

Grade II listed cottage Nailsworth

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Case study 36



£288

Saving
on fuel bills

26%

Reduction
in carbon
emissions

| Measures installed | Total cost | Annual CO ₂ saving (tonnes) | Annual fuel bill saving |
|---------------------------------|------------|----------------------------------------|-------------------------|
| Sloping ceiling insulation | £3,195 | 0.63 | £117 |
| Replacement boiler and controls | £3,433 | 0.95 | £165 |
| Double glazing | £2,214 | 0.03 | £6 |
| Total package | £8,842 | 1.61 | £288 |

The home

This home is a Grade II listed, semi-detached cottage that is over 300 years old. The original building is constructed from large stone blocks and has many original features, including wooden beams in the living room and attic room. A rear extension was added in the 1970s, which has cavity walls. All of the windows are single glazed, although few of the original windows remain.

What they did

The Target 2050 home energy survey highlighted the priority measures as being cavity wall insulation for the extension,

insulation to the sloping ceilings in the attic room, replacing the gas boiler and adding a programmer to improve control of the heating system. A free survey from the Gloucestershire Warm and Well scheme revealed that the cavity walls of the extension had already been insulated, although there was no visible sign of this.

Heating improvements, in the form of a new efficient combination boiler and thermostatic programmer were approved along with insulation to the sloping ceilings in the attic room. Consent to upgrade the single glazing proved to be difficult, so currently double glazing has only been installed in the rear extension area.

“The attic room was boiling hot in summer and freezing cold in winter. Now it is the nicest room in the house.”



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SevernWye
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Replacement gas boiler and improved controls

Whilst it is normally advisable to insulate before replacing the heating system, the householder chose to have a combination boiler, which meant the hot water storage tank in the attic room was no longer required. It therefore made sense to remove this before the room was insulated, which also freed up some valuable space. An added benefit of the new boiler installation was that the system was power flushed to remove any blockages in pipes and radiators, improving heat delivery throughout the home but in this case, especially on the top floor.

Prior to the boiler upgrade the heating system was controlled by a timer and thermostatic radiator valves (TRV's) with no overall thermostatic control, usually provided by means of a room thermostat. Whilst TRV's are useful to minimise heating in rooms where there is little demand they do not have a direct link to boiler controls, and the latter can continue to fire. A thermostatic programmer was installed as part of the boiler installation. This controls both the time and temperature aspects of heating, maximising comfort and reducing wasted energy. The heating work was carried out by MPHS Ltd.

Sloping ceiling insulation

With the attic room cleared of all redundant plumbing, the walls could be insulated. This required listed building consent because the listed status covers the whole house, in order to protect the structure and any period features or materials. Consent was granted in this case as the work was not deemed to cause any such damage. The material used was 50mm phenolic foam bonded to 12.5mm plasterboard as a single sheet. When finished with a plaster skim the roof beams are still visible and the room is much warmer. The insulation work was carried out by Bond Brothers.



Completed sloping ceiling insulation re-plastered and ready for redecoration

Glazing improvements

The householder also wished to improve the glazing of the property as many of the windows were in poor repair. Listed building consent was sought and obtained, but initially only single glazing was allowed. After some discussion it was agreed that double glazing would be acceptable in the modern extension at the rear of the property, so this went ahead. Although not original to the property the front windows are yet to be replaced. Various options were explored, including slim line double glazing, but none have so far proved acceptable. Single glazing could be fitted, but this seems like an expensive solution when the existing windows also need replacing.

| Energy consumption | Total (kWh) | Per m ² floor area |
|----------------------------|---------------------|-------------------------------|
| Before improvement (2010) | 28,621 | 329 |
| After improvement (2011) | 20,081 | 231 |
| With all possible measures | 13,123 | 151 |
| UK average (2011) | 19,800 ¹ | 217 ⁴ |

| Running costs | Total | Per m ² floor area |
|----------------------------|---------------------|-------------------------------|
| Before improvement (2010) | £1,449 | £16.64 |
| After improvement (2011) | £1,161 | £13.33 |
| With all possible measures | £919 | £10.55 |
| 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) | 6.20 | 71 |
| After improvement (2011) | 4.59 | 53 |
| With all possible measures | 3.34 | 38 |
| UK average (2011) | 6.00 ² | 66 ⁴ |

³Ofgem 2011

⁴Based on 91m² from English Housing Condition Survey 2011