People Exploring Low Energy Homes

Aberdeen Square, CB2 8BZ

Ian and Janet: Ian says,

We became increasingly restless to act to reduce our use of finite natural resources and offset the escalating cost of energy. Our previous home was an Edwardian detached property with an Energy Performance Certificate rating of F. When our children moved out of home it seemed like a good time to make a change and move to a more energy efficient house.

We wished to stay within the City Centre and had observed the evolution of the Accordia development. We had the benefit of being able to see other houses of the same type that had already been built. Although they were very comfortable, we were looking for an opportunity to take steps to future-proof our home, and become more isolated from energy shocks.

We've now been living in our home for 2 years, and we have found that we have significantly reduced our energy consumption, and made significant savings as well.

Overview

Age, Type: **2010, End terrace townhouse**

Wall type, Floor area: **Block and brick, 263 sq m**

Project timescale: **18 mths**

Energy usage

Before (2 adults, 3 children):
50kWh per sq m pa electricity
160kWh per sq m pa gas
250 cubic metres pa water

After (2 adults):
40kWh per sq m pa electricity
4kWh per sq m pa gas
90 cubic metres pa water

Key features

+ living space on first floor to maximise light
+ extended window lengths
+ highly airtight
+ ventilation: trickle vents and stacked floor plan
+ passive solar gains on main work areas
+ solar PV
+ air source heat pump
+ gas stove as supplementary heat source
+ air infused shower heads, dual flush toilets, water butt
+ high performance appliances

While we enjoy our home, we also like the atmosphere of the emerging community. Since most residents don't have their own gardens the large outdoor areas with nearby allotments are shared public space and are an important amenity.

There is also a flourishing community association that has put on wonderful events including a cycle powered cinema evening, monthly green gyms and has recently converted a WWII pillbox into a **bat hibernaculum** as part of improving biodiversity, which you can see here; http://goo.gl/qWeC0.

Low Energy Measures

Our main focus when making changes to the build were to use **light, air and heat to best effect.** The west facing deck on the 1st floor connects **indoor and outdoor living space** and provides **natural light** into the main living space of our home.

Study areas on the south side of the first and second floors benefit from **passive solar gains** during the workday. The **stacked floor plan**, along with **trickle vents** means that the house ventilates naturally.

In addition to changing the layout of the house we made changes to the heating and energy systems. We installed a **3.7Kwp solar PV system** and a **Daikin 14 kwp split system air sourced heat pump** that meets the needs of the under floor heating running at 35C. For supplementary heating in the living room we also had a **gas fire** put in. We also find this nice aesthetically as a focal point for the room.

Although we didn't alter the lighting plan, we have installed 40% **low energy lighting**, and we will look to install LEDs in the future.

System Performance

Solar PV: 3200 Kwh/annum. 2300Kwh used, 900Kwh exported

Estimated COP for Heat Pump: 3

Pressure test: 4M³ (Where 10M³ is reasonable practice, 7M³ is good practice, and 3M³ is best practice)

U Values:

Windows – 1.59

External walls – 0.35

Ground floor – 0.22

Flat roof – 0.16

Savings

Our new home was given an EPC rating of B when built, which assumes an average use of 21500 kWh/year energy, emitting 4700 kT/year of C02. Our actual results have been much better. In the year ending December 2012 we used just 11,500 of which 2300Kwh was produced by our solar PV, reducing our C02 emissions to 2000KT.

In addition to this we exported 900Kwh of electricity, which brought our net energy running 'costs' to an income of £340 and a saving of over £2000/annum.

Future Plans

Improve the measuring capability of the heat pump

Update the lighting to LEDs

Examine the electric car

Confirmation of RHI for domestic heat pumps

Products and Costs

Daikin Air sourced Heat Pump
www.elliotts.co.uk

Sharp MonoCrystaline PV panels & Kaco Inverter
www.evoenergy.co.uk

Esse Flueless Gas Fire
www.esse.com

Ideal Combi Windows & Doors
www.idealcombi.com