

# 1960s detached house Cheltenham

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connecting with local tradespeople

## Case study 21



£289

Saving  
on fuel bills

20%

Reduction  
in carbon  
emissions

Measures installed	Total cost	Annual CO <sub>2</sub> saving (tonnes)	Annual fuel bill saving
External wall insulation	£2,352	0.7	£113
Solar PV 2.88 kWp	£14,275	1.0	£176
Total package	£16,627	1.7	£289
Plus income from PV Feed-In Tariff (FIT)			£1,194

## The home

This family home is a detached house built in 1969. The survey identified that the majority of the walls were of a cavity construction and had already been insulated, but that there was also an original un-insulated tile hung solid brick section at the front of the house. The loft had a thin layer of insulation, and all of the windows had been double glazed.

## What they did

The owner had commented that despite the cavity insulation they didn't like the fact that they were still losing so much heat through the un-insulated wall. Domestic & General Insulation were employed to complete the work to insulate this heat loss area.

This involved the removal of the existing tiles, fitting a layer of insulation and replacing the tiles.

The Target 2050 survey had also highlighted that the front roof of the house was south east facing, which is potentially a good orientation for the generation of energy from solar panels. The owners were keen to investigate the feasibility of solar PV and commissioned a local company, BCL Energy from Cheltenham to install twelve 240w hybrid panels with a maximum output of 2.88kW's.

"Considering that February is not an ideal month for solar, already our generation seems pretty good, plus we have also benefitted from reduced power company bills."

£1,194

Income  
from Feed-In  
Tariff (FIT)



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**SevernWye**  
energy agency



**CHELTEHAM**  
BOROUGH COUNCIL

## Solid wall insulation

The solid brick tile hung section of wall at the front of the property was a heat loss area that could not be improved with cavity insulation as the other walls in the house had been. It was an area considered by the owners to be noticeably losing heat so they were keen to find out how this could be insulated.

This involved the erection of scaffolding, and the removal of all of the existing tiles. A waterproof membrane was then applied along with the insulation, 50mm phenolic foam boarding. The tiles were then re-instated, including new tiles to the newly insulated area between the first floor windows.

There was some corrective work to agree on and address with the installers before final completion of the project. This included replacement of some broken roof tiles, and adjustment of lead flashing and window flashing. The owners have not yet been able to quantify how much the insulation has benefitted the property in their fuel bills, though they had noted that since insulating this area they have not had the gas central heating on quite so much.

## Solar electricity

Solar panels do not normally require planning permission as they are classed as "permitted development". If however the property is listed, or in a location where planning restrictions may apply, such as within a conservation area, then it is advisable to contact the planning officer at your local authority to confirm permission before proceeding with an installation.

The 2.88kWp system comprising twelve 240W hybrid panels is estimated to produce 2,662 kWh of electricity per year. In the two months after installation which fell into the early months of the year, the system had generated 350 kWh of electricity which the owners are very pleased with. The solar system also benefits from payments under the governments Feed-In Tariff



*Tile hung wall after insulation installed*

(FIT) scheme. Other than a small electrical connection issue that has since been resolved, the installation of the system progressed well. The total cost for the PV array amounted to £14,275.

## Next steps

The next main priority for the owner is to clear out his loft area to complete the process of insulating the entire loft to the recommended depth of 270mm. At some point in the future, they are also considering further utilising their roof area and investing in a solar thermal system to provide a proportion of their hot water.

Energy consumption	Total (kWh)	Per m <sup>2</sup> floor area
Before improvement (2010)	35,765	309
After improvement (2011)	30,661	265
With all possible measures	14,814	128
UK average (2011)	19,800 <sup>1</sup>	217 <sup>4</sup>

Running costs	Total	Per m <sup>2</sup> floor area
Before improvement (2010)	£1,770	£15.30
After improvement (2011) - excl FIT income	£1,481	£12.80
With all possible measures	£924	£7.99
UK average (2011)	£1,032 <sup>3</sup>	£11.34 <sup>4</sup>

<sup>1</sup>Ofgem 2011

<sup>2</sup>English Housing Condition Survey 2011

CO <sub>2</sub> emissions	Total (tonnes)	Kg per m <sup>2</sup> floor area
Before improvement (2010)	8.09	70
After improvement (2011)	6.44	56
With all possible measures	3.30	29
UK average (2011)	6.00 <sup>2</sup>	66 <sup>4</sup>

Possible next steps	Annual CO <sub>2</sub> saving (tonnes)	Annual fuel bill saving
Loft insulation top-up	0.80	£139
Solar thermal	0.23	£35
Total	1.03	£174

<sup>3</sup>Ofgem 2011

<sup>4</sup>Based on 91m<sup>2</sup> from English Housing Condition Survey 2011