1890s detached house Cheltenham

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Case study 23

£404 Saving on fuel bills

12% Reduction in carbon emissions

Measures installed	Total cost	Annual CO_2 saving (tonnes)	Annual fuel bill saving
Solid wall insulation (kitchen area)	£2,479	0.35	£70
Sloping ceilings (kitchen area)	£2,435	0.30	£62
Double glazing of sash windows	£9,502	0.30	£58
Draughtproofing	£1,801	0.01	£1
Replacement boiler	£3,225	0.67	£113
Log burner	£2,406	0.17	£100
Total package	£21,848	1.80	£404

The home

This home is a red brick semi-detached house built in 1894. Built with solid brick walls over three floors it is, as the current owners say, "a house that belongs to an era when the owners would have had fires going in every room, and there was no awareness of climate change or the need to conserve resources." The owners purchased the house in 2000 and have since completed a large amount of necessary renovation to their home.

What they did

As part of the renovation process they had talked about making the house warmer and more energy efficient, though had not appreciated just how inefficient it was, and the effect this was having on their fuel bills, until they saw the results from their Target 2050 survey.

The room used most often by the family is the kitchen, part of which extends beyond the main outline of the house. This room was always felt to be colder than the rest of the house so they were keen to improve the warmth in this area. The survey had highlighted a number of possible improvements including installing insulation to the external wall areas and the sloping ceiling. The old inefficient gas fire and boiler housed in the kitchen area were also replaced with a new closed log burner and 'A' rated boiler. Double glazing and renovating a number of windows in the rest of the house completed the programme of works which has significantly improved comfort levels for the home owners.

"The house is definitely warmer. We also feel that we've added value to the property. Before making improvements the energy efficiency rating and fuel bills might have put off prospective buyers."

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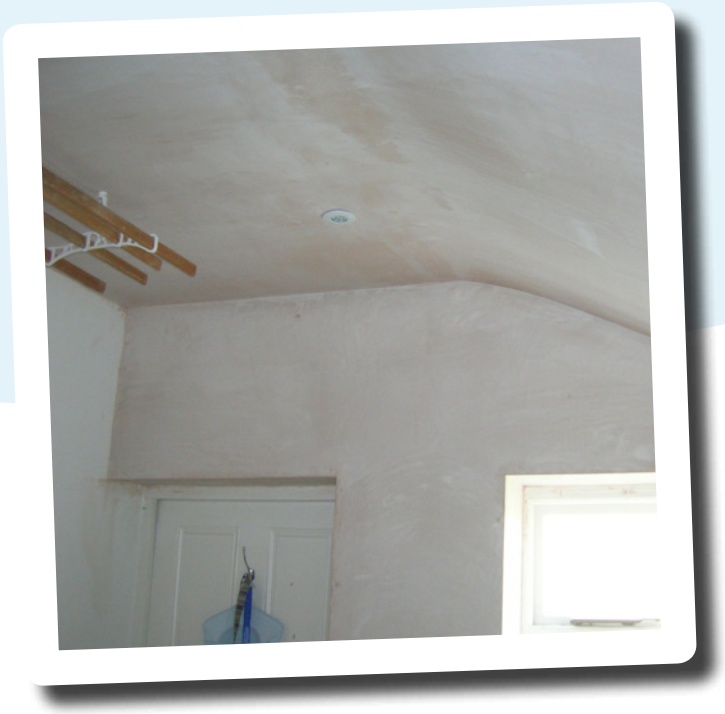
Solid wall and sloping ceiling insulation

External wall insulation was initially ruled out as it would alter the appearance of the home, something the owners were keen to avoid. Quotations were therefore sought to internally insulate the exposed areas of the single storey kitchen, which was difficult to heat. Bond Brothers from Gloucester were chosen to install internal insulation to the walls and sloping ceilings, consisting of a 50mm phenolic foam insulation board bonded to standard gauge plasterboard. The total cost to complete this work amounted to just over £4,900.



Insulated walls and ceiling ready for redecoration

Heating improvements

Whilst the insulation work progressed, the family also took the opportunity to replace the old gas fire in the kitchen with an efficient closed log burner, and to replace the gas boiler with an 'A' rated replacement. The cost to remove the old fire, install the new stove and complete the associated works including the flue lining and vents amounted to £3,100 and was completed by Banwell and Sons from Cheltenham. Another Cheltenham based company, J Fry Heating Solutions Ltd, fitted the new boiler at a cost of £3,200. The stove and insulation in particular made a real difference in transforming their previously "freezing cold" kitchen into somewhere where they could comfortably spend time. The owners commented that having the new stove meant that now they didn't always have to have the central heating on during the day and at weekends.

Glazing improvements

Attention now turned to the single glazed sash windows, a character feature of the property but also a significant area of heat loss. However sympathetic improvements could be made. Wessex Restoration Ltd from Somerset submitted a quotation to replace ten of the front windows with a replacement "Slimlite" double glazing that is suited to period windows. They also proposed renovating the remainder of the windows using the Ventrolla system in which the window is initially treated and restored, before adding a perimeter sealing system specifically designed for sash windows that eliminates draughts and reduces heat loss. These improvements were completed at a cost of just over £11,300. The family were pleased with the completed work, and felt that it would certainly be something that they would recommend for other period properties.

Next steps

The family are now in the process of replacing their halogen lighting with energy saving LED bulbs which can provide a saving of 90% in energy use against the existing bulbs. Further plans may include replacing the old and draughty French doors in the kitchen with double glazed sliding doors.

Energy consumption	Total (kWh)	Per m^2 floor area
Before improvement (2010)	79,911	358
After improvement (2011)	67,057	301
With all possible measures	26,301	118
UK average (2011)	19,800[1]	217[4]

CO_2 emissions	Total (tonnes)	Kg per m^2 floor area
Before improvement (2010)	15.22	68
After improvement (2011)	13.42	60
With all possible measures	6.62	30
UK average (2011)	6.00[2]	66[4]

Running costs	Total	Per m^2 floor area
Before improvement (2010)	£3,445	£15.44
After improvement (2011)	£3,041	£13.63
With all possible measures	£1,677	£7.52
UK average (2011)	£1,032[3]	£11.34[4]

[1] Ofgem 2011
[2] English Housing Condition Survey 2011
[3] Ofgem 2011
[4] Based on 91m^2 from English Housing Condition Survey 2011

Energy performance and carbon emissions in the Target 2050 exemplar homes have been modelled using the UK Standard Assessment Procedure (SAP). The savings data presented here is based on a standard occupancy pattern. This may not reflect actual usage by the building's current residents but is used to compare homes of different sizes and types in a way that assesses the building itself rather than the behaviour of any particular occupant.