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Glossary of Energy Terms

GENERAL

Energy – the ability to do work or make things move. Energy is found in different forms, such as light, heat, sound and motion. There are many forms of energy, but they can all be put into two categories: kinetic and potential. Common units for measuring energy are calories, joules, Btu, and kilowatt-hours.

FORMS OF ENERGY

Kinetic Energy – motion of waves, electrons, atoms, molecules, substances, and objects. There are several forms of kinetic energy:

Electrical Energy – the movement of electrical charges. Everything is made of tiny particles called atoms. Atoms are made of even smaller particles called electrons, protons, and neutrons. Applying an electrical or magnetic force can make some of the electrons move. Electrical charges moving through a wire is called electricity. Lightning is another example of electrical energy.

Motion Energy – the movement of objects and substances from one place to another. Objects and substances move when a force is applied according to Newton's Laws of Motion. Wind is an example of motion energy.

Radiant Energy – electromagnetic energy that travels in transverse waves. Radiant energy includes visible light, x-rays, gamma rays and radio waves. Light is one type of radiant energy. Solar energy is an example of radiant energy.

Sound – the movement of energy through substances in longitudinal (compression/rarefaction) waves. Sound is produced when a force causes an object or substance to vibrate—the energy is transferred through the substance in a wave form, not by moving the material like wind does.

Thermal Energy or **heat** – the internal energy in substances caused by the vibration and movement of the atoms and molecules within substances. Geothermal energy (in the form of material heated by the Earth) is an example of thermal energy.

Potential Energy – stored energy and the energy of position, or gravitational energy. There are several forms of potential energy:

Chemical Energy – energy stored in the bonds of atoms and molecules. It is the energy that holds these particles together. Biomass, chemical batteries, petroleum, natural gas, and propane are examples of stored chemical energy.

Gravitational Energy – the energy of position or place. A rock resting at the top of a hill contains gravitational potential energy. Hydropower, such as water in a reservoir behind a dam, is an example of gravitational potential energy.

Nuclear Energy – energy stored in the nucleus of an atom—the energy that holds the nucleus together. The energy can be released when the nuclei are combined or split apart. Nuclear power plants split the nuclei of uranium atoms in a process called

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fission. The sun combines the nuclei of hydrogen atoms in a process called **fusion**. Scientists are working on creating fusion energy on earth, so that someday there might be fusion power plants.

Stored Mechanical Energy – energy stored in objects by the application of a force. Compressed springs and stretched rubber bands are examples of stored mechanical energy.

ENERGY CONVERSION (TRANSFORMATION)

Combustion – the process of burning a fuel to release heat energy

Conversion – the changing of a substance or the energy in it from one form to another

Conversion Efficiency – the percentage of the amount of energy that is usable compared to the amount of energy needed to produce that usable energy.

EFFICIENCY = (Energy output / Energy input) x 100 expressed as a percentage

Conversion Loss – the amount of energy lost in the changing of one form of energy to another form. Much of this energy loss is in the form of waste heat.

Energy Conversion Device – a machine or object that changes one form of energy to another form such as an automobile engine or an electric motor.

Fuel – any substance that can be burned to produce heat. (With nuclear energy, a substance that undergoes fission in a chain reaction to produce heat.) The fuel is consumed (lost) in the conversion process.

Photosynthesis – the process by which green plants use solar energy to convert simple substances into complex ones which contain chemical energy. Carbon dioxide and water are combined, in the presence of sunlight and chlorophyll, into carbohydrates such as sugars, starches, and cellulose.

ENERGY CONVERSION DEVICES

Battery – a device that uses the energy stored in chemicals to produce electricity.

Fossil Fuel Powered Electric Generating Plant – a facility in which electricity is produced by burning fossil fuels (coal, natural gas, petroleum) to make steam which powers the generator.

Fuel Cell – a device that changes the energy in fossil fuels to electricity.

Nuclear Powered Electric Generating Plant – a facility in which electricity is produced by using the heat given off by nuclear fuel from a controlled chain reaction to make steam which powers the generator.

Solar Cell – a device that changes the energy from sunlight directly into electricity.