

COMMENTARY

Time for radical building design

A radical architectural rethink of the way buildings are put up would pave the way to a more energy-efficient and sustainable future. But the appetite for such a rethink is weak

By *Phil Thane*

- European governments are implementing new sustainability rules for the building industry
- Rooftop solar PV offers an economical solution to energy problems
- House buyers are typically conservative and radically reshaping those instincts would be difficult

Architecture is an emotive subject; no matter who owns a building, lives in it or works in it, everyone who passes it is affected by how it looks. Consequently everyone has an opinion, and those opinions tend to be conservative. We are used to how things are and wary of change, so right across Europe new housing developments incorporate elements of the vernacular architecture of the region; white walls and 'Roman' tiles around the Mediterranean, brick and tile (or slate) further north.

Commercial buildings and apartment blocks do not have such a long history, which means there is little in the way of tradition and so more leeway for designers. The biggest influence is on family houses and it is especially noticeable in the UK with its uniquely high levels of owner-occupancy.

Sustainability

Across Europe governments are implementing new sustainability rules for the building industry; the UK's Code for Sustainable Homes (CSH) is typical.

The UK-based BRE (Building Research Establishment) has developed its own methodology for assessing building design, BREEAM (BRE Environmental Assessment Method) and is marketing its expertise to other countries under the brand name BRE Global.

These rules and methodologies are important, as buildings being planned now will probably be standing for 50 years or more, but they are very conservative. Mandating condensing boilers and improved insulation is welcome, of course, reduced flow rates

of showers will save some water and energy but on renewable energy the new rules have little to say.

CSH works on a points basis, and as points add up to levels of sustainability, it is up to the developer and the designer to decide which level to aim for and how to accumulate the necessary points.

Ostensibly this approach allows developers to innovate and adopt any new technology they see fit that will enable them to meet their target. It also has the unfortunate effect of encouraging companies to design to the target, resulting in houses that are not easy to improve as technology develops.

Solar energy is likely to play an increasing part in the energy mix in future; solar hot water has long been an important technology in southern Europe and photovoltaic (PV) power generation is becoming more widespread as improved production methods drive prices down and countries adopt Feed-in Tariffs (FiT).

PV is not yet cheap enough to be fitted to every new build, and in northern Europe the benefits of solar hot water are marginal but it is almost certain that as energy prices rise and mass production techniques reduce costs both will become very common.

Critical questions

With that in mind, isn't it time our building design started to reflect these coming changes? It would be wrong for governments to back any particular technology; mandate thin-film PV for all now and you preclude the possibility of some better technology emerging in future, but the track of the sun across the

European sky is not going to change, and solar energy is the best long-term source we have. Why do we not insist on all new houses having single pitch roofs facing south?

It sounds simple, but it contradicts just about every other design rule currently applied to new housing. Apart from small garden sheds, single pitch roofs are not in any vernacular tradition, which worries planners who want buildings to "fit in."

Maybe we could settle for ridged roofs orientated East-West so one side faces south, but for the last 50 years we've been deliberately avoiding straight rows of housing in favour of winding, traffic-calming roads, with houses built around village greens and cul-de-sacs to create a community feel and to prevent housing developments becoming rat-runs. It is not impossible to design a development where all the roofs face south, but it is not easy.

But the key issue at stake here is the innate conservatism of house buyers. The simplest answer to roof orientation is a square house, but square is boring. People prefer wings, L shapes, extensions, dormer windows, all of them making it harder to fit a PV array or solar hot water system.

Radical rethink? No thanks

REM contacted the UK Home Builders' Federation (HBF) about how mass-market housing design could change to make it more suitable for next-generation solar energy systems and found, perhaps not surprisingly, that its focus lies elsewhere. ►►

COMMENTARY

Across Europe house builders are finding it hard to stay afloat at the moment, so increasing cost by redesigning their standard houses and re-thinking the street layout of developments is not on the agenda.

HBF spokesman Steve Turner agreed that whilst current designs were not ideal for solar energy systems, change would only happen if the market or the regulatory authorities demanded it.

In the UK the regulatory system has changed recently, giving local authorities more power to demand certain features. In future we may see UK planning authorities demanding more radical design, but it is unlikely, as local politicians tend to pander to the basest instincts of their electorate rather than trying to lead them.

HBF's customer satisfaction surveys

show them that they are building the sort of homes people want. There have been great improvements in the energy efficiency of houses and buyers like that. It adds relatively little to the cost, the payback is obvious and crucially it does not radically alter the aesthetics. They do not have customers clamouring for houses with south-facing roofs. And they certainly do not anticipate a demand for

Whilst current designs are not ideal for solar energy systems, change would only happen if the market or the regulatory authorities demanded it

radically different roof styles to accommodate combined PV and solar hot water systems.

It is unfair to expect individual builders to put their businesses at risk by adopting radical designs that may alienate potential customers and neither should an industry body such as HBF dictate such things.

We need our politicians to take the lead here. Not to impose unpopular designs, but to lead the debate, to explain design issues to the majority of people who have little understanding of design or technology but need to feel comfortable in their houses and public spaces.

It is hard to see that happening anytime soon, however, whilst governments are pre-occupied with restoring shattered economies. ■

Lacking the mandate

Asian governments have failed to show much ambition when it comes to biofuel blend mandates, despite the obvious economic and energy security benefits to be had

By Amrit Sidhu

- **China has the potential to double its use of biofuels in petrol and diesel by 2020**
- **India's biofuel market is waiting for the deregulation of the sugarcane sector**
- **Brazil, Europe and the US leave Asia far behind in terms of mandating biofuel blends**

Asian governments have failed to show much support for ambitious mandates on biofuel and ethanol, which has led to fragmented industry development in the import-dependent but high-growth region, industry officials say.

The biofuel industry needs government mandates in order to develop trade, especially in the rapidly expanding transportation sector, Shell's vice president for downstream management consultancy and CO2, Nick Allen, said during a Shell energy forum in Singapore on June 9. He stressed that mandates were essential to ensure quality fuel products for the transport sector.

However, industry experts see little drive to implement mandates, even though Asia's main biofuel markets,

especially those in China and India, are driven by energy security.

Malaysian and Indonesian biofuel markets, meanwhile, are driven by agricultural benefits, but government support is lacking in these two countries, according to industry observers.

Malaysia, the world's second biggest producer of crude palm oil after Indonesia, seems to have postponed its decision to mandate the B5 fuel mix in 2006. Indonesia was supposed to have B1 and E1-5 in 2009, said the officials.

China and India, however, are showing some inclination towards a greater commitment to biofuels.

China

China has sent out a signal of its intent,

having cut the import duty on ethanol to 5% from 30%.

This is a significant change in policy on domestic production and imports, Dean Nelson, managing director of EDF Man's Asia sugar division, said at the recent Kingsman Asia-Pacific Sugar Conference in Singapore.

Furthermore, China has the potential of doubling the use of biofuels in its 10% petrol blend to 10 million tonnes per year by 2020 from 5 million tonnes in 2007, according to Nexant Asia senior consultant Connie Lo, who was speaking at the same Singapore event.

She added that for diesel, this 10% replacement could also double to 24 million tonnes per year in 2020 from 12 million tonnes in 2007. ►►