

## Low Carbon House



**Location**

Kilmington, Devon

**Client**

Richard and Louise Quincey

**Project Size**

4 bedroom house

**Status**

Completed June 2005

This house was designed to surpass sustainable building standards for many years to come, providing a repeatable prototype of a low-energy house with net zero carbon emissions. The project represents one of Studio Partington's main preoccupations: the challenge of reducing the environmental impact of new housing without making aesthetic sacrifices.

**Overview**

Situated in Kilmington, a village near Axminster, the house was designed as a realistic and repeatable model for low-energy housing that meets and surpasses both current and proposed carbon emissions targets. Whilst being environmentally innovative, the design remains both economical and buildable, and also functions as an ideal family home for the client, engineer Richard Quincey, with whom Studio Partington collaborated in designing the house.

**Exterior Design**

Externally, the house adopts a functional form and a modest appearance that makes reference to simple barns and agricultural buildings with its large pitched roof, oriented so that one plane faces due south. While deviating from the local

architectural vernacular of thatch and stone, the design complements the house's surroundings through the use of local stone, red cedar cladding, and other natural building material, and includes an airtight panelised timber frame. With sustainability being a key element of the project, the construction materials used were super-insulated and lightweight, requiring little to no maintenance.

**Low Energy Design**

The design team utilised a number of strategies, including both active and passive solar measures, to keep the house running while consuming very little. Double height spaces enable excellent daylight penetration to the heart of the building, limiting the need for artificial light. Where such lighting is required, low energy lighting has been used, and low





energy and low water use appliances were specified in the design. The house's daylighting was meticulously modelled for each space, so a variety of different window types were used – 26 in total. Had a more standardised type been applied, there would have been unsatisfactory lighting levels or unwanted solar gains in various parts of the house.

The building's layout promotes natural cross and stack ventilation, and features windows that are secure when open, thus making ventilation possible at night and when the house

case of the need for extra hot water and heating.

The house includes a double-height winter garden that acts as a thermal buffer during summer and a passive collector of solar energy during winter. Along with the shading that is provided by the window reveals in the house's deep south façade, the winter garden offers solar protection that prevents overheating in summertime. The design also allows for the addition of further renewable technologies, such as a roof-mounted wind turbine and photovoltaic cells, at a time when

“So what is it like to live in? The air tightness and insulation means outside noise rarely intrudes; [the] central space is very well daylit with lots of internal vistas; ... house temperatures are very stable and comfortable. ... The winter garden really does work as a laundry drying space, and we are still able to grow chillies In October.”

– Richard Quincey, Client

is empty. The double-height stair hall, from which all the habitable rooms directly open, provides a large space for the distribution of fresh air through positive input ventilation. Two active solar systems, Ecosun and Sunwarm, were chosen to reduce the house's energy and carbon footprint. These systems help with ventilation and heat recovery, and benefit from the passive heating measures incorporated in the design. An efficient, directionally adjustable log stove is also installed in the main living space, and a small, highly efficient boiler is provided in

those technologies have become more affordable.

Unlike many other exemplar sustainable projects, the house has been regularly monitored to prove its environmental performance. Thanks to the success of this project, Studio Partington have worked with Richard Quincey to develop variations on the environmental systems used in the Low Carbon House, to be applied to low cost sustainable housing in future schemes.

