



By Tim Pullen

Solar Thermal Energy



Solar water heating systems convert solar radiation (heat and light) into heat, which can be used directly or stored. If you have ever stood in a greenhouse on a cloudy day you will understand that bright sunshine is not essential to produce heat.

Types of Solar Thermal Technology

There are 2 kinds of solar thermal system, flat panel and evacuated tube.

1. Flat panel - as the name suggests these are flat boxes with a light absorbing coating over heat collectors all under a, usually, glass or polycarbide sheet. They are cheaper than evacuated tube, can be integrated within the roof covering (rather than mounted on top of it) and are very robust. They have a life of 25 to 30 years and need no maintenance. Good quality ones have a dirty-repelling coating on the glass or polycarbide so that cleaning is not needed to maintain good production.



2. Evacuated Tube - again as the name suggest, a tube with a vacuum in it. In fact 2 tubes, one inside the other with a light reflecting coating on the inside of the outer tube and a light absorbing coating on the outside of the inner tube. Said to be more efficient than flat panel in that they convert more solar radiation to heat, but more expensive. The advantage they have is that when your roof is not exactly south-facing the tubes can be turned on their mounting to face nearer to south and thereby gather more light.



Which is best?



It is a matter of horses for course. In a new-build with a south-facing roof there is no reason to use anything other than flat panel. They are cheaper and can be designed to generate as much heat as reasonably needed. If the roof is not exactly south-facing then maybe evacuated tube will be more productive. But generally good supplier is more important than the best technology.

How much does it cost to install a solar system?

The cost of a professionally installed solar water heating system will vary with the type and supplier. It should be around £4500 for cheaper flat panel up to £7000 for the best evacuated tube, both for a typical system for a 3 to 4 bedroom house with 4 people living in it.

How much power can a domestic system generate?

The energy from solar hot water panels will vary with the type and manufacturer. They are rated in kWh per year and a rough guide is 500kWh per square metre of flat panel. A typical system for our typical house will be (typically) 4 sq.m, giving about 2000kWh per year. Our typical household will need about 3800kWh per year for hot water (NOT space heating) so the solar system will provide about 50% of that.



Do I need planning permission?

Unless you have a listed building or live in a conservation area the answer is usually no. However, because local authorities vary in the way they interpret the rules you should always contact your local council and speak to a planner before proceeding.