

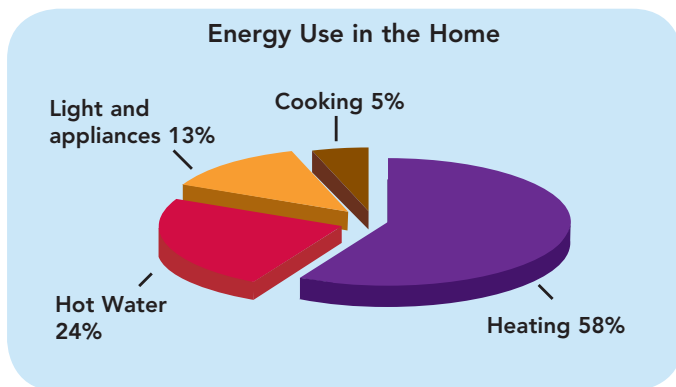


Solar water heating



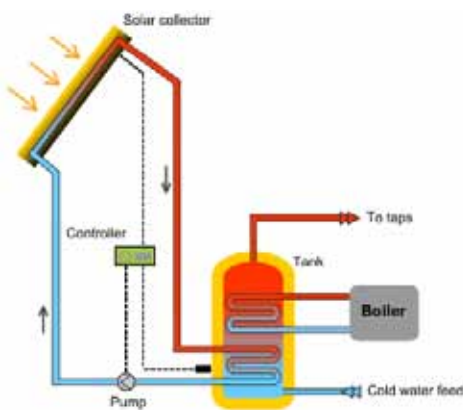
What is it?

Solar water heating uses heat from the sun to provide hot water. This form of energy is free and when used in a typical household could save between 12- 17% of annual fuel costs. There are over 80,000 systems in the UK making this the most popular renewable energy installation.



How does it work?

The process of solar water heating involves the absorption of the sun's radiation by collectors, via a fluid (usually water and/or antifreeze), and the transfer of the heat to a hot water storage tank. This then supplies hot water taps, as in conventional plumbing systems.



(Solar Trade Association)

There are two main types of collector for solar water heating: flat plate and evacuated tube collectors. Both types, correctly sized, can produce the same quantity of domestic hot water per year. Some flat panels can be roof integrated, similar



Solar water heating, Bridport (Jim Shearman)

to Velux windows. Evacuated tubes are more efficient, therefore a smaller area of roof is required. However they are also more expensive. A third

type, called unglazed collectors, are cheaper and used for outdoor swimming pool systems.



Woodmead Halls, Lyme Regis

Most systems installed in the UK involve a closed loop arrangement where antifreeze is pumped from the solar collector to the hot water tank and heats

the water indirectly through a heat exchange coil (see diagram).

Other systems are "open" or direct where the hot water from the solar collector is pumped directly into the storage cylinder. Direct systems don't lose so much energy in heat transfer but do not contain antifreeze and therefore require special plastic expandable pipes to combat freezing. They may also need a water softener in hard water areas to prevent limescale build-up.

Solar panels work best when they are placed at an angle of 30- 50° from horizontal and are orientated between south east and south west. Some types of evacuated tube system have greater flexibility since individual tubes can be turned at an angle so that the flat solar absorber plate inside the tube is facing south.

Solar collectors can be fitted in conjunction with combination (combi) boilers to provide pre-heated water and thereby reduce the energy needed to bring the water to the required temperature.



However, if retrofitted, this requires more expensive installations and space for an unvented hot water cylinder. Not all combi boilers will accept pre-heated water.

Can I produce all my hot water with this technology?

No. A typical system will provide virtually all your hot water in the summer and about 50-60% of the year round demand. For example, a Dorset house with a south facing roof fitted with 4 m² of flat plate solar collectors will produce around 1600 kilowatt hours (kWh) of hot water per year, which is 50% of average domestic hot water needs. There is a big difference in the solar energy available throughout the year but as a rule a solar collector will provide 80-100% of the hot water during summer months and perhaps as little as 15% in the depth of winter.

How much roof space is required?

A system will be sized according to the needs of the property, ranging from small domestic systems of 3-4m² to much larger installations, for example in hotels. Swimming pool collector systems are typically about half the size of the pool surface area. Evacuated tubes produce more hot water than flat panels per square metre of collector; typically 3m² of evacuated tubes produce the same amount of hot water as 4m² of flat panels.

How much maintenance is required?

You should check fairly regularly to see if any debris (such as leaves and bird droppings) has fallen on the collectors. The panels can be cleaned with soapy water and a soft bristled brush. You may need to replace the anti-freeze after about five years. Systems ought to be serviced every 2-3 years. This will include checking the system pressure gauge and the pump. The pump is the only moving part of a solar installation and it should be conveniently located to enable a replacement to be fitted in the event of a breakdown.

How much does it cost?

Each installation is different due to roof access, existing internal plumbing arrangements etc. A typical flat-panel system for an average property will cost around £3,500-£4,000 whilst an evacuated tube system may cost around £5,000 fully installed.

This would include the panel, a new twin coil hot water tank, pump and controls. Some householders may prefer a DIY installation which can be done for around £2,000, but will require time to learn the skills needed. Also a DIY installation is not eligible for a grant.

Technology		Installation	2 m ²	3 m ²	4 m ²	6 m ²
Flat plate	Closed	Installer	/	£3,150	£4,200	£5,000
		DIY	/	/	£1,500	£2,500
	Open (direct)	Installer	/	£3,400	/	/
		DIY	/	£2,500	/	/
Evacuated tube	Installer	£4,200	£5,500	/	/	
	DIY	£2,115	/	/	/	

Prices quoted on the web (inc. VAT) from the following sources: www.solartwin.com, www.sustainabletechnology.uk.com, www.imaginationsolar.com, www.southernssolar.co.uk, www.diy.com

Can I get a grant?

As a householder you can apply for a £400 grant from the Low Carbon Buildings Programme. The installer and the product must be approved and a condition of the grant is that you must already have installed a basic level of energy efficiency measures including cavity wall and loft insulation, adequate heating controls and low energy light bulbs. The householder grant programme is currently due to end in April 2011 and will be replaced at that time with financial support through a "Renewable Heat Incentive." Community groups can get 50% funding through the community sustainable energy programme, Low Carbon Buildings Programme Phase 2 and can also apply to energy companies with green energy funds.

What is the pay back?

The capital cost of a solar system is more expensive than an equivalent fossil fuel system but as solar energy is free your yearly fuel costs will be reduced. A solar system that replaces a peak rate electric hot water heating (immersion heater) will save an average home around £200 per year. This means it would take approx 12 years to pay back for a DIY installation, 20 years for flat panels and 21-27 years for evacuated tubes.

Are there any planning issues?

Domestic solar thermal hot water panels are now permitted development except in Conservation Areas, World Heritage Sites and on listed buildings.



Evacuated tube solar water heating, Wimborne, Dorset

Planning permission is required in these areas if the system is to be installed on a front roof slope or visible from the public domain. If in doubt you are advised to contact your local planning authority. See also the link in "More information" below. Planning permission is still required for all community and commercial scale solar installations.

What is the potential for this technology in Dorset?

Dorset has one of the best solar energy resources in mainland UK. As well as any property with a roof facing between SE and SW, there is good potential for installation within the tourism sector which requires high levels of hot water demand in summer. Examples include camp and caravan sites with shower blocks, hotels, guesthouses and swimming pools.

Pros and cons of solar water heating

Pros

- Mature industry with lots of local installers
- One of the lowest capital cost renewable energy options
- Good savings if substituting for peak rate electricity
- Virtually no maintenance

Cons

- Water heating only
- Can be visually intrusive in certain circumstances
- Need a hot water cylinder
- Difficult to integrate with combi boilers which adds extra cost



Accredited Solar Water Heating Installers operating in the South West

In order to access a £400 grant from the Low Carbon Buildings Programme accredited installers and accredited products must be used. These are listed on the Microgeneration Certification Scheme (MCS) website: www.microgenerationcertification.org Telephone **020 7090 1082**

The Dorset Energy Group suggest always getting two quotes before committing to an installer, as a number of solar companies operating in Dorset use high pressure sales techniques and contracts that exclude a cooling off period. In some cases the small print may contain a contract cancellation charge of several thousand pounds. If in any doubt contact the South West Energy Saving Trust Advice Centre **0800 512012** before inviting a solar water heating company into your home for a "no obligation" quote.

All accredited MCS installers will allow a cooling off period and have signed up to government approved quality assurance standards.

In addition, there are a number of local reliable solar water heating installers who have registered with the Dorset Trading Standards "Buy with Confidence" scheme. Whilst not MCS accredited, since the cost of accreditation is disproportionately high for smaller companies, these companies can often provide competitive quotations relative to MCS accredited installer prices.

Dorset Trading Standards "Buy with Confidence" registered solar installers:

Jim Shearman, Bridport Telephone 01308 425669 e mail jimshearman@tiscali.co.uk

More information

Solar Trade Association

01908 442290

www.solar-trade.org.uk

Grants

Low Carbon Buildings Programme

0800 9150990

www.lowcarbonbuildings.org.uk

Community Sustainable Energy Programme

0845 3 671 671

www.communitysustainable.org.uk

Planning

Planning - permitted development rights for solar panels

0800 915 0990

www.lowcarbonbuildings.org.uk/info/permitted/

Renewable energy advice for householders:

SW Energy Saving Trust Advice Centre

0800 512012

www.energysavingtrust.org.uk

Renewable energy advice for businesses in Dorset:

Business Link

0845 600 9966

www.businesslink.gov.uk/southwest

Renewable energy in Dorset and advice for community groups:

Renewable Energy Development Officer, Dorset County Council

01305 228530

p.west@dorsetcc.gov.uk
www.dorsetforyou.com/climatechange

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