3.2 Conservation of Energy

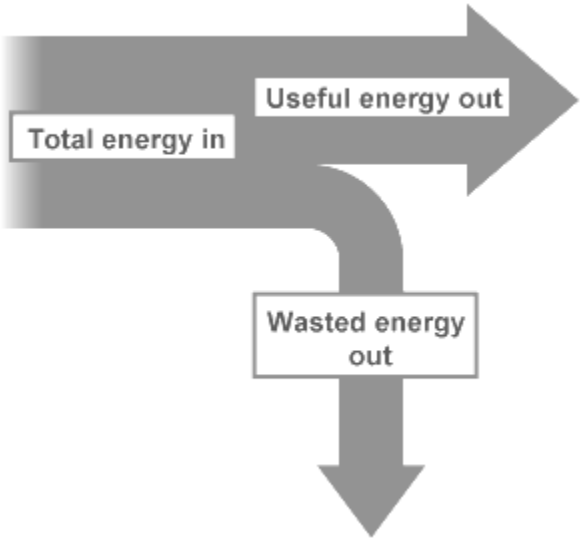
The principle of conservation of energy states that:

Energy cannot be created or destroyed, it is always conserved.

- In a closed system, the total energy before a process is equal to the total energy after the process.
- Energy can change from one form to another, but the total amount remains constant.

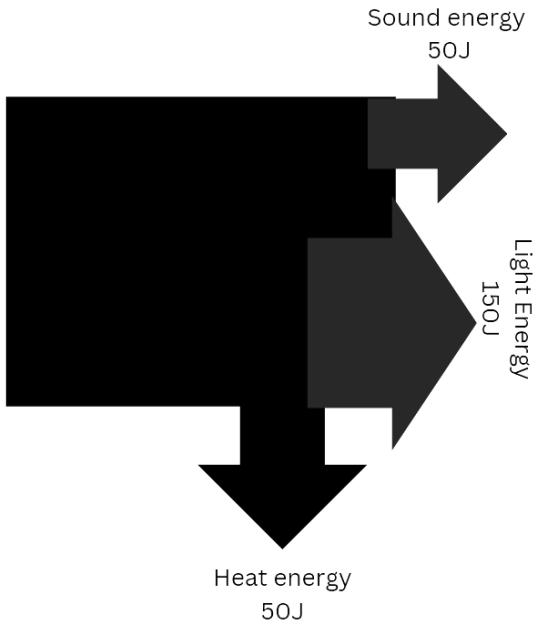
Sankey Diagram

A Sankey diagram is a type of flow diagram that displays the flow of energy. They display the useful and unwanted energy of the system.



- The arrow that goes horizontally is the energy useful. The arrow that goes downwards bends downwards is the unwanted energy.
- The width of the arrow represents the amount of energy flow.
- The thicker the horizontal arrow, the more efficient the system is.

For example: This is a Sankey diagram for a television.



Sound and light energy are useful energy. Heat is the unwanted energy.

Efficiency

Efficiency: This measures how well a system converts input energy into useful output.

Efficiency (n)= $\frac{Useful\ output\ energy}{Input\ energy}$ x 100

For example:
Calculate the efficiency of the television, shown in the Sankey diagram above.

Efficiency (n)= $\frac{Useful\ output\ energy}{Input\ energy}$x 100

Efficiency (n)= $\frac{50J+150J}{250J}$x 100

Efficiency (n)= 80%

The television is 80% efficient.