



BedZED is held up as a model for green homes. But it's still plugged into the National Grid. **Bill Rashleigh** asks if the government's zero carbon ambitions will get off the drawing board

The phrase 'zero carbon homes' has been reverberating around parliament lately to furious nodding of heads from both sides of the House.

Perhaps it's not surprising amid allegations of sleaze and cover-ups that politicians are groping for the moral high ground. Certainly, candidates for Number 10 from Labour and the Conservatives are clambering over each other to appear the most eco-friendly. David Cameron is sticking a wind turbine on his house and has resurrected John Gummer to chair his environment policy group. And Gordon Brown then upped the ante by announcing that all newly built zero carbon homes would be exempted from stamp duty, from April, for at least three years.

The government's ambition is that by 2016 all new homes would be zero carbon – meaning they generate energy by solar panels and the like, returning to the national grid the same amount of electricity they use.

But like the Yeti, there's no evidence that such a thing actually exists. The Energy Saving Trust welcomed Brown's pledge, but pointed out that there is no independent monitoring scheme to demonstrate the presence of a single zero carbon home in Britain. It says that 2030 would be a far more realistic target for making all new homes zero carbon.

The government's response is to cite the Beddington Zero Energy Development (BedZED) project in Hackbridge, Surrey. Finished in 2002, it was hailed as the UK's first high-density, zero carbon housing development – the blueprint for sustainable housing. Which it was, until its wood-burning combined heat and power (CHP) generator, which was to provide all the hot water and electricity for the homes, blew a gasket in 2005 and residents had to be plugged into the national grid.

Discussions are under way to replace the faulty CHP system and get the development back to zero carbon status later this year. So ROOF went to BedZED to chat to the residents of Britain's most celebrated soon-to-be-zero carbon development to get a taste of what life will be like when (and if) all new homes are built to the BedZED standard.

The 82-home settlement has had a bumpy ride in the press – lauded one minute, derided the next. In looks, it's been compared to a battery farm of Kellogg's cockerels, while Hackbridge locals call it 'Tellytubby land' – apparently with affection.

Designed and developed by Bill Dunster's ZEDfactory and the BioRegional Development Group, on land owned by the Peabody Trust, its green credentials are impeccable: the homes are squeezed onto a 3.5 acre patch of old sewage works and built out of renewable or recycled materials sourced within a radius of 35 miles. All homes face south and have conservatory-style glass 'sun spaces' plastered with photo-voltaic cells to generate electricity; there are reed beds to recycle water; multi-coloured wind cowls with heat exchangers; and roofs planted with sedum, a carpet of low-growing succulents that reduce heat loss and absorb pollutants.

ROOF's first port of call was Paul Miller's one-bedroom flat, deep in the heart of BedZED. Paul moved here from a Victorian terrace house in 2004 after his mum spotted an advert in the back of the *Ecologist* magazine. 'It was the fact that it was a bit pioneering, that it was trying out new things that sold it to me,' he says. 'But there's nothing weird about living here and

you don't have to do anything differently in terms of how you live your life. I don't have to get up every morning and charge the washing machine and fridge with a giant hamster wheel.'

There may be no human dynamos, but there are unusual aspects to living in BedZED. For starters, it is completely silent. No noise from the outside world – including the nearby main road – penetrates the flat. All the windows are triple glazed, the ceilings are solid concrete slabs, the walls are 60cm thick and pumped full of recycled newspaper pulp for insulation. 'It's very quiet if you want it to be,' says Paul. 'I've never heard any noise from the neighbours above me.'

The down-side of living in such splendid insulation is that it gets hot. None of the properties in BedZED has central heating. Instead they use a natural ventilation system designed to keep the homes cool in summer and warm in winter.

Stale air from inside the homes flows out of internal ducts, pulling in fresh air from the multi-coloured wind cowls on the roof. This is heated on the way down by the expelled air.

'In this flat, if you close everything in the summer and go out, it's a perfect temperature when you come back because the natural ventilation does its job,' says Paul.

It may work in Paul's flat, but it doesn't work throughout the development. Samantha, who has been living at BedZED for four years, is less impressed. 'It would be nice to have a bit of oxygen so you feel you can breathe in the summer. The thermometer is right at the top of the scale all summer and I have to hang sheets over the windows to stop the place from getting like an oven. It's especially bad for the kids because they get so hot. When my baby was born she screamed all summer because of the heat.' The thermal mass of the homes does mean that utility bills are 'ridiculously cheap', as Paul says, but for Samantha these savings are outweighed by the physical discomfort.

The most disappointing aspect for most residents seems to be that the desired zero carbon living has failed to materialise. Lisa, one of the original BedZED residents, says: 'Having to pay to get your electricity off the national grid defeats the object because the whole idea was that this would be environmentally aware housing, and that's what attracted me.'

Sue Riddlestone, a director of BioRegional and a BedZED resident herself, says discussions are under way to rectify the problem: 'We were zero carbon for a few years and we're looking at either fixing up the existing CHP system or replacing it altogether.'

To be fair, the problems came about because the company that supplied BedZED's CHP generator went bust. 'It



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Paul Miller, BedZED resident

does annoy me that people have been saying it proves that this sort of technology doesn't work,' says Paul. 'None of the things that have gone wrong here have been down to the technology. Companies do go bust, it happens.'

The real hitches have been behind the scenes, says Paul, and they have been of a political rather than a technological nature. 'The impression you get from living here is that when things have gone wrong it's mainly been down to the politics of the organisations involved. There are some real ingrained issues when you mix up developers, local government officials and greenie do-gooders. You're

always going to get clashes of values and what's amazing to me is that this place got built in the first place.'

It nearly didn't. A major house builder put in a higher bid for the site than Peabody, and, as local authorities have an obligation to accept the highest price, BedZED had to go before the environment secretary for approval. It only got the green light because Sutton council was permitted to take into account the environmental and social benefits.

The other sticky issue has been cost. BedZED was a reported £10.6 million over budget because of unforeseen construction costs, and each home is estimated to have cost 30 per cent more to build than a traditional house.

Sue Riddlestone attributes this overspend to 'overheating in the construction industry'. She says: 'It was hard to get the contractors and the fees just kept going up. Also the way it was managed wasn't ideal in that it wasn't treated as a start-to-finish project.' She says that BioRegional has learnt from BedZED and wants to apply the knowledge on a bigger scale. Plans have been drawn up for a 2,000-home zero carbon development called Z-squared, and the search is currently on for a suitable site in London.

The development will have the same green ideals as BedZED, but it won't look as striking, says Riddlestone, who has reservations about the cost effectiveness of some of the design elements, such as the super-thick walls. Research carried out by BioRegional suggested that while residents at BedZED emitted 40 per cent less carbon than the average UK household, only 3 per cent of that was as a result of its design.

But for residents, the look and feel of BedZED is part of the attraction. 'Everyone here that I know loves the architecture. There's something about it that gives you a kick and that's a big reason for staying here. It's lovely being able to sit around and chat to people in these surroundings,' says Paul.

Even so, it's clear that achieving zero carbon living requires more than snazzy architecture. 'It's the attitude of the residents,' says Zoltan Zavody from the Energy Saving Trust. 'If you build something that's zero carbon in theory, then the families who move in stick in plasma TVs, DVD players and air conditioning, then very rapidly it becomes a non-zero carbon house.'

Zavody says that when BedZED's new CHP generator is up and running it will have good grounds for reclaiming its zero carbon crown. But the problem remains that no one knows how to tell when a home is zero carbon. Until some sort of carbon monitoring system is put in place, goals such as the 2016 target will remain nothing but hot air.