

76 Hollingdean Terrace, Brighton BN1 7HA



Overview

Period/age of house: 1930

Type: end of terrace

No. of rooms: 5 bedrooms, 3 other rooms

No. of floors: 3

Wall: cavity

Costs: PV £7.5k, sheeps wool insulation £1k

Features

- + Grey water recycling
- + Rainwater harvesting
- + Photovoltaic panels
- + Floor and roof insulation
- + Wood burning stove
- + Green roof (on shed)

Introduction and approach

Nigel and his teenage sons have been living in their 1930s end of terrace house since 2001. As a builder and roofer Nigel has always made home improvements. Nigel has a growing desire to run the house in a sustainable way to ensure his children will be able to enjoy the environment in future years. On getting a water meter he realised that as his children were growing older they were taking longer showers, and the utility bills were rising. He approached the task of eco renovation with renewed vigour.

Nigel's approach has been very practical, applying small mindful solutions, observing the impact and tweaking for maximum efficiency. With a large house and a low budget this has kept things manageable, and flexible to the growing needs of his life and family.

Water saving measures

Nigel has installed a detailed water saving system using rain water and greywater to maximum effect. Two ballcocks in one of his toilets allow infill from rainwater or mains, and kitchen greywater is routed via the shed's turf roof to irrigate the plum tree in a planter below. Shower water is collected in butts to water the garden; the butts are kept out of direct sunlight and turnover is regular, to avoid storing the water which needs using immediately. Low flow taps and aerated shower heads on all the showers have reduced water use significantly but resulted in no complaints from his discerning teenagers!

Nigel has kept detailed records of water use over the past 5 years which demonstrate the benefits of their water catchment and reuse. In their case the family's demand for water has increased rapidly as the household has grown from 4 to 5, and his children have gone from a bath per week as younger children, to a shower every day as teenagers, however their water saving actions have kept usage constant at 140m³/year despite this.

Electricity saving measures

When the feed-in tariff (FIT) became available Nigel bit the bullet and spent all his savings on a 2.12 kW PV array confident it was a great investment. The array consists of 12 Sharp NU-180E1 180 watt panels totalling 15.8 m². He hasn't been disappointed, generating 2300 kW of electricity in the first year alone, earning £1,000 through the FIT and providing free electricity during sunlight hours. Even though the FIT to the public is now lower, since installation costs are also now lower Nigel believes it is still possible to get a 10% return on PV investment at current rates.

Nigel has also taken simple actions and made lifestyle changes to minimise his electricity usage.

He has upgraded his fridge freezer to an A-rated low energy Samsung fridge and moved it away from warm spots in the kitchen, he uses appliances in the daytime when electricity is being generated by the PV panels, and uses a 'Laundry Maid' drying rack, which dries a full washing machine load in 24 hours all year round.

He has also replaced all his light bulbs with low energy LED or compact fluorescent bulbs where possible. He realises that 10 recessed spotlights in a kitchen at 50 watts each uses ½ kW to light a kitchen, whereas LED lighting has a higher initial cost but lasts for years and pays for itself many times over.

Electricity use in Nigel's household has increased markedly over the past 5 years as his boys have become teenagers and the number of TVs in the house has risen from one TV and one computer in 2001 to 5 computers, 4 TVs and 3 games consoles now. Despite this his electricity costs have remained at the same level because

of the solar panels and the other small changes he has made.

Electricity usage for the 10 years prior to installing the panels was around 3,700 kWh. Since installing the panels it has reduced to 2,800 despite the increase in use from extra TVs, computers and games consoles.

Gas saving measures

The condensing combination boiler he had fitted in 2006 has reduced water heating costs, and all new boilers are now required to be condensing – typically 95% efficient, as against 65% efficiency for a 20 year old boiler.

Space heating has been reduced by using the Hunter Hawk wood-burner in the living room to supplement the central heating

Insulation measures

The house benefits from having a cavity wall which was previously filled, though topping up or refilling may be needed in due course to maintain it's performance.

The loft had been previously converted, and insulated with multifoil insulation, but to increase the level of insulation, Nigel as an experienced roofer, took the unusual step of adding 100-150mm sheeps wool insulation from the outside, cutting away the felt and sliding in a breathable membrane in sections. He used sheeps wool for its superior handling properties, though in the event of any moisture from above, its ability to provide an insulating effect would be compromised.

He has also reduced cold ingress from and heat losses to below the ground floor through the conversion of his basement into a separate flat, building in very high levels of Rockwool insulation for thermal performance and soundproofing.

The house already had uPVC windows to the front, and Nigel had uPVC double glazing installed in the remaining windows to give improved thermal performance at low cost, despite an awareness that the environmental impact of uPVC is contentious.

Future changes

Installation of a solar thermal hot water system, top up cavity wall insulation and ongoing developments to the water saving systems are all on the agenda for Nigel. As well as larger projects, it is the regular small tweaks and changes that he expects to make over the years that often make the biggest difference as he tailors the house to balance efficiency with the needs of the householders.

Lessons learned

Topping up cavity wall insulation is difficult, so if you are replacing windows check that the fitters prevent this insulation falling out.

If you are having a loft conversion take the opportunity to really get the insulation right – the type and thickness of the insulation materials and the quality of their installation are all important.

Nigel's top tips for reducing household energy consumption and are

Insulation Cavity and loft insulation are low cost and very effective. At 2012 they are available free from Brighton & Hove City Council. From 2013 these can be installed through the Green Deal, a new finance mechanism.

Air tightness Changing window units and doors can improve air tightness, but if you have draughty windows and are not planning to change them, try draught proofing tapes and films.

Low Energy Whenever you are changing or purchasing any household item, from light bulb to TV, go for most efficient model possible. There can be large differences between the energy usages of common items and over the life time of appliances that could add up to a lot of electricity.

Solar thermal and PV If you have done these three cheaper measures first you may wish to look into solar thermal and PV. In the right circumstances they can represent a good long term investment

Professional contacts

Solar Solar Rise fitted the Solar PV array
<http://solar-rise.co.uk/>

Woodburning stove Hunter stoves
www.hunterstoves.co.uk/stoveindex.html

Eco Open Houses is an annual collaborative project between Brighton Permaculture Trust, Low Carbon Trust and Brighton & Hove City Council. This year the event is run as part of the EcoFab 2 project and has been selected within the scope of the INTERREG IV A France (Channel) – England cross-border European cooperation programme and is co-financed by the ERDF