People Exploring Low Energy Homes

Coton Road, CB3 9NT

Vicky and Oliver Smith – they say:

We are both trained as architects and we have always been interested in **passive solar energy** and the reuse of materials. **Low energy building design** was not new to us as we were trained to think this way at architecture school.

We bought the house in 1993 and immediately built a large back extension. We have been waiting to upgrade the fabric of the original house and invested in it this year.

The 1994 back extension has **insulated walls** and solid floors, **double glazed windows** and a **roof insulated** with a **recycled newspaper** product, and has always been very **warm and draughtfree**.

In contrast, the main house, with its original front door and metal frame windows, was always very **draughty** and **streamed with condensation**.

Overview

Age, Type: **1926, Semi-detached**

Wall type, floor area: **Brick cavity, 160 sq m**

Timescale of project: **1 yr, ongoing**

Cost of measures: **£25,000 for recent upgrades**

Energy usage

After: Not yet available - recently upgraded

Before: **34 kWh** per sq m pa electricity
13 litres per sq m pa oil

Key features

+ principle: maximise insulation, air-tightness
+ insulation: cavities, ground and first floors, roofs, timber framed extension
+ exterior walls: externally insulated all round
+ air-sealed entrance lobby
+ windows: double and triple-glazed
+ photovoltaic (PV) cells: use appliances daytime
+ floor coverings: reclaimed wood block, wool carpet
+ architectural salvage, reused materials
+ monitoring: timing, whole house heating controls
+ appliances: using while PVs generating power
+ lighting: LEDs or low energy bulbs
+ water: dual low flush toilets, water butts

Low Energy Measures

We were considering replacing the old metal windows with **triple glazed Velfac aluminium and timber windows**, and knew that eventually we might want to upgrade the insulation value of the walls with **external insulation**.

It was expensive to do both together, but in the end we decided to go for it - the detail is better as the new windows sit proud of the original face of the brickwork, thereby **avoiding cold bridging**, and it gets the disruption over all in one go!

The **external insulation** was applied to the external face of the brickwork and then rendered over, so **we lost no inside space**. We are amazed by how wonderful the house looks now – it's appearance is greatly enhanced, yet it still retains its 1920's feel.

We considered installing **photovoltaic** (**PV) cells** when we heard about the ECoton group scheme. The figures stacked up, and we were very grateful to be able to piggy back on other's research. **Pooling resources** in this way is a great idea and it saved us a huge amount of research time. We were impressed by the professional attitude of Upbeat Energy and within a few weeks we were up and running **generating our own electricity**.

Our approach to this project has been piece meal and the project is still ongoing. Our guiding principle has been to **maximise insulation** and **minimise draughts**, by inserting a **sliding door** to make a **draughtproof entrance lobby in the hall**.

The measures have been so successful that we were presented with an **entirely new problem** – the open fire in the sitting won't light unless the back door is open! So the next part of the project is to improve ventilation to the fireplace, or to change the open fire to a **sealed wood burner**.

Future Plans

We are planning heat recovery and ventilation for the two bathrooms, and looking into air source heat pumps and solar thermal tubes.

We are also considering sealed wood burners.

Professional Contacts

Vicky's blog: http://77overcoton.wordpress.com

Architects: Oliver Smith www.5thstudio.co.uk and Vicky Smith www.stridedesign.com

Builder: Carlton E West Building Services Ltd www.carltonewest.co.uk

Plastering: M and J Plastering Contractors Ltd www.mandjplasteringcontractors.co.uk

Products and Costs

Photovoltaic (PV) cells: 16 x 2.40 kWp panels, Trina system, Upbeat Energy www.upbeat-energy.com £10,000

Insulation

Main house

External wall insulation and render: Kingspan 80mm insulation and Weatherby silicone render, applied by specialist plastering contractor £7500

Loft: 300mm fibreglass quilt to ceiling; rigid insulation board to sloping sections

Suspended timber floors: carpet, underfelt and hardboard

Extension

Cavity walls: 50mm fibreglass batt insulation

Roof: Warmcell recycled newspaper

Solid floors, under screed: 50 mm insulation board

Windows and doors

Main house

Windows: Velfac triple glazed themally broken aluminium and timber replacement windows to original house £4000

Front door: bespoke softwood and double glazed, Eversden Joinery £1000

Extension

Windows: K-glass sealed double glazed units in timber frames

Glass doors: K glass sealed double glazed units in timber frames

Heating system

Heating controls: timer and thermostatic radiator valves

Fireplace: Jet master open fire

Green materials

Architectural salvage, reused materials, FSC timber

Floor coverings: reclaimed wood block floors and pure wool carpets