7.4 ENERGY TRANSFORMATIONS

Chapter 7

ENERGY

What is energy? (from Chapter 5)

Energy is the capacity to produce **change**

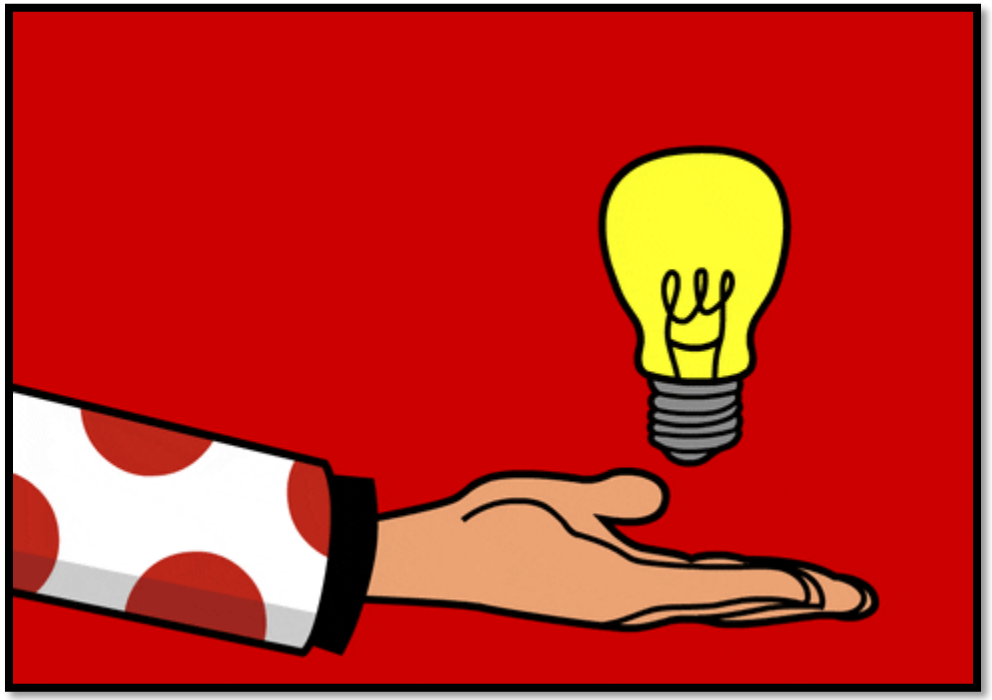
- This change could be to emit **heat** or **light** or produce a **movement**

ENERGY

In chapter 5, we talked about the different types of renewable and non-renewable energy

- If you recall, we are rarely able to use the energy from these sources directly. Most of the time it has to **undergo a transformation** before it becomes useful to us

ENERGY



Useful energy:

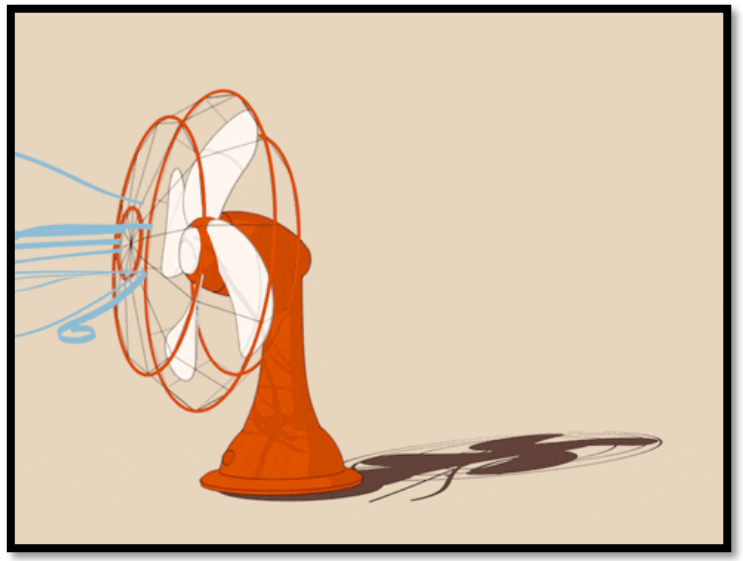
- form of energy that **humans can use to meet their needs**

FORMS OF USEFUL ENERGY

Mechanical energy:

Comes from the **motion** of an object

Example:



- moving fan
- motor spinning wheels
- motor causing a drill bit to rotate

FORMS OF USEFUL ENERGY

Thermal energy (heat):

Comes from the **agitation (movement) of particles** in matter

Example:

- fire
- a heater
- oven or stove

FORMS OF USEFUL ENERGY

Luminous energy :

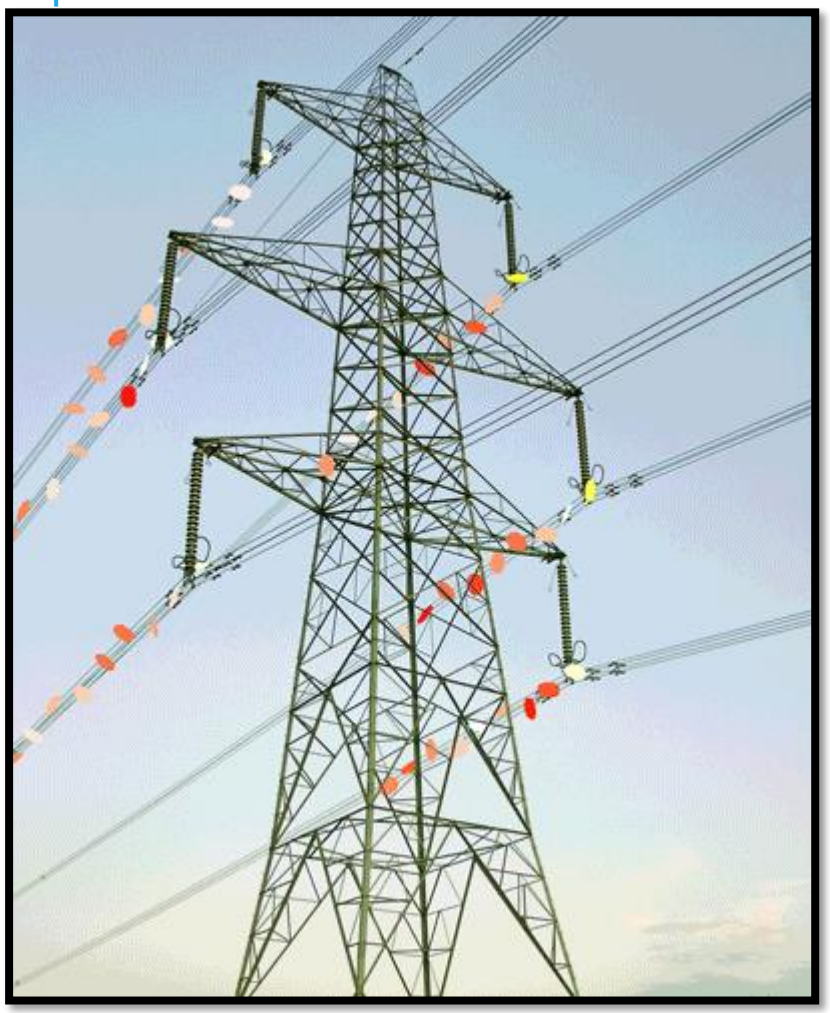
Comes from **light**

- could be natural light or artificial

Example:

- sunlight
- lamp

FORMS OF USEFUL ENERGY



Electrical energy :

Comes from the movement of electrons (**electricity**)

Example:

- electricity in power lines

- electricity that powers electronic devices

ENERGY TRANSFORMATIONS

Energy can be **changed from one form into the other**

- *Think back to Chapter 5*

ENERGY TRANSFORMATIONS EXAMPLES

Photovoltaic cells:

Solar energy → electrical

Thermal energy
Ex: pool heater

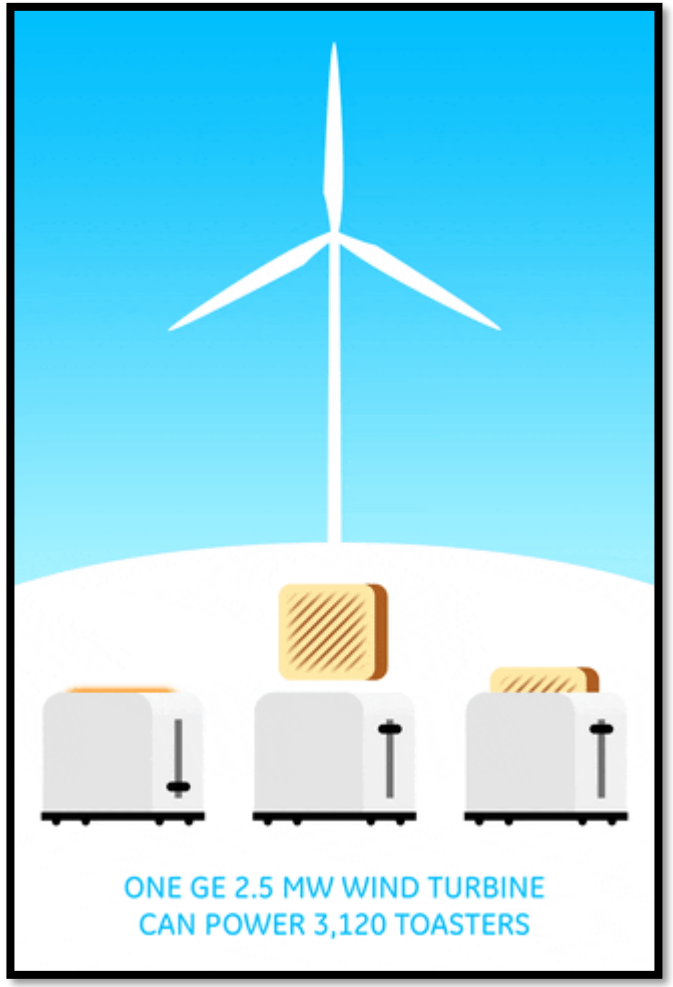
Luminous energy
Ex: calculator

Mechanical energy
Ex: solar-powered toy

ENERGY TRANSFORMATIONS EXAMPLES

Wind turbines:

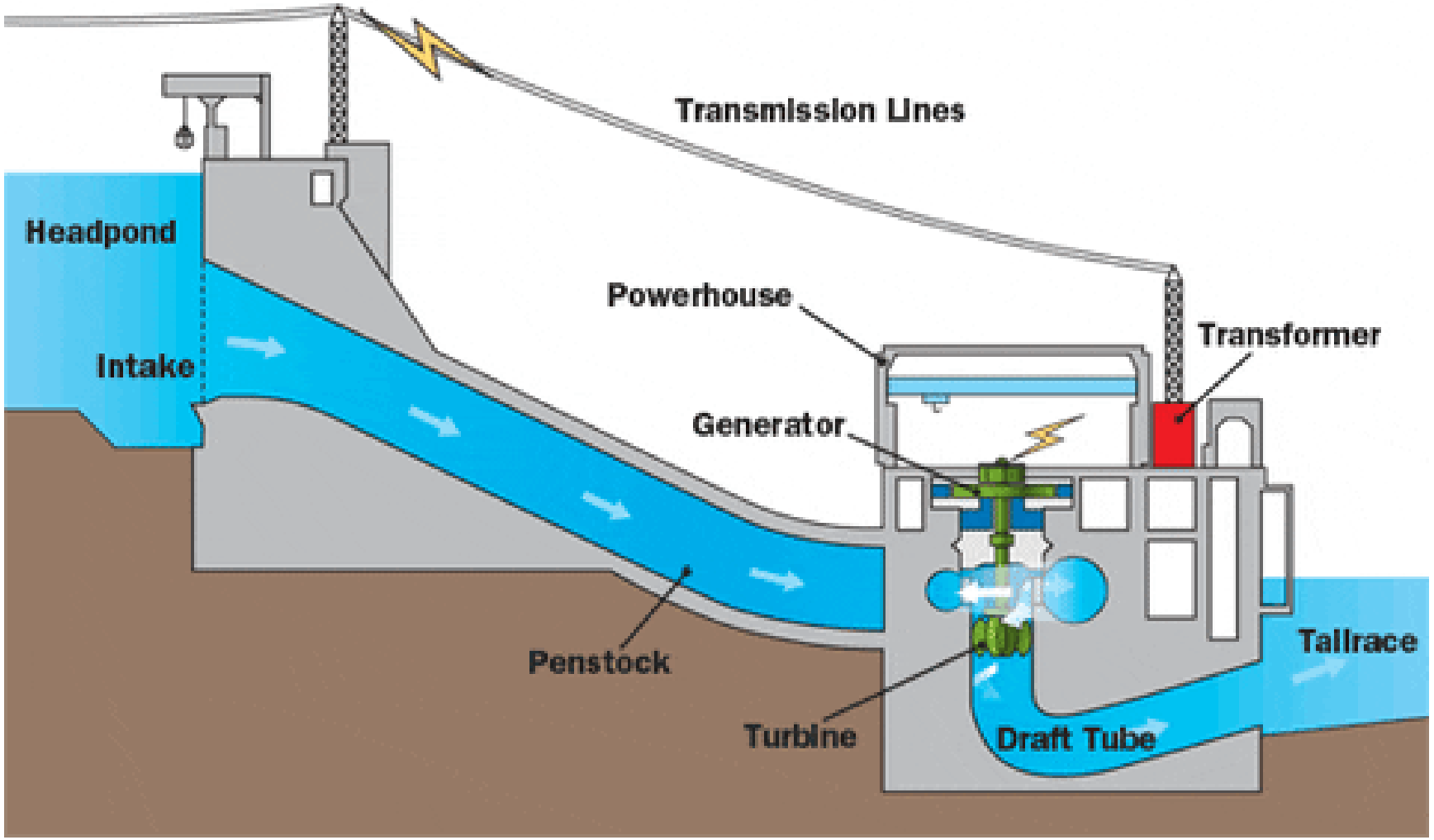
Wind energy → Mechanical energy → Electrical energy



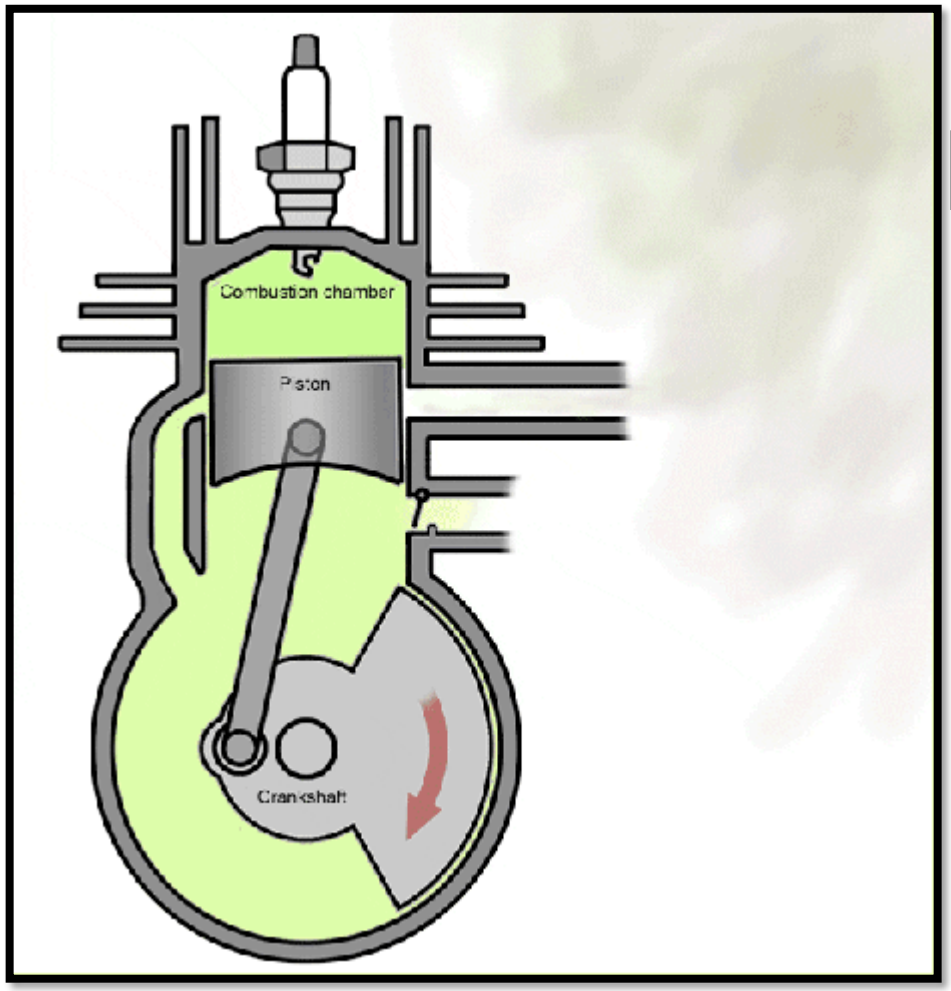
ENERGY TRANSFORMATIONS EXAMPLES

Hydraulic energy:

Hydraulic energy → Mechanical energy → Electrical energy


Transmission Lines
Headpond
Intake
Powerhouse
Transformer
Generator
Penstock
Turbine
Draft Tube
Tailrace

ENERGY TRANSFORMATIONS EXAMPLES



Fossil fuels:

Fossil fuel energy → Thermal energy → Mechanical energy

ENERGY TRANSFORMATIONS EXAMPLES

Nuclear energy:

Nuclear energy → Thermal energy → Mechanical energy → Electrical energy

WORKBOOK

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