

# 14 Newport St, Brighton BN2 3HL



## Introduction and approach

Since David acquired this house in 2010, he has made a number of energy saving improvements, including installing solar thermal hot water, double glazing the rear facade and highly insulating the loft. David's motivation has been an awareness of diminishing fossil fuels and the need to switch to renewables. At the same time he is delighted by the idea that the sun can provide much of his hot water; avoiding the need to burn gas. Nevertheless the house still felt cold and it was clear further work needed to be done.

The recent Green Deal assessment has built on this excellent start to go even deeper, primarily by enhancing the insulation to the fabric of the house. This has tackled the much trickier areas of external and internal wall insulation, together with underfloor insulation, whilst also insulating awkward places such as the ceiling above the bay window.

The last piece of the puzzle has been to have new double glazed timber sashes built for the front of the house, to complete the whole house solution.

## OVERVIEW

Type: Terraced

Age: 1890

Beds: 3

Floors: 2

Walls: Solid brick

Area: 141 m<sup>2</sup>

Residents: 1 adult

## FEATURES

- + Condensing boiler
- + External wall insulation (rear)
- + Internal wall insulation (front)
- + LED lighting
- + Loft insulation
- + Solar thermal
- + Sun tube
- + Underfloor insulation

## Energy and CO<sub>2</sub> performance

As the work has only recently been completed, it is not yet possible to measure the impact of energy saving measures on consumption and CO<sub>2</sub> emissions. Better efficiency, renewables and insulation improvements mean that these should be around 60% lower than for a typical UK dwelling, aided by simple low cost measures such as moderate thermostat setting and heating timed to match occupation.

## Energy efficiency measures

### Heating and hot water

After acquiring the house, David replaced the old boiler with a new, more efficient condensing boiler. Hot water is augmented by solar thermal panels which he also had installed. These two measures alone have cut energy bills by around 20%. In addition, David has reduced heating consumption by a further 20% or more by setting the thermostat at a modest 17°C and only heating the house for the 7 hours of daytime occupation.

### Insulation

Some time ago, David had the loft insulated with 270mm of mineral wool insulation, supported by the subsidies available under the old CERT scheme. However, this still left the tricky ceiling area above the front bay uncovered. This cold spot has now been corrected.

Because the house has an attractive brick facade, it would have been incongruous with the rest of the terrace to have fitted rendered external insulation. Instead, the front walls were lined internally with 100mm of Kingspan Kooltherm phenolic foam internal wall insulation, mechanically fixed to the existing plaster using broad-headed plastic anchor bolts. In the lounge this was carried back along the solid hall wall in 30mm phenolic board, to prevent thermal bridging, which could have created a cold spot.

This whole process involved detailed preparation, in terms of relocating skirting, radiators and electrical sockets and switches; consistent with the new raised wall surface.

The rear of the house had no constraints regarding appearance and was insulated using 100mm phenolic external wall insulation, again mechanically fixed to the wall with nylon bolts, with slightly thinner 70mm insulation used on the bays. This was covered with a robust mesh, bedded into an initial resin-based render skim and finished with a further self-coloured textured render, which required no further decoration.

The effect of solid wall insulation has been to reduce u values below 0.20 W/m<sup>2</sup>K, cutting wall losses by over 90%, and reducing the heating bill by around one third.

As this house has a very deep void below the suspended wooden floor,

it was possible to cut an access hatch to enable workmen to go below and friction fit 150mm mineral wool underfloor insulation between the joists from below, eliminating the need to lift all the floorboards, which can be very expensive and disruptive. This was sealed in place with Tivec membrane stapled to the undersides of the joists and taped for airtightness at the edges. This measure cut the floor u value from around 0.70 W/m<sup>2</sup>K to 0.20.

The windows at the rear were replaced with double glazing shortly after David moved in, but he was reluctant to have uPVC double glazing at the front, as he likes the appearance of timber framed sashes. The compromise solution has been to retain the frames and have new double glazed timber sashes built, which also have modern draughtstripping.

### Renewables and low carbon technology

Solar thermal hot water is provided by panels on the roof, installed by local firm DH Solar Engineering, who also fitted the sun tube.

### Electricity

Where possible, LED lighting has been installed to replace inefficient halogen bulbs. Similarly, other lamps have been changed for low energy CFLs.

Lighting use has also been limited by the installation of a sun tube, which fills the enclosed upper landing with natural light.

### Monitoring

As part of long term research into the effects of internal wall insulation on wall humidity, sensors were fitted to the walls behind the board and also in the underfloor void, linked up to a Hydrotrac hub. This in turn is linked to a router, which enables data on humidity

### Some costs of the energy efficiency measures

Please note that these do not include a Green Deal Assessment or project management of the works

Internal solid wall insulation (front)	4,281
External solid wall insulation (rear)	7,004
Suspended floor insulation	1,421
Replace halogens with LED's	246
Insulate loft above bay window	181
Draught proof external doors	481
<b>Total</b>	<b>13,614</b>

to be gathered remotely by AECB, who are coordinating the research. This can be accessed remotely from their website, to monitor changes in humidity levels following installation.

### Professional team on behalf of The Green Building Partnership

#### Project Management

Earthwise Construction:  
www.earthwiseconstruction.org

#### Contract Management

The Green Building Partnership:  
www.greenbuildingpartnership.co.uk

#### Design

Cityzen:  
www.cityzendesign.co.uk

#### Solid wall insulation

Beaumont Facades:  
www.beaumontfacades.co.uk

#### Carpentry

Minton Young:  
www.mintonyoung.com

#### Electrics & plumbing

Woodmans: www.woodmans.net

### Materials

#### Wetherby insulation system

www.wbs-ltd.co.uk

#### Insulation board

Kingspan Kooltherm Phenolic:  
www.kingspaninsulation.co.uk

#### Architectural mouldings

www.sytexuk.co.uk

### Other

**Monitoring** Association of Energy Conscious Builders (AECB):  
www.aecb.net

**Solar Thermal** DH Engineering:  
www.dh-solarengineering.co.uk

Eco Open Houses is an annual collaborative project between Low Carbon Trust, Brighton Permaculture Trust and Brighton & Hove City Council. This year the event is run as part of the Ecobee Project and has been selected within the scope of the INTERREG IV A France (Channel): England cross-border European cooperation programme and is financed by the ERDF. For more information on the Ecobee Project see: www.ecobeeproject.eu

