

CASE STUDY 2 - DOMESTIC SOLAR HEATING

Pembrokeshire Housing Association, Erw Lon, Pen y Cwm

Pembrokeshire Housing Association installed solar water heating panels on some of their houses in Pen y Cwm in 2000 as an experiment. It was believed that the Housing Association obtained funding from DETR at £300 per property installation. Four Solar Heating systems were installed in total by Filsol Ltd and maintained by West Wales Solar Heating.



TENANT FEEDBACK

After speaking to three tenants regarding their solar water heating (two with and one without), Pembrokeshire Housing Association has received positive feedback.

The tenant without solar water heating is currently spending £500 for 750 litres of heating oil this year. Last year the cost was £360 for 500 litres and £152 the year before.



The tenants with solar heating are spending £200 - £300. One tenant said that she doesn't need to use the boiler between May and September. She is very happy with the current system.

TECHNICAL DATA

The system installed on each house is a 4m² array with a 200 litre cylinder, utilising a pressurised solar circuit with temperature differential control.

Filsol Stamax collectors should provide, accounting for all solar and DHW system losses, approximately 2.5kWh per day, per m², at peak in midsummer, to the storage cylinders.

To raise 200 litres of water from 12°C to 55°C requires 10kWh and therefore 4m² of Stamax collector were specified. The output of the system is predicted to provide 1,760kWh of hot water energy per year. Assuming an average boiler system efficiency of 80%, the solar water heating system will therefore displace 2,200kWh of energy and reduce carbon emissions by 418kg per year (based on gas fuel being displaced with a value given of 0.19kg carbon emission saved per kWh).



The annual output data has been based on the following:

Solar collector efficiency over the range of operating temperatures likely to be encountered in an average year has been estimated to be 65% for Filsol Solar's flat plate collectors based on test data derived on the panel at Cardiff University (tests performed to BS6757).

Radiation data obtained from 21 year average year figures from Kew Observatory gives a figure of 1,100 kWh per m² for the site. At 65% efficiency this results in a solar collector output of 715 kWh per m² per year for the Filsol Solar Ltd flat plate collectors. When this figure is adjusted to account for all solar and DHW system losses the expected average solar water heating system output would be in the region of 440kWh per m² per year.

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WELSH SOLAR HEATING ASSOCIATION