

Bath Green Homes

1980s Bungalow: Renewable energy, energy efficient appliances & use of natural & recycled materials



Overview

Age/period:	1988
Type:	Bungalow
Years in residence:	5
No. bedrooms:	3
Wall type:	Stone façade over breeze blocks with cavity
Area:	Larkhall

Key Features

- Solar PV
- Solar hot water
- Sun-pipes
- Smokeless wood burning stove
- Sheep's wool loft insulation
- Dishwasher & washing machine run off solar hot water

Introduction

Built on a south-east facing hillside, Cloud's Hill bungalow has an open southerly aspect. However, when the current homeowner bought the house, it was cold and dark, with internal walls blocking the natural light and too-small windows. A programme of building works followed which included knocking through walls, enlarging windows and double glazing, as well as installing loft and cavity wall insulation.

Driven by a "love of this planet", the homeowner is also concerned about resilience – being independent and able to withstand energy shortages. Cloud's Hill primarily uses wood and solar energy, with gas heating

as back-up. Featuring locally made products and natural materials, the homeowner takes into account the "embodied energy" of appliances and materials, reclaiming and re-using these wherever possible. The house also includes low cost DIY draught proofing measures.

"It's all about saving energy and the impact you have on the world around you."

Features

Renewable energy

1. Solar photovoltaic (PV) panels for electricity (Sunpower)

Installed in 2008, the homeowner now believes that the orientation of the solar panels on the south-east elevation of the house wasn't quite right and that it might have been better to have them on the south-west elevation. Due to the house's position on a south-east facing hillside, morning mist can block daylight making the panels less effective. The ten panels produce 2.1 Kilowatts of electricity at peak power output with an estimate 1800 Kilowatts of annual energy yield.

2. Solar water heating (evacuated tubes – 20 tube Thermomax system on south-west elevation)

The washing machine bought in 1996 has two feeds (hot and cold water) making it possible to use solar water heating. The energy efficient dishwasher can also run off solar hot water if the system is set to a maximum temperature of 60C.

The home owner's electricity provider is Good Energy which provides 100% of its energy from renewable sources. The HotROCS (Renewable Obligation

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Certificate) scheme also pays the home owner for solar water heating.

3. Sun-pipes

Made by Monodraft, these transparent pipes are an ideal solution for spaces where natural light is limited, or for internal rooms. The homeowner installed these in the ceilings of the dark north-facing spare bedroom, former kitchen (now used as a snug) and the internal bathroom. Magnetic “dustbin-lid” covers are used to close the opening to the sun-pipe to keep light out when not required. Installing a sun-pipe in the windowless bathroom has made a big difference, with no lights needed during the day-time.

4. Smokeless wood burning stove

This ‘Flat-Top Vision’ stove was locally made in Herefordshire by Clearview. It is regularly used for kettles and heating. For the home-owner, it provides comfort, beauty and resilience: *“It’s an independent source of heat.”* An eco-fan distributes the warm air around the open-plan living space and the rest of the house as necessary. Eco-logs are used as fuel.

Insulation

The homeowner made use of a local authority grant to install rockwool cavity wall insulation but would have preferred a natural material. As part of initial building works after moving in, loft insulation was also installed. However the roof-space was so well-insulated that all the pipes above it were exposed to the cold. This caused major flooding when one pipe burst. The loft insulation had to be completely re-done, with sheep’s wool in the joists and Celotex in the rafters. At the same time the home owner also had Celotex under-floor insulation installed.

Draught proofing

Thermal material is used to divide off the kitchen in order to retain heat where required, for example, near the wood burning stove, and screen off unheated areas such as the garage and store.

Appliances

When renovating the kitchen, the homeowner re-used the existing sink and taps and reclaimed an old cooker which was about to go to the tip. Where possible cooking is done on a Remoska low electricity mini-cooker. Gas use is very low.

All appliances are as energy efficient as possible:

- Triple A rated CFC-free fridge specially ordered

- from Germany (1996)
- Triple A rated Bosch dish-washer run off solar hot water (2007)
- A rated washing machine with two feeds, runs off solar hot water (1996)

The homeowner is concerned with the embodied energy of appliances and materials (the energy involved in manufacture, transport and disposal) and chose not to buy a new energy efficient boiler: “Faced with a choice between an old boiler that could last forever provided you replace the parts and a new energy efficient boiler with an eight-year life expectancy, I chose to keep the old boiler. It’s not my main source of energy – it’s back-up only and I rarely use it.”

Use of natural and recycled materials

From an environmental and health perspective, the house features natural materials wherever possible, and eco-paints throughout (no VOCs). Kitchen and bathroom flooring is Marmoleum (made from a mixture of wood flour, jute, rosin, and linseed oil). The living room carpet is made from 100 percent British wool for greater sustainability and to help the local economy.

The owner also makes a point of using recycled materials wherever possible, with salvaged furniture, reclaimed lamps and tiles, and even re-used electronic appliances such as a TV/cassette player from the 1970s adapted and connected to a Digibox for digital black-and-white TV. The kitchen work-tops are made from recycled glass and internal doors are either reclaimed or made by local craftsmen using sustainably sourced wood.

Contacts

Solar panel installers (solar PV and solar water heating): Solarsense

Sun-pipe suppliers & installers: Overt Locke, Somerton, Somerset

Solar panels: Sunpower

Solar inverter: Fronius 1G20

Wood burning stove manufacturers & installers: Clearview, Herefordshire

Suppliers of thermal material: Shaws, Westgate Street, Bath

Eco-kitchen fittings (recycled glass work-tops): J W Smith

Flooring suppliers & contractors: Marmoleum (supplied by tile shop in London Road)

Up-cycler of old electronic appliances (e.g. TV/ cassette players): Mike Roberts, Bath 01225 852204



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