

# 1850s mid-terrace house Wiltshire

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## Case study 7



£186

Saving  
on fuel bills

54%

Reduction  
in carbon  
emissions

Measures installed	Total cost	Annual CO <sub>2</sub> saving (tonnes)	Annual fuel bill saving
Loft and sloping ceiling insulation	£2,495	0.03	£3
New range / boiler	£5,252	5.64	£124
Double glazing	£9,201	0.65	£59
Total package	£16,948	6.32	£186

## The home

This home is a mid-terrace property built around 1850 as workers' accommodation for the Savernake Estate near Marlborough. It is constructed from solid brick with flint panels on the rear elevation and is built around a large four-chimney stack in the centre of the property. Although it is characterised by a number of period features, it is not a listed building, and does not lie within a conservation area. The property had no mains gas supply, and was heated by an anthracite-fuelled Rayburn, with hot water provided by solar panels installed in the late 1990s.

The annual energy consumption of the property was significantly higher than an average property of its size, and due to its reliance on burning coal, it also registered higher than average carbon emissions. The old and draughty single glazed windows were causing noticeable heat loss.

## What they did

There were three key areas of energy inefficiency highlighted within the Target 2050 advice report that the owners were keen to address. The first priority was to find practical ways to reduce the heat loss through the roof by improving the insulation within the loft and surrounding ceiling area.

The next step was to replace the old inefficient single glazed windows, and the third important area to address was the heating, and in particular to replace the Rayburn with a cleaner, more efficient alternative.

“During the very cold spell in December 2010 the house was noticeably warmer than usual. Before the loft insulation and double glazing, the old Rayburn struggled to keep the house warm”



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## Loft insulation

Part of the loft area at the front of the property had previously been converted to living space, but at the back it was not insulated and losing heat. On examination it was discovered that the ceiling above the first floor rear bedroom was structurally unsound, so this was replaced, which provided the opportunity to insulate behind the small area of sloping ceiling, at the same time as the floor of the loft space and the walls separating the loft space from the adjacent living space. This work was carried out by a local carpentry and joinery company for just over £2,300, not including the structural work.

## Double glazing

Tucker Joinery based in Andover were commissioned to replace all the original sash windows with bespoke double glazed replacements that would replicate the appearance of the originals. These new units have been constructed with hardwood frames and 'Slimlite' double glazed panes, a particular brand of replacement window specifically designed for historic homes. The design comprises a 4mm clear outer pane, a 4mm gap filled with an inert gas that performs well in smaller cavities, and a 4mm inner pane of low emissivity glass. The windows have trickle vents to allow controlled ventilation of the living space.

The family also took this opportunity to replace the old single glazed rear door with a hardwood, Slimlite glazed replacement and had a small amount of refurbishment work done to move it to a better position at the back of the house.

## Replacing the Rayburn

The owners were keen to keep the same style of combined cooker and heating, but recognised that a change in fuel would help to lower their carbon emissions and reduce fuel costs. Sarson Stoves from Andover were employed to install an Esse wood-fired range, which is a cooker combined with a thermostatically controlled boiler providing heat to the radiators and hot water cylinder. The cooker provides a hot



*Sloping ceiling insulation being installed*

plate, fast and slow ovens, and the system performs at its optimum when burning good quality, well seasoned logs. Designed for continuous use, it can be kept alight indefinitely, and should require only occasional ash removal.

The Esse will provide all the space heating requirements for the house, with the existing solar thermal system providing additional heat for the hot water produced by the stove, particularly in the summer months. The cost to install the stove with required alteration work amounted to around £5,200.

## Next steps

Future plans include adding porches to the front and rear doors to reduce draughts, and replacing the existing halogen lighting with LEDs.

Energy consumption	Total (kWh)	Per m <sup>2</sup> floor area
Before improvement (2007)	37,024	327
After improvement (2010)	29,048	257
With all possible measures	17,221	152
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)	£1,404	£12.40
After improvement (2010)	£1,218	£10.76
With all possible measures	£844	£7.46
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)	11.65	103
After improvement (2010)	5.33	47
With all possible measures	1.61	14
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
Solid wall insulation	2.85	£252
Solar PV (1 kWp)	0.49	£88
Total	3.34	£340

<sup>3</sup>Ofgem 2011

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