

Residential buildings: Insulation will not be enough to hit targets

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By Mike Scott

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The UK government has set a target for every new home to be “zero-carbon” by 2016. Given that it intends the industry to be building 240,000 new homes a year by that date, it is an ambitious target – in fact, it is the most far-reaching initiative to cut emissions from the housing sector anywhere in the world.

Homes account for 27 per cent of UK carbon emissions, according to the Department of Communities and Local Government. Making new residences more environmentally friendly is much easier than tackling the problem in existing buildings, although measures are being taken here as well.



The Code for Sustainable Homes, introduced in 2006, gave the industry a tight deadline of 10 years to achieve the zero-carbon goal. “Homes account for over a quarter of our carbon emissions – that is why it is so important that new homes meet much higher standards in future,” said then housing minister Yvette Cooper. “We need a revolution in the way we build new homes – both to cut carbon emissions and to respond to our changing climate.” The code rates houses one to six, with six being the most sustainable. A variety of issues are considered, including waste, water, health and well-being, materials, surface water run-off, and ecology.

From this month, all new homes should be rated to show how they perform against the code, with the 2006 Building Regulations being the starting point. By 2010, all new homes must emit 25 per cent less CO2 and by 2013 the figure is 44 per cent less, which corresponds to Code Level 3. By 2016, new homes that are not zero-carbon, or Level 6, will not get planning permission.

Currently, the most environmentally advanced homes in Europe are “passive houses”, which do away with the need for a conventional heating system by being exceptionally airtight, using a lot of insulation, and a heat recovery system that transfers heat from air being expelled from the building to cooler, incoming air. These are about equivalent to Code Level 4 – the furthest possible to advance by improving the fabric of the building.

To reach Level 5, homes should include water-saving features such as rainwater harvesting and greywater recycling; while heating, lighting and hot water should be powered by zero-carbon sources such as solar panels. The last step to zero-carbon rating Level 6 requires all energy to come from zero-carbon sources, preferably on-site.

This will be the most challenging aspect of the code. In a poll conducted by Inbuilt, a sustainable building consultancy, many of the UK’s biggest house builders said they would not be able to meet the targets without using at least some offsite-generated renewable electricity.

Work done by **Barratt** at its “eco-village” site in Chorley, Lancashire, tested the available technologies on standard houses to see which ones worked best. Solar panels and heat pumps worked “very well” but had unrealistic payback times. Micro-wind turbines did not perform well but micro-combined heat and power (CHP) units and solar systems to heat water were “reasonably satisfactory”.

The company’s Hanham Hall development in Bristol will incorporate a biomass CHP plant and it has teamed up with the utility Eon to explore the best ways to meet the government’s

requirements. Power supply will be one of the big challenges in meeting the government's targets – if there is not sufficient renewable power available, it will be impossible for homes to be zero-carbon and it is not clear whether off-site renewables will be allowed to contribute to the targets.

In addition, to achieve the full benefit of the homes, consumers have to be better informed in order to “use” the buildings properly, as well as change their behaviour across a range of activities.

Meeting the zero-carbon target is estimated to add about £35,000 (\$69,000) to the cost of a home. A report from the National Home Builders Council Foundation titled “Zero carbon: what does it mean for homeowners and house builders?”, says consumers are not prepared to pay extra for more sustainable homes. They are also reluctant to do without features such as power showers and gas appliances.

To meet Level 6 of the Code, the next generation of housing would differ significantly from current buildings, says Nick Raynsford, MP, chairman of the NHBC Foundation, but there is no guarantee consumers would want to live in them.

“It is vital for homebuyers to actually want to live in zero carbon homes if they are to be a successful reality,” says Mr Raynsford.

“If this does not happen, there is the distinct possibility that purchasers will decide against buying newly-built, low carbon properties. This could create serious problems both for the industry and for the government's targets for 3m new homes in England by 2020.”

This view was backed up by David Pretty, chairman of the New Homes Marketing Board, who says: “Most people agree that reducing carbon emissions from their homes is an important objective and it's right that our national targets should be demanding. However, those buying the new low and zero carbon homes of the future will also want them to be affordable, comfortable and reliable.

“At the same time, there are huge carbon savings to be made by improving the energy efficiency of existing homes, which make up over 90 per cent of our housing stock. We need a national strategy to develop affordable solutions for all homes,” he adds.

Even so, it remains to be seen whether consumers have fully understood the sustainability message that the government is trying to convey.

When asked how they would spend any savings from lower energy bills, the most common answer was “an overseas holiday involving air travel”.

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