**Electrical energy sources and types** 



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This article provides information on the following six methods of producing electric power.[1]

Electrical energy is the most suitable form of energy that people use in their daily life. It is caused by the flow of negatively-charged electrons in a conductor. The faster they move, the higher the energy generated. As the charge carriers are in motion, electrical energy is a form of kinetic energy. This flow of electrons through a conductor also produces an electric current resulting in electricity. Thus, electricity is an energy carrier to power homes and appliances.

Electrical energy can be stored in small quantities using fuel cells, batteries, capacitors, or magnetic fields. Charges build up in a capacitor, which then stores electrical energy. Thus, electrical energy is also a type of potential energy.

Electrical energy is not a primary source of energy. It is a secondary source because it is produced from primary energy sources such as coal, natural gas, nuclear energy, solar energy, and wind energy. These primary sources drive electric generators and solar cells to produce electricity for easy use and transport.

Electrical cables transport electricity from one place to another through conduction. Conductors made from metal are used for this purpose. This method of transporting electrical energy for hundreds of miles is called an electrical grid. The electrical grid's rate of energy transfer is called electrical power.

The quantity of electrical energy transferred to an appliance depends on its power and the duration it is switched on. The amount transferred from the mains is measured in kilowatt-hours or kWh. It is the commercial unit of electricity. One unit is 1 kWh.

The equation for electrical energy is given by the following:

E : Energy transferred in kWh (1 kWh =  $3.6 \times 106 \text{ J}$ )

P : Power of the appliance in kW (1 kW = 1000 W)

t : Amount of time in hours that the appliance operates ( 1 h = 3600 s)

Example: If a 60-Watt lamp is turned on for two hours, how many joules of electrical energy are converted?

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