

The Plot, Fovant

New build two-bedroom passive house, nearing completion.



Key features

- Construction to Passivhaus standards
- Mechanical ventilation and heat recovery
- Triple glazing
- Air source heat pump
- Solar PV with thermal store
- Recycled plastic slates

The Story

For Jeremy and Cindy Harris, the unexpected opportunity of early retirement in 2010 was the chance to fulfil their dream of building their own low energy home. The first challenges were finding a building plot, sorting out legal aspects and finalising planning permission and conditions, but by spring 2013, they were ready to start work. As an engineer with some DIY experience, Jeremy drew up the plans, managed the build and carried out some of the practical work. There were numerous setbacks and crises, not least from the enormous delivery trucks blindly following their satnavs. However, the house itself went up in four days with the minimum of fuss, and Jeremy is full of praise for the Irish contractors, especially since the costs have proved no more than for a home to standard building regulations.

The Home

Design and materials: The timber framed house exceeds [Passivhaus](#) performance standards, and has a SAP EPC rating of A107, meaning that it is a net energy exporter. However, it is not Passivhaus certified. It was constructed by [Viking House/ MBC Timberframe](#). There are no dug foundations, and the house sits on a recycled polystyrene base, with a thin (100mm) internal reinforced concrete floor slab. The frame was made off-site, and is FSC certified, with local larch cladding from [Ridley Sawmill](#), at Ansty. The [Ikoslate](#) roof slates are made from recycled plastic and car tyres. Overall build cost, excluding initial site preparation, will be around £160,000 (£1230/m² of internal floor area).



Insulation: The house faces South to make the most of solar gain. Floor insulation and wall insulation (from recycled newspapers) are 300mm, while there is 400mm in the roof. Tested air tightness was $1.22\text{m}^3/\text{h}/\text{m}^2$ compared to $10\text{m}^3/\text{h}/\text{m}^2$ required by Building Regulations.

Heating, ventilation and hot water: As a low energy home, it has minimal heating ($\sim 1.6\text{kW}$ maximum) for when the temperature reaches minus 10°C or less. A Danish [Genvex mechanical ventilation and heat recovery](#) (MVHR) system has been installed, and a small [air source heat pump](#) (ASHP) provides underfloor heating for very cold days. Hot water is provided by pre-heat from the air source heat pump, with the [thermal store](#) heated by the excess energy from the solar PV on the roof.



Windows and doors: Triple glazed from [Munster Joinery](#). They are argon filled, soft E coated, Passivhaus Institut certified, made from sustainable timber with external aluminium cladding. U value $0.7\text{W}/\text{m}^2\cdot\text{K}$.



Lighting, appliances and electricity generation: Lighting is a mix of LED downlights and low energy (CFL) wall mounted uplighters, with occupancy sensors in little used rooms. All appliances are A rated or better. The 6.25kW photovoltaic array is built into the roof, with a controller to divert excess energy to the heat store. It was supplied and fitted by [Save Energy Ltd](#), in Poole. Jeremy already has an electric bicycle and a partially electric car (Toyota Prius hybrid).

Water: Off-grid water supply from a private borehole, with no connection to the mains water supply, plus [Bio-pure](#) package sewage treatment plant. This choice was due to the expense of getting water and sewage to the site. However, running costs will be around $\pounds 180\text{-}200$ per year.

More information

Jeremy provides extensive further information in his [blog](#).