Case study

46 Beechwood Avenue Worthing, BN13 2HS

Overview

Owners: Alan and Pauline Cory

Type: semi-detached bungalow

Age: 1930's

Beds: 2 bedrooms

Walls: cavity

Area: 85 m^2 approx

Residents: 2

Key Features

Water efficiency

Solar PV

Innovative Waste Practices

Other Features

Cavity wall insulation

Combi boiler

Double glazing

Draught-proofing

Heating controls

Low energy appliances

Low energy lighting

Loft insulation

Underfloor heating

Low waste household

Introduction and approach

As a director of Transition Town Worthing, Pauline spends a lot of her time at home organising projects and events (like this one) aimed at reducing impact on the environment. In an endless effort to be the change you wish to see in the world, Pauline and Alan's home is a living example of small, achievable, inexpensive steps.

This 2-bedroom bungalow with both Pauline & Alan at home all day most days, has low energy and water consumption.

Go along and see just how simple it is to achieve, through eco appliances and settings, water butts and a conscious choice to use mains water at a minimum.

Pauline and Alan also have solar PV panels, which were paid back after 7 years in 2021, allowing them the luxury of being guilt and carbon free as they power their home needs.

And let's not forget their zero-cost rebuilt shed (from Freecycle), and their home-made pond - costing them just the liner as the rest was created from materials left around the property, from other home improvements.

This is a cosy, comfortable and environmentally positive home that is efficient and yet has come together from a make-do and mend philosophy using and reusing everything

Come and talk to Pauline and Alan about simplistic efficiency that's actually very easy to achieve

Energy and CO2 performance

Pauline and Alan switched to Ecotricity in 2014 for gas and electricity to help promote the development of renewable energy. The solar PV helps reduce carbon emissions to an estimated 63% of the UK average.

Energy efficiency measures

Heating and hot water

Heating, hot water and cooking, is with gas. The bungalow has a new gas combi boiler, which in its first year saved them a lot of money on gas bills. A few years ago, when the hot water cylinder sprang a leak, Alan replaced it with a twin-coil cylinder which has the potential to connect to a solar system if they ever decide to do this.

In summer, utilising the benefits from the solar panels, they have the boiler switched off and use a timer on the immersion heater to heat the hot water at periods of maximum generation from the solar panels.

The heating has a programmer, whole house thermostat and thermostatic radiator valves (TRV's) on all radiators, all of which have been replaced as each room has been decorated. Radiators on external walls have heat reflective panels behind them to help avoid heat loss through the walls.

The 5kW wood-burning stove (fed purely with waste wood) gives additional top-up heating as required.

The conservatory has wet underfloor heating connected to the gas heating system.

Insulation

Walls - cavity wall insulation is blown loose fill, installed 17 years ago. In order to check it's still functioning properly, a friend went over the whole building using a thermal imaging camera to check any areas that might be a bit suspect. All appeared to be well, thankfully. It was a fascinating exercise.

Windows - The entire building, including conservatory, is double glazed. The conservatory has high performance heat reflective units. The porch has a double-glazed outer door/window. The inner porch door has draught excluding tape around it.

Loft - 100mm of fibreglass quilt is laid under the floor and 100mm of fibreglass quilt above the plasterboard ceiling. In the section of loft, which is used for storage, the roof has been insulated with 100mm quilt with a membrane stapled to the underside of the rafters to reduce draughts.

Insulation has been topped up to a full 300mm of mineral wool, sharply

cutting roof losses. The floor is carpeted as well.

Airtightness & ventilation - Where floorboards have been stripped, gaps have been sealed with mastic. Inlet air for the wood-burner is ducted to a floor grille adjacent to the unit.

Renewables and low carbon technology

Solar PV – A 3kWp system, comprising 12 Solarworld PV panels using one Power One inverter, DC and AC isolators, Generation Meter and Wireless Monitor, was fitted in March 2014

Woodburning stove – installed by Alan and uses scrap wood. When in use, the central heating thermostat can be turned down by 2 degrees.

Electricity

All lighting is low energy.

They have a low energy shower and washing machine.

Carbon emissions

Energy Use: Electricity 2800 kWh pa and Gas 10400 kWh pa, Wood 550 kWh pa, PV 1818 kWh pa.

Other sustainable measures/ lifestyle decisions

Waste - Pauline is deeply concerned about our impact on the planet and is passionate about zero waste, using as little plastic as possible, local food and recycling,
so they use refills wherever possible and avoid wasting food. Any food waste goes into the hot-bin to be turned into compost. Alan has built a little recycling centre for all the items that can now be passed onto projects like Terracycle (via Recycling in Lancing for example) when plastic waste is hard to avoid.

Make do and Mend – Alan has always been an avid DIY enthusiast so make-do and mend has always been a big part of his life. Transition Town Worthing has been running a Repair Cafe once a month since 2018 that Pauline helps to organize and Alan does repairs for. They believe in trying to conserve what they have, rather than replace something that still has plenty of life left in it, as long as it's not consuming extra energy.

A great example of this is their kitchen, which still has 2 original 1930's cupboards - the rest were changed in the 1950's – still functions well and often gets remarks like "oh, it's just like my granny's kitchen used to be!"

Clothes drying - When they are able to, they line dry clothes outdoors, otherwise this is done on washing lines in the conservatory, utilising the heat produced from the underfloor heating and the sun.

Water conservation - Savings on hot water are achieved by showering and washing up by hand (not using running water) once or twice a day. There are 8 water butts – 4 of them made from old mayonnaise/olive containers. They try hard not to use mains water in the garden, better for plants and the environment and saves on water bills.

Once the garden needs watering daily, Alan diverts the kitchen waste water pipe into a galvanized tank in the yard so they can use it to water the garden.

Cooking methods - 2 day's meals can be cooked at once, using stainless steel saucepans with the lids on and turning them off about 5 minutes before the end of cooking time.

Food cultivation - Pauline & Alan grow their own vegetables and fruit at home and help to run two community allotments, so they always have plenty of fresh produce. They usually manage to freeze enough fruit to last them until the next growing season. All produce from the allotments is shared with volunteers and any surplus is shared with local food banks. As much as possible, Pauline & Alan try to eat seasonally, locally or buy produce from this country to avoid excessive food miles.

Biodiversity - Pauline and Alan have deliberately designed their garden to support wildlife, pollinators and biodiversity through choice of plants, wildlife pond and doing all they can to encourage birds to nest and live in their garden. As avid skip-raiders, their garden furniture is mostly refurbished stuff that others have thrown away, even though it still had plenty of use in it. Alan loves nothing more than bringing something back to life and their home, garage and side yard often has stuff waiting to be repaired, including items that have been brought into the Repair Café.

Sedum Roof – a local green roof specialist advertised lots of free modules of sedum roofing on Freegle. Pauline had wanted a green roof on the garage for years, so off they went to Portslade to collect 10 of them – making a very good start to the dream green roof!

Lessons learned/further improvements:

When installing/repairing underfloor pipework it would have been sensible to insulate under the floorboards at the same time.

Adding woollen curtains to the bedroom made a big difference in warmth in the winter and keeps the room cool in the summer. Curtain material was from The Good Stitch – surplus British Airways seat material! A friend gave Pauline a large, lined curtain which they put in the opening between the conservatory and the living room. The difference in temperature when the curtains are drawn is really noticeable in the winter – the living room alone is 3-5 degrees warmer.

Professionals and projects related to this case study

Double glazing and conservatory:
www.anglianhome.co.uk/

Cavity wall insulation:
www.downsenergy.co.uk/

Solar PV - Sussex Eco Solutions, Enterprise Units 1-5, Harwood Road, Littlehampton BN17 7AT: www.sussexkingsleyecosolutions.co.uk

All other work done by Alan Cory

Recycling in Lancing:
https://recyclinginlancing.org.uk/

Transition Worthing Repair Cafe:
https://worthingrepaircafe.org/

The Good Stitch:
https://www.thegoodstitch.co.uk