



## CONSTRUCTION

# Whole-house thinking

What's the point of zero-carbon homes that aren't fit for habitation? There is more to sustainable building than meeting Government targets, argues **Dr David Strong**

**T**he UK Government has declared a laudable and ambitious plan to ensure all our new homes are zero carbon by 2016 and new non-domestic buildings zero carbon by 2019. The impact of this plan has been felt throughout the property and construction industry, and the drive towards zero-carbon has already had a powerful effect in galvanising the house-building and property development community, and in stimulating innovation. I am not sure that would have happened without such a strong legislative and policy initiative.

Of course the huge surge in interest in sustainable building is good news. After 35 years working in the industry, it is highly gratifying to see sustainability finally reaching the top of the political, planning and construction agenda. The emphasis being put by the Government on more energy-efficient buildings, and greener communities generally, is a truly welcome and encouraging sign.

However, those of us who are passionate about delivering a genuinely sustainable built environment currently face a real dilemma.

Here's our problem: there is so much more to delivering exemplary built environments than zero carbon. In fact, there is even a danger that a fixation on zero carbon may result in highly perverse outcomes and deliver seriously damaging and unintended consequences in terms of sustainability – with the pursuit of the 'best' becoming the enemy of the good.

The Government wants to see all new homes built to the highest level (Level 6) of the Code for Sustainable Homes by 2016. Allowing for the time required to design, specify and fund a development of Code Level 6 new homes by 2016 means housebuilders and designers having all the answers to the zero-carbon challenge by about 2012 – just four years from now. Housebuilders working in the social housing sector are having to move even faster, producing Code Level 3 or 4 homes already.

The risk that is now being recognised is that the single-minded scramble to design and build Level 6 homes gives out the message that this is

the highest ambition and most worthy outcome we should aim for. It's not.

If we end up with 'zero-carbon' Level 6 homes that are uneconomic to maintain, are built on flood plains, overheat in summer, have poor acoustic performance, poor indoor air quality or other unintended consequences, then we have created a generation of homes unfit for people. This cannot be called 'sustainability'.

For example, some recent prototype 'zero-carbon' houses have been widely and misleadingly publicised as the answer to our zero-carbon aims. In fact, recent research has revealed that some technologies (such as micro-wind systems) fitted on buildings contribute little to carbon reduction, particularly when applied in the urban environment – indeed, in some locations they may even be net consumers of energy.

I am not convinced that zero carbon is even a useful label for dwellings at all. The actual definition of 'zero carbon' differs significantly between various Government departments and agencies, and some of the definitions are based on completely unscientific formulas.

A home is only 'zero carbon' in the sense that it complies with a theoretical carbon requirement. It's how we use that home that really matters. Calling a home 'zero carbon' could offer consumers a false promise. A home can only be genuinely zero carbon if the occupants' lifestyles are prescribed and energy is rationed in order to balance on-site energy-generation – which is both impractical and entirely politically unacceptable.

Addressing the challenge of climate change requires a more holistic approach – addressing and nurturing behavioural change in occupants and users, which in turn supports a low-carbon and sustainable lifestyle.

For instance, incorporating appropriate planting and landscape strategies can reduce

'urban heat island' and building energy loads, as well as offering visual and amenity value and support for ecological enhancement. Designing for local food production and space for 'farmers' markets' can reduce vehicle journeys and offer amenity and ecological benefits. Integrating living and working environments with local satellites and homeworking options can have similar benefits.

At Inbuilt, we have developed a five-step 'whole-system' approach to delivering sustainable built environments, which involves a close and collaborative partnership with our clients, and a complete integration of the design process. This approach involves engaging with clients at the earliest stage, designing out technical complexity by fully exploiting all passive design options, and ensuring that buildings are as energy-efficient as possible.

It also means incorporating cost-effective renewable technologies, ensuring that buildings can easily be maintained and managed, and finally undertaking post-occupancy evaluation – not only to check that buildings are fit for people to live in, but also to feed the research findings into future projects and continuously improve current technologies.

The 'whole-system thinking' approach means working to find natural solutions to reduce our dependence on energy-intensive systems. Nature offers so many opportunities to heat, cool and illuminate our buildings.

There is also a critical role for the ecologist and landscape architect. Landscaping in urban design plays an important part in microclimate control, maximising biodiversity and managing carbon. We need to discuss issues such as the appropriate density of development as well as urban and landscape design quality.

For new developments this might mean working to a greater extent with the natural

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landform and ecosystems rather than trying to impose a false order and contrived design. In existing urban environments, it may mean a return to the tree-lined streets of Georgian and Victorian times, or higher-density redevelopments with fewer personal gardens but more modern public parkland, in the style of the best-designed parts of London or Bath.

The key to 'whole-system thinking' is a close collaboration from day one, working with the client, the local community, the architects and landscape architects, ecologists, planners, building control authority, sub-contractors, energy suppliers and the entire supply chain.

Together we find solutions that address and resolve multiple problems and issues simultaneously. We save money and time, and deliver numerous synergistic benefits.

In the meantime, we also need to remind the Government that the zero-carbon issue is not just about newbuild. We've already built more than 70 per cent of the 2050 stock, so reducing the carbon footprint of our existing built environment should be our highest priority.

We need to avoid being distracted by the newbuild zero-carbon rhetoric from the vital challenges of reducing the carbon emissions of the existing building stock, and of securing investment and planning permission for large-scale renewable energy systems.

In terms of pounds sterling invested per tonne of carbon saved, both of these objectives will provide a much greater and faster return than making all new buildings 'zero carbon'. **E**

**Dr David Strong is the chief executive of Inbuilt Consulting**