

## How does a generator work?

### Making it spin

The electricity we use in our homes is generated using lots of different methods. These include:

- **Gas, coal and oil-fired power stations**
- **Nuclear power stations**
- **Wind turbines**
- **Hydroelectric and pumped storage power stations**

All of these generating methods start by transforming an initial type of energy into rotational kinetic energy.

For example, in a gas-fired power station the chemical potential energy in the gas is transformed into heat energy when the gas is burned. This heat energy is then transformed into rotational kinetic energy by passing the hot exhaust from the burning gases through a turbine.

### What's so important about rotational kinetic energy?

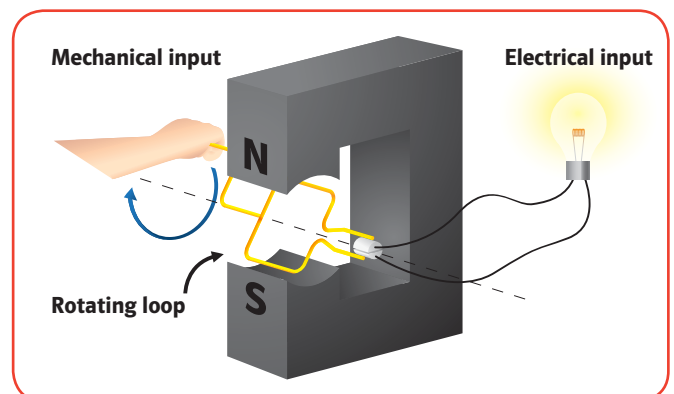
Rotational kinetic energy is important because it is the form of energy most easily transformed into electrical energy by a generator.

### What's a generator and how does it work?

Generators are machines. In most situations they provide the simplest and most efficient way for us to produce electricity.

They work by making use of a very simple principle – when you move a conductor through a magnetic field, a voltage is induced in the conductor and this causes an electrical current to flow.

You can see this when a voltmeter is attached to the two ends of a piece of wire and then waving the wire through the field of a strong magnet. You should see the voltmeter reading change as you move the wire. This is called the generator effect.



### How do we use the generator effect?

In the experiment mentioned above only a fraction of a volt will be produced. To increase the voltage you can do the following things:

- **Use a stronger magnet (or magnets)**
- **Use more wire**
- **Move the wire faster**

For a small generator the most efficient way of doing this is to wind the wire into a coil which can be spun between the poles of a strong magnet.

Larger generators, like the ones used in power stations, will usually have the magnet spinning and the coil stationary.