Energy Concepts

Intro to Environmental Science

DartmouthX

Energy:

ability to
do work or
transfer heat

Energy units:

joules (J)
calorie (c)
British Thermal Unit (BTU)
kilowatt-hour (kWh)

British Thermal Unit (BTU)
is not included in
"International System of Units" (SI)

Joule:

a unit of energy;
one joule is needed
to light a one watt
lightbulb for
one second

$$\text{Power} = \frac{\text{Energy}}{\text{Time}}$$

Units of power:

watts
kilowatts

1 kilowatt = 1,000 watts

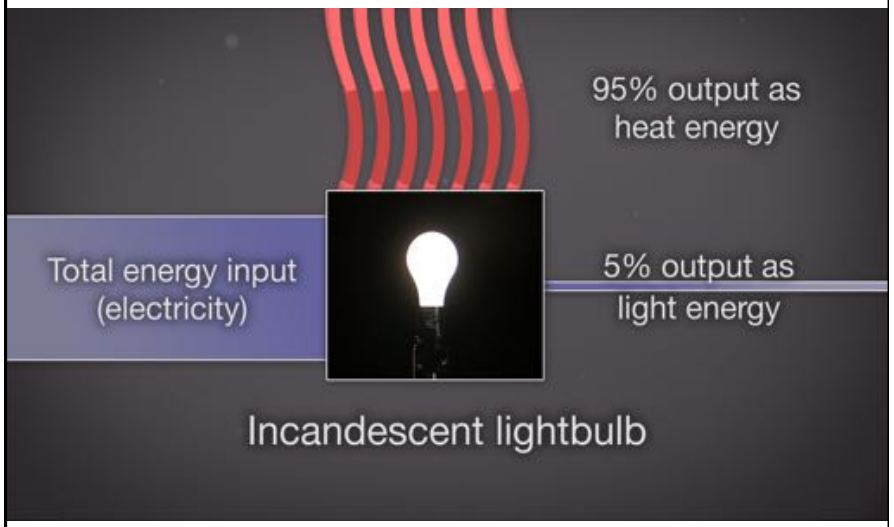
Potential energy:

energy stored
but not yet released

Chemical energy:

potential energy stored in
the chemical bonds of
a material

$$\text{Efficiency} = \frac{\text{work in the form you want}}{\text{total work or energy input to the system}}$$

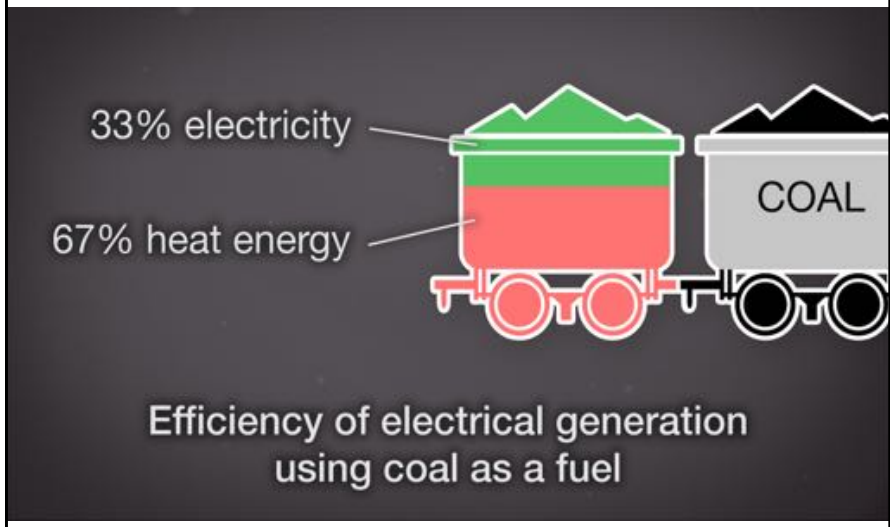


Quality:
the ease with which an energy source can be converted from one form to another

Entropy:
disorder or randomness of a system

1st Law of Thermodynamics:
energy can neither be created nor destroyed, only transformed from one form to another

2nd Law of Thermodynamics:
when energy is transformed, its quantity remains the same but ability to do work diminishes


33% electricity
67% heat energy
COAL
Efficiency of electrical generation
using coal as a fuel