

High Beech, Maudlyn Park Steyping, BN44 3PS

Overview

Owner: Di and Mike Croker

Type: Detached

Age: 1953

Beds: 3

Walls: cavity filled

Area: 140 m²

Residents: 2 adults

Features

Cavity wall insulation

Double Glazing

Low energy appliances

Low energy lighting

Solar PV (3.0 kWp)



Introduction and approach

Di and Mike have a simple philosophy of avoiding waste, which has led them to try and make their house as efficient as possible, within reasonable economic constraints.

They were both brought up to avoid waste and have steadily improved their house, with cavity wall insulation, new double glazing and good levels of loft insulation. They also took the advantage of re-insulating a flat roof from above, when the felting had to be renewed.

Lighting has also been tackled, using CFLs initially, but more recently LEDs. Mike is also involved in the Power Rangers initiative, which involves lending monitoring equipment to householders, to enable them to appreciate the electrical energy used by items of equipment and track down waste.

By adopting common sense measures, they have cut their total CO₂ emissions by over 75% versus the norm for UK housing.

The last obvious target is the non condensing boiler, which is still wasting lots of gas, but its days are numbered.

Energy efficiency measures

Heating and hot water

When they bought the house in 1981, it had a coal fired Aga, that consumed a hundredweight of coke a week, and had to go.

Heating and hot water has since been provided by a, now ageing, non-condensing Potterton Kingfisher gas boiler. This has not been replaced, as heating demands are very low, which means that the cost of replacement would take a long time to recover from savings. However, replacement is actively under consideration. There are good heating controls including separate thermostats for the hall and lounge, as the lounge is only used intermittently.

The house thermostat in the hall is kept at around 16.5°.

The lounge has an fireplace with a Jetmaster fire, which burns logs at 50% efficiency – which is far higher than a conventional fireplace and an interesting alternative to a woodburning stove.

Insulation

Walls – the Cavities were filled with beads many years ago. However, it is not certain how well this was done and if doing it again another system would be chosen.

Windows – original Crittal windows, with secondary glazing, were recently replaced with

efficient B rated ones ($u = 1.4 \text{ W/m}^2/\text{K}$), which effectively cut window heat losses by half, and also reduced draughts.

Loft – this has the recommended 270mm of insulation. Also, when the flat roof over the dining room was renewed extra insulation was inserted from above.

Renewables and low carbon technology

Solar PV – 3 kWp of very efficient Sungrid panels, which perform well even in indirect light, were fitted on the west southwest facing rear roof in 2011 by Solar Advanced Systems. Since mid 2013, a SolarImmersion controller has been fitted to divert surplus electricity to the immersion heater in the hot water tank.

Electricity

All lighting is low energy, mainly CFLs and LEDs, with replacement strip LED lights in the old fluorescent luminaires in the kitchen.

Recently Mike changed from using a tower pc to using a laptop, with a reduction in consumption of over 75%.

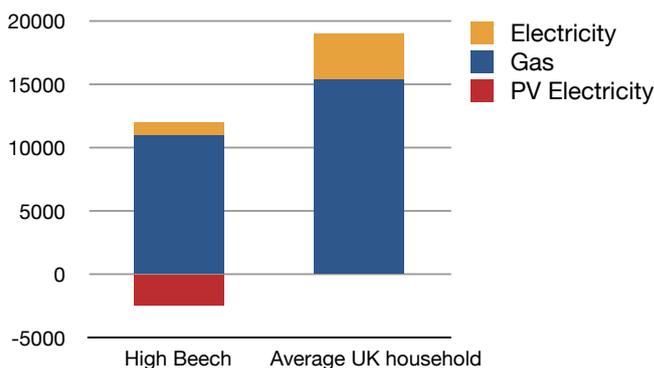
Mike monitors electricity usage on a weekly basis, keeping records going back three years. He is also involved in the Power Rangers initiative of Steyning 10:10 Climate Campaign, which involves lending householders plug in energy monitors to check the usage of individual equipment, as well as a whole house Owl monitor, which can give a continuous graphical record of electricity use. Householders are encouraged to keep a diary, to note the time equipment is used, so that this can later be related back to its impact on the graphs.

Carbon emissions

Energy Use: Electricity 1000 kWh pa, Gas 11000 kWh pa, PV 2500 kWh pa.

Net CO₂ emissions: Total 1.6 tonnes (70% less than average UK dwelling), 11.7 kg/m² (82% less than UK average).

Energy and generation (kWh)



Other sustainable measures / lifestyle decisions

Water conservation – Three water butts around the house collect water for the garden. The shower has an aerating head to reduce consumption.

Lessons learned

The old boiler not only has a lower efficiency, at around 75%, but it has a continuously running pilot light, which has been measured to use 1450 kWh pa. Interestingly, pilot lights are not taken into account when assessing boiler efficiency, so the real efficiency of the boiler is a low 60 – 65%.

When changing to LED lighting, the colour of the light can be important. Most people choose warm light lamps, which approximate to tungsten. 'Cold' or 'daylight' lamps can appear a little stark. As you will be living with an LED for many years, it pays to choose carefully.

It is extraordinary how much prejudice still exists about cavity wall insulation causing damp and a recent Steyning 10:10 initiative to promote this met with hostility from some who refuse to accept the science.

Professionals

Jetmaster open fireplace: www.jetmaster.co.uk

Solar PV: www.solaradvancedsystems.co.uk

Solar Immersion Controller:
www.solarimmersion.co.uk

