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## Get your own zero-carbon home

First affordable house to meet the highest level of the government's sustainable building code



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The RuralZED housing system on display at Earls Court. Photo: Stuart Saunders/Digital Nation Ltd

Delegates attending a conference and exhibition on green building this week had the chance to see what manufacturers are calling the UK's first commercially viable, affordable and ready to purchase zero-carbon home.

A half-hour queue snaked around the outside of the life-sized exhibition house. It was one of the main attractions at the EcoBuild exhibition, which took place in Earl's Court, London over three days this week.

The house, built by a ZEDfactory, consortium of architects and specialist green manufacturers, has been awarded Code 6 status – the highest level in the government's code for sustainable buildings which all new housing will have to meet from 2016.

Built with energy-saving fabric and renewable energy systems, manufacturers say the "RuralZED" house can go for a whole year without drawing on National Grid power. It is capable of coping with almost any weather without needing more energy than it generates by itself. It uses environmentally sound materials, gains heat from renewable sources, and offers green solutions for water use and waste generation.

The house uses a flat-pack timber-frame kit based on the concept of the timber-framed houses that were built in Britain about 1,000 years ago. The timber frame is then laminated and built in a box shape formed by posts and beams on a low-carbon concrete foundation. Heavyweight eco concrete panels manufactured using a high level of recycled aggregate content rest on the solid timber beams. These are an energy-efficient alternative to domestic plasterboard and give the house its "thermal mass" that absorbs and releases heat slowly.

This "super insulation" is three times as effective as that of a normal house and will keep residents cool in summer and warm in winter.

By using a frame and traditional material for insulation – instead of the plastic foam currently used in modern construction – manufacturers say that the home is more durable and avoids problems – such as poor air quality and the release of gases through decomposition of material – that are associated with plastic foam building.

The super insulation and energy-efficient appliances reduce the energy requirements to such an extent that all the building's needs can be met through renewable technologies. Microgeneration technology is easy to install in the form of solar panels on the roof and wind turbines.

Water heating will come from solar roof panels, and in the winter, from a biomass boiler fuelled by wood chips.

Start-of-the-art modern materials that have been used in the house include worktops and tables made from 85% recycled glass bottles collected from the capital's pubs and clubs.

Water is conserved with a grey-water recycling system, low-flow showers and thermostatic bath and shower mixers.

Light, fresh air, natural materials and finishes are at the heart of the house - there is even room to grow your own vegetables and options for vegetable oil powered cars.

The flexible design and construction of the kit means that detached houses, semi-detached houses, or terraces of up to six homes can be built, with different internal layouts and external appearances. The frame can be adapted to two or three storeys.

Six properties are already under construction at Upton, Northampton, and 24 are in the planning stage, ZEDfactory says. The homes are ideal for self-builders or housing providers who want to stop climate change and to build a sustainable, healthy future, they say.

It costs from £1,150 per square metre based on the purchase of six units, and take three weeks to erect (ZEDfactory can erect it for you). So a three-bedroom home would cost about £150,000.

The architectural brains behind the project is Bill Dunster, the same architect who was responsible for BedZED, the low-carbon complex of 80 eco-friendly apartments in south London.

"The main goal with carbon neutral housing is to reduce carbon emissions and the risk of climate change. Until now, proposals and prototypes of other house designs have lacked the commercial and financial viability to make them serious alternatives to traditional housing and building techniques," Dunster said.

"The RuralZED house has overcome financial constraints due to the strength of the RuralZED consortium, which has created a house that is, in addition to being the most ecologically sound housing option to date, affordable to build and desirable to live in, making it the most serious contender in the race to beat the effects of residential carbon emissions."

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