

# 1850s semi-detached Gloucester

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## Case study 16



£375

Saving  
on fuel bills

38%

Reduction  
in carbon  
emissions

Measures installed	Total cost	Annual CO <sub>2</sub> saving (tonnes)	Annual fuel bill saving
External solid wall insulation	£10,551	1.78	£307
Floor insulation	£498	0.29	£50
Improved heating controls	£100	0.06	£12
Double glazing	£480	0.04	£6
Total package	£11,629	2.17	£375

## The home

This is a semi-detached house built around 1850. The current owners have lived there since 2007 and had found the house difficult to keep warm.

A number of improvements had been made to the property before taking part in the Target 2050 project, including good levels of insulation to the three separate loft areas, installation of a condensing gas boiler and double glazing to all but one window.

Internal insulation to some walls and sloping ceilings had also been installed by the owner, though the majority of the front and side sections of the house remained without insulation.

The cement render on the walls of the property was coming off in several places and the owners had decided to remove it and replace it.

The property succumbed to further cosmetic damage during the winter of 2009, when the weight of snow accumulated on the roof of the front bay window caused some of the brick work to crumble.

## What they did

The main energy efficiency issue to address was the heat loss from the walls. The need for repair to the render made external insulation an ideal choice.

Comfort in the living room was further improved with the addition of under floor insulation.

The cellar underneath had been a source of draughts, making the room uncomfortably cold, but was now a useful way of accessing the under floor area providing plenty of space to work in.

"It was a very damp and dank house when we moved in, but it is gradually being transformed into a warm and cosy haven."



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**SevernWye**  
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## External wall insulation

External insulation is the most effective approach, as it keeps the whole structure of the building warm. Several quotes were obtained for the work and BCL Insulation from Andoversford were employed to complete the required work. The householder removed all of the remaining cement render himself, and carried out repairs to the bay window. The front and side elevations were insulated with 80mm thick polystyrene, fixed with adhesive and mechanical fixings and covered with a mesh, render basecoat and coloured topcoat. The south facing rear elevations were excluded because the number of smaller surfaces, windows and service pipes made this complicated and expensive for the benefit it would confer. The bay window at the front had already been insulated from inside.

During the insulation work, the owner of the attached property became interested in what was happening. The thickness of the insulation (80mm) plus the render coats meant that a small step would be created on the front elevation where the two properties join. Although not detrimental to the neighbouring house, the owners were keen to preserve the uniform appearance of the pair and joined Target 2050 to extend the insulation across the front of both properties.

Due to the extreme cold weather at the end of 2010 and early 2011, the work was delayed as the temperature was too cold to allow the render to set properly. The owners reported that the application of the insulation boards made a real difference from the very first day they were fitted. Despite the sub-zero temperatures, they no longer left the heating on overnight, with the house retaining heat for much longer. They also commented on the minimal disruption during the process, apart from scaffolding. The external insulation work was completed at both properties in February 2011 at a cost of £10,551 for the original house, and a further £3,300 for next door.

## Double glazing

The remaining single glazed sash window was replaced with an A-rated double glazed unit for £480.



*Insulation boards applied and render in progress*

## Floor insulation

JR Wynter Joinery Services from Gloucester fitted 50mm phenolic foam insulation boards to the underside of the floorboards, keeping air vents clear to ventilate the cellar. This relatively low cost improvement of around £500 made a noticeable difference in comfort: in the owner's words it has "made our living room liveable – it's good to watch TV without being swathed in blankets!"

## Heating controls

Thermostatic radiator valves were added to five radiators for £100. These will help to save energy by reducing the heat provided to individual rooms when not considered necessary.

## Next steps

The family would like to investigate integrating solar power into the home in the future.

Energy consumption	Total (kWh)	Per m <sup>2</sup> floor area
Before improvement (2007)	25,185	277
After improvement (2010)	13,963	154
With all possible measures	12,078	133
UK average (2011)	19,800 <sup>1</sup>	217 <sup>4</sup>

Running costs	Total	Per m <sup>2</sup> floor area
Before improvement (2007)	£1,276	£14.04
After improvement (2010)	£901	£9.91
With all possible measures	£795	£8.75
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 (2007)	5.66	62
After improvement (2010)	3.49	38
With all possible measures	2.86	31
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
Solar water heating	0.21	£30
Solar PV (1kWp)	0.42	£76
Total	0.63	£106

<sup>3</sup>Ofgem 2011

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