

Renewable energy

Factsheet 3

Solar water heating

Introduction

Solar water heating systems gather energy radiated by the sun and convert it into useful heat in the form of hot water. Systems have been available in the UK since the 1970's and the technology is now well developed with a large choice of equipment to suit many applications.

Solar water heating systems work alongside your conventional water heater to provide hot water.

What are the benefits?

- It can provide almost all of your hot water during the summer months and about 50 per cent year round.
- It will reduce your impact on the environment - the average domestic system can reduce carbon dioxide emissions by 0.4-0.75 tonnes (or 400-750kg) per year, depending on the fuel replaced.



Fig 1: Solar water heating system installed in Perthshire home with the help of an Energy Saving Trust household grant.



Applications

Solar water heating can be used for domestic water heating and also for larger scale applications including swimming pools. A solar water heating system for domestic hot water comprises three main components: solar panels; hot water cylinder; and a plumbing system.

- Solar panels are fitted to your roof and retain heat from the sun's rays and transfer this heat to a fluid.
- A hot water cylinder stores the hot water that is heated during the day and supplies it for use later.
- The plumbing system is made up of simple piping and sometimes a pump, which moves the fluid around the system.

Different types of system

There is a range of different system types and configurations for solar hot water systems. There are two different types of solar collectors; flat plate and evacuated tubes. Flat plate systems have an efficiency of around 30 per cent and are cheaper to install. Evacuated tube systems occupy a smaller area and have an efficiency of approximately 40 per cent but are generally more expensive.

For areas that are liable to periods of freezing temperatures, either a drain back or a closed loop system is used, whereby an intermediary (anti-freeze) fluid and a heat exchange system heat the water in the tank indirectly. Other systems circulate and heat the water directly in the panels.

Some systems require a pump to move the fluid through the systems, whilst others use natural convective forces. Active systems are usually easier to fit but they may be more expensive. There are other system variations and the option which best suits your needs depends on a range of factors. The main issues to consider are:

- Amount of south facing roof space.
- Existing water heating system (e.g. some combi boilers may not be suitable).
- The budget you have for the project.

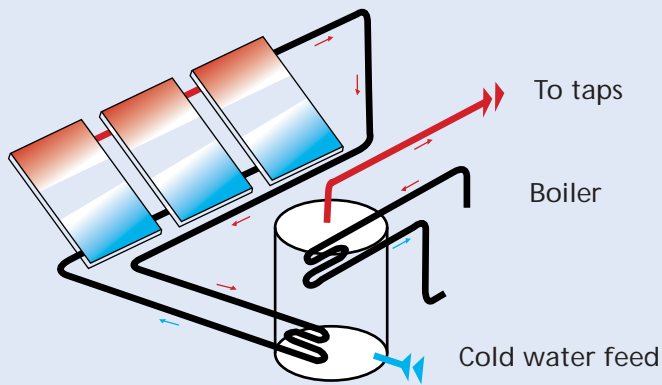


Fig 2: Typical domestic solar heating system set-up

A competent professional installer should assess your situation and discuss with you the best configuration to meet your needs. This includes ensuring that the solar system is efficiently integrated with any auxiliary water heating sources to gain the greatest benefit.

Is my property suitable?

Preferably you will need:

- 2-5m² of southeast to southwest facing roof space that receives minimal shading during the main part of the day.
- Space to locate an additional water cylinder if required.

Cost and maintenance

Costs vary due to a range of factors such as size of collector, type of roof, existing hot water system and geographic location. The typical installation costs for flat plate collectors is £2,000 - £3,000 while evacuated tube systems will cost £3,500 - £5,000.



Fig 3: Flat plate collector system installed in Glasgow with help of an Energy Saving Trust grant

Alternatively you can fit or build the system yourself. It can work out cheaper but will take longer and you'll need a certain level of skill. However, you should bear in mind that DIY jobs are not eligible for grant funding (see below for further information).

Solar hot water systems generally come with a 10-year warranty and require very little maintenance. A yearly check by the householder and a more detailed check by a professional installer every 3-5 years should be sufficient (although you should consult your system supplier for exact maintenance requirements).

Are there grants available?

Yes, householders and community groups in Scotland can access grants from the Scottish Executive. These grants are managed jointly by the Energy Saving Trust and the Highlands and Islands Community Energy Company. Householders can access capital funding of up to £4,000 and community organisations can access up to £10,000 for feasibility assistance and up to £100,000 for capital assistance. For more information call the helpline on 0800 138 8858.

Where can I get more information?

The Energy Saving Trust offers a one-stop shop that provides funding, advice and project support to further the development of small-scale renewable energy projects. To assist community projects there is a network of Development Officers which the Energy Saving Trust co-manages with the Highlands and Islands Community Energy Company; these officers provide an advisory and project management service to community groups within their local region. To find your nearest Development Officer call the helpline on 0800 138 8858.

The Energy Saving Trust also provides information and advice for householders via its Energy Efficiency Advice Centre (EEAC) network which provides householders with free and impartial advice on how to improve energy efficiency in the home. EEAC advisors have been trained to provide advice about renewable energy and will be able to advise you on the issues you need to consider when installing a renewable energy technology. To contact your nearest EEAC call 0800 512 012.

Useful links

- The Energy Saving Trust renewable grants for Scottish householders and community groups: www.est.org.uk/schri
- For advice and information about renewable energy technologies and other energy saving measures for your home: www.est.org.uk/myhome
- Scottish Solar Energy Group: www.sseg.org.uk
- Solar Trade Association (STA): www.solartradeassociation.org.uk

Title picture courtesy of AES Solar System
Fig 3 courtesy of Dr Jonathon Oates

