

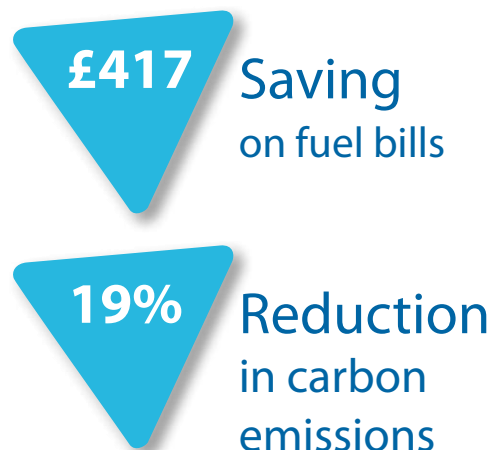
Extended period property South Gloucestershire

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Case study 31



Measures installed	Total cost	Annual CO ₂ saving (tonnes)	Annual fuel bill saving
Loft insulation top-up	£464	0.17	£45
Cavity wall insulation	£199	0.50	£137
Floor insulation	£528	0.20	£54
Insulate sloping ceiling	£1,081	0.06	£16
Connect boiler to hot water cylinder	£755	0.30	£113
Log burner	£2,072	0.20	£52
Total package	£5,099	1.43	£417

The home

This family home purchased in 2009 came with a 'G' rated Energy Performance Certificate, the lowest rating band available. This would indicate that heating and electricity costs for the house would be high.

The original part of the house was built around 1900 and it has since been extended to the side and rear during the 1980s. The house had previously been used as two separate flats, so a large part of the initial work was to begin the process of making the house into a single dwelling, including the replacement of multiple heating systems with something simpler and more efficient.

What they did

On moving in the family found that the main living room in the lower floor of the house was cold and difficult to heat. The only heat source was an electric panel heater. This was quickly replaced with a wood burning stove, which is much more effective and cheaper to run. The Target 2050 report had also highlighted a number of areas in the home where the insulation could be improved. This led to fitting some cavity wall insulation in the extension, and employing a number of insulation methods to reduce heat loss through the loft.

The existing space and water heating system was also adapted to be more suitable for a family home with the inclusion of a second wood burning stove for the other living room.

"The house generally feels a lot warmer after having the insulation installed, and with the two wood burning stoves we don't have to use our LPG central heating as much."



asiantaeth ynni
SevernWye
energy agency



Insulation improvements

The first improvement was to insulate the cavity walls of the 1980s extension. This was completed with a partial grant from the Gloucestershire Warm and Well scheme. The measure which has produced the most noticeable benefit to the household is insulation to the roof areas. Due to the varied construction types making up the property this has been done in three different ways.

Some areas were accessible via a loft hatch and the householders were able to top up the loft insulation to 250mm themselves. At the rear of the property there was no loft hatch and the shallow pitch of the roof further compounded access difficulties so an installer was used to remove the external tiles and felt, insulate the area and then replace the roof covering.

Finally there was an area with no roof void at all, so the contractor insulated the sloping ceilings from the inside using plasterboard backed with 75mm of phenolic foam insulation. Before insulating, this room was very cold and little used. The improvement in warmth here has been noticeable and the room is now used regularly.

The original section of the house was built with an accessible cellar area, which allowed them to add underfloor insulation. This was professionally installed using standard loft insulation material held in place with netting. The family have already noticed it is warmer in these areas.

Heating improvements

Prior to improvement the main source of heating was an LPG combi boiler, however this was only serving half of the house and the hot water was being provided by an electric immersion heater. Heating was supplemented by a wood burning stove in one room, leaving several rooms without any fixed heating.

The family had hoped that they would be able to connect radiators and a hot water cylinder to their existing wood burning stove but they would have had to replace the stove



Log burner installed in living room

to achieve this. Instead they decided to purchase a second wood burning stove for the other main living room and make better use of their LPG heating.

To avoid using electricity for heating water, which is costly as well as the highest carbon heating fuel, the immersion cylinder was removed and alterations made to pipe work to allow the combi boiler to provide all hot water. Two radiators were added, one in a bathroom which previously only had an electric fan heater. The LPG heating now provides background heat in the majority of the home, with the wood burning stoves as the primary heating in the main living areas. The householder reports that the house certainly feels a lot warmer, and they are pleased to be reducing their use of costly LPG.

Next steps

In the future, the family are also hoping to insulate the solid brick wall area that adjoins the sloping ceiling and fit extract ventilation in the kitchen below. This will help to mitigate condensation issues caused by excess warm air from cooking.

Energy consumption	Total (kWh)	Per m ² floor area
Before improvement (2010)	27,345	218
After improvement (2011)	21,663	172
With all possible measures	14,320	114
UK average (2011)	19,800 ¹	217 ⁴

Running costs	Total	Per m ² floor area
Before improvement (2010)	£2,222	£17.68
After improvement (2011)	£1,805	£14.36
With all possible measures	£845	£6.72
UK average (2011)	£1,032 ³	£11.34 ⁴

¹Ofgem 2011

²English Housing Condition Survey 2011

CO ₂ emissions	Total (tonnes)	Kg per m ² floor area
Before improvement (2010)	7.64	61
After improvement (2011)	6.21	49
With all possible measures	4.55	36
UK average (2011)	6.00 ²	66 ⁴

³Ofgem 2011

⁴Based on 91m² from English Housing Condition Survey 2011