

People Exploring Low Energy Homes

## St John's Road, CB5 8AN

### Steve Beeby

St John's Road is an exemplar renovation of a Regency house, and this is the first time this building has been open to the public for viewing. This is a unique opportunity to see how a University of Cambridge College team tackles home improvement, energy efficiency and long term environmental improvements. Although the renovation includes features specifically for homes of multiple occupancy this is an excellent visit for any householder.

Here Steve Beeby, Superintendent of Buildings at St John's College, explains the thinking behind the renovation.



#### Overview

**Property age:** Built 1810

**Type:** Terrace

**Wall type:** Solid

**Floor area:** 142m<sup>2</sup>

**Project Timescale:** January 2015 - June 2015

**Cost of retrofit:** £121K

**Occupants:** 5 adults

	Energy kWh/m <sup>2</sup> /yr		Carbon kgCO <sub>2</sub> /yr	
	Elec	Gas	/m <sup>2</sup>	/person
Before	n/a	n/a		
After	3265	13829		

#### Key features

##### Insulation and Glazing

- 600mm ground floor insulation
- Roof
- Internal solid wall
- Double or secondary glazing throughout

##### Heating/energy

- Motion controlled heat recovery vents
- Zoned underfloor heating
- Efficient boiler with hot water tank
- Variable temperature heat control
- Mifare cards to prevent leave-on's
- Daylight tubes
- Lighting motion sensors

#### The Renovation

'We bought the house in November 2014. Like many colleges we own a great deal of property and face enormous utility bills. In addition we face an additional tax known as "CRC" (Carbon Reduction Commitment). It is therefore important that we find ways of reducing our overall carbon footprint within the constraints of listed buildings and properties in conservation areas.'

The property was in a very poor condition when we purchased it in late 2014 and required a full refurbishment, the cost of the refurbishment was a consideration along with the purchase price. As well as all the environmental improvements the property was fully refitted with new kitchens and bathrooms and made compliant to the HMO regulations (house of multiple occupancy).'

#### Energy

'The focus has been on reducing energy consumption, fuel bills and carbon emissions. We have insulated all the external walls, the ground floor and the roof, as well as fitting double or secondary glazing throughout. We fitted 600mm of underfloor polystyrene insulation and zoned underfloor heating on the ground floor.'

## People Exploring Low Energy Homes

The heating is controllable from each room. We fitted a highly efficient gas boiler, controls to all rooms, and a variable temperature control, which reacts to the weather conditions outside. Then we added extractor fans with heat recovery.

To reduce the cost of lighting we installed daylight tubes, LED lighting and motion sensors. We also fitted Mifare card systems for all bedrooms so appliances can't be left on when occupants leave the house. The exception to this is a 5 amp restricted socket for charging mobile devices. This trips if anything more demanding gets plugged in, and stops people leaving electric heaters on.'



## Finances

'We didn't calculate any payback figures. There are copious amounts of facts and figures available indicating what the various upgrades will save. In my experience these tend to be unreliable. I knew the upgrades would save money on utility bills and improve comfort conditions of the property but the real proof and extent of any savings would only become factual after a lengthy monitoring period.

The project is self financed by Saint John's College and although we consider it an investment, our main aim was to bring the property up to a good standard of student accommodation while at the same time lowering the carbon footprint of the property. The work was carried out mainly by the College's own maintenance department and assisted by various specialist contractors.'

## Performance

'The St John's Road refurbishment was in some ways an experimental project to compare what energy savings could be made against similar properties in the street. If successful this approach would then become the standard refurbishment specification for a number of similar Victorian properties owned by the college. In performance terms the enhancements have surpassed my expectations and I am currently working on a scheme to upgrade other properties in the area to a similar specification. This has been a worthwhile exercise giving great data to apply to future refurbishments.'

## Professional contacts

This project was designed and implemented by the Colleges Maintenance Dept.

## Advice

The Building Research Establishment is a very good source of information, particularly the article on low carbon domestic refurbishment.

<http://www.bre.co.uk/page.jsp?id=3313>

[http://www.breeam.com/filelibrary/BREEAM%20Refurb/KN4613 -  
\\_BREEAM Domestic Refurbishment.pdf](http://www.breeam.com/filelibrary/BREEAM%20Refurb/KN4613_-_BREEAM_Domestic_Refurbishment.pdf)

<http://www.bre.co.uk/news/BRE-launches-free-sustainable-retrofit-guidance-at-Housing-2014-990.html>

## What is your top energy-saving tip for householders?

'Consider any environmental upgrades carefully particularly in older buildings. Ensuring fresh air movement around the property can prevent harmful long term problems with roof spaces and suspended timber floors.'