

## Building a Greener Future – Towards Zero Carbon Development



### DCLG Consultation Response from the National Home Energy Rating (NHER) Scheme

#### **About the NHER**

The NHER is the UK's first and largest energy rating scheme. Members of the NHER include more than 200 local authorities, over 130 housing associations, 200 builders and more than 250 engineering and architectural practices. 700 accredited individuals are currently registered to deliver quality assured energy ratings.

Our objective is to provide excellent technical software, training and technical support to individuals and organisations involved in reducing energy consumption from both new and existing dwellings. The NHER is operated by National Energy Services, which also operates the SAVA scheme for Home Inspectors.

To gather views and inform our response, our members and selected others were invited to attend a workshop on 19th February 2007 or to submit comments to us by e-mail. Details of attendees and e-mail respondents are given in Appendix 1.

#### **NHER Consultation Response**

- 1. Are we right about the need for new housing to lead the way in delivering low-carbon and zero-carbon housing, and is it achievable in the timescale we have set out?*

New housing can demonstrate what is achievable in a way that existing housing cannot, so it is right to dedicate resources in this area. It is essential for the industry to have a target and we believe that the target that all new housing be zero carbon is achievable. Achieving this by 2016 will however require the kind of commitment, planning and concerted action that put a man on the moon. It will in our view require the following to be put in place quickly:

- A network of exemplar schemes, which clearly demonstrate a variety of ways to achieve zero carbon in practice. Reports must be issued and widely disseminated regarding actual monitored fuel consumption and associated materials outlining what worked and what did not work. This may require legislation for utilities to make available meter reading data on a routine basis. (Supplier switching has made fuel bill data much harder to acquire due to there being multiple suppliers within a group of dwellings.)

- Agreed and published methodologies for assessing total net carbon emissions. We would point to the BREDEM 12 (2006) methodology incorporated into NHER software as an already available methodology for assessing total carbon emissions. The methodologies must be able to incorporate new technologies as soon as there is hard data on their performance. The Appendix Q procedure built into SAP 2005 and into BREDEM 12 2006 provides the mechanism for doing this, but the infrastructure for assessing candidate technologies is currently inadequate. For example, small scale wind generators cannot currently be modelled in either SAP or Appendix Q.
- Sufficient financial resources to fund essential research and software approvals. For example, to enable the research required to quickly acquire independent hard data on the performance of products. There is also a need for funding for research projects to test out products combined in situ. The current rate of progress is clearly insufficient. For example, the algorithms for modelling micro CHP were available within SAP in 2005. Yet, in 2007, there are no micro CHP units listed in the boiler efficiency database so that micro CHP cannot be specified in SAP/DER software. Similarly, there are no range cookers or solid fuel systems in the boiler database. There is also inadequate resource to quickly test & approve SAP and RDSAP software. These institutional and financial barriers need to be quickly removed if zero carbon housing by 2016 is to be in any way realistic.
- A programme of skills development for UK installers, including knowledge transfer from other countries. Currently, the skill levels and quality control processes in the UK are poor for many aspects of building design and build. For example, we have very little experience of minimising thermal bridging, making homes air tight, installing mechanical ventilation with heat recovery systems, building Passive Houses etc.
- Incentives for homeowners to own and maintain micro generation such as PV; currently the rates paid by suppliers per unit of electricity sold to the grid are substantially lower than cost of electricity purchased from the grid. For example, in SAP 2005 the assumed purchase price for Standard Tariff Electricity is 7.12 pence per kWh whereas the assumed export price is 3.0 pence per kWh. A higher export vs import price would give consumers a real incentive to invest in renewables. Regarding the capital cost, the Low Carbon Building Programme has proved insufficient to meet demand and this has caused disappointment and confusion to householders and organisations who have been refused funding.
- Engaging householders in the best use of installed technologies and minimising their fuel consumption and carbon emissions e.g. feedback on electricity being consumed and generated in their homes. Various studies suggest that this will produce reductions comparable with those achieved through increased efficiency and local generation.

- The definition of Affordable Housing should take into account running costs for occupants as well as the capital cost of dwellings. We would point to our NHER Cost Table in Appendix 2 as a tool for making the running costs associated with zero carbon homes visible to householders.

2. *Have we got the assessment of costs and benefits right?*

No comment

3. *Have we got the balance right between the contribution of the planning system and that of Building Regulations? Are there other policy instruments we should consider? Are there ways in which we can design our policy instruments to achieve the same goals more cost-effectively?*

Fabric improvements must be given high priority, since these will be effective for the whole life of the building whereas some renewable energy measures may require periodic maintenance and replacement. Occupants may not opt to replace defunct systems with equally efficient systems. Building Regulations should specify increasingly lower backstop U-values and increased airtightness to ensure this prioritisation of fabric measures.

Electrical appliances and lighting now represent a large and growing proportion of energy use in the home. For example, in a typical semi detached house built to the 2006 building regulations, lights and appliances accounts for 45% of the carbon emissions. (Heating accounts for 29%, hot water 17% and cooking 9%). Policies for improving the energy efficiency of these should therefore be strengthened and allied to those on total home energy consumption. If significant improvements are made in the efficiency of appliances and lighting, heat gains will be reduced, with a knock-on increase in the heating demand of homes. The BREDEM 12 model described in 1 above is able to model the interaction between appliances' electricity usage and heat demand. This is not the case within the SAP / DER algorithms.

4. *Are there significant solutions to climate change that our policy framework does not encourage and are there other things we should be doing to address this?*

Carbon emissions calculated in SAP / DER and in NHER software assumes certain carbon outputs per fuel type. This carbon factor depends upon the assumed fuel mix of the grid electricity supplied. Changes in the assumed fuel mix will result in changes in the carbon outputs of specific dwellings. A dwelling that was zero carbon in 2009 might therefore become a carbon generating dwelling in 2012, simply because of this change in fuel mix. To address this, carbon milestones presented by government should state clearly the assumed fuel mix alongside the carbon emissions. Care must be taken not to confuse and demoralise those attempting to meet these targets. Even if the figures are very uncertain, they could be agreed upon, thus enabling industry to plan ahead.

According to the 40% House report there are around 24 million existing dwellings, with only 180,000 new units (0.75%) built each year. Setting a target of all new homes being zero carbon by 2016 will clearly bring the capital costs of many new technologies down, with spin-offs in the very much larger existing homes sector. To make full use of these, a correspondingly ambitious carbon target for existing homes by 2016 is also required, backed up by specific programmes designed to meet this target.

5. *Are we right in our assessment of what we should seek to achieve through the planning system and through Building Regulations? Are there other policy instruments we should consider?*

Central control of targets is desirable as it would provide a single focus and reduce the need for developers to have different standards in different areas. If standards continue to be set locally, this would create much duplication of effort and greatly reduce the level of expertise and attention that could be allocated. Central control through the Code will certainly lead to greater carbon savings being achieved overall, and sooner.

In the vast majority local authorities, Energy and Sustainability Officers are fighting a losing battle to increase standards beyond the minimum. Central policy will create the opportunity for increased energy efficiency by providing the requirement and thus pushing the issue up the agenda. It will also eliminate local requirements that are not sensible and overcome the potential use of high standards by local authorities to deter developers from building new housing in their area.

The Code is sufficiently flexible to allow further innovation by local authorities where appropriate. English Partnerships (and afterwards Communities England) will be able to continue, and indeed must, set an example and stretch the boundaries of current practice by setting standards above normal requirements. For example, the Milton Keynes Development Corporation (later to become part of English Partnerships), in association with NHER, have used energy ratings to set standards above Building Regulations since 1988.

6. *Are there areas of duplicative – or even conflicting – regulation in the framework that we have described? Do these threaten to get in the way of the goals we have set?*

The size footprint of new homes will necessarily be increased through compliance with the Code, as the need for lifetime homes, private external space, cycle storage and recycling facilities take up internal and/or external space. This is in conflict with the pressures in both energy and housing policy to reduce the size of dwellings.

Affordability of housing poses a conflict with the Code, as the requirement for new environmental technologies increases build cost. This conflict can however be reduced by taking into account reduced running costs within the definition of affordability.

7. *Do you agree that all new homes should receive a mandatory rating against the standards set out in the Code from April 2008?*

If the 2016 target has any chance of being met, the Code standards must be made mandatory as soon as possible. We interpret a mandatory rating to mean a Code assessment regardless of the score. However our members are concerned that this would in practice mean that Level 1 will be necessary. If mandatory rating is implemented ahead of the next Building Regulations revision in 2010, this would mean legal standards being pushed through a back door route. In this case, it is crucial that the Technical Document is published in April 2007 to give industry time to prepare and deliver by April 2008.

8. *Do you believe that our timetable for delivering zero carbon development through more stringent Building Regulations is sensible and achievable, too stringent or not stringent enough?*

Only if accompanied by the actions outlined in 1 above.

9. *Do you think our assessment of the costs of achieving these targets is realistic? Can you offer additional supporting evidence on costs?*

See question 2

10. *Do you agree the definition of zero carbon in paragraph 2.33 is the right approach? Where there are circumstances in which the additionality of offsetting measures outside the development can be demonstrated and are more cost-effective (eg. on small infill developments), is there a case for carbon neutrality (ie. taking account of offsetting measures)?*

We agree with the carbon definition. Small infill developments cannot be discouraged as this would contradict policy to build on brownfield land. It will be much more difficult and sometimes impossible to achieve a sufficient Code score for developments of one or two dwellings. Offsetting could be a mechanism through which funding for improvements to existing housing could be supplemented. For example, local authorities could require that such developments are supported by proportional funding to add to their cavity wall and loft insulation programmes.

We know that the key to renewable energy generation is to heavily exploit suitable sites. In new-build projects, developers should be encouraged to maximise renewables on suitable sites, and not necessarily only for the benefit of those new dwellings. It would reduce emissions from the existing housing stock if a larger renewables scheme could be installed because developers would get extra recognition for having a positive impact on the local community.

11. *Does the framework that we describe give adequate room to authorities and developers to make best use of the opportunities available at different spatial levels, for example district heating and cooling?*

No comment

12. *Do you agree that, for the reasons set out, there should be a national strategy for regulating the emissions from buildings supported by local promotion of renewable and low carbon energy supply?*

Yes

13. *Are we right to assume that our twin goals – of delivering the new homes that are needed and reducing emissions from the housing stock – will be achieved more effectively by relying on national standards (ie. Building Regulations and the Code) than through encouraging earlier action by individual local authorities?*

See question 5

14. *Given that the proposed PPS on climate change will apply in England but not in Wales, are there any specific implications for Wales for the future direction of Building Regs implied by this consultation?*

No comment

## **Appendix 1**

### Workshop attendees:

Dave	Hedger	Domestic Energy Consultant
Wayne	Howard	HCA London
Tony	Caine	Great Places Housing Association
Andrew	Breakell	Nobo Heating
Lawrence	Ennis	Nobo Heating
Peter	Williams	Landmark Energy
Kirsten	Elder	St Albans District Council
Trevor	Brennan	St Albans District Council
Iraj	Maghounaki	I.M. CAD Design Services Ltd.
John	Slaughter	Home Builders Federation
Gordon	Glass	Milton Keynes Energy Agency
Robert	Litherland	Robert Litherland
Alex	Taylor	NHBC
Kelly	Butler	Glen Dimplex
Ray	Grace	R J Grace and Associates
Graham	Fright	GDF
Martin	Davies	Milton Keynes Council
Bruce	Hattersley	National Energy Foundation

### E-mail responses from:

Andy	Frew	Northern Ireland Housing Executive
Denys	Stephens	Penwith Housing Association

## **Appendix 2: NHER Cost Table (2006)**

<b>Floor Area:</b>	<b>40</b>	<b>60</b>	<b>80</b>	<b>100</b>	<b>120</b>	<b>150</b>	<b>180</b>	<b>220</b>	<b>260</b>	<b>300</b>	<b>400</b>	<b>500</b>
<b>NHER</b>												
<b>0</b>	1710	2400	3090	3780	4450	5500	6500	8000	9300	10700	14000	17500
<b>1</b>	1290	1780	2250	2730	3200	4000	4500	5500	6500	7500	9900	12300
<b>2</b>	1060	1420	1790	2150	2500	3000	3500	4300	5050	5800	7580	9400
<b>3</b>	910	1200	1490	1780	2070	2500	3000	3500	4100	4650	6100	7500
<b>4</b>	810	1050	1280	1520	1750	2100	2500	2900	3400	3900	5100	6200
<b>5</b>	750	930	1130	1320	1520	1820	2100	2500	2900	3300	4300	5300
<b>6</b>	700	840	1010	1170	1340	1590	1840	2180	2520	2850	3700	4500
<b>7</b>	650	760	910	1050	1190	1410	1610	1900	2215	2475	3200	3900
<b>8</b>	600	685	820	930	1060	1240	1390	1660	1910	2150	2750	3330
<b>9</b>	550	615	730	810	920	1070	1190	1410	1605	1825	2300	2765
<b>10</b>	500	550	650	700	800	900	1000	1200	1300	1500	1850	2200
<b>11</b>	450	495	585	630	720	810	900	1080	1170	1350	1665	1980
<b>12</b>	400	440	520	560	640	720	800	960	1040	1200	1480	1760
<b>13</b>	350	385	455	490	560	630	700	840	910	1050	1295	1540
<b>14</b>	300	330	390	420	480	540	600	720	780	900	1110	1320
<b>15</b>	250	275	325	350	400	450	500	600	650	750	925	1100
<b>16</b>	200	220	260	280	320	360	400	480	520	600	740	880
<b>17</b>	150	165	195	210	240	270	300	360	390	450	555	660
<b>18</b>	100	110	130	140	160	180	200	240	260	300	370	440
<b>19</b>	50	55	65	70	80	90	100	120	130	150	185	220
<b>20</b>	0	0	0	0	0	0	0	0	0	0	0	0

Table of total annual fuel running costs (£) by NHER and floor area (m2); based upon May 2006 fuel prices

### **Important Note**

The NHER Cost table has recently been extended to include large dwellings, up to a floor area of 500 square metres. For dwellings with a floor area greater than about 250 square metres the assumptions made in the calculation procedures regarding the number of occupants may be inappropriate. This will affect the calculated energy used in cooking, water heating and lights and appliances.

The NHER assumes that the number of people living in large dwellings ranges from about 5 (total floor area 180 m2 ) to 8 (total floor area 400 m2). If the number of occupants is less than assumed then the running costs will be less than the values shown in the Cost Table.

Table of total annual fuel running costs by NHER and floor area