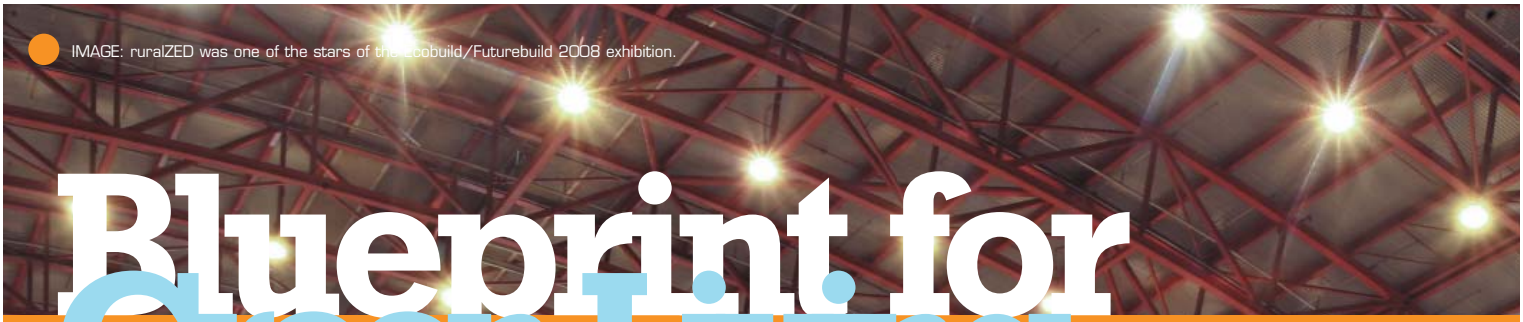


IMAGE: ruralZED was one of the stars of the Ecobuild/Futurebuild 2008 exhibition.

Blueprint for Green Living

Director of ZEDfactory, **BILL DUNSTER** and his architectural firm, are part of a team behind another visionary housing scheme – one that will hopefully see a new generation of affordable and near-zero carbon homes in development soon. What can ruralZED achieve?

If you attended the Ecobuild/Futurebuild exhibition at Earls' Court in February, you will not have failed to notice the constant stream of visitors waiting to take a tour of the ruralZED house. Is it a blueprint for green living? ruralZED's project architect Matt Hoad thinks so, calling it: "The UK's first affordable, practical and ready-to-purchase zero-carbon home." A bold claim: the ruralZED™ housing system brings together the speed and quality of lightweight offsite construction at an 'affordable price.' The cost of the affordable price is open to much debate in the present climate of house price uncertainty, but ZEDfactory feels the homes are: "Ideal for self-builders or housing providers who want to stop climate change and build a sustainable, healthy future."

The simple modular timber frame kit can be configured in both two and three-storey versions and can be used to provide a combination of either detached, semi-detached or terraced housing or even housing with courtyards. They also include a flexible choice of cladding materials and roof finish. Certainly, the flexible design allows for variations on internal space and external appearance. The designer approach integrates as many building elements as possible, resulting in fewer components and finishes. In keeping with an offsite construction ethos, the best way to reduce risk was to design a complete prefabricated kit of parts with known costs and predefined volume discounts. Bill Dunster has a clear vision of what was required: "We wanted to create a flat-pack prefabricated frame kit that would meet the government's definition of a modern method of construction while also integrating enough exposed radiant thermal mass to achieve comfortable temperatures during summer without resorting to carbon-intensive air conditioning."

Lex Cumber, of ruralZED consortium member mi-space, adds: "The great thing about the ruralZED house is that it has four years of research and development by one of the most talented design teams in the UK, sunk into the very fabric of the building. It's affordable, and has an integrated supply chain determined to drive costs out to make it even more competitive until finally there is no excuse for building new houses that don't hit these environmental standards."

ruralZED has been designed to provide zero carbon, low- to medium-density housing solutions for the 70 per cent of the UK that is built at 50 homes/ha or under. It is trying to mix the quest for zero carbon with the Government's hifalutin placemaking agenda.

"The main goal with carbon neutral housing is to reduce carbon emissions and the risk of climate change," continues Dunster. "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

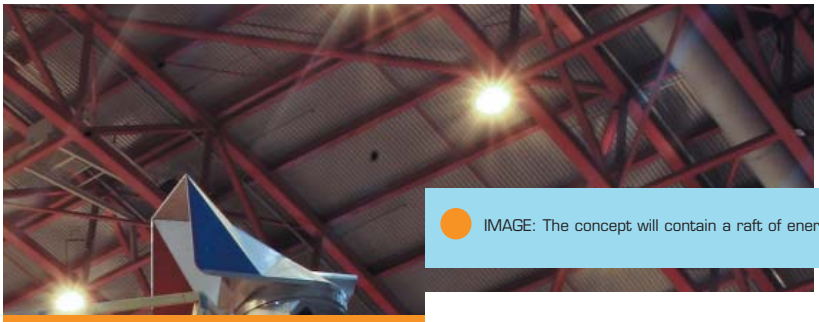
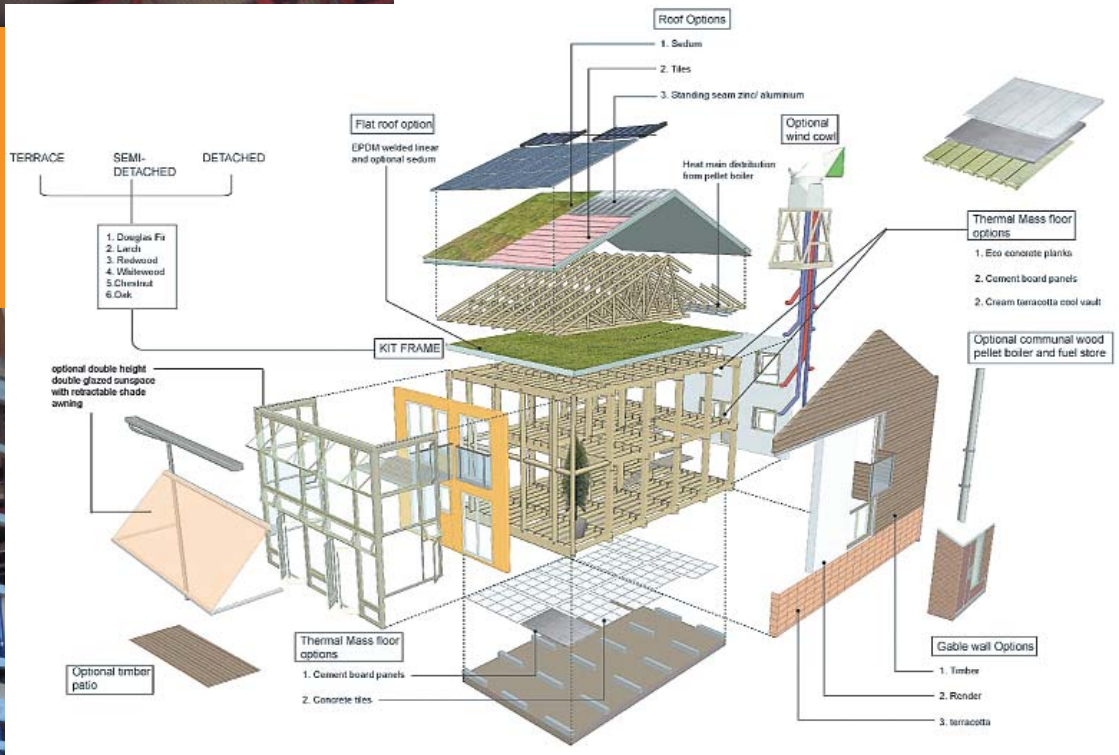


IMAGE: The concept will contain a raft of energy efficient features built around a timber frame.



The construction strength of ruralZED relies on the heavy timber frame. The post and beam frame is set on a 'strip' concrete foundation. Heavyweight eco-concrete planks rest on the solid timber beams keeping temperatures constant.

building techniques. 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."

THE BIG BARN

The construction strength of ruralZED relies on the heavy timber frame. The post and beam frame is set on a 'strip' concrete foundation. Heavyweight eco-concrete planks rest on the solid timber beams keeping temperatures constant. The high levels of thermal mass will help keep residents cooler in summer and warmer in winter. By employing prefabrication and volume sales discounts, costs will be from £1,150 per sq m based on the purchase of six units, and will take three weeks to erect. So a three-bedroom home could cost about £150,000.

Although formally launched at Ecobuild, the kit has actually been around for a little while. Early collaboration between Mark Lovell Design Engineers and the Cornwall Sustainable Building Trust produced an assembly manual and training course that enables any competent builder to build a zero-carbon home. The first ruralZed frame kit using was erected with the co-operation of English Partnerships on a brownfield site in Camborne in 2007.

CSH UPGRADE

To learn a little more about the scheme we spoke to Donaldson Timber Engineering – one of ruralZED's essential partners. Jim Provan, DTE's Sales and Marketing Director takes up the story. "With the government announcement that all new homes will be zero carbon Code 6 by 2016, (except for Wales where it's even earlier - 2012), and with Code 3 becoming mandatory for the public sector in May 2008, developers in the private and public sectors have already started to look seriously at developments which achieve the escalating codes. Eco-architects ZEDfactory are leaders in the field of zero-carbon design and development, with a unique track record in delivering Zero Energy Developments (ZED) buildings in the UK. Their latest housetype, ruralZED, takes this a stage further. Certainly, ruralZED has managed to achieve the much sought-after zero carbon standard, and has been designed to meet Code 6 (subject to site specific requirements and a BRE assessment) – the highest level in the government's Code for Sustainable Homes. Built with energy-saving fabric and renewable energy systems, the claim is that the ruralZED house generates its own power per annum using micro renewable technologies onsite.

"A major factor in the house's affordability and practicality is the ability to upgrade from Code 3 all the way to Code 6. The core building fabric is

"We wanted to create a flat-pack prefabricated frame kit that would meet the government's definition of a modern method of construction."- Bill Dunster

IMAGE: The roof utilises pre-fabricated timber roof trusses, manufactured from high quality, stress graded PEFC-certified timber.

supplied by a dedicated supply chain and consortium with ecologically sound and prefabricated components delivered at a fixed cost. ruralZED utilises a hybrid laminated timber frame, strong enough to support thermally massive walls, floor finishes and ceilings, with flexible masterplan options allowing all orientations with flexible architectural design.

"The glulam can be erected in a couple of days, as shown at Ecobuild, and is used to support white eco concrete internal panels that are installed easily with no need for wet trades. The roof utilises pre-fabricated timber roof trusses, manufactured from high-quality, stress-graded PEFC-certified timber. Trusses deliver a flexible, practical, simple-to–erect engineered solution to roofing requirements and as they can use up to 40 per cent less timber than a traditionally formed roof, they also deliver on competitive pricing and the environmental agenda.

"Given just a two-week timeframe, our Oxford factory designed, manufactured and delivered roof trusses, on the day requested, to a site in East Sussex. Here the whole house was pre-constructed and the building was then transported, in sections, to Ecobuild, where the various component parts were successfully craned into position."

ZEDfactory's Matt Hoad confirms the importance of utilising MMC in the project: "Due to the use of a range of prefabricated components, ruralZED can be built by a local semi-skilled labourer, removing the need for highly skilled, expensive dry and wet trades, with all the benefits that implies for affordability." ZEDfactory's cost projections for ruralZED make interesting reading, particularly the comparisons with standard housing and other zero carbon housing. The approximate cost for a three-bedroom version of ruralZED, including erection by ZEDfactory, is given as about £150,000; the build price of a standard three-bedroom home built to current building regulations is given as about £100,000 and the build price of the only other Code 6, zero-carbon home so far designed in Britain - Kingspan Off-Site's Lighthouse - is given as about £180,000, excluding erection.

This cost differential makes the ruralZED house a practical proposition, and a serious contender, particularly in the affordable housing sector. With the new standards looming for carbon free homes, ruralZED provides more than a great demonstration project: for ZEDfactory, and for supplier partners such as DTE, it proves that the zero carbon house is a serious, deliverable proposition, available now and one which can be designed and constructed using mainstream technology.

On a tour of the house it is plain to see that the amount of time spent bringing together the expertise and sustainable knowledge has paid huge dividends. And if ruralZED is to be rolled out in the numbers that are required across the UK, then the environment and homeseekers are in for a real treat. At the moment, six properties are already underway at Upton, Northampton, with 24 others in the planning stage. So, it is now up to an innovative new breed of developers to take a leap of faith, a deep breath and invest some time, money and clout to match ruralZED's commitment.

ruralZED - essential information

- **ruralZED** - ZED stands for Zero (Fossil) Energy Development. 'Rural' is a way of reminding everyone that the majority of the UK's housing functions at a lower density than the urban developments that sometimes command a lot of attention.
- **Price cost** - ruralZED prices start at approximately £89,000 for a basic self-build Code 3 ruralZED unit.
- **Kit cost** – all the specialist parts you need to build the home including simple services and mechanical, electrical and structural packages.
- **Erection cost** – all the contractual labour and site specific services required to complete a home.
- **Design cost** – for site-specific planning and scheme design including architectural, visualisation and building regulations and wider communal services design including the carbon footprint and SAP calculations - available from the ZEDfactory and its in house consultants.
- **A lifetime flexible home** – with disabled access and lift locations built into the plans
- **Stamp duty** – stamp duty is paid by the purchaser on any property over £125k and any property over £150k in 'disadvantaged' areas. Stamp duty exemption can be claimed if the housebuilder can show a heat loss parameter equivalent to 0.8W/m^{2}K using the SAP system and generate sufficient power from renewable sources connected to the house/community to balance the power used by the home and its appliances. ruralZED has built this into its design and manufacture.

ruralZED™ is a consortium of companies specialising in eco-building. The consortium comprises Charcon, Hansgrohe, mi-space, Rationel, Rockwool, ZEDfabric and ZEDfactory.

For more information contact: www.ruralzed.com and www.donaldson-timber.co.uk

Zero chance of zero carbon homes - say housebuilders

Many of the UK's major housebuilders have admitted they do not believe they will meet the government's goal for zero carbon new homes by 2016. Senior managers in seven of the UK's largest housebuilding firms made the admission in a poll conducted by sustainable buildings consultancy firm Inbuilt.

Most respondents to the housebuilder poll felt the Treasury's definition of zero carbon, for stamp duty relief purposes, played no part in helping them to deliver zero carbon homes. Housebuilders said they faced increased build costs and very little chance of passing on this cost to the buyer. Housebuilders said government must simplify its definition of zero carbon and allow builders to access at least some offsite-generated renewable electricity from certified, additional sources if they are to stand a chance of meeting its aims for 2016.

Dr David Strong, Chief Executive of Inbuilt, said: "At first almost all of them said they thought the 2016 target was achievable, albeit with significant caveats. As our discussions continued, their discomfort became palpable, expressed in warnings about the unrecoverable costs, the lack of reliable technologies, supply chain, skills or expertise, and the trouble accessing renewable energy sources".

Most housebuilders who responded felt biomass boilers, ground-source heat pumps and solar technologies were the renewable energy technologies most likely to help them reach the zero carbon target. David Strong said: "There is clearly a risk some housebuilders are seizing the first technical solution they can afford, rather than taking the long-term view or considering the broader sustainability implications of their decisions. This could lead them into technical cul-de-sacs that cost a fortune to back out of later on.

"We should also heed the warnings of insurers like NHBC and its equivalents in Canada and New Zealand, all of whom at some point have had to deal with costly construction crises as a result of untested, poorly managed government initiatives to speed up the delivery of new homes." All respondents held the view that newbuild housing had a significant role to play in helping to combat climate change, but a lot more needed to be done to tackle the performance of existing homes.

The poll was conducted between January and February 2008.