

SIX BASIC FORMS OF ENERGY

Energy exists in a number of different forms, all of which measure the ability of an object or system to do work on another object or system. There are six different basic forms in which we use energy in our day-to-day life:

Mechanical Energy (Kinetic)

Energy that a body possesses by virtue of its motion. A few examples are a baseball player pitching a ball, a plow being pulled by a tractor, and a hammer that is being used to pound nails.

In the United States, we use about a third of our total energy for transportation or movement of people and goods.

Mechanical Energy (Potential)

Energy that a body possesses by virtue of its position relative to a reference point. A few examples of mechanical energy include a pendulum, a bow (archery), a spring, and a hammer that is raised in preparation to pound nails.

A book sitting on a shelf in the library is said to have potential energy because if it is nudged off, gravity will accelerate the book, giving the book kinetic energy. Because the Earth's gravity is necessary to create this kinetic energy, and because this gravity depends on the Earth being present, we say that the Earth-book system is what really possesses this potential energy, and that this energy is converted into kinetic energy as the book falls.

Chemical Energy

Energy locked in the bonds of molecules in the form of microscopic potential energy, which exists because of the electric and magnetic forces of attraction exerted between the different parts of each molecule:

It is the same attractive force involved in thermal vibrations.

The molecular parts get rearranged in the chemical reactions, releasing or adding to this potential energy.

Some examples include a battery, burning wood, and glucose in the body.

Approximately 85% of the energy used in the U.S. comes from fossil fuels such as coal, oil, and natural gas.

All of these fuels store energy in the form of chemical energy.

When they are burnt, these fuels release energy in the form of heat or thermal energy.

The glucose (blood sugar) in your body is said to have "chemical energy" because the glucose releases energy when chemically reacted (combusted) with oxygen. Your muscles use this energy to generate mechanical force (work) and also heat.

Thermal or Heat Energy:

Energy that combines microscopic, kinetic and potential energy of the molecules. Some examples of this include a hot beverage and boiling water.

Temperature is really a measure of how much thermal energy something has: The higher the temperature, the faster the molecules are moving around and/or vibrating, i.e., the more kinetic and potential energy the molecules have.

Fuels (chemical energy) are oftentimes burnt and converted to thermal or heat energy, which is then converted to motion in an automobile or electricity.

Thermal Energy

A hot cup of coffee is said to possess "thermal energy," or "heat energy," because it has a combination of kinetic energy (its molecules are moving and vibrating) and potential energy (the molecules have a mutual attraction for one another) - much the same way that the book on the bookshelf and the Earth have potential energy because they attract each other.

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