

#### The Generation of Energy

Nearly all modern and emerging technology relies on electrical energy and it is therefore crucial that efficient ways of generating electricity are developed and used. This is a global problem.

There are two main ways in which electrical energy is produced:

- through the burning of fuels;
- through the use of the natural environment (green energy).

Although nuclear and fossil fuels differ, the way that electricity is generated from the energy that they release is similar.

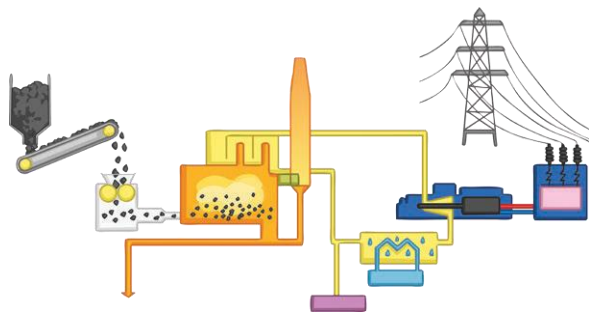
The energy is used to heat water.

The steam powers huge steam turbines, creating movement energy.

This powers an electrical generator.

The electricity is then passed on to the national grid via a transformer.

Energy from power stations cannot be stored. It is simply generated on demand for consumers.



#### Non-Renewable Energy

This group of energy sources is the traditional group of energy sources used in the UK to power manufacturing, homes and energy production. They are seen as more convenient and more readily available than renewable sources.

#### Fossil Fuels

Fossil fuels are finite natural resources. All fossil fuels are derived from the remains of plants and organisms that lived millions of years ago. Scientists can identify areas in the geography where it is likely fossil fuels exist and the fuels are mined or drilled and pumped from their location. The three fossil fuels are:

- coal
- oil
- natural gas

#### Green Energy Sources:

**Wind Power** has seen considerable investment over the past ten years in Europe. As the UK is surrounded by sea, offshore wind farms have been established all around the island. Elsewhere in Europe, it is common to see huge arrays of the tall windmills throughout the countryside. Wind turbines produce electricity when the wind turns the three huge rotor blades. This kinetic energy is transferred through a shaft to a gearbox and then to a generator where electricity is produced. It is then fed into the national grid.

**Solar Power** Huge arrays of solar cells are now commonplace in some parts of the UK. Unlike all other forms of energy production, solar farms do not require turbines to transfer movement energy to generators. Solar cells create electromotive force that is converted into alternating current and supplied to the national grid.

#### Enquiry questions

**What other forms of renewable 'green' energy sources can you find out about?**

**What are the advantages and disadvantages of 'green' energy sources?**

#### Vocabulary Dozen

<b>renewable energy</b>	created by resources that nature can replace, such as wind, water and sunlight.
<b>conserve</b>	use as few resources as possible
<b>non-renewable energy</b>	a source of energy that will eventually run out as it cannot be made as quickly as it is consumed, such as coal.
<b>abundant</b>	available in large quantities
<b>minerals</b>	solid, naturally occurring inorganic substances
<b>turbine</b>	a machine for producing continuous power
<b>extracted</b>	remove or take out, especially by effort or force
<b>distributed</b>	shared or spread out
<b>hydroelectric</b>	the generation of electricity using flowing water
<b>nuclear fuel</b>	made using the metal uranium, the fuel is used in a nuclear reactor, which produces lots of electricity from very small amounts of nuclear fuel.
<b>import</b>	bring (goods or services) into a country from abroad for sale
<b>export</b>	send (goods or services) to another country for sale

#### Prior knowledge

KS1 - Understand geographical similarities and differences through studying the human and physical geography of an area of the UK, and a contrasting non European country.

LKS2 - Describe and understand key aspects of human geography, including: types of settlement and land use, economic activity including trade links, and the distribution of natural resources including energy, food, minerals and water