



# Introduction to renewable energy

Imagine burning 237 million tonnes of oil. That's roughly the contents of nearly 1000 of the world's largest super tankers.

The energy released by burning this amount of oil is approximately 100 million billion joules. This is the amount of energy that the United Kingdom consumed in 2001<sup>1</sup>.

In reality, not all of the energy used in the United Kingdom comes from burning oil. There are lots of other energy sources that are used to supply us with electricity, heat our homes and power our cars. Most of these are non-renewable, which means that once they have been used they are gone for good. Fossil fuels such as coal, oil and gas are all non-renewable energy sources.

## Problems with fossil fuels

- **Running dry.** If we keep using supplies of non-renewable energy at the rate we are using them today, our best estimates tell us that world coal reserves might last for about 200 years, world natural gas reserves for about 60 years and world oil reserves for just about 40 years. However, we might actually use them up even more quickly than this. Global energy demand is predicted to rise as countries industrialise and the world population continues to grow.
- **Climate change.** More and more experts agree that the world's climate is changing. Over the past century global temperatures have risen by some 0.7°C and all of the ten warmest years on record have occurred since 1990. Scientists believe that this warming is due, at least in part, to our increased use of fossil fuels. Burning fossil fuels releases carbon dioxide into the atmosphere and this gas is one of the main so-called 'greenhouse gases'.

Concerns over climate change have led 119 countries to sign up to the Kyoto Protocol, which sets out legally binding targets for the reduction of greenhouse gas emissions, and came into force on 16 February 2005. Under the treaty, the 30 industrialised nations signed up to the treaty have until 2012 to reduce their emissions of six of the worst greenhouse gases to around 95 per cent of their 1990 levels.

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<sup>1</sup> DTI, *Energy Consumption in the United Kingdom*



- **Security of supply.** A reliable supply of energy is vital to all aspects of modern life. For the last 30 years the UK has been fortunate in that it has been able to extract its own oil and gas from fields below the North Sea. In recent years, the amount extracted has begun to decline, making it necessary to import more oil and gas from abroad. As global supplies of fossil fuels dwindle, it is likely that our energy supplies will become much less reliable if we continue to rely on non-renewable sources.

### **The solutions**

There is wide agreement that the solution to all of these problems is to reduce our reliance on fossil fuels and other non-renewable sources of energy. To do this, we need to find alternative sources of energy that will not run out and will not pollute our environment.

The good news is that such sources of energy do exist. In fact, people have been using energy sources such as wind energy, solar energy, geothermal energy and bio-energy for thousands of years. These sources are called renewable energy sources because they are not used up in the same way that fossil fuels are.

In the past, people have used bio-energy in the form of burning wood to heat their homes, wind energy to push their sailing boats across the sea, and solar energy to dry their clothes. These have all been small-scale uses. In the last 30 years, technology has allowed us to use renewable energy on a much larger scale, so it can now provide power to whole towns.

Currently, the United Kingdom meets just over three per cent of its energy needs from renewable energy sources. However, the UK has access to some of the best renewable energy sources in the world, particularly wind and wave. There is recognition that these renewable sources need to be used more; not only to protect our environment but also to make sure that the UK has a reliable supply of energy for the future. To this end, the government has set a target of meeting 10 per cent of our energy needs from renewable sources by 2010.

Renewable energy offers safe, reliable and cheap alternatives for all of our energy needs. It can provide everything that fossil fuels currently offer, but without the pollution.