

## An introduction to Solar Thermal

### What is solar PV?

Solar thermal panels use energy from the sun to heat water for use within the home or business. The panels are linked to an insulated water storage tank from which the water is distributed. It is normal to install a back-up water heating system to serve the hot water tank; such as a boiler or electric immersion, to ensure sufficient hot water is available in Winter or during cloudy days when the solar panels are not working at their most efficient.

Two principal forms of solar thermal systems exist:

- **Flat plate** – these are often considered to be more aesthetically pleasing;
- **Evacuated tube** – these are more expensive, but are more efficient in the UK climate, and the individual tubes can be replaced if needed.

These systems can be either roof mounted - mounted on a frame above an existing roof or integrated into the roof covering or ground mounted – mounted on a frame within a building curtilage.

The efficiency of the system is dependent on:

- Orientation of the installation - ideally systems should be south facing and angled at 30-50° from horizontal. Systems positioned outside these limits may be viable although less efficient;
- Shading - shading will act to reduce light exposure and drastically reduce generating capacity.

Maintenance of Solar Thermal panels is limited, requiring external cleaning of the conductive surfaces and ensuring overshadowing from vegetation does not occur.

### Why install the technology?

Solar hot water systems can help you reduce your energy use, bills and carbon emissions. According to the Energy Saving Trust (2010), for a typical domestic system of 4-5 square metres of solar panels with an installation cost of £3,000 - £6,500, the following savings are achievable (excluding the Renewable Heat Incentive).

Replacing gas usage £50    Replacing electricity £80    Replacing Oil £55    Replacing solid fuel £60

The Government is encouraging installation of this technology through offering a Renewable Heat Incentive (RHI). This is only available for [Microgeneration Certification Scheme](#) (MCS) or [CEN Solar Keymark](#) accredited equipment, installed by an accredited MCS installer. The RHI is due to be introduced in 2011 in two phases. Information regarding these schemes is available from the [Energy Saving Trust](#) and [Department for Energy and Climate Change](#) (DECC).

From 2012 the Government's proposed 'Green Deal' will provide householders and businesses loans for energy efficiency works, repayable through savings on energy bills, with additional help available for vulnerable people and buildings requiring extensive works. For more information visit [www.decc.gov.uk](http://www.decc.gov.uk)

### What permissions are required?

#### **Planning Permission: Residential**

Solar thermal systems constitute permitted development for most domestic properties, meaning that full planning permission is not required. In the case of micro renewables, permitted development extends to a building which consists wholly of flats, or that which is used solely for the purposes of a dwellinghouse.

Full planning permission would still be required for dwelling mounted installations if:

- the equipment would protrude more than 200mm beyond the plane of the wall or the roof slope;
- it would result in the highest part of the equipment being higher than the highest part of the roof; the solar thermal equipment would be installed on a building within the curtilage of the dwellinghouse where the dwellinghouse is a listed building.

In the case of land within a Conservation Area or World Heritage Site, permission would be required if:

- the installation is situated on a wall forming the principal or side elevation and would be visible from a highway;
- the installation is situated on a wall of a building within the curtilage and would be visible from a highway.

Permitted development rights in relation to solar thermal do extend to Listed Buildings; however, listed building consent is likely to be required. Pre-application consultation with the Local Planning Authority is advised.

For solar thermal panels mounted on the ground planning permission will be required if:

- there are more than one stand alone solar systems within the curtilage;
- the installation would exceed 4m in height above ground level;
- the installation would be sited within 5m of the boundary;
- the surface area of the installation would exceed 9m<sup>2</sup> or housing 3m by 3m.

In the case of land within a Conservation Area or World Heritage Site, permission would be required if:

- the installation is situated within any part of the curtilage of the dwellinghouse and would be visible from the highway.

### ***Planning Permission: Non-Domestic Properties***

In the case of non domestic buildings, solar systems may could be considered as an 'alteration' to an existing building and, subject to meeting the appropriate conditions, it could be classed as 'permitted development' and therefore not require full planning permission. Each building and installation is required to be considered individually; therefore consultation with the planning authority is required.

Agricultural buildings do not have specific permitted development rights to install microgeneration systems; however, if the installation is reasonably necessary for the purposes of agriculture within that unit it can be considered permitted development under Part 6, Class A of the Town and Country Planning (General Permitted Development) Order 1995. Each building and installation is required to be considered on its merits; therefore, it is necessary to consult the planning authority

### ***Building control***

Building regulation approval is required for solar panel installations, which will consider the suitability of the building for the installation and electrical installation. It is advisable to contact the local authority Building Control Department in the initial stages of the project.

### **Is Solar thermal the correct option for my home/business? What to do next?**

- Consider what alternative energy saving or renovation work you can also complete.
- Look at your annual energy bills to assess the level of energy used for your hot water and heating.
- Get quotes from [REAL Assurance Scheme](#) registered installers.
- If you wish to be eligible for the RHI ensure the supplier and equipment is [MCS/Keymark accredited](#).
- Ask for an estimate of potential heat generation for your property in writing from your installer as well as a quote for the works before you sign a contract to install the equipment.
- Contact your LPA to see if you need planning permission and/or building regulations.
- Check if your property insurance will cover solar thermal panels.
- Get the system installed and start saving both money and carbon!

## What should I ask my supplier?

- Whether your roof is strong enough.
- How the panels will be mounted to ensure complete water tightness of your roof.
- How compatible your current water heating method will be with the proposed solar thermal system and whether your current hot water tank is adequate.
- If any of the installation needs to be inspected by building control.
- Whether they will apply for planning permission and building regulations, if needed.
- Where the new wiring and plumbing will run and how that affects those rooms.
- What maintenance will be required.
- The life expectancy and warranty of the system, its parts and the installer's workmanship.
- About the arrangements needed for installation. i.e. will they arrange the scaffolding, will there be any disruption to your energy and water supplies, and for how long?

### Case Study: Ambleside, Lake District National Park

(Information courtesy of Solar Sunrise Ltd)

The picture shows a typical solar thermal system for a 3 bedroom property which was installed in Ambleside two years ago.

The evacuated tube solar thermal panels are those on the top left part of the roof and they cover a total area of 3m<sup>2</sup>. The solar system was plumbed into a 210 litre water tank, and the hot water can also be heated by immersion heater when needed. The roof faces almost due south, but is shaded by surrounded building during the winter months. The amount of hot water produced varies depending on the weather, but between March and September the solar panels provide about 80% of the hot water required by the family.

There were no planning issues with this installation. The panels were installed on the back of the property and cannot be seen from a public location.



Visit case studies like this during the annual [Cumbria Green Build Festival](#).

For case study information from across the North West visit the Climate Change North West online map. <http://www.climatechangenorthwest.co.uk/northwest-map.html>

### Where can I find out more information?

Energy Saving Trust 0800 512 012 <a href="http://www.energysavingtrust.org.uk">www.energysavingtrust.org.uk</a>	Microgeneration Certification Scheme <a href="http://www.microgenerationcertification.org">www.microgenerationcertification.org</a>	Department for Energy and Climate Change <a href="http://www.decc.gov.uk">www.decc.gov.uk</a>
Centre for Alternative Technology 01654 705989 <a href="http://www.info.cat.org.uk">www.info.cat.org.uk</a>	Cumbria Action for Sustainability 01768 210276 <a href="http://www.cumbriagreenbuild.org.uk">www.cumbriagreenbuild.org.uk</a>	REAL Assurance Scheme <a href="http://www.realassurance.org.uk">www.realassurance.org.uk</a>



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Please note: the information provided in this factsheet is guidance only, for use at the client's discretion. We in no way guarantee that should the information be acted upon, that planning permission would be granted or refused. It is recommended that you consult with your local planning authority to ensure that local planning requirements are fully addressed prior to any renewable energy installation.