

RENEWABLE ENERGY

EXPLAINER GUIDE

This **Explainer Guide** covers the key principles of renewable energy.



What is renewable energy?

The UN defines **renewable energy** as 'energy derived from natural sources that are replenished at a higher rate than they are consumed. Sunlight and wind, for example, are such sources that are constantly being replenished.'

Some common types of renewable energy include:

Wind: Wind energy is one of the oldest forms of renewable energy (it has been around for millenia!). Nowadays technologies have improved to generate electricity in more efficient ways, such as through taller turbines.

Solar: Solar technologies convert sunlight into electrical energy through the use of photovoltaic panels, or mirrors that concentrate solar radiation. There is also solar thermal, which uses the sun to warm water for storage in a thermal store or hot water cylinder. Due to the rapid decrease in costs more recently, solar is actually one of the most affordable forms of electricity.

Heat in the air, ground, or water: Thermal energy in the environment is naturally replenished. This can include in the air, ground, or bodies of water such as rivers, lakes, and the sea. Even when they are below 0°C, there is still thermal energy which can be captured, and technologies such as air, water, or ground source heat pumps can 'uplift' this low grade heat to be used for heating radiators or hot water for buildings at high efficiencies.

Other forms of renewable energy include **tidal power**, **wave power**, and **geothermal energy**.

Why is it important?

There are many benefits that renewable energy can offer. This **includes**:

- **Climate change mitigation:** Renewable energy has zero net greenhouse gas emissions. This makes it the best solution to environmental harm.
- **Energy security:** Renewable energy sources can be found across the world. They are therefore reliable sources of energy that do not rely on more economically volatile fossil fuel imports.
- **Inexhaustible:** Fossil fuels are finite resources. In comparison, renewable energy is infinite and can continue to be generated in the future.

However, it is important to note that there are still many challenges around renewable energy. For example, there are regional differences in access to renewable energy sources. Renewable energy installations can also have high levels of **embodied carbon**.

What is the role of the built environment?

From on-site use of renewables powering construction machinery, to retrofitting buildings to install solar panels, renewable energy can benefit the entire building lifecycle.

Over the last two decades, built environment emissions have **reduced by 30%**. Most is largely due to a reduction in **operational** emissions, which are attributable to rapid decarbonisation of the electricity grid in recent years through use of renewables.

Whilst newly constructed buildings are more energy efficient, **80%** of buildings in 2050 have already been built, so a major priority is decarbonising our existing stock. A key way of doing this is through the installation of renewable sources of energy such as solar on existing buildings, or swapping to a high quality renewable energy green tariff.



FURTHER RESOURCES

- UKGBC [Advancing Net Zero](#)
- UKGBC [Renewables and Offsets Guide](#)
- United Nations [What is renewable energy?](#)