

Electricity

What is electricity?

Electricity is a flow of electrical charge. It is a secondary energy resource – this means that we produce it by transforming other types of energy such as chemical potential energy (coal, oil or gas), nuclear or kinetic (wind).

The energy resource we use to generate our electricity can be:

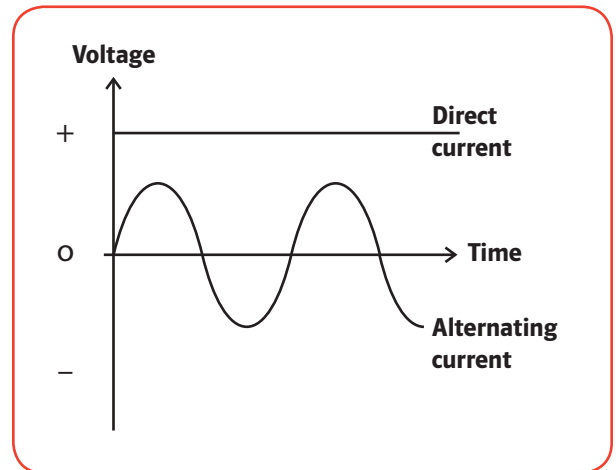
- **renewable** – they are constantly replenished, e.g. solar and wind
- **non-renewable** – they are limited e.g. oil, gas and coal.

How exactly does electricity 'flow'?

Electrical conductors contain electrons which are free to move around. Usually they move around in random directions.

When an electrical potential, or voltage, is applied across the conductor it causes the electrons to all move in one direction. When the electrons are moving like this we call it an electric current.

These moving electrons have energy, which means they can be used for anything from lighting a bulb to spinning a motor.



What are the different types of electricity?

Electricity can be divided into two different types:

- **Current electricity is the type of electricity described above, where electrons all move in one direction.**
- **Static electricity is electrical charge which does not flow as a current. You can experience static electricity by rubbing your feet on a nylon carpet and then touching something metal. Because static electricity has no active current, it is not very useful for doing work.**

Current electricity can then be divided into:

- **Direct current (DC). This is the type of electricity you get from a battery. It always flows in one direction.**
- **Alternating current (AC). This is the type of electricity you get from the mains supply in your house. It is produced by a generator at a power station which causes the flow of electrons to constantly reverse direction. In the UK this happens at 50 times a second, so we say that the mains supply has a frequency of 50 hertz (Hz).**

Why do we use AC electricity in our homes?

It is much easier to transport AC electricity over long distances through power lines as we can use transformers with AC but not with DC. Using transformers allows us to increase the voltage and decrease the current so there is less energy loss due to heating in the cables.

At the users' end of the line, transformers can be used again to reduce the voltage to the necessary level.