

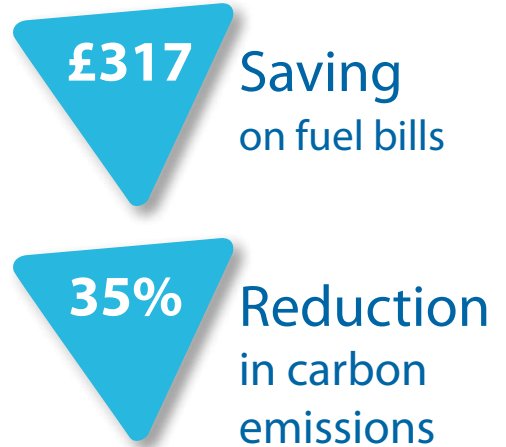
1930s mid terrace house South Gloucestershire

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Case study 32



| Measures installed | Total cost | Annual CO ₂ saving (tonnes) | Annual fuel bill saving |
|---|---------------|--|-------------------------|
| Loft insulation top-up | £113 | 0.09 | £15 |
| Cavity wall insulation | £199 | 0.66 | £113 |
| Replacement boiler | £3,680 | 1.02 | £175 |
| Replace halogen bulbs with LED lighting | £16 | 0.04 | £14 |
| Total package | £4,008 | 1.81 | £317 |

The home

This is a 1930s mid terrace house which has been in its current ownership for around five years. It has a small flat roofed extension at the rear and has been double glazed throughout. The family had been considering some further energy efficiency improvements to their home as they were aware that the insulation could be improved, and the ageing gas fired back boiler was due for replacement.

What they did

The Target 2050 report identified cavity wall insulation as a high priority measure. This was completed along with the topping up of the loft insulation. These are the two measures

that can typically make the most difference in helping to reduce heat loss and energy bills in a home.

The existing space and water heating for the house was provided by an old and inefficient back boiler. This boiler and connected water cylinder were replaced with a new 'A' rated condensing combination boiler along with updated heating controls. This offers them a better, and more cost effective method of heating their home.

The family have also now begun the process of replacing their existing light bulbs with low energy, compact fluorescent versions and LED's

"The cavity wall insulation helps maintain the temperature and keep the house very comfortable during the very cold weather we've had recently!"



asiantaeth ynni
SevernWye
energy agency



Insulation improvements

Both the original part of the house and the rear extension had cavity walls which had not been insulated. A referral to the Gloucestershire Warm and Well scheme enabled the householders to install the insulation at a discounted price. This measure alone could save them over £100 on their annual fuel bill.

The next insulation improvement to address was the loft. There was already 100mm of mineral wool insulation between the joists and a layer of reflective foil attached to the rafters. It was recommended that they improve the joist level insulation to the recommended depth of 270mm. The depth of the joists in one area was increased by fixing additional timbers crossways. The extra insulation could then be laid between them and this would allow boarding to be placed across the joists to provide a storage area. It is important not to squash insulating material as this significantly reduces its effectiveness.

Replacing the boiler

With the main insulation improvements made, attention could turn to upgrading the gas fired back boiler. The replacement condensing combination boiler had to be placed on an external wall in the kitchen as it required a fanned flue system to remove the waste gases, and a pipe to run condensate to an external drain. This could not be accommodated within the existing chimney where the old back boiler was located. Choosing a combi boiler meant that the family could remove the old and poorly insulated hot water cylinder. This did provide them with a new additional storage area within the home. The hole where the back boiler was has also become a storage cupboard.

The householders are pleased with the new heating system for the home and have found that they can keep the house at a more even temperature day and night. Due to the age of the original boiler installation, the system was only 'single pipe' which means the radiators furthest from the boiler



Back boiler replaced with combi boiler mounted on the kitchen wall

receive less heat. Modern "feed and return" systems serve each radiator individually so that all are heated to the same temperature. The additional cost to change the pipe work meant that it was not possible on this occasion.

Low energy lighting

The majority of the old incandescent bulbs have now been replaced with compact fluorescent versions, and the halogen lamps in their kitchen are being changed for LED lighting. Halogen lights typically consume around 40-50 Watts per bulb whereas LED bulbs, can consume as little as 3-4 Watts. LEDs are more expensive to purchase, at £7-£10 for a good quality bulb but they can last for around 20 years. As the current halogen lighting is mains voltage, (240v or GU10 bulbs) the bulbs can be replaced with LEDs one at a time with no electrical alterations.

| Energy consumption | Total (kWh) | Per m ² floor area |
|----------------------------|---------------------|-------------------------------|
| Before improvement (2010) | 22,188 | 297 |
| After improvement (2011) | 13,064 | 175 |
| With all possible measures | 9,279 | 124 |
| UK average (2011) | 19,800 ¹ | 217 ⁴ |

| Running costs | Total | Per m ² floor area |
|----------------------------|---------------------|-------------------------------|
| Before improvement (2010) | £1,204 | £16.14 |
| After improvement (2011) | £887 | £11.89 |
| With all possible measures | £707 | £9.48 |
| 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) | 5.16 | 69 |
| After improvement (2011) | 3.35 | 45 |
| With all possible measures | 2.31 | 31 |
| UK average (2011) | 6.00 ² | 66 ⁴ |

| Possible next steps | Annual CO ₂ saving (tonnes) | Annual fuel bill saving |
|---------------------|--|-------------------------|
| Solar PV 1kWp | 0.50 | £88 |

³Ofgem 2011

⁴Based on 91m² from English Housing Condition Survey 2011