

# Energy Security

## Energy Security

- Access to cheap energy sources has become essential to the functioning of modern economies.
- Energy security is defined as the ability of the energy system to react promptly to sudden changes within the supply-demand balance.
- The IEA defines energy security as the uninterrupted availability of energy sources at an affordable price.
- Energy security has many aspects: long-term energy security and short term energy security.
- Long-term energy security mainly deals with timely investments to supply energy in line with economic developments and environmental needs. On the other hand, short-term energy security focuses on the ability of the energy system to react promptly to sudden changes in the supply-demand balance.

## **ENERGY SECURITY AT A GLOBAL LEVEL:**

- Following are the features of energy security in terms of production/ consumption at a global level:
  1. Production skewed by source
  2. Consumption skewed by regions
  3. Industrial sector the largest consumer
  4. Reduced coal dependence
  5. Fossil dependent

# Renewable energy



## What is renewable energy?

- Renewable energy comes from sources that won't run out, including:
  - the wind
  - the sun
  - the waves and tides
  - natural underground heat
- energy crops, wood and waste.
- We can use renewable energy to provide electricity and heat for homes and businesses.

## Why do we need renewable energy?

- Most of the electricity we use in the UK comes from non-renewable sources, such as coal and gas.
- These 'fossil fuels' are running out.
- Burning them to provide energy also releases gases that contribute to climate change.
- Renewable sources of energy don't run out or pollute the environment.

## Why don't we get all our electricity from renewable energy?

- It is important to have a mix of energy sources so, if one fails, another can be used. Also, many renewable technologies are still being developed.

## Wind energy

Giant machines, called wind turbines, can be used to make electricity in windy places. Groups of wind turbines – or wind farms – are being built on land and out at sea.

## Hydroelectric energy

Hydroelectric energy means energy from moving water. Water flowing from a reservoir to a river through a hydroelectric dam can be used to make power.

## Geothermal energy

Geothermal energy means the natural heat of the Earth. Geothermal power stations use heat from deep underground to generate electricity.

## Biomass energy

Biomass is plant and animal matter (e.g. wood, straw, sewage and waste food), or trees grown for fuel. We can burn biomass to produce heat and electricity.

## Hydrogen fuel cells

Hydrogen fuel cells make "clean" electricity from hydrogen gas. They work like batteries, and can power cars or buses.

## Solar energy

Solar energy means energy from the sun. The sun's light and heat can be captured by solar panels and turned into electricity or used to heat water.

## Tidal energy

Every day, the tide at the seaside goes in and out, as the sea rises and falls. Marine turbines can use this movement to generate electric power.

## Wave energy

Waves are made when wind blows across the sea. The energy in waves can be used to make electricity by new technology such as the Pelamis wave machine.

**It's Only Natural**

See [www.dti.gov.uk/renewables/schools](http://www.dti.gov.uk/renewables/schools)

## **Classwork:**

1. List out 10 points to conserve different sources of energy.
2. Evaluate and write any two points of advantages and disadvantages of the following:
  - a) Solar energy
  - b) Wind energy
  - c) Hydro energy
  - d) Geothermal energy, etc.

