



People Exploring Low Energy Homes

Knight's Way, CB24 6DE

Nat and Mary-Ann – Nat says:

We bought our 1960's semi in June 2009. It was in a poor state of repair and we saw it as a great opportunity to start from scratch and put in **high-efficiency systems**. The three year plan includes major renovation and the addition of a **two-storey rear extension**.

I have a long-term interest in **sustainable building** and learnt a lot helping out with a number of off-grid self-build houses in California in the 1990s.

I hadn't thought that I would have the chance to put this experience into practice, but this house became available and presented the opportunity.

A particular focus of the project is to see what is possible within the **limitations of refurbishment**, as the style and construction of the house



Overview

Age, Type: 1960s, Semi-detached

Wall type, Floor area: Cavity, 150 sq m

Project timescale: 3 yrs

Cost of low energy measures: £16,000

Energy usage – 2 adults, 1 child

20 kWh per sq m pa electricity (estimate)
100 kWh per sq m pa gas (estimate)

Key features

+ insulation: cavity walls, carbon zero, loft

+ insulation: thermal beam & block, extension floor

+ windows and doors: double-glazed

+ energy efficient systems

+ condensing boiler and radiators: A-rated

+ solar thermal system and thermal store

+ lighting: compact fluorescents, LEDs

+ rainwater harvesting

+ rainwater for toilets, clothes and gardening

+ low flush toilets

+ high-efficiency appliances

+ future: thermal store input from solid fuel source

+ future: large vegetable garden

+ Nat's blog: www.knightsway.blogspot.com

www.openecohomes.org

www.cambridgecarbonfootprint.org

represents a **significant proportion of the UK's housing stock**. In many cases substantial improvements to efficiency were achieved simply by installing modern **energy efficient equipment**.

Low Energy Measures

New **20 mm sealed-unit double-glazing** was installed throughout.

Cavity wall insulation had been installed by the previous owner but the loft was poorly insulated. **Carbon zero loft insulation** made from recycled plastic bags was installed in the loft. The new extension is heavily insulated in the cavity, roof and uses **Thermal beam and block** in the floor.

The existing hot-air heating system was removed and replaced with an **A-rated condensing boiler and radiators**.

The old, poorly insulated, hot water cylinder was replaced by a **thermal store** and a **solar thermal system** was added in June 2010.

The thermal store has one unused input, which could be used in the future for input from a **solid fuel source**.

New windows and a new condensing boiler are not explicitly eco-friendly or out of the ordinary, just built to newer standards.

In other aspects simplicity was the focus

The rewire avoided complex and energy-hungry lighting schemes with the **highest consumption in the long lounge-diner of 40W**.



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The refitted kitchen is lit by **8 LED lamps, totalling under 20W between them.**



Current work

The extension is nearly complete. The new **rainwater harvesting system** has recently been commissioned and provides water for **low flush toilets, clothes washing and garden watering**.

Work for 2012 will focus on the garden, including the creation of a **large vegetable patch**.

Professional Contacts

Nat Johnson's Blog:

www.knightsway.blogspot.com

Builder: Jamie Beynon

www.jbeynon.co.uk

Electrician: P. J. Deane

Solar Thermal: EnviroSolar www.envirosolar.co.uk

Rainwater Harvesting: Combined Harvester

www.combinedharvesters.co.uk

Products

Loft insulation: Earthwool carbon zero

Paints: Ecos Organic throughout.

Rainwater harvesting: Graf Platin 5000l tank, with pump and

Loft tank: bespoke, Combined Harvesters

Hot water and heating

Condensing boiler: Baxi Megaflo 18kW boiler. Gledhill Torrent RE

Solar thermal store: 277l 30 Thermamax

Solar thermal evacuated tubes: Deltasol control and pumps.

Lighting

Compact fluorescent: throughout, except kitchen

LED lamps: in the kitchen