



## Introduction to Solar

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The sun is the original source of almost all the energy used on the Earth. It provides the energy that drives our weather systems and so the energy sources of wind, water and waves are in fact a form of solar energy. Trees and other plant life are sustained by using sunlight to create stored chemical energy through the process of photosynthesis and it is this energy that is released when planet material is burned. Since this energy from the sun is in continuous supply these energy sources can be constantly replenished and hence are categorised as renewables.

Fossil fuels, which the world is at present so dependant on for energy, are deposits formed from the dead vegetation of millions of years ago (an indirect form of solar energy). There are two major issues with fossil fuels that make them an unsustainable energy source. Firstly, being finite, they are not renewable (except over geological timescales) and so will eventually run out. Secondly, when burned they release large volumes of CO<sub>2</sub> into the atmosphere. The increase in the atmospheric concentrations of CO<sub>2</sub> is the main cause of global warming, which is destabilising the planet's climate. The Royal Commission on Environmental Pollution's Report,

*Energy –*

*The Changing Climate* indicated that the UK needs to reduce emissions of CO<sub>2</sub> by 60% by the year 2050 and by 80% by the year 2100.

A sustainable energy system must ultimately be based upon renewable energy sources, all of which are based upon solar radiation. Thankfully, the Earth receives a staggering amount of energy from the sun, as much energy falls on the planet each hour as the total human population uses in a whole year.

### Types of Solar Technology

There are several ways in which the solar energy the Earth receives can be used directly for heating and electricity generation. The various technologies are often classified as either 'passive' or 'active'. Passive solar systems do not involve the input of any other forms of energy apart from the incoming sunlight. Passive solar water heaters, for instance, have no pumps and may rely upon capillary action to pump water. Active solar systems use additional mechanisms such as circulation pumps. These mechanisms are typically powered by electricity and may have additional electronic or computerized

automatic controls.

Read on for further information or download our Solar Energy Fact Sheet.

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- [Passive solar design in architecture](#)
- [Solar thermal heating systems](#)
- [Electricity from the sun](#)
- [Types of PV system](#)
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