Nightingale Avenue, CB1 8SG

Anne Cooper and Simon Ruffle – Anne says:

We moved into our house in 1991. It was built as a detached three-bedroom family house in 1958. The underlying construction is uninsulated **Fletton brick cavity walls** (both skins) with a traditional cut timber concrete pantile roof and solid floors.

I've been interested in **low energy design** since training as an architect in the 1970's. As I see it, a **well designed house is warm and draught-free**. The first thing to look at is the **insulation** followed by the **heating and hot water systems**. These should be as good and as sophisticated as it is practical to achieve. I also believe in flexibility.

Overview

Age, Type: **1958, Detached**

Walls, Floor area: **Cavity + Timber extn, 208 sq m**

Project timescale: **18 yrs + 1 yr** (pre- + post-2009)

Cost of measures: **£9,000 for PV system**

Energy usage – 3 adults

After: **24 kWh** per sq m pa electricity (post-2009)
90 kWh per sq m pa gas (post-2009)

Before: **42 kWh** per sq m pa electricity (pre-2009)
177 kWh per sq m pa gas (pre-2009)

Key features

+ insulation: cavities, floors, roofs, extension
+ condensing boiler, energy efficient controls
+ 'weather compensator' control
+ draught proof entrance lobby
+ solar thermal panel, solar PV panels
+ unvented solar hot water cylinder
+ reclaimed floor tiles: kitchen, extension, patio
+ floor covering: rubber, cork, wool carpet
+ heat recovery extractor fans
+ rainwater harvesting
+ lighting: LEDs or low energy bulbs
+ bespoke sun tube: natural lighting
+ roof lights: natural lighting, ventilation, security
+ water: aerated taps, dual low flush toilets
+ clothes drying: under cover outdoors
+ grow your own: vegetables, fruit

As well as **solar thermal** and **photovoltaic (PV)**, we have an open fire, providing options should the gas or electricity be cut off.

I was brought up in Yorkshire, in a culture of **self-sufficiency**. My parents always grew their own fruit and vegetables. We have an allotment, and we **grow a large part of what we eat.**

Lifestyle is a big motivator for me, as well as a desire to be **warm and comfortable**.

Low Energy Measures

The first things to go were the empty cavities, which were rapidly and very successfully **filled with Rockwool**. Next, the old boiler was replaced by a **condensing boiler** and **energy-efficient controls**.

Since then the house has been extended and altered on a number of occasions. The flat roofed extensions have been demolished and the house is now a five-bedroom, three-bathroom property.

The two side extensions and the rebuilt front bay and **draught lobby** have **insulated solid floors** (100mm of Celotex). The first extension was brick and block with **cavity fill and internal insulated lining.** The most recent extension is timber frame with **Celotex insulation between and underlining the studs**, achieving a **U value of better than 0.2**.

The **roofs of the extensions are insulated** with Celotex between and under the rafters. The main roof has Tri-Iso **multi-foil insulation** under the main rafters and **Rockwool** between the ceiling joists. The internal **Fletton walls are lined with Celotex insulation** when redecorating rooms.

When carrying out the most recent extension, the heating and hot water system was replaced with a new Vaillant **condensing boiler**, energy-efficient **'weather compensator' control, solar thermal panels, under floor heating** and an **unvented solar hot water cylinder**.

A **rainwater harvesting system** was installed to provide water to the **washing machine** and **three of the four toilets** in the house, along with the **outside tap and a vegetable-washing tap** in the utility room.

Two of the toilets are **Swedish Ifo low flush units**. **Reclaimed floor tiles were used in the kitchen, extension and patio**. Other floor coverings are **rubber, cork and wool carpet**.

There is both **under cover and outdoor clothes drying facilities** and 4 **heat recovery extract fans** play an important role in the clothes drying strategy. **A or A+ rated goods** are bought when replacing white goods and there are **low energy bulbs or LEDs** in almost all light fittings.

Getting **natural light** into the house is also a priority and there is a bespoke **light tube over the landing**. And finally **roof lights** located above the staircase and in most of the bedrooms provide **natural ventilation** combined with security.

Most recently a **1.88kW array of PV cells** has been installed on the South-West roof slope and the household lifestyle is being adapted to suit the daytime energy production.

Professional Contacts

Architects: AC Architects Cambridge Ltd
www.acarchitects.com

Builder: Andrew Whitmore & Son
whitmoreandson@ntlworld.com

Solar thermal plates installation: Solarworks
www.solarworks.co.uk

Solar photovoltaic (PV) cells installation: Midsummer Energy www.midsummerenergy.co.uk

Products

Insulation

Cavity wall: Rockwool (done in 1991)
www.rockwool.co.uk

Loft: Tri-Iso and Rockwool www.triiso.co.uk

Flat roof, underfloor insulation in new extension: Celotex www.celotex.co.uk

Lighting

Windows: purpose-made hardwood double glazed low E argon fill. The most recently installed windows have a special seal too.

Roof lights: Velux www.velux.co.uk

Heating

Heat recovery system, Humidistat controlled: Johnson and Starkey or Silavent

Condensing boiler and heating controls: Vaillant
www.valliant.co.uk

Solar thermal hot water system: Evacuated tubes, Thermomax www.thermomax.com

Solar photovoltaic (PV) system: 1.88kW array,
www.midsummerenergy.co.uk

Water conservation

Low flush toilets: Ifo www.ifosanitar.com

Rainwater Harvesting