

1950s semi-detached Gloucester

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connecting with local tradespeople

Case study 27



£403

Saving
on fuel bills

39%

Reduction
in carbon
emissions

Measures installed	Total cost	Annual CO ₂ saving (tonnes)	Annual fuel bill saving
Loft insulation top-up	£37	0.21	£28
Gas central heating	£6,899	1.70	£295
Solar hot water	£3,508	0.31	£80
Total package	£10,444	2.22	£403

The home

This is a semi-detached house built in the 1950s with cavity walls. The current owners have lived there since 1995, and have made a number of refurbishment improvements to the house since moving in. These have included replacing the windows and having the cavity walls insulated.

The home was heated by ageing electric storage heaters, although not all the rooms had a heater, so plug in electric convector heaters were often used. This meant the running costs of the home were high.

What they did

The key improvement for the family was to consider upgrading the heating system. Mains gas was available within the property, and was already being used for cooking and a focal point fire in the living room.

The Target 2050 survey calculated that replacing the storage heaters with gas central heating could reduce the family fuel bill by around £300 per year and carbon emissions by 1.70 tonnes. The change in heating system also provided a great opportunity to integrate a solar hot water system, and these improvements were further complimented by ensuring that their loft insulation was topped up to the recommended 270mm.

“The house is a lot warmer with our new gas central heating, and the additional loft insulation has meant that this heat is not escaping through the roof.”



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Gas central heating with solar thermal

The family obtained quotations from several locally based installers and Elite Efficient Energy from Stroud were employed to install a condensing boiler and hot water cylinder. This supplies heat to eight new radiators throughout the property, each of which has a thermostatic radiator valve. The whole system is controlled by a room thermostat and programmer to ensure that heat is provided only when required.

This change in heating system also provided the opportunity to integrate solar thermal water heating, which had been an aspiration of the householder's for a long time. The front roof of the house faces south east so is well suited to capture energy from the sun. Two flat plate solar collectors were installed by Elite Efficient Energy which feed into the hot water cylinder, with the boiler topping up the heat when required.

The solar panels should provide the family with the majority of their hot water requirements over the summer and a good proportion over the rest of the year. The cost of fitting the complete new gas central heating system amounted to £6,900 with a further £3,500 spent on the solar water heating.

DIY loft insulation

Since installing the new central heating, the family have reported that the house feels a lot warmer. To ensure that they were making the most of their new efficient heating system, and preventing heat loss, the family also topped up the loft insulation themselves. They already had insulation to a depth of 120mm laid out across the loft space. Twelve rolls of mineral wool insulation were purchased from a local DIY store at a discounted cost of £37 and laid over the top of this to provide the recommended depth of 270mm. The family say that they would recommend this as the quickest and easiest way to improve the energy efficiency of a house.

Energy consumption	Total (kWh)	Per m ² floor area
Before improvement (2010)	16,571	207
After improvement (2011)	13,695	171
With all possible measures	11,549	144
UK average (2011)	19,800 ¹	217 ⁴

Running costs	Total	Per m ² floor area
Before improvement (2010)	£1,319	£16.49
After improvement (2011)	£916	£11.45
With all possible measures	£760	£9.50
UK average (2011)	£1,032 ³	£11.34 ⁴

¹Ofgem 2011

²English Housing Condition Survey 2011



Full central heating installed with radiators in each room

Next steps

The introduction of a new heating system and renewable technology has not only aided in improving the energy efficiency of the home, it has also generated further interest in renewable systems. The family are actively considering other possible home generation systems in their future plans.

CO ₂ emissions	Total (tonnes)	Kg per m ² floor area
Before improvement (2010)	5.76	72
After improvement (2011)	3.54	44
With all possible measures	2.66	33
UK average (2011)	6.00 ²	66 ⁴

Possible next steps	Annual CO ₂ saving (tonnes)	Annual fuel bill saving
Solar PV 1kWp	0.45	£87

³Ofgem 2011

⁴Based on 91m² from English Housing Condition Survey 2011