CLASP. Climate Change Local Area Support Programme

Fact Sheet 2: Solar Thermal Panels

Sunlight is a powerful and abundant free energy source, and solar thermal panels are designed to use sunlight to produce hot water.

Two types of solar thermal panel

What are they?

A solar thermal panel is a unit that can be mounted on a building's roof, containing a series of pipes. When the sun shines on it, the sunlight heats a liquid passing through the panel.

What do they do?

Solar thermal panels use the sun's heat to warm domestic hot water. This is usually used for hot water in sinks, showers and baths. Large solar panels can be used to supplement heating systems although this does work best in the summer months when there is usually little demand for heating. Solar thermal technology can save money on a domestic or commercial building's energy bills, and many installations will be eligible for the Renewable Heat Incentive (RHI).

How do they work?

Solar thermal panels work as part of a solar thermal system, which typically consists of the panels plumbed to a storage tank. This tank should be larger than conventional hot water tanks, at about 200 litres capacity for an average domestic house. The solar thermal system is typically isolated from the rest of the plumbing system, as the water in the panels will often contain antifreeze to prevent damage to the panels during the winter. The conventional hot

water supply will pass through a heat exchanger in the tank, transferring heat without mixing with the water. A conventional boiler or other heat source can be used to 'top up' the water temperature during the cooler months.

Solar thermal panels work on the principle that materials with a dark colour absorb the heat from sunlight. The challenge is to transfer the heat from this material to water with high efficiency. There are two designs of solar thermal panel:

- 'Flat plate' panels are flat rectangular panels with a glass front and insulated on the sides and back. The collector material is inside the panel, with pipes running through it. The heat from the material is passed to the water running through the pipes. The insulation reduces the heat lost from the material to the surrounding air.

- 'Evacuated tubes' are long glass tubes about 10cm in diameter, with a strip of collecting material inside them. The tubes are made like a double glazed window or a vacuum flask, to contain the heat inside the collector. These tubes are set up as arrays, with several used in one installation.

Where do they go?

The panels go on the roof of a building or as a free-standing structure, ideally south facing (although east or west facing will still work). The panels need direct sunlight, so avoid any shade. Bear in mind that the sun changes position through the day, so shadows may not be completely avoided.

A typical domestic installation would use 3 - 5m^2 of panels.

What issues need to be considered?

An efficient solar thermal system will reduce but not replace the need for a conventional heating system. It is ideal for pre-heating water, or for low-temperature uses e.g. oversized radiators or under-floor heating.

What are the planning requirements?

Most householders can carry out small extensions or additions to their homes without the need for planning permission. This is known as '**permitted development'**.

Domestic solar thermal panels are classed as permitted development, subject to certain conditions being met. These are summarised below:

i. Solar thermal panels in homes

Fitting solar panels on the roof of a house or a block of flats is permitted development, but the following limits apply:

- Panels should not be installed above the roof ridgeline (excluding the chimney) and should project no more than 200mm from the roof or wall surface.

- If your home is in a conservation area or within a designated World Heritage Site, planning permission will be required if panels are to be fitted on a wall which fronts a highway.

- If your home is a listed building or on a site of a designed scheduled monument, planning permission, and in some cases listed building consent, may be required.

Please note: You may also need Building Regulations approval to ensure the roof can take the weight of the panel(s).

ii. Solar thermal panels in gardens

A single free standing solar panel array can be installed within a residential garden area without the need for planning permission, providing the array is:

- No bigger than $9m^2$ in area and less than 4m in height.
- Is set more than 5m away from the garden boundary.
- If your home is in a conservation area or within a World Heritage Site, it should not be visible from the highway.
- If your home is a listed building or on a site of a designated scheduled monument, planning permission, and in some cases listed building consent, may be required.

iii. Solar thermal panels in other buildings

Permitted development rights for small scale renewables currently do not extend to non-domestic buildings, and planning permission will most likely be required before solar panels can be installed on non-domestic buildings such as offices, schools, industrial premises and agricultural buildings.

To help the Planning Department make an informed judgement, it is useful to submit information on the technology with the application e.g. the size and external appearance of the panels and provide plans showing where the equipment will be installed.

Solar panel applications will generally be simple and straight forward, but it is always recommended that applicants speak to the Planning Department as soon as possible to identify the planning requirements, especially if the building is listed, or within a conservation area.

Please note: You may also need Building Regulations approval to ensure the roof can take the weight of the panel(s).

More info

The Department of Energy and Climate Change's (DECC's) page outlining information on Solar Thermal, with links to further information:
http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/explained/microgen/solar_h20_heat/solar_h20_heat.aspx

The companion guide to planning policy statement 22 provides more information on the planning and development of renewable energy schemes across England:
http://www.communities.gov.uk/publications/planningandbuilding/planningrenewable

Please Note: National planning guidance is currently under review and the companion guide to planning policy statement 22 is referred to for information only.