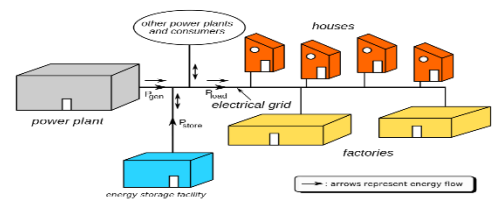
**Potential energy** - Stored energy that depends upon the relative position of various parts of a system.



**Power** - Energy that is produced by mechanical, electrical, or other means and used to operate a device.



**Power grid** - An electrical grid, electric grid or power grid, is an interconnected network for delivering electricity from producers to consumers.



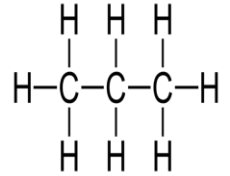
**Power plant** - An installation where electrical power is generated for distribution.



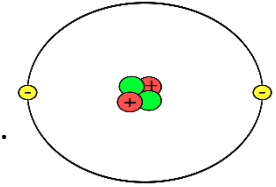
**Propane** - A flammable hydrocarbon gas of the alkane series,



present in natural gas and used as bottled fuel.



**Protons** - Positively charged particles within the nucleus of an atom.



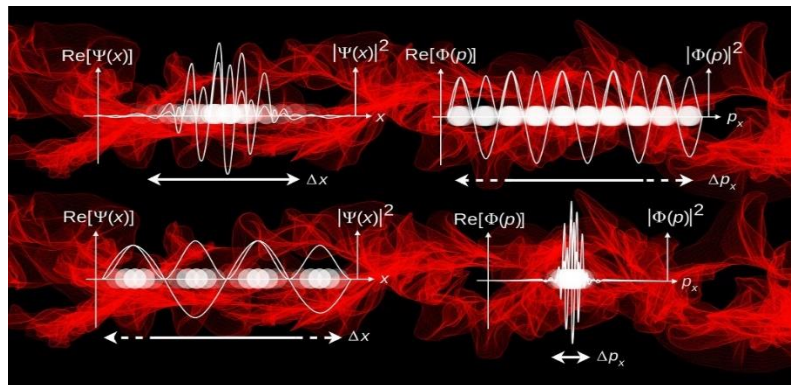
**Public utility** - An organization supplying the community with electricity, gas, water, or sewerage.

EXAMPLES in Oklahoma - ONG (Oklahoma Natural Gas)

OG&E (Oklahoma Gas and Electric), CEC (Central Electric Cooperative)

**Q**

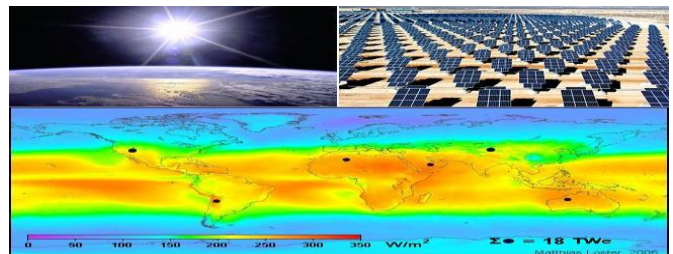
**Quantum** - A discrete quantity of energy.



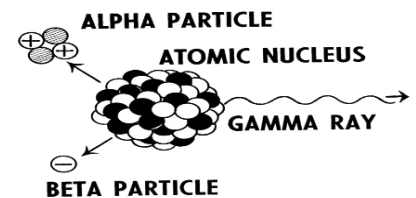
**R**

**Radiant energy** - Electromagnetic energy that travels in waves

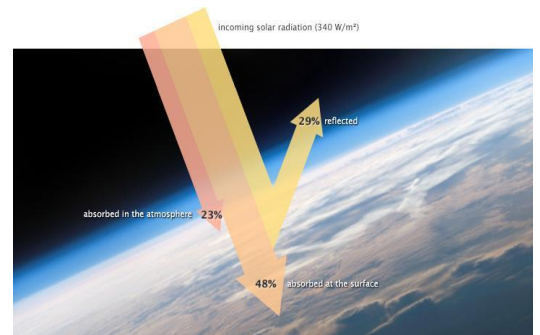
such as light, x-rays, and microwaves.



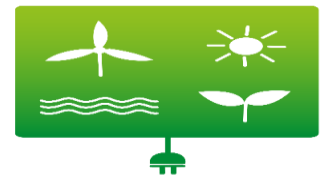
**Radioactive** - When a material is giving off harmful amounts of radiation.



**Reflect** - (Of a surface or body) throw back (heat, light, or sound) without absorbing it.



**Renewable energy** - Fuels that can easily made or replenished; we can never use up renewable fuels.



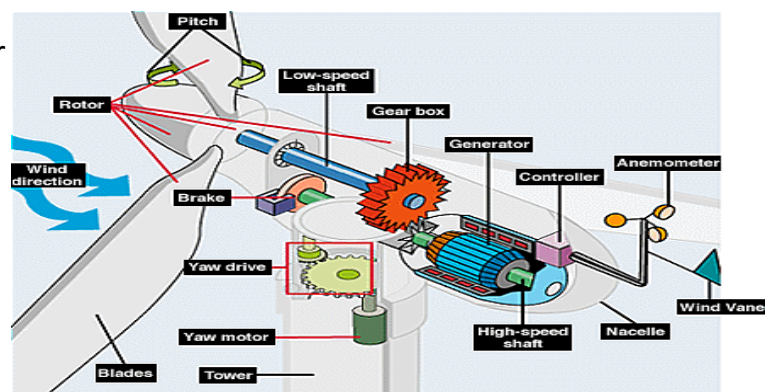
**Reservoir** - A large natural or artificial lake used as a source of water supply. A place where fluid collects, especially in rock strata or in the body.



**Resistance** - A property that slows the flow of electrons in electricity.

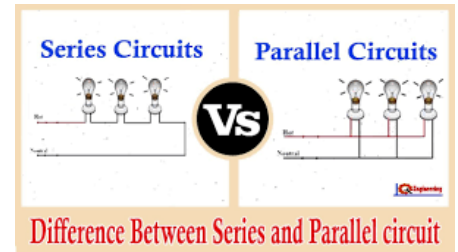


**Rotor** - Wind blades and hub together form the rotor.



## S

**Serial circuit** - Used to obtain a higher voltage, obtained when the positive terminal of one is connected to the negative terminal of another.



**Shale** - Soft, finely stratified sedimentary rock that formed from consolidated mud or clay and can be split easily into fragile slabs.



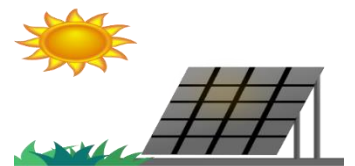
**Silicon** - A non-metallic element; number 14 on the periodic table of elements.

14: Silicon

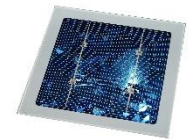
2,8,4



**Solar energy** - The energy from the sun, which can be changed into other forms of energy.



**Solar cell** - A device that changes energy from the sun into electricity.



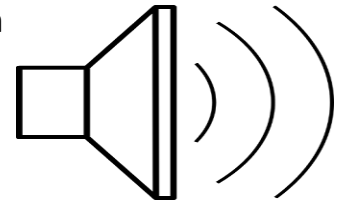
**Solar collector** - An item, like a car or greenhouse, that absorbs energy from the sun and traps it.



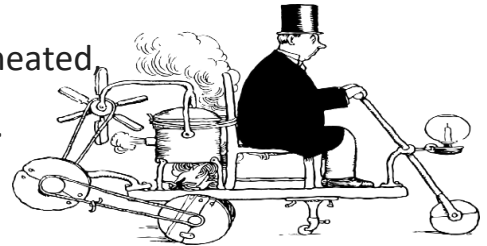
**Solar panel** - A group of solar cells put together to create a larger amount of electricity at once.



**Sound energy** - The movement of energy through substances in longitudinal waves causing a vibration; a kinetic energy.



**Steam** - The vapor into which water is converted when heated forming a white mist of minute water droplets in the air.



**Steam turbine** - A turbine in which a high-velocity jet of steam rotates a bladed disk or drum.



**Sustainability** - The ability to maintain our natural resources at a certain rate or level in order to keep ecological balance.



**T**

**Temperature** - The degree or intensity of heat present in a substance or object, especially as expressed according to a comparative scale and shown by a



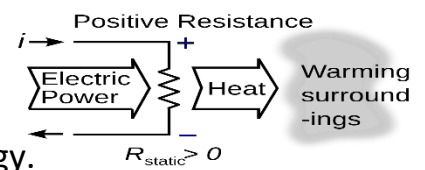
thermometer or perceived by touch.



**Thermal energy** - The sum of energy of the molecules making up a substance; for this unit, it is used to mean heat.



**Thermodynamics** - The branch of physical science that deals with the relations between heat and other forms of energy (such as mechanical, electrical, or chemical energy), and, by extension, of the relationships between all forms of energy.



**Transformer** - A device that controls the voltage of the electricity on power lines.



**Transmission lines** - Power lines that move larger amounts of power at a high voltage, usually over long distances.

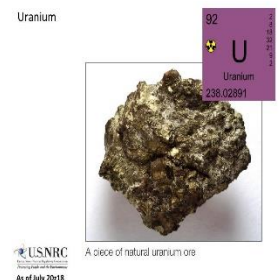


**Turbines** - A device with blades, which are turned by water, wind, or steam.



## U

**Uranium** - A radioactive, silvery metal that provides nuclear fuel used to generate electricity in nuclear power stations.





## V

**Voltage** - Measurement of electrical energy.



## W

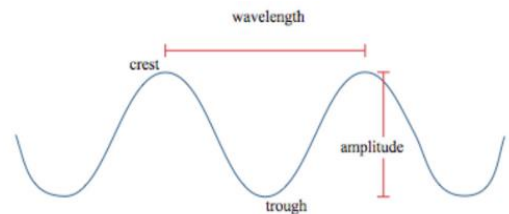
**Waste** - (Of a material, substance, or byproduct) eliminated or discarded as no longer useful or required after the completion of a process.



**Watt** - Measurement of electric power.



**Wavelength** - Distance from one crest to another, or from one trough to another, of a wave.



**Waves** - Regular patterns of motion.

Waves transfer energy.



**Wave power** - Power obtained by harnessing the energy

produced by waves at sea.



**Wind** - The movement of air, caused by the uneven heating of the Earth by the sun and the Earth's rotation.



**Wind farms** - Areas where a number of wind turbines are grouped together, providing a larger total energy source.



**Wind power** - Power obtained by harnessing the energy of the wind.



**Wind turbine** - A turbine having a large vaned wheel rotated by the wind to generate electricity.



**Wind vane** - Measures wind direction and communicates with the yaw drive to orient the turbine properly with respect to the wind.



**Windmill** - A building with sails or vanes that turn in the wind and generate power.



**Work** - Force applied over distance.

X

Y

**Yaw drive** - Orients upwind turbines to keep them facing the wind when the direction changes.

**Yaw motor** - Powers the yaw drive.

Z

