

What are the different types of energy store:

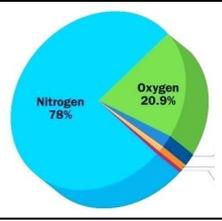
1. Thermal
2. Kinetic
3. Gravitational Potential
4. Chemical
5. Nuclear
6. Elastic
7. Magnetic
8. Electrostatic

**Units of Energy:**  
 J = Joules  
 kJ = kilojoules

**Conversion Factors:**  
 1kJ = 1000J  
 1J = 0.001kJ

**% of gases in the air**

78% Nitrogen  
 21% Oxygen  
 1% Argon  
 0.04% Carbon Dioxide  
 0-3% water vapour



Energy Resource	Advantages (+)	Disadvantages (-)
Solar energy	Renewable No greenhouse gas emissions	Unreliable - does not work at night time!
Wind energy	Renewable No greenhouse gas emissions	Turbines can be ugly and noisy Unreliable - if the wind stops, you get no energy.
Biomass energy	Renewable Doesn't need any special equipment, No net greenhouse gases	Need to transport the biomass
Geothermal energy	Renewable No greenhouse gas emissions	Need access to hot rocks near the surface - not possible in most places
Nuclear energy	No air pollution, because nothing gets burned Reliable	Produces dangerous radioactive waste. Expensive to build and decommission
Hydroelectric energy	Renewable No greenhouse gas emissions. Cheap once built.	Need to build a reservoir - habitat destruction. Expensive to build.
Tidal energy	Renewable No greenhouse gas emissions. Reliable, because there are always two tides every day	Need to build a tidal barrage - habitat destruction. Expensive to build. Need appropriate site.
Wave energy	Renewable No greenhouse gas emissions	The machines costs a lot of money The machines can be damaged by storms
Fossil fuels	Reliable Cheap Proven technology	Non Renewable fuels - they will run out. Release carbon dioxide and other pollutants

## ENERGY IN THE HOME

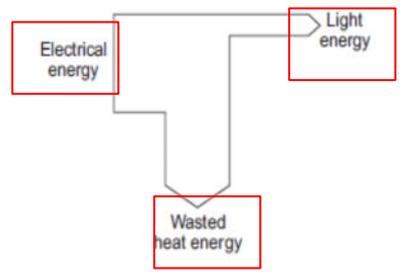
$$\text{Energy} = \text{Power} \times \text{Time}$$

$$\text{Efficiency} = \frac{\text{Useful energy out}}{\text{Total Energy in}}$$

Ways carbon dioxide levels are increasing due to human activity:

1. Burning fossil fuels
2. Deforestation
3. Cement Manufacture
4. Agriculture

**Sankey Diagrams:** These show energy input, the useful energy output and the wasted energy output.  
 E.g Sankey Diagram for a filament light bulb:



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

**Units of Power:**  
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**Conversion Factors:**  
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Ways to reduce our impact on carbon dioxide levels:

1. Use less energy
2. Use renewable energy resources
3. Plant more trees
4. Reduce waste
5. Reuse
6. Recycle

What is the efficiency of a bulb that converts 200J of electrical energy into 12 Joules of light?

$\text{Efficiency} = 12 / 200 = 0.06$  (or 6%)

Impact of increasing carbon dioxide levels on Earth:  
**Enhanced greenhouse effect leads to Global warming** causing climate change, sea level rise, extreme weather events,

**Energy changes in a Coal Power Station:** Draw a flow chart showing the energy changes



At each stage of the process some energy is wasted as **HEAT**.

**Specific Heat Capacity:** This is the energy needed to raise 1kg of a substance by 1°C

Energy = mass x specific heat capacity x change in temperature

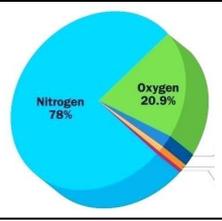
What are the different types of energy store:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

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% of gases in the air



Energy Resource	Advantages (+)	Disadvantages (-)
Solar energy		
Wind energy		
Biomass energy		
Geothermal energy		
Nuclear energy		
Hydroelectric energy		
Tidal energy		
Wave energy		
Fossil fuels		

Ways carbon dioxide levels are increasing due to human activity:

Ways to reduce our impact on carbon dioxide levels:

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

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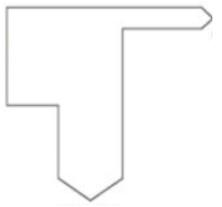
Impact of increasing carbon dioxide levels on Earth:

# ENERGY IN THE HOME

$$Energy = Power \times Time$$

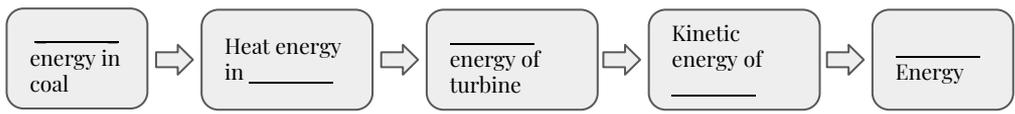
$$Efficiency = \frac{Useful\ energy\ out}{Total\ Energy\ in}$$

**Sankey Diagrams:** These show energy input, the useful energy output and the wasted energy output.  
 Label the Sankey Diagram for a filament light bulb:



What is the efficiency of a bulb that converts 200J of electrical energy into 12 Joules of light?

**Energy changes in a Coal Power Station:** Draw a flow chart showing the energy changes



At each stage of the process some energy is wasted as \_\_\_\_\_.

**Specific Heat Capacity:** This is the energy needed to raise \_\_\_\_\_ of a substance by \_\_\_\_\_

$$Energy = mass \times specific\ heat\ capacity \times change\ in\ temperature$$