

# **Building A Greener Future: Towards Zero Carbon Development Comments by the Royal Institute of British Architects**

## **Introduction**

The Royal Institute of British Architects welcomes the opportunity to comment on the draft consultation paper Building a Greener Future, which we see as an important opportunity to achieve a step-change in the sustainability of the UK's built environment.

The Royal Institute of British Architects is one of the most influential architectural institutions in the world, and has been promoting architecture and architects since being awarded its Royal Charter in 1837. The 35,000-strong professional institute is committed to serving the public interest through good design. It also represents 85% of registered architects in the UK through its regional structure as well as a significant number of international members. Our mission is simple- to advance architecture by demonstrating benefit to society and promoting excellence in the profession.

## **Summary**

- A clear and communicable definition of zero carbon is required
- All new homes should achieve at least Code Level 1 by April 2008
- Better assessment and proper enforcement are vital to achieving the targets
- Post-occupancy evaluation should take place as a matter of course
- The Code must be only the first step to covering all buildings, including commercial, industrial and existing homes
- Local planning authorities should be free to aim for higher building standards within a common framework

## **New housing and zero carbon development**

The RIBA welcomes the Government's recognition of the important role that reducing carbon emissions from housing can make towards achieving the long term goal of reducing the UK's carbon dioxide emissions by a minimum of 60% by 2050. We believe that the target of achieving zero carbon emissions from new housing by 2016 is achievable, however this will require investment and direction from Government together with radical action from the construction, planning and design and architectural professions. We look forward to working with the Government towards this goal.

The RIBA is pleased that the Government recognises the importance of taking action towards reducing the carbon emissions from the existing housing stock, but would like to emphasise that it is essential that measures (whether fiscal, regulatory or incentive) are brought forward to tackle this issue sooner rather than later, given that around two thirds of the housing stock that will be in use in 2050 has already been built. We note that a commitment to introduce a Code for Sustainable Buildings was

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contained in the Government's 2005 manifesto, and urge the Government to extend the principles of the Code to cover all non-residential buildings, both new and existing.

## **Terminology: definition of zero carbon**

The definition of zero carbon set out in the current consultation states that for a new home to be genuinely zero carbon, it will need to deliver zero carbon (net over the year) for all energy use in the home, including electrical appliances, in addition to space heating, cooling, ventilation, lighting and hot water. For the avoidance of doubt, it would be worth clarifying that the term “zero carbon” refers simply to emissions in use and excludes embodied carbon. The issue of embodied carbon does need to be addressed however, particularly for the non-domestic sector where building replacement cycles tend to be shorter.

The Government's definition of zero carbon also seems to imply that all energy used by a development must be generated on site whether at the building or development scale; however we do not believe that this will always be the most effective approach, both in terms of cost-effectiveness and sustainability. Indeed the technical possibility and costs of full on-site generation remain uncertain; achieving zero carbon standards on a small scale/ single unit level may prove uneconomical due to cost and access considerations; some RIBA members have suggested that achieving full zero carbon will only be cost-efficient at a development level of over 250 homes.

Whilst the first priority must be exploiting reasonably cost-effective on site potential, we do believe that in certain cases the use of direct and verifiable offsetting measures or the use of energy from outside the development must remain an option. Defining what offsetting is acceptable and developing a set of tests is vital. Thus ‘additionality’ is a requirement. Opportunistic use of someone else's renewable resource should not be allowed, neither should simply buying international carbon ‘offset’ as this does not satisfy the UK's policy objectives. There should be a time linkage between delivery of a development and the delivery of its associated renewables. Contributions towards enabling a wider community wide renewable energy system should be permitted.

With regard to including appliance energy usage within the definition of zero-carbon, given that this will be in effect a design target, we anticipate that a definition of “standard” appliance usage will be developed so that proposals can be assessed on a like-for-like basis. However it is clear that, in practice, there are wide variations in how people use their buildings and alternative ways of rewarding good behaviour will need to be developed to maximise the effectiveness of the tightened standards and to drive improvement of the existing stock. The presumption that design standards exactly equals performance outcome is wrong – it is important that the Government's approach takes into consideration the fact that how a householder ‘drives’ the house will determine to a large extent how much energy is used. The ability of householders in operating increasingly complex shading, fenestration, ventilation and lighting technologies can be highly variable, and whilst actual energy bills can act as a check on achieved use, no enforcement seems to be envisaged in relation to ‘careless driving’.

Given the above we believe that a clear distinction needs to be made between carbon reductions to be achieved by efficiencies and those to be achieved through carbon neutral energy (“renewables”). More needs to be understood in respect of the maximum that can be achieved in the UK's climate so that realistic standards may be set for the respective contribution to be expected both of efficiencies and renewables.

Such an approach would help with the problem presented by including appliance energy usage within the definition of annual zero carbon expenditure. This is logical but presents the very significant problem of unpredictability of demand and suggests that the focus needs to move away from building regulations and towards energy supply or market measures to moderate demand.

For example we think the development of a fairer and consistent system of selling electricity back to the Grid should be a priority; householders in the UK who export surplus energy may receive as little as a few pence per unit, whilst in Germany householders receive around 30p per unit - an incentive that, in a large part, has driven the take-up of renewable technologies in that country. However we recognise that such measures are not at the core of this consultation exercise.

### **Introduction of the Code for Sustainable Homes**

We support the Government's proposal that all new homes should receive a rating from April 2008 against the standards set out in the Code for Sustainable Homes as we believe that this will enable more enlightened consumer choice and encourage developers to build to higher standards. Building homes to higher standards of energy efficiency will lead not just to lower levels of carbon emissions, but also to lower energy bills for consumers (based on current energy consumption patterns and fuel prices) and we believe that it is likely that home buyers will take this in to account when choosing a new home to a greater extent than is acknowledged in the consultation. Indeed there seems to be a growing public appetite for "green homes" and this can only increase as public consciousness develops about the various benefits associated with living in low and zero carbon homes. We believe that the introduction of the Code for Sustainable Homes will have major benefits to householders in providing warmer, cheaper and greener homes and congratulate the Government on these proposals.

However we believe that it is important that the Government's proposals on achieving zero carbon are actively marketed in a way that is easily understood by the consumer, and would ask for a clear commitment and timeline for marketing and promoting the Code in this respect. Public awareness and education about climate change and the role of the householder will be vital in achieving the step-change that is needed to reduce emissions significantly. We call on the Government to increase its efforts to inform the public about the links between energy-inefficiency and climate change.

We support the announcement that all homes built by built by the Housing Corporation and English Partnerships will now have to meet Code Level 3. However, we believe that it should be made mandatory for all new homes to achieve compliance with at least Code Level 1 by April 2008.

### **Costs and benefits**

Whilst the extra costs of delivering Code level 3 are likely to be relatively modest, the costs of meeting the top standard is likely to be significant, with some estimates showing a potential additional cost of 30-40%. Suggested additional costs of this scale could have a negative effect on development and it is important that this is recognised. However, although the lack of a significant numbers of existing buildings

built to zero carbon standards makes estimation of costs difficult at this stage, it is forecast that as they become mainstream, costs of low and zero carbon technologies will fall significantly as the market develops.

An important related point is that the costs of achieving low and zero carbon emissions from new developments are closely connected with scale and density; it will be both easier and cheaper to design and build a high density 250 unit development to zero carbon standards than two or three unit sites. There may be similar economies of scale by following a co-ordinated approach to developing nearby sites in separate ownership. However, this raises issues of energy infrastructure investment, particularly for phased development, and potential conflicts with the requirement for flexibility of consumer choice of their energy provider.

However this does not mean the challenge is insurmountable; only that it will require Government, architects and the construction sector to work closely together in a co-ordinated way to design genuinely sustainable communities.

We recommend that the Government give further consideration to planning and fiscal incentives to encourage householders and others to invest in energy efficiency measures. At the community level of providing more cost effective renewable capacity there is a lack of incentives for any party to take a lead. Existing Energy Supply Companies (ESCOs) have to date shown little interest in providing renewables because of the as yet unproven commercial returns, and developers are limited by their site size, the majority of which are below 50 homes. We believe a system of incentives for developers will be also be needed: architects' experience is often that while some developers are keen to express aspirations to build low carbon developments, there is not necessarily any real commitment to achieve those aspirations unless the financial aspects make sense.

The projected savings of carbon emissions from implementing the Code for Sustainable Homes has been estimated at between 127 and 136 MtC of CO<sub>2</sub> over the period to 2050 – a significant portion of the overall 60% reduction in carbon necessitated by Government policy. However there remains a question mark over whether or not the 60% target will be enough to mitigate the worst affects of climate change;- the Stern Review found that to maintain stabilisation in the long term, global emissions will need to be reduced to over 80% below current annual emissions. The RIBA's Council has unanimously adopted Contraction and Convergence (C&C) as the basis for the Institute's policy to guide targets for reduction in emissions, which will also necessitate overall emissions reduction of around 80%. So whilst improving the energy efficiency of new homes will be important, the Government must also take urgent action to deal with emissions from other sectors- including existing homes, commercial properties, transport and industry. We therefore believe that the principles of the Code should be extended to cover all buildings.

## **Reform of the Building Regulations**

The RIBA believes that the proposed timetable, whilst demanding and ambitious, is achievable by 2016. However achieving this target will necessitate increased investment in skills and production, as the architectural and construction sectors also face the target of increasing new-build housing supply in England and Wales to 200,000 homes per year.

The RIBA, working in partnership with the Academy for Sustainable Skills, stands ready to help the Government in delivering the advanced skills and knowledge needed to design and implement better designed and more sustainable homes, and are delighted to already be working with the Department for Communities and Local Government on the reform of the building regulations.

Whilst a two step approach could be an alternative method to achieving the overall target of zero carbon by 2016, the three step approach (25% improvement by 2010, 44% by 2013 and zero carbon by 2016) seems to us to strike the right balance between the urgent need for measures to mitigate climate change and the capacity of the design and construction sectors to deliver these targets.

More thought is needed about the change between 2013 (44%) & 2016 (zero carbon). The 44% reduction is in SAP energy uses only, while Level 6 in addition includes the occupants cooking, washing, electronics, etc. Hence, moving from Level 5 to 6 is effectively a jump from 44% to around 135%. While this may well be possible by 2016, more transparency on this is required.

The Government's proposal that all new homes should be zero carbon by 2016 has brought a sudden, but very welcome, focus on the need to reduce carbon emissions from the domestic building sector. However it has resulted also in a certain degree of posturing which may ultimately prove counterproductive. The National Housing Federation has proposed that 2012 should be the target date; the Welsh Assembly Government says 2011. We applaud their ambition, but worry that there may come a point where the whole project risks being compromised or brought into disrepute through failed expectations if the race to zero carbon is run too quickly.

Whilst it might be possible to move faster to zero carbon, we feel a process of ordered progress has more to recommend it. Once the roadmap to zero carbon is agreed, developers should be encouraged – perhaps with grant or other incentives – to test future higher standards early, on condition that performance in practice is monitored and the results disseminated. This will enable the industry to iron out unforeseen implications of high standards and for the industry to develop robust best practice in advance of those standards becoming mandatory.

## **Assessment, enforcement and compliance**

A survey by Building Design magazine recently found that two thirds of local authorities are not ready to implement the new Code for Sustainable Homes, while one in five are struggling with the implementation of the new Part L Building Regulations. The Environmental Audit Committee has looked in detail at the enforcement of, and compliance with, the Building Regulations, and expressed "alarm" at the apparent ease and possible extent of non-compliance with Part L, calling on the Government to conduct a thorough review to establish the extent of the problem. Indeed, Environment Agency research has shown that 30% of new homes built do not comply with Building Regulations, and it is thought that the true figure may be even higher than this. Compliance and enforcement will require investment in skills development for building control officers in addition to increased capacity;- however we must emphasise that non-compliance with the Building Regulations must have meaningful consequences.

We are concerned about the lack of information regarding the proposed inspection scheme and how checks made under Building Regulations and the Code interrelate.

We understand that there may also be capacity issues with regard to availability of trained surveyors or other suitably trained professionals. We believe that this needs to be addressed urgently. We recommend that a system of post-construction inspections is introduced as post-occupancy evaluations of buildings are vital in discovering if new buildings live up to their expected levels of energy use. There is considerable evidence that most new buildings substantially underperform once constructed when compared to their original plans, and may require fine-tuning to enable them to reach their potential in terms of efficiency. However, architects often find it difficult to persuade their clients to commission return visits to a building 12 or 18 months after completion to conduct post-occupancy evaluation (POE), due to the associated cost, time required, and changes of ownership or responsibility. The Government should give serious consideration to leading by example by commissioning such post-occupancy checks and fine tuning as a matter of course. In the non-domestic sector there may be a significant role for extending the requirement for Operational Energy Performance Ratings so that users can benchmark and improve day to day performance. In the domestic sector, providing better information linking Home Energy Performance Ratings to actual consumption should have similar benefits.

## **Planning System**

We have responded separately to the Governments' consultation Planning Policy Statement: Planning and Climate Change (Supplement to Planning Policy 1).

## **Balancing national standards and local measures**

We believe that the Government is right in seeking to drive standards for reducing carbon emissions from buildings at a national level, and welcome the ambition shown. However we also feel that that it is important that local authorities retain the right to specify higher environmental standards in certain cases for new developments than those proscribed nationally, both for commercial and non-commercial developments. This would need to be set in a common framework that gave equal weight to energy saving measures as well as the contribution of renewables.

We understand the concern of the Government that there should not be a profusion of different standards across the country; however if local authorities were able to specify higher standards for housing defined by levels of the Code for Sustainable Homes, this would remove that problem. Similarly, for commercial developments, it would likely be appropriate to adopt an evolution of the BREEAM system, adapted in the same way as the Code to include mandatory rather than tradable standards for the key issues of carbon, water and waste. Local authorities who wish to set higher standards could do so in the knowledge that they would be providing a challenge to developers to "raise their game", rather than only building developments to the minimum standards laid down by the Code. Therefore we also support Martin Caton's 'Local Planning Authorities (Energy and Energy Efficiency) Bill, which gives local planning authorities precisely this power.

We support the right of the Welsh Assembly to set standards for building regulations, and therefore support the devolution of planning regulations to Wales.