

BRIEFING NOTES:

SOLAR WATER HEATING

May 04



1.0 Principles

- 1.1 Solar energy is commonly harnessed in two ways - either to generate electricity using photovoltaic (pv) cells, or by capturing its heat directly - typically to warm water in thermal collectors or panels. PV technology is being developed rapidly but is still very expensive - payback period can easily be 25 yrs or more. Thermal collectors are more straightforward technology and typical payback periods of 10 yrs or so are often quoted.
- 1.2 Although solar thermal collectors could be used to heat buildings, in Britain this is not usually considered economic as the highest heating load tends not to be when solar energy is available (winter mornings and evenings). Instead solar systems tend to be used to help to heat the domestic hot water, and will typically meet 80-100% of all hot water requirements in summer and 25-30% in winter. The overall saving on fuel bills is sometimes quoted at about 40-60%, but this will obviously depend on size of house, number (and cleanliness!) of occupants, number of panels etc.
- 1.3 Various types of thermal collector are available, ranging from the cheapest which use a small pv cell to run the circulating pump and rely on flexible tubing to avoid freeze bursting, to more efficient and expensive systems that use vacuum collector tubes and refrigerant to extract the most energy.

2.0 Installation

- 2.1 In order to contribute to the heating of the domestic hot water, a solar installation will also include a special hot water cylinder with two independent sets of coils - one from the boiler and the other from the solar panels. This is obviously most economic for new installations or when the hot water cylinder is due for replacement anyway.
- 2.2 The solar panels themselves are best sited on a south-facing roof slope. One typical system uses panels of 1m x 2m; two or three of these panels would provide the optimum output for a family of four.
- 2.3 After several years of inconsistent planning authority attitudes to solar collectors, the position in England was clarified in April 2008 when many small-scale domestic microgeneration technologies were classed as permitted development (i.e. not requiring planning consent). There are exceptions (unusually large installations, those that sit very high above the roof, those in Conservation Areas or on Listed Buildings etc.), but it is now fair to say that most standard domestic solar thermal installations are likely to be permitted.

3.0 Costs

- 3.1 Recent installations of 2no. 2m² panels on private houses tend to come in the range £4500-5500 + VAT. This figure includes a new twin-coil hot water cylinder.

Under the government's Low Carbon Buildings Programme, solar water heating installations can attract a grant of up to £400 or 30% of the overall cost, whichever is lower. To be eligible, installations must be by an approved installer.

4.0 Links

Low Carbon Buildings Programme website, for information about the grant process:
www.lowcarbonbuildings.org.uk

Energy Saving Trust for reasonably balanced, non-commercial information about green technologies:
www.energysavingtrust.org.uk/Generate-your-own-energy/Types-of-renewables/Solar-water-heating

5.0 Summary

5.1 Pros

- Very low carbon emissions - only little electricity req'd for the circulating pump
- Long lifespan and low maintenance
- Almost no operating costs

5.2 Cons

- Installation cost
- Panels can be unsightly (and / or require planning consent), especially if mounted above the roof.
- Only houses with largely south-facing roof slopes lend themselves to straightforward, efficient installations.

