

Energy costs and energy transfers

1 Keywords

Energy	The ability to do work. Measured in Joules (J).
Power	The rate of transfer of energy. Measured in Watts (W).
Work	The energy transferred by a force.
Conserved	When the quantity of something does not change after a process takes place.
Kinetic Energy	The energy that an object possesses due to its motion
Elastic Energy	The energy stored by an object when it is squashed or stretched
Gravitational Energy	The energy an object has due to its position above Earth
Chemical energy	Energy stored in the bonds of chemical compounds
Thermal energy	The energy stored in a system due to its temperature.
Useful energy	Energy transferred into a form we want
Wasted energy	Energy in a form we don't want and can't use - normally dissipated to the surroundings as heat
Sankey diagram	Energy transfer diagram that shows the proportion of energy transferred.
Conservation of energy	Energy cannot be created or destroyed; it is transformed from one type to another
Kinetic energy	Anything moving has kinetic energy.
Gravitational potential energy	Objects held 'up' against gravity have gravitational potential energy
Elastic potential energy	Energy stored in an objects that can be stretched or squashed

2 Transferring energy

The following are ways that energy can be transferred:

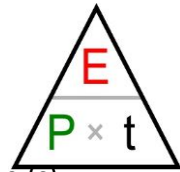
- By **mechanical** work (a force causing an object to move);
- By **electrical** work (when charges move due to a potential difference);
- By **heating** (due to a difference in temperature);
- By **radiation** (due to electromagnetic waves, eg light).

3. Power

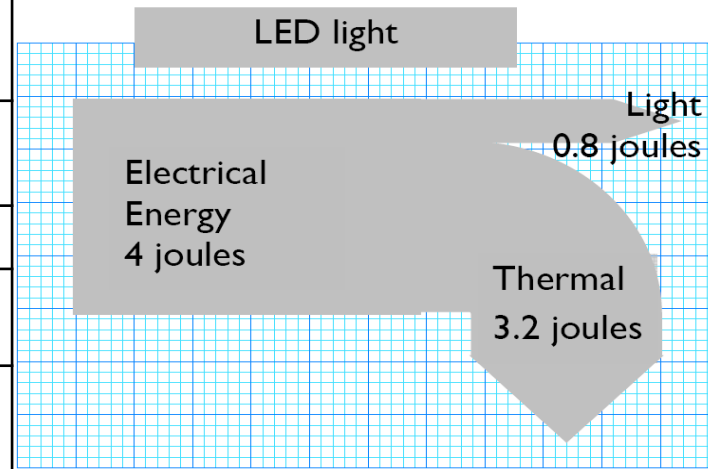
Power is calculated by dividing energy transferred by time taken:

$$P = E/t$$

P = Power (W); E = energy (J); t = time (s).



4. Sankey diagrams

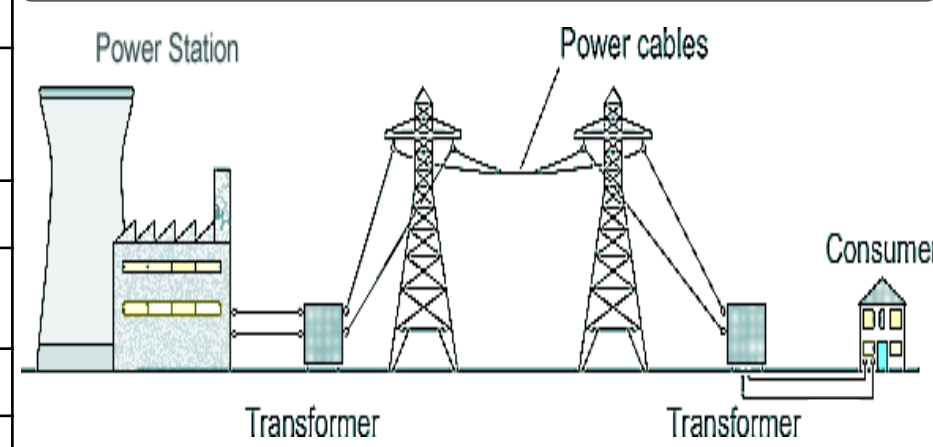


Energy Resources

5. Keywords	
Power	The amount of energy transferred per second
Non-renewable	An energy resource that cannot be replaced and will be used up.
Renewable	An energy resource that can be replaced and will not run out. Examples are solar, wind, waves, geothermal and biomass.
Reliable	An energy resource that can be used all of the time whatever the weather or time of day.
Fossil fuels	Formed from the remains of ancient plants or animals. Examples are coal, crude oil and natural gas.
Nuclear	Takes energy from the splitting of atoms.
Biofuels	Any fuel taken from living or recently living organisms.
Wind	A wind turbine uses the force of the wind.
Wave	Waves are used to make a floating generator move up and down.
Hydroelectric	Uses the power of flowing water to turn turbines.
Tidal	Traps water from each high tide behind a barrage. The high tide can then be released into the sea through turbines.
Solar	Solar cells and solar panels use the Sun's energy to generate electricity or heat water.
Geothermal	Uses thermal energy from hot rocks beneath the Earth's surface to turn turbines.

6. Non - renewables	
Non-renewable Energy types	Description
Fossil fuels	Formed from the remains of ancient plants or animals. Examples are coal, crude oil and natural gas.
Nuclear	Takes energy from the splitting of atoms.

7. Fossil fuel power station



8. Nuclear reactor

