

Des res, future style

Housing design for low carbon living will challenge our architects – and our aesthetics. **Marie-Louise Schembri** looks forward to it.

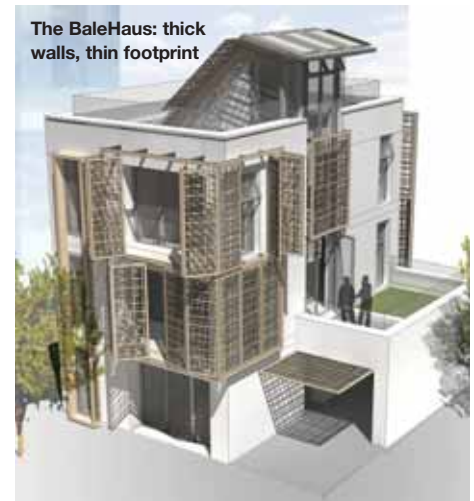
If you image of the future of housing is based on the Jetsons' bubble on a pole, you're probably on the wrong track (despite it being very land efficient). But the shape of things to come is likely to be radically different – driven by the need to reduce carbon emissions, water consumption, waste to landfill, and the flooding provoked (or exacerbated) by the spread of urban development.

The government's Code for Sustainable Homes has introduced mandatory standards as of May 2008, with staged targets between 2010 and the 2016 deadline when all new homes must achieve zero carbon status. The Code also encapsulates a number of other environmental issues besides carbon emissions, but this is by far the most challenging target – and designing new homes for low and zero net energy demand is likely to have the most significant influence on the way they look.

Increasing air-tightness also makes it more critical to provide enough controlled ventilation. Under UK regulations you can do without ventilation fans, if you use trickle vents or passive stack ventilation instead. But whichever way you do it, the lost heat still needs to be replaced. Heat recovery – reintroducing the heat from extracted air to the incoming fresh air – would require roof lanterns or intricate chimney stacks, to provide the required ventilation using the stack effect or by harnessing low velocity winds. If the use of these solutions picks up in the future, it will have a significant impact on our urban roofscapes.

The appearance of our homes will also be affected by changes in materials and construction techniques.

Take the walls, for example. They are likely to become thicker as insulation demands increase. However, a brick facing external wall



The BaleHaus: thick walls, thin footprint

Photo: BaleHaus by www.mocell.co.uk

composites, sealants and warm edge 'hybrid' spacers.

To reduce heat loss through the building fabric and unwanted gaps, the pre-fabrication industry has developed higher specification, made-to-measure building elements. This approach is revolutionising the design and construction industry, changing construction detailing and processes, reducing site times – and requiring architects to work closely with the manufacturing industry and site personnel to develop new skills.

The deluge of new performance requirements over the next eight years may seem a little overwhelming. However, they do represent a positive push towards design and construction that is more considerate to the bigger picture. While the cost implications of achieving higher levels of the Code for Sustainable Homes may be a contentious issue, the process surely should not be obstructed by a reluctance to adapt to the 'new look'. It should be embraced as a revived challenge for architecture to respond better to the turbulent climatic and socioeconomic context of the 21st century. ☺

Marie-Louise Schembri heads the Sustainable Design Group at Entec UK.



Straws in the wind: from Grand Designs to a site near you

Expect to see more features such as:

- Buildings with south-facing aspects and some rather unusual roof shapes, using asymmetric 30-degree pitches to exploit solar heat and light energy
- Innovative 'sunspaces' and thermal walls, providing passively heated buffers between living rooms and the outside
- External shading on facades, made more necessary by increases in summer temperatures, and by requirements for better air-tightness and insulation of future homes
- Radically rethought internal layouts, such as 'upside down' designs to reduce overshadowing of the main living spaces by neighbouring buildings
- Site-generated energy, whether photovoltaics on roofs or communal wind-turbines.

would have to be over 17 inches thick to meet the Energy Saving Trust's 'Advanced Standard', incorporating a 220mm layer of mineral wool – which is itself impractical, when the maximum length for cavity wall ties is only 150mm. And houses with walls that thick would take up appreciably more land space too! So the implication of such insulation standards is that traditional wall construction will give way to more use of new light concrete products or (structural) insulated panels, thus completely changing the aesthetics of the building.

Or take the windows – often the weak points of a building's skin in terms of thermal conductivity. A wide range of different glass types and technologies now offer reflective, absorptive and emissive properties suited to even the most extreme weather conditions. And window frames have never had such complex profiles, incorporating material

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