

45 Kings Barn Lane Steyning BN44 3YR

Overview

Address: Owners: David and Jill Herson

Type: detached chalet style bungalow

Age: 1930s renovated 1990

Beds: 4

Walls: cavity filled

Area: 200 m²

Residents: 2 adults

Features

Cavity wall insulation

Condensing boiler

Double Glazing

Low energy appliances

Low energy lighting

Remote control programmer

Solar PV (2.25kWp)

Solar thermal



Introduction and approach

David and Jill abhor waste and made it a priority to steadily improve the energy performance of their house when they moved in 2004. The house itself had previously been heavily upgraded from the original 1930s bungalow, by a developer in 1990.

So far they have changed the boiler and controls, installed both Solar thermal and Solar PV, as well as Cavity wall insulation and low energy lighting. The new heating programmer allows for remote control and David hopes to use it to fine tune even further. As a result net carbon emissions are more than 80% lower than a typical house of their size.

They are not obsessed with climate change, but consider it prudent to run the house economically and have brought up their children to follow this philosophy. David carries the work further, being trained as a waste prevention advisor for WSCC and giving talks to local schools.

Energy efficiency measures

Heating and hot water

Heating and hot water is provided via a Worcester Bosch condensing gas boiler, with good heating controls including programmer, room stat and TRVs. The programmer is very sophisticated and can be adjusted remotely by mobile phone. This means the heating can be switched off if accidentally left on and can also be asked to start a few hours before returning from a trip, so as to arrive back at a cosy house.

Hot water is augmented by a large solar thermal array on the south and west facing roofs, which means that hardly any gas is used in summer. Because of the good levels of insulation, the heating only needs to run briefly in the morning and the evening.

Insulation

Walls – cavity wall insulation was installed in 2007, but was subsequently found to be very patchy. This led to a claim against the installer and the job effectively being redone using Whitewool. However, it has now been double checked and is working well.

Windows have good double glazing, but David is considering upgrading to triple glazing at some time in the future.

Roof – the insulation in the sloping roof was done at the time of conversion in 1990, but seems to work well. The chalet design leaves little storage in the attic and eaves, so insulation is limited to between the joists.

Renewables and low carbon technology

Solar Thermal was transferred from the couple's previous house when they moved 10 years ago. The work was done by Sunuser, based in Leeds. This is a big array on the south and west facing roofs and provides ample hot water.

Solar PV was fitted only recently, again by Sunuser, and consists of 9 x 250W panels on the only available roof space, which faces east. Because of the space limitations, high efficiency Sharp units were chosen.

David is also chair of governors of a local primary school and was successful in encouraging them to install a 10 kW array on the school roof, which has proved a very positive investment and a big boost for renewable generation.

Electricity

David has experimented with low energy lighting and has found a wide range of very keenly priced LEDs on the internet. This means that lighting load is now minimal.

Carbon emissions

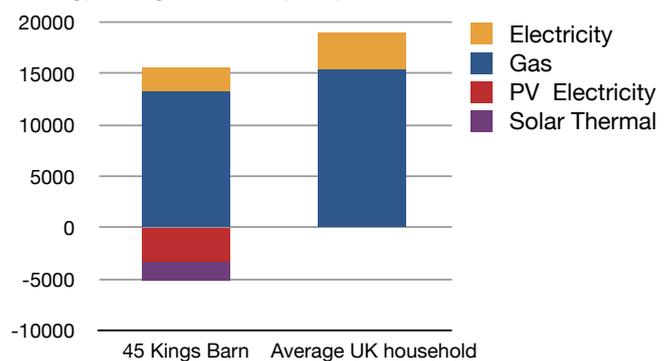
Energy Use: Electricity 2400kWh pa, Gas 13200kWh pa, PV 2000kWh pa.

Net CO² emissions: Total 2.4 tonnes (57% less than average UK dwelling), 11.9kg/m² (81% less than UK average).

Other sustainable measures/ lifestyle decisions

Water conservation – rainwater is collected from butts around the house, which means that no tapwater is needed for watering.

Energy and generation (kWh)



Washing up water and water collected whilst waiting for the tap to run hot is also saved and used on the garden.

Composting – David and Jill are enthusiastic home composters. They have three different composting bins as well as a Green Cone for processing food waste. The resulting compost is used throughout the garden primarily to improve soil texture and nutrition.

EV car charging point – this was fitted for free in Autumn 2013, under an offer from South Downs Solar, which was funded by the government. David is thinking of buying a hybrid VW Up, so that he can take advantage of free charging from the PV in summer. This car has a battery range of 30miles, so would be fine for 90% of journeys, yet have the support of a conventional engine for longer trips.

Monitoring – David has monitored energy use for several years and keeps a rolling record of the steadily reducing average daily usage of both electricity and gas as well as water.

Lessons learned

On reflection, it was probably not worth moving the solar thermal panels from the previous house, as the cost of moving and re-installation was high and relatively inconvenient.

Professionals

Solar Thermal and Solar PV – Sunuser, Leeds.