From A to ZED

With its origins in an apple orchard, Bill Dunster's zero carbon journey so far has been long and fruitful, taking in architecture, product design, urbanism and sustainability along the way. **ROGER HUNT** discovers more about ZED Factory's latest projects and what the future holds

Bill Dunster arrives for our interview in a LEAF electric car. Soon he has me riding one of his battery powered ZEDbikes. ZED stands for Zero (fossil) Energy Development and we are meeting at his ZED Factory office within BedZED in south London, the UK's largest mixed-use, near-carbon-neutral development, which he designed for the Peabody Trust in 1998. In short, Dunster is committed to all things zero carbon and housing in particular: his services to sustainable housing design were recognised with an OBE in the 2010 Birthday Honours.

A doctor's son from the south London suburb of Molesey, Dunster describes his early life as totally unremarkable although, as he explains, one event was to shape his future. "We used to play in a beautiful field with an apple orchard and large horse chestnut trees, which were cut down by a property developer and turned into executive homes – little noddy boxes. It so infuriated me that I thought there's got to be a better way of designing and working out a way of living that doesn't involve this environmental destruction."

Dunster was 12 or 13, "just old enough to get angry". Later, his A-levels included design. "I spent a lot of time in the workshop learning to make things". He went on to graduate as an architect from Edinburgh ▶

Bill Dunster at BedZED with a ZEDbike

Roger Hunt

BedZED

ABOVE Jingdezhen Ceramic Centre, a large mixed use scheme in China

BELOW The ZED Pavilion at Shanghai EXPO 2010, an exemplar building showing how zero carbon architecture can be achieved in the Chinese climate

University where he met Sue, his future wife, who was studying fine art and architecture. She is now a director and the office manager at Zed Factory.

For 14 years Dunster worked at Michael Hopkins and Partners on projects specialising in low energy and sustainable development, such as the Jubilee Campus at Nottingham University and Portcullis House in London. His first experimental ZED project was Hope House, in Molesey, which he built in 1995 as his family home. Sue acted as clerk of works and they still live in this prototype low-energy live/work unit, which continues to act as a testing station for renewable technologies.

ZED Factory began as Bill Dunster Architects in 1998. From day one, the company was committed to low-carbon building and development. BedZED, which stands for Beddington Zero Energy Development, helped put Dunster on the map and set new standards in sustainable building.

The scheme won the 2003 RIBA Sustainability Award and was shortlisted for the prestigious Stirling Prize. Despite this, and its enduring success, BedZED's pioneering nature and use of untried technology inevitably meant that some aspects, notably the combined heat and power plant, were less successful than others. Over the years certain sections of the press have reported negatively and Dunster admits that the scheme still upsets conventional urbanists. "On the whole it's incredibly successful and it's a happy community and the property resale values are high. The architecture, the urban design principles, the roof terraces, the sunlight and the public realm; all these things which give a high quality of life are working very well."

Dunster describes what he and his team at ZED Factory do as being an amalgam of architecture, product design, urbanism and acting as an environmental pressure group. As a factory, the practice works with its supply chain and people who make things while inputting research and development that includes the very latest environmental thinking and an increasingly complex understanding of building physics.

"We're hoping in a small way to show how the industry can solve problems in a different and worthwhile way. The Zero Bills Home we've just built in the BRE Innovation Park at Watford has no net annual energy bills despite the lack of feed-in tariff. If that technology was rolled out to the rest of the UK, whether new build or retrofit, it would mean no requirement whatsoever for the nuclear programme, or for Russian gas, or the need to fight for fossil fuels outside our national boundaries."

The Zero Bills Home represents 10 years of innovation and supply chain development and is the first show home for a 96-home Zero Bills development in Newport, Essex, with another scheme for 89 homes onsite shortly for Ecogrove Homes in Barking and Dagenham. The

homes are built using a hybrid modular, laser-cut, galvanised-steel, powder-coated structural ring beam with timber studs and OSB structural boards. This enables one floor to be built every two days with all the timber coming from the UK. The concept is, according to Dunster, at a point where a kit of parts for a Zero Bills Home could be available from "pretty well any builders' merchant".

On the roof is a ZED Factory-designed building-integrated PV solar roofing system which provides a durable roof with electric generation and optional solar loft conservatory. Along with this comes a battery storage system that minimises grid imports and limits grid exports to 3kW, thus avoiding the need to upgrade the existing mains grid infrastructure.

"The entire building envelope is generating enough electricity to run the house, power your car to get to work in the morning and meet your peak electric demand, so we're only grid connected for about 20% of the year," says Dunster.

He emphasises that, through good design, the Zero Bills Home achieved an airtightness of 1.3 air changes per hour at 50 pascals on the first test. This was done without the walls being plastered, at no extra cost and with no special skill set.

"We worked with a small builder who'd never done anything like this before," he explains. "Give us another year of monitoring results at the house, and we'll show that the performance gap is not there, and that delivering super-insulated, draught-proofed, energy-efficient homes that generate more energy than they use is within reach of the smallest builders."

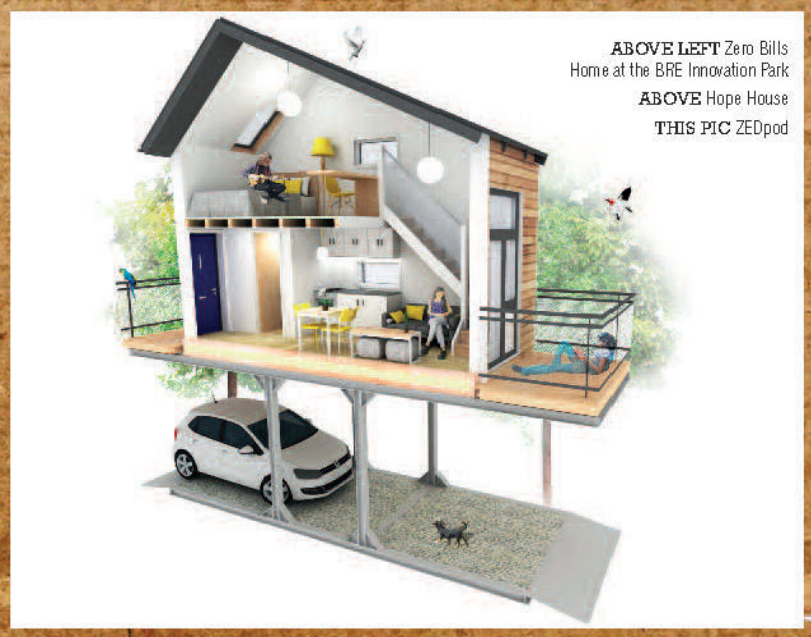
Dunster argues that homes like Zero Bills are not only possible but affordable and questions the motivation for dismantling the Code for Sustainable Homes. "It's criminal and it's not acting in the national interest; it's the industry and the housebuilders not behaving responsibly. The elephant in the room is that the Code was not dismantled because it couldn't be met, it was dismantled because the land bank owners perceived there would be an increase in construction costs and didn't want that taken off their land value. That's farcical, with the Code there would have been a level playing field with huge economies of scale and exemplars, like the Zero Bills Home, would have become the industry norm."

A method of development that Dunster welcomes is custom build and it is one that ZED

"With current technology everything we've been talking about for years is utterly deliverable"

Factory will offer on future schemes. "What's interesting is that, if you're a landowner and you just work directly with people like us, our Zero Bills Home development appraisals show that you can have an exemplar development built to a much higher environmental performance standard and still make a higher return on your asset than if you sold to a volume housebuilder."

ZED Factory's team of around 18 are working on projects in Europe as well as in Brazil, Africa and China where the biggest scheme is the ▶



ABOVE LEFT Zero Bills Home at the BRE Innovation Park
ABOVE Hope House
THIS PIC ZEDpod

ECO house feature

Jingdezhen Ceramic Centre, which will be "one of the best global examples of low carbon urbanism applied to an interesting and diverse public realm". Here a large solar farm forms the translucent ventilated glazed roof that shelters the main circulation routes, creating pedestrian-friendly streets in all weathers.

Recently, ZED Factory launched the ZEDPod for which the first planning applications will be in shortly. These affordable starter homes are formed of energy-efficient pods that cluster to create a pop-up village. No land is required, just air rights over existing car parks and the homes have the potential for no net annual energy bills.

When it comes to considering the lives of future generations in terms of the environment, Dunster says that he is optimistic and goes as far as guaranteeing that, in practical terms, the problems are solvable. "With current levels of technology everything that we've been talking about for years is utterly deliverable. The question I can't answer is whether we've got enough political and financial support from people who really matter to pull it off. It won't be very easy and what will happen is totally unnecessary brinkmanship."

Dunster foresees a string of environmental disasters and associated degradation, which will cause untold suffering but will ultimately push people to respond. "We won't be having this conversation in 30 years because we won't need to. It will be blindingly obvious that we all have to live together in an equitable fashion to achieve social stability in the context of dwindling reserves of natural capital and accelerating climate change. I regard all the people who put off finding alternatives to our fossil and nuclear powered lifestyle as being virtually criminal because they're literally trading other peoples' futures for their own short-term gain, including my kids' and everybody else's." sh

CONTACTS

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Read Roger Hunt's blog www.huntwriter.com and follow him on Twitter @huntwriter

BELOW BowZED: a block of 4 flats in east London that generates as much energy from renewable sources in a year as it consumes
BELOW RIGHT BedZED
BOTTOM ZEDpod


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