

Solar water heating

Turning sunshine into free hot water ...

Using the abundant and free energy from the sun to heat the hot water in your home means that you will save money on your fuel bills.

Solar water heating, often referred to as 'solar thermal', involves using solar panels to absorb the heat of the sun and transfer it to the water you use in the home. On warm summer days a solar thermal system could provide all of your hot water. During the winter the output will be considerably less.

How does it work?

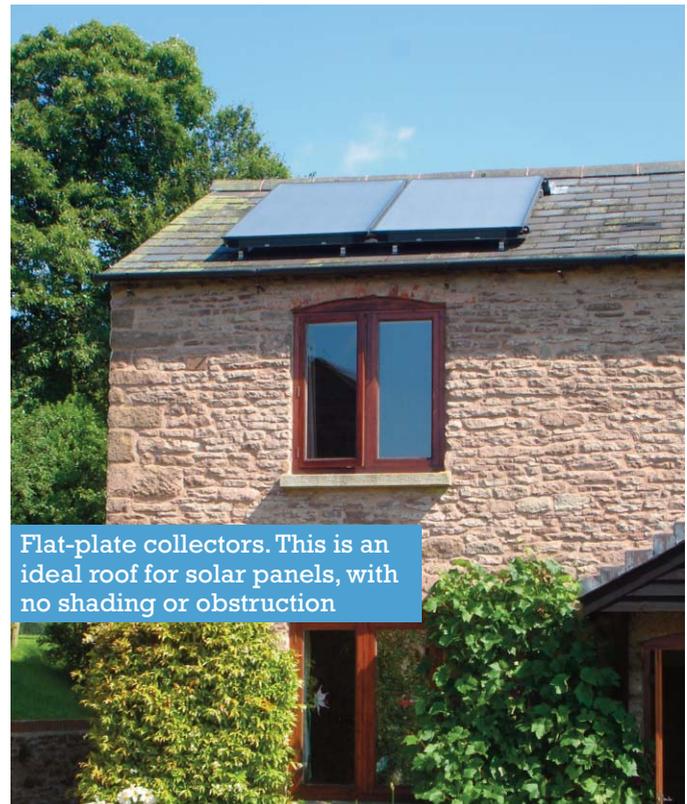
Solar thermal technology works alongside conventional water heating systems. Heat absorbed by the panels is used to pre-heat the water in a hot water storage cylinder. This reduces the amount of fuel needed to bring the hot water up to a useable temperature, saving money on heating bills and reducing carbon emissions.

In a 'direct' or 'open-loop' system the water heated in the solar panels goes directly into the domestic hot water cylinder. These systems are very rarely used in the UK because of the risk of both freezing and overheating (solar panels are remarkably efficient).

So most solar systems are 'indirect' – that is, the liquid in the panels is not the same as what comes out of the taps. Instead, it is a mixture of water and antifreeze, and the heat it absorbs from the sun is transferred to the water in the hot water cylinder by way of a copper coil.

Likely savings

A well-installed and properly used solar hot water system can save a household £55 a year when replacing gas heating or £80 a year when replacing electric immersion heating. Systems fitted by MCS accredited installers (see over) may also be eligible for the Renewable Heat Incentive payments (see www.cse.org.uk/rhi)



Flat-plate collectors. This is an ideal roof for solar panels, with no shading or obstruction

Photos: top, Tim Weisberg; below, www.iStock.com / JBen White; bottom, www.iStock.com / Dmitry Naumov



Evacuated tube panels

There are two main types of solar collector. **Flat plate collectors** are dark, box like structures (top photo) which contain a series of pipes running horizontally and vertically inside them. **Evacuated tube** systems are a series of glass tubes (above). The vacuum created within the tubes

"Before you install solar panels, check with your local planning department, especially if you live in a conservation area or a listed building."



continued overleaf ▶

minimises heat loss from the solar collector, particularly in colder conditions. No liquid passes through the tubes themselves, rather the heat is transferred through a heat exchanger which is fixed to the top of the tubes.

Evacuated tube systems tend to be more efficient but are also more expensive.

Is your home suitable?

Here are four practical things you will need to consider before investing in a solar water heating system.

- 1) Your roof should face predominantly south. Due-south is ideal but anywhere between south-east and south-west is also likely to be suitable.
- 2) You'll need between 2 and 5 m² of roof space. The available roof space needs to have as little shading as possible from buildings, chimneys or trees. Any shading will reduce the output of the solar panels.
- 3) Some 'combi' boilers are unable to accept pre-heated water, so won't be compatible with a solar system. But if you already have a hot water storage cylinder then you're likely to be OK.
- 4) Some systems involve the installation of an additional hot water cylinder so you may need space to fit this.

In terms of planning permission solar panels are usually classed as a permitted development, but some restrictions still apply so it best to check before proceeding.

What about costs?

Most domestic solar water heating systems cost somewhere between £2,000–£6,000 depending the size, type and number of panels, and whether it is a direct or indirect system. Installers will offer different systems, so it's worth doing the research and getting quotes from at least three suppliers. Make sure that both system and installer

are registered with the **Microgeneration Certification Scheme** and ideally use an installer who is a member of the **REAL Assurance** scheme.

Maintenance costs on solar hot water systems are minimal and you should expect a 10 year warranty at least. You can perform a yearly check yourself on the condition of the panels and arrange for a professional installer to check the system thoroughly every three to five years. You may have to top up the antifreeze mix every few years.



Photo: www.stock.com/Amanda_Grandfield



More information

Microgeneration Certification Scheme
www.microgenerationcertification.org

REAL Assurance www.realassurance.org.uk

Heating and Hot Water Industry Council
www.centralheating.co.uk

Solar Trade Association www.solar-trade.org.uk

This leaflet was originally produced by the **Centre for Sustainable Energy** (CSE) and reprinted in this version on behalf of SEACS.

CSE's Home Energy Team offers free advice on domestic energy use to householders in Bristol and Somerset (including the unitary authorities of North Somerset and Bath & North East Somerset).

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