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Passiv aggressive

This north 'Passivhaus' uses a fraction of the normal energy without compromising on design. Why aren't all houses built like this, wonders its architect Justin Bere

WORDS: Lee Cheshire

There are no windmills on the roof, it's not built into a hillside, and there are no cheerfully coloured vents or flues. Nonetheless, this zinc-clad house squeezed onto the end of a north London terrace points the way forwards for environmentally friendly building in this country.

Architect Justin Bere has been able to dispense with all the outward signifiers of an eco-home because this building, dubbed the Focus House, is designed from the inside out to conserve energy, both in its use and in its construction.

As ever, we are a couple of steps behind the continent. The technology and ideas used in the Focus House are increasingly common in Germany and Austria, where they were developed, being used in everything from social housing to supermarkets. In the UK however, they are still the preserve of passionate self-builders like Edward Gibbs.

The house is sited on a derisory strip of land at the end of a Victorian terrace, barely big enough for car parking. Gibbs was convinced he could get a house on it for his family of five, and one better organised and more efficient than his current conventional terrace. So he bought the property next door, renovated it and sold it off to raise funds. After finding Bere through the RIBA's architect search service, he brought him a model to show how he thought it might work.

The front of the plot is very narrow – under 3m rather than the 5m of a normal London terrace – but it widens up at the back to 8m, “embracing the garden” as Bere puts it. The upper floors are stepped back, an artful pile of metal boxes. The result is a large house but one that has a modest street presence.

The narrow front façade is taken up by an entrance hall and a home office which juts out ▶



Opposite: The front of the house is extremely narrow...

Above: ...but it stretches out at the back, embracing the garden



over the top. The original plan was to use concrete to achieve this cantilever, but the cost proved too high. Bere was stumped until he discovered solid timber panels. Basically giant plywood boards, 15cm thick, they are prefabricated in Austria and are strong enough carry the weight of the first floor as well as the concrete.

But they proved even better. As well as being cheaper and quicker to build with, the wood's carbon-storing properties underpinned the Focus House's eco-credentials.

Instead of releasing over 30 tonnes of CO₂ in the atmosphere, caused by the concrete's construction, the wood locks up over 40 tonnes of CO₂, which stays there as long as the house exists. Bere points out that CO₂ was released in transporting the materials to site, but hopes that in the future it could be grown and produced in the UK.

As well as being low-carbon in its production, the house is designed to use as little energy as possible, influenced by a building code developed in Germany called Passivhaus. Through a combination of extra-thick insulation, triple-glazing, airtight construction, and in-built ventilation systems, energy consumption is reduced by as much as 90% compared to a house built to normal building standards. Quite simply, the buildings retain heat so well that a normal central heating system is not required. Hot water requirements are met primarily through a solar installation on the roof.

Although not quite meeting the rigorous Passivhaus standards – among other things, planners prohibited the south-facing windows vital for making the most of solar gain – the Focus House is a vast improvement on normal standards. There are very few drawbacks, and Bere has found clever workarounds for most. For instance, the extra thick walls required reduces the amount ▶



Top: The rear of the house is taken up by an open-plan living space

Bottom: A small home office is suspended over the entrance, allowing the occupants views into the street



of usable floor space. So instead of cladding the building with brick, which would take up even more room, Bere opted for thinner zinc.

Passivhauses are healthy too. A ventilation system (stored within a small cupboard) constantly draws fresh air into the house, kept warm by a heat exchanger. Pollutants are filtered out, and the dryness of the air reduces the amount of dust mites – a boon for asthma sufferers.

The inside of the Focus House uses a simple palette of natural materials. The aim is calmness and liveability, says Bere. “It’s amazing how often people want to make a splash, do something that’s different. Use funny materials and splashes of colour. You quickly get sick of that, it becomes an imposition on your life. By contrast we have used healthy materials which you will grow to love.”

The result is not as austere as it might sound – the modern open-plan living areas, fine-quality finishes and striking metallic exterior make a house that is comfortable and not just worthy. “What I want to show is that you don’t have to compromise design for the environment.”

Bere work on a wide range of projects – including the recent replanning of the space around the Monument – but are still excited by the possibilities of residential architecture. The practise is developing the lessons learnt on the Focus House, and hopes the Passivhaus standards can be taken up by the rest of the industry.

“In the UK people say they can’t achieve high building standards, but it’s down to design techniques,” he says. “People are misguidedly wasting money replacing boilers in their homes. In Germany, they are turning them into buildings which don’t need boilers. We are going to have to do the same eventually. Why don’t we do it now? Why wait?” †



Top: The kitchen extends out seamlessly into the garden

Bottom: The interiors make much use of simple, natural materials