

Viewpoint

Zero carbon homes – worthy of all the debate?

The end of 2008 saw a flurry of new policies, reports and consultations on our future as a low carbon society, despite the turmoil in the global economy. Driving this impetus is the recognition that green investment represents a silver lining as a new source of employment and the creation of an infrastructure capable of mitigating the longer-term economic effects caused by climate change and key resource constraints.

There is arguably no sector more in need of investment than housing, as the recent downturn has destroyed land values that were already fragile due to escalating sustainability targets, including the zero carbon homes requirement by 2016.

The long awaited consultation on the definition of zero carbon homes was finally published mid-December, amid frantic calls from developers and planners to resolve the near paralysis of major projects with build programmes extending beyond 2016. Progress had been stymied due to confusion around the multiple definitions of zero carbon, and the need to address financial and technical deliverability concerns associated with the current definition as laid out in the Code for Sustainable Homes and the Stamp Duty Land Tax exemption order.

Pre-consultation, the attainment of zero carbon required a minimum level of energy efficiency, and zero net carbon emissions from energy used for heating, hot water, ventilation, lighting and appliances. These could be either included in the development or located close by, and physically connected via a dedicated electricity cable known as a 'private wire'.

When compared with other carbon savings measures available to the UK, these requirements were considered both unduly expensive and technically unviable for certain development types, such as city infill schemes with poor access to solar, wind, and biomass resource. A European Court of Justice's recent ruling has also questioned the legality of private wires as a barrier to consumer choice, making this a subject of a further government consultation in spring 2009.

The Department of Communities and Local Government estimates a zero carbon homes policy has the potential to reduce 4mn tonnes of carbon dioxide (MtCO₂) by 2020, representing 3.6% of the minimum greenhouse gases emissions budget recommended by the Committee on Climate Change.

While this is a relatively small contribution, which would be even smaller if current build rates continued, there are more important considerations that support the introduction of a zero carbon policy. By 2020, existing homes will account for 88% of all housing stock, so it is imperative not to overlook their contribution in making equivalent carbon savings, particularly as there are plenty of cheap and simple energy

efficiency improvements available. Stimulating technology innovation across all housing stock stands out as the strongest reason for policy implementation and a vital component in helping to achieve the UK's unprecedented carbon reduction targets.

The likely impact of the zero carbon policy, including any post-consultation amendments, is that standards for on-site carbon reduction in new homes will continue to improve on the regulated emissions target of 44% planned for 2013, but the step-change in 2016 will be less than originally considered.

The existing definition suggested a high reduction target of around 150% in regulated emissions, as unregulated energy consumption for appliances is taken into account. However, this target is not recommended in the consultation as the supporting models could not identify any appropriate solutions for apartments. Reductions of 70 and 100% were modelled but both were heavily reliant on biomass, suggesting that these lower targets may also be ruled out.

The challenges associated with biomass are borne out by the few existing examples of zero carbon homes in the UK. The biomass combined heat and power unit installed at the BedZED development in South London was notoriously problematic and never fully commissioned. Since then, a more robust technology, based on combustion rather than gasification, has been incorporated into a number of schemes, but designed output has not been achieved and units are currently only available at a single size of 100 kW.

On a smaller scale, a number of single house prototypes were developed for the BRE's Offsite 2007 exhibition, including the Kingspan Lighthouse which incorporated photovoltaics, solar water heating and a biomass boiler. Here, the choice of plant was an issue as a 10 kW

boiler was the smallest available, five times the required size of 2 kW.

Technology risks and issues aside, few are convinced that the zero carbon homes policy alone will be sufficient to drive the necessary development of, what is currently, a highly fragmented biomass supply chain, given that new homes represent less than 1% of the domestic market in any year.

Nowhere in the consultation is there any suggestion that the total reduction of carbon emissions needed will be relaxed. The options presented are based around a change in the balance between on-site solutions, referred to as the 'carbon compliance level' and a flexible approach to off-site solutions referred to as 'allowable solutions'. A number of these allowable solutions are proposed, but they stop short of a simple off-set fund or the purchase of international carbon credits.

The most interesting section of the consultation, particularly for the uneasy development sector, is a capped cost of carbon of between £100 and £200 per tonne of carbon dioxide (tCO₂) – an order of magnitude higher than the carbon traded on the EU Emissions Trading Scheme valued between £10 and £20 tCO₂. The figures assume emissions of around 2 tonnes per dwelling over a 30 year life, which would equate to £6 to £12,000 per dwelling, much lower than the existing definition's modelling which was greater than £20,000 per dwelling.

This concession recognises that not all of the necessary policy details can be fully resolved now, and that some limit on future liability will be required for land transactions to take place. Whatever figure is finally agreed, this will represent a key milestone towards a future where environmental costs are explicitly written into both policy requirements and asset values.

It is difficult to paint an accurate picture of the future as agreement and adoption of the UK's definition of zero carbon is still a way off. Until capital cost reduction is achieved for PV, the UK looks set to be increasingly reliant on the decarbonisation of both central electricity grids and heat either through district systems powered by waste or biomass, or the production of biogas which can be fed into the gas grid.

While off-set payments from developers will act as a partial incentive, a much grander plan is needed to achieve a greater level of investment than can be extracted from development land values. With ever increasing demands for public funding from almost every sector, how far up the Government's wish list does the vision for zero carbon homes and communities sit? ●



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