

SOUTH SHROPSHIRE CLIMATE ACTION BUILDINGS REFIT CASE STUDY

REMOTE HOUSE IN SHROPSHIRE HILLS

This four-bedroomed house was built around 1990 on the site of a derelict farm half a mile from the road down a rough track. The walls consist of two layers of concrete block with insulation in the cavity. Old stone from the previous farm house has been fixed to the outer layer of the walls. The loft is insulated with fibreglass layers over 12 inches thick. The house is connected to the electricity grid, but there is no gas and it is too remote for oil deliveries. The Environmental Performance Certificate (EPC) is D, but this now needs revising.



Since the present occupants who arrived in 2011 the following improvements have been made:

- **Solar PV panels**: 16 panels were installed in 2011, generating about 3,800 kWh a year.
- **Triple glazing** was put in five years ago. Its effectiveness is shown by the persistence of frost and mist on the outside for much longer than on the previous double-glazed windows.
- **Air source heat pump (ASHP)**. The original heating system was night storage electric radiators and a wood burner. A year after moving in the occupants decided to change to an ASHP system, partly for environmental reasons, but also because it was the most practical option in their situation: the terrain was too rocky for a ground source heat pump (GSHP), and electricity was the only energy source. They were, in effect, replacing the existing electrical system with a better one. Their electricity comes from the renewable supplier Octopus.

Their chosen contractors were Wilson Heating of Wellington, who were very helpful. Since the ground floor is open plan they opted for an underfloor system with two zones.

The occupants dug up the floor, the contractors then laid the underfloor installation of blue plastic tubes in polystyrene trays, and the occupants themselves covered these with cement boarding and engineered floorboards. Upstairs the contractors fitted a new water tank and double radiators with wider pipework.



The cost of the system is partly covered by the Renewable Heat Incentive (RHI).

The experience of the ASHP system has been very positive. The underfloor heating is kept running for 24 hours a day, and the radiators are timed to come on twice a day. This allows the water tank to be heated at night (with a weekly boost from the immersion heater to deal with legionella bacteria). There is an occasional burst of vibration and steam as the external ASHP defrosts itself. The water level has to be topped up occasionally to maintain pressure, but otherwise no servicing is required.

There was an initial problem with the system cutting out repeatedly. This seems to have been because the original Hitachi pump was undersized, and the larger Hitachi pump with which the contractors replaced it removed the difficulty.

Supplementary heating in cold weather is supplied by a new and better wood burner.

Transport: The distance from the road makes transport provision for shopping and heavy materials essential. This is provided by:



- An electric bike
- an old diesel pickup (about 2500 miles per annum)
- a six-year old Volvo diesel (about 2500 miles per annum)