

# Building A Greener Future: Towards Zero Carbon Development



Consultation



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December 2006  
Department for Communities and Local Government

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## Foreword by The Secretary of State



Climate change is real and happening already. There is no more fundamental threat to our future.

The recent Stern Review on the economics of climate change made clear the need for urgent international action on climate change.

Stern changed the terms of the debate. Now mainstream public opinion is discussing what we can do about climate change and how soon we can take action.

If the world does not act, the impacts of climate change on our communities will be severe. And it will be the poorest members of our societies, those least able to adapt, who will suffer most and earliest. In the UK, it will be families unable to afford rising insurance premiums and recover from the impacts of storms or floods.

And security of our energy supply is also a serious policy challenge. The decline of North Sea oil and gas will mean that the UK will soon become dependent on imported energy at a time when global demand and prices are rising.

But the opportunity exists to avert this threat. New and emerging technologies and building techniques can help reduce carbon emissions and build a better quality of life for all.

In response to demographic changes which are increasing the number of households living in the UK, we have already committed to building more new homes, increasing housing affordability for young families. These new homes represent a real opportunity to do things differently.

And by developing new homes to low and zero carbon standards on a large scale, we can promote technologies and innovation which will help drive down emissions from the existing stock too.

Our key goal is to achieve zero carbon new homes within a decade.

In this document I set out a package of measures which will support this ambition – consultation on a new Planning Policy Statement and on a progressive tightening of Building Regulations, and the launch of a new Code for Sustainable Homes. This will achieve significant reductions in carbon emissions, and contribute to other environmental goals, such as reducing waste and other harmful transport emissions.

And to support this aim and kick-start deployment of these new technologies the Government will introduce a time-limited stamp duty exemption in 2007 for the vast majority of new zero carbon homes.

The UK is already leading the way on many aspects of climate change; indeed we are one of very few countries in the world on track to meet our international climate change targets set at Kyoto. With these proposals the UK will become the first country to set a timetable for delivering zero carbon homes.

These measures taken together will be an important part of meeting the Government's climate change targets. Setting a timetable now for the progressive tightening of environmental standards over the next decade will also provide certainty for business, driving innovation in the market and reducing costs of technologies.

There are other advantages for UK industry. I believe we have a huge amount to offer in terms of our engineering capability. As action on climate change increasingly becomes global, the UK is well placed to take advantage of the market opportunities that arise.

Most importantly these proposals are supported by many of the communities, businesses, and organisations who will deliver them. I believe that the real success of this policy will be in achieving these changes in the villages, towns, cities and communities we serve, working with developers, local and regional government, and other organisations.

These proposals are just the start. But they represent a real change, setting us on the right path to delivering on one of the most immense policy challenges this Government faces.

A handwritten signature in black ink, appearing to read 'Ruth Kelly', written in a cursive style.

The Rt Hon Ruth Kelly MP  
December 2006

# Introduction

The recent Stern Review<sup>1</sup> has shown that there is now an overwhelming body of scientific evidence that indicates that climate change is a serious and urgent issue. And whilst there are some remaining uncertainties about the eventual impacts, the body of evidence is now sufficient to give clear and strong guidance to policy-makers about the urgent need for action.

Emissions of greenhouse gases, particularly carbon dioxide, are the main cause of climate change. The UK emitted more than 150 million tonnes of carbon dioxide in 2004 (carbon equivalent) (MtC). Energy use in buildings accounted for nearly half these emissions, and more than a quarter came from the energy we use to heat, light and run our homes.

Energy security is also an important challenge. Soon we will be net importers of oil, and dependent on imported gas at a time when global demand and prices are increasing. Many of the measures needed to cut carbon emissions to address climate change also contribute to creating a healthy diversity of energy supply, and address fuel poverty through lower bills for householders.

Against this backdrop, we need to address the issue of housing supply. Many families cannot afford a suitable standard of accommodation: only half of 30-year-old couples can afford their own home, and that proportion is predicted to drop to just one-third if housebuilding continues at currently planned levels.

Evidence indicates that we have been building too few homes to meet demand since the early 1980s. As Kate Barker's recent report into housing affordability<sup>2</sup> made clear, we need additional housing provision.

If we build the houses we need, then by 2050, as much as one-third of the total housing stock will have been built between now and then. So we need to build in a way that helps our strategy to cut carbon emissions – both through reducing emissions of new homes and by changing technology and the market so as to cut emissions from existing homes too. We want to see a scale of new development which will deliver economies of scale and bring down costs of environmental technologies that could apply not only to new homes but to existing homes too.

We therefore believe *we need to set a target now for moving to zero carbon housing within 10 years*. We would propose to achieve this in three steps: moving first, in 2010 to a 25% improvement in the energy/carbon performance set in building regulations; then second, in 2013, to a 44% improvement; then, finally, in 2016, to zero carbon. Zero carbon means that, over a year, the net carbon emissions from energy use in the home would be zero.

We will aim to do this through setting the right planning framework for low carbon development, and by improving the environmental standards of our homes through the Code for Sustainable Homes and Building Regulations. We have worked up these proposals in consultation with the housebuilding industry, local government and other stakeholders and we want to continue to work together to deliver them.

<sup>1</sup> Stern Review on the Economics of Climate Change (October 2006).

<sup>2</sup> Review of Housing Supply (2004) – Delivering Stability: Securing our Future Housing Needs (Kate Barker, March 2004).

And these developments will be of benefit to consumers, who will gain through lower fuel bills and warmer homes.

To support our aim of zero carbon homes and kick-start deployment of these new technologies the Government will introduce a time-limited stamp duty in 2007 for the vast majority of new zero carbon homes.

We believe the planning system, the new Code for Sustainable Homes<sup>3</sup> and Building Regulations must all play a part in delivering this agenda. This consultation sets out how planning, the Code and Building Regulations can drive change, innovation and deliver improvements to the environment. It sets out the policy framework for achieving zero carbon development over time. And so we ask here some fundamental questions.

- Q1 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?
- Q2 Have we got the assessment of costs and benefits right?
- Q3 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?
- Q4 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?

Your answers to these questions are important. It is vital that we get our approach right. We want the homes of the future to be truly sustainable – for the people who live in them, for the wider community and for the planet.

The Government is clear in its determination to achieve its energy policy objectives through an approach that is consistent with the principles of good regulation. Over the coming months, we will work to refine our estimates of the benefits the measures in this consultation document are expected to deliver, and the policy and administrative costs that will arise. Only measures that are well targeted, reasonable and proportionate will be implemented. We will assess this on a case-by-case basis, while having regard to the collective regulatory impact on business and other parties.

<sup>3</sup> *Code for Sustainable Homes* – a step-change in sustainable home building practice (Communities and Local Government, December 2006).

## How to respond

Questions on which we are seeking input are raised throughout this document and repeated in Annex A. Responses to this consultation must be received by 8 March 2007. These can be submitted by email, letter or fax to:

Christopher Mountain  
Climate Change & Sustainable Development Team  
Department for Communities and Local Government  
Zone 4/G6  
Eland House  
Bressenden Place  
London  
SW1E 5DU  
Fax: 020 7944 3779  
email: [buildgreen@communities.gsi.gov.uk](mailto:buildgreen@communities.gsi.gov.uk)

When responding please state whether you are responding as an individual or representing the views of an organisation. If responding on behalf of an organisation, please make it clear who the organisation represents and, where applicable, how the views of the members were assembled.

## Additional copies

You may make copies of this document without seeking permission. Further printed copies of the consultation document can be obtained from the contact details above.

An electronic version can be found at the Consultation Section of the Department's website: [www.communities.gov.uk](http://www.communities.gov.uk).

## Confidentiality & Data Protection

Your responses may be made public by Communities and Local Government. If you do not want all or part of your response or name made public, please state this clearly in the response. Any confidentiality disclaimer that may be generated by your organisation's IT system or included as a general statement in your fax cover sheet will be taken to apply only to information in your response for which confidentiality has been specifically requested.

Information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information regimes (these are primarily the Freedom of Information Act 2000 (FOIA), the Data Protection Act 1998 (DPA) and the Environmental Information Regulations 2004). If you want other information that you provide to be treated as confidential, please be aware that, under the FOIA, there is a statutory Code of Practice with which public authorities must comply and which deals, amongst other things, with obligations of confidence.

In view of this it would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the Department.

The Department will process your personal data in accordance with the DPA and in the majority of circumstances this will mean that your personal data will not be disclosed to third parties.

## Help with queries

Questions about the policy issues raised in the document can be addressed to Chloe Meacher at the address on page 5.

If you have comments or complaints about the way this consultation has been conducted, these should be sent to:

Albert Joyce,  
Department for Communities and Local Government Consultation Co-ordinator,  
Zone 6/H10, Eland House, Bressenden Place, London, SW1E 5DU;

or by e-mail to: [albert.joyce@communities.gsi.gov.uk](mailto:albert.joyce@communities.gsi.gov.uk)

**A copy of the consultation criteria from the Code of Practice on Consultation is in Annex B.**

## Section 1: The importance of housing in delivering real emissions reductions

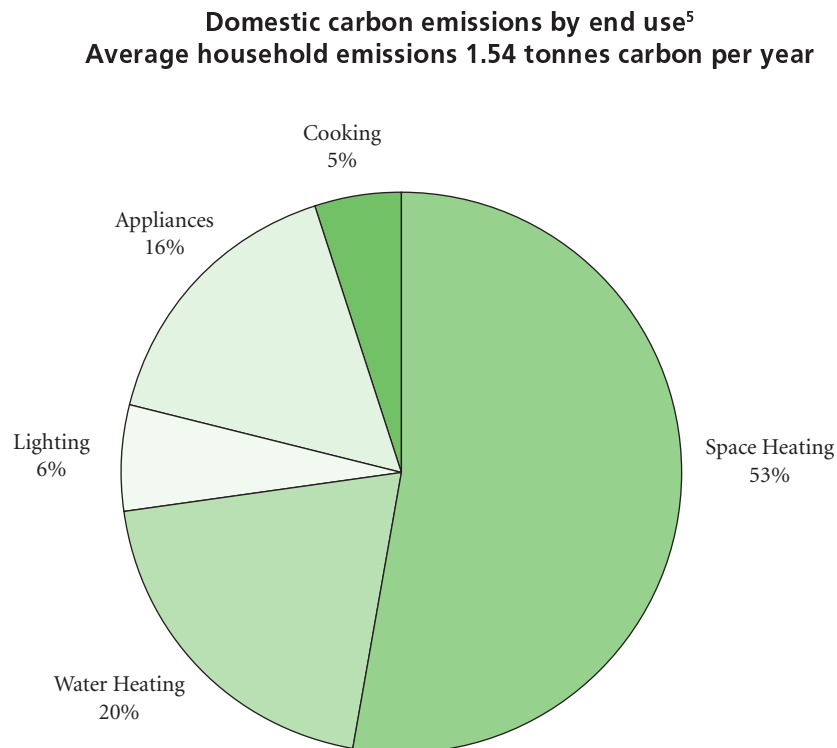
### Climate change and energy security represent a huge challenge for government policy

- 1.1 This Government believes that climate change is the greatest long-term challenge facing the world today. The Stern Review on the economics of climate change, published in October 2006, reported that unabated greenhouse gas emissions risk raising average temperatures by over 5°C from pre-industrial levels. This would transform our planet, with the poorest countries suffering earliest and most.
- 1.2 The report concluded that the potential costs of unchecked climate change (up to 20% of global GDP) are far higher than the costs of taking action (around 1% of global GDP). And that, most importantly, there was still time. The task is urgent, but international action could ensure that we avoided the worst impacts of climate change.
- 1.3 The challenges of energy security represent an addition to the risks from climate change. The UK is increasingly dependent on imports of oil and gas, while at the same time global energy demand is growing rapidly and there will be greater competition for supplies, pushing up prices.
- 1.4 As noted in the recent Energy Review<sup>4</sup>, the imperatives of reducing carbon emissions and ensuring security of energy supplies are closely linked. Security of supply means good access to a diverse range of available energy sources, having the infrastructure in place to transport the energy to users, and effective markets that match supply and demand as efficiently as possible. Many of the measures needed to cut carbon emissions also contribute to creating the healthy diversity of energy sources needed to meet the challenge of energy security.
- 1.5 The UK has already taken significant steps to meet the challenges of climate change and energy security. Government has introduced innovative policies, such as the Climate Change Levy and Climate Change Agreements, the Renewables Obligation and the Energy Efficiency Commitment. And we have built on our domestic policy experience to foster action at international and EU level – most notably with the introduction of the EU Emissions Trading Scheme.
- 1.6 The combination of these measures has had a substantial impact on greenhouse gas (GHG) emissions in the UK. We are one of very few countries on course to meet our commitments under the Kyoto Protocol. Indeed, we have made progress beyond this commitment: our GHG emissions are projected to be almost 20 per cent below 1990 levels during the Kyoto period 2008-12. The UK is also one of the few countries in the world that has demonstrated that it is possible to boost economic growth whilst simultaneously reducing emissions.

<sup>4</sup> The Energy Challenge – Energy Review Report 2006 (DTI, July 2006).

## A significant proportion of energy is used to heat and run our homes

- 1.7 In 2004 the UK's total carbon dioxide emissions for 2004 were 152.5 MtC. Emissions from the domestic housing sector represent around 27% of this figure – these emissions come from energy use in the home for heating, hot water, lighting and appliances. The chart below shows that the overwhelming use of energy in homes goes to heating and hot water. Over half is used for heating and around one-fifth for hot water. The recent trends in the domestic sector have been to increase use of energy for lighting and appliances, whilst energy use for cooking and hot water has been declining.
- 1.8 There is likely to be a continuation of these trends through for example, the growth in the market for home entertainment equipment such as large-screen televisions and home computers. Moreover, climate change itself may lead to further developments, for example a growth in take-up of home air conditioning units.



<sup>5</sup> Breakdown by end use as of 2003. Source: *Climate Change – The UK Programme 2006* (HM Government, March 2006).

## **We already have a significant programme of measures in place to tackle domestic energy use**

1.9 Government has in place a strong programme to secure reductions in emissions from the domestic sector through promoting energy efficiency and conservation. This programme includes: action to promote achievement of greater domestic energy efficiency by electricity and gas suppliers through the Energy Efficiency Commitment (EEC); promotion of voluntary schemes in the retail sector to encourage take-up of more energy-efficient consumer electronics products; engagement with citizens, retailers and suppliers via the Energy Savings Trust (EST); and action via the Warm Front programme and Decent Homes standard to tackle fuel poverty and energy wastage through improved home insulation and heating.

## **But we will need further action to tackle energy use in the existing stock**

1.10 These schemes have produced significant results to date. The Energy Efficiency Commitment, Warm Front and other measures to cut fuel poverty are expected together to deliver reductions in emissions of about one million tonnes of carbon by 2010.

1.11 However, if we are to deliver significant cuts in carbon to achieve our climate change targets, we will need to see a further step change in emissions from the domestic sector. Much of this will need to come through improvements to existing homes, and through influencing consumers' behaviour.

1.12 The existing buildings review, led by Communities and Local Government, has examined the scope for reducing energy and carbon in the existing housing stock. It concluded that a large cost-effective potential exists. If we did everything in existing homes that was cost-effective we would save 7MtC per annum.

## **New homes will need to make a significant contribution too**

1.13 But, to put this in context, if we built the new homes we need to accommodate the predicted population and demographic changes, and built them to current building regulation standards (which already far exceed those in the existing stock), early estimates suggest that we would need to reduce emissions by about 30MtC in the domestic sector by 2050. This estimate is based on the domestic sector taking a proportionate share of the 60% target and does not take account of potential future changes to electricity supply, nor does it reflect behavioural or other changes. However, it does give a feel for the scale of the challenge we are facing – the 7MtC we can achieve cost-effectively in the existing stock represents just less than a quarter of what might be necessary.

1.14 So we need to examine the case for environmental improvements in new homes as well, in order to minimise further increases in carbon emissions.

## Section 2: New development

### We need to tackle housing affordability by delivering more homes

- 2.1 The availability of new homes is an important policy issue. The housing market has not responded sufficiently to meet the needs of the country's ageing and growing population, leading to a significant gap between housing supply and demand. Over the last 30 years of the 20th century, housebuilding rates halved while the number of households increased by 30%. As a result, many people cannot afford a suitable standard of accommodation, and families are finding that it is increasingly difficult to get onto the housing ladder.
- 2.2 This pressure is likely to grow. The latest household projections<sup>6</sup> show that households in England will grow by 209,000 per year up to 2026, of which 72% are single person households. But in 2004/05, only around 168,000 extra homes were delivered. This gap is unsustainable. If we don't increase the supply of homes, the proportion of 30-year-old couples able to afford to buy a place of their own will drop from around half to less than a third by 2026.
- 2.3 As Kate Barker's 2004 report into housing affordability<sup>7</sup> made clear, we need additional housing provision. That is why, in the Government's response in December 2005, we set out our ambition to increase housing supply in England to 200,000 per year by 2016.

### This provides a real opportunity to deliver more sustainable homes

- 2.4 We have an overriding responsibility to ensure that these new homes are planned and built in a way that helps our strategy to cut carbon emissions. And there are synergies here.
- 2.5 Driving forward an ambitious agenda of change with our housebuilding programme also allows us to lead an emerging market in environmental technologies, pushing innovation and driving costs down. Estimates based on experience of low and zero carbon technologies indicate that costs could be reduced significantly for each doubling of installed capacity.<sup>8</sup> Industry analysts have predicted that if there were 12 million installed Micro-Combined Heat and Power (CHP) units the additional cost might fall from around £2,000 (marginal cost based on a current typical market price) to £400.<sup>9</sup>
- 2.6 And new homes are already very significantly more energy efficient than the average of the housing stock. Changes to Building Regulations in April 2006 have achieved a 40% improvement compared to pre-2002 standards, and a 70% improvement compared to pre-1990 standards, in the energy efficiency of new houses.
- 2.7 However, we believe we need to go further and faster in reducing emissions from new homes. New homes make up less than 1% of the stock every year. But, in 2050, around a third of the housing stock will have been built between now and then.

<sup>6</sup> New Projections of households for England and the Regions to 2026 – Communities and Local Government Statistical Release 2006/0042 (March 2006).

<sup>7</sup> Review of Housing Supply – Delivering Stability: Securing our Future Housing Needs (Kate Barker, March 2004).

<sup>8</sup> Based on research conducted by M. Hinnells, the international Energy Agency and the Government Performance and Innovation Unit, and Code for Sustainable Homes cost reviews, English Partnerships/Housing Corporation.

<sup>9</sup> For projections of cost reductions across a range of microgeneration technologies, see *Potential for Microgeneration – Study and Analysis* (Energy Saving Trust, December 2005)

2.8 That is why the Government has set out the ambition that we move towards zero carbon development over time. This means a transition first to *low* carbon development, through measures that drive down carbon dioxide emissions from homes, buildings and other infrastructure; and ultimately to *zero* carbon, ie zero net carbon emissions from new developments.

2.9 Within this policy framework, there are three main policy levers at our disposal that can affect energy performance of new development:

- the planning system;
- the Code for Sustainable Homes; and
- Building Regulations.

2.10 We envisage a complementary relationship between the planning system and building regulations/the Code. In considering the location and design of new development, planning can reduce the need to travel and build in provision for low carbon or renewable sources of energy supply. Building Regulations and the Code are focussed on the performance of the buildings themselves.

## **The planning system sets out the overall framework for development**

2.11 As part of this consultation we are publishing a draft Planning Policy Statement: *Planning and Climate Change* for consultation (“the PPS”).<sup>10</sup> The draft PPS describes how we expect spatial planning, regionally and locally, to help shape places with lower carbon emissions and fit for the climate they are likely to experience in the future. It sets out, in particular, how the location, siting and design of new development can contribute both to the reduction of emissions and delivery of zero carbon development, and to the shaping of sustainable communities that are resilient to the climate change now accepted as inevitable.

<sup>10</sup> Planning Policy Statement: *Planning and Climate Change* – consultation on Supplement to Planning Policy Statement 1 (Communities and Local Government, December 2006).

2.12 The PPS makes clear that spatial planning has a significant role in helping to secure enduring progress against our national emissions targets. In particular, the draft PPS expects that all planning authorities should prepare and deliver spatial strategies that:

- make a full contribution to delivering the Government's Climate Change Programme<sup>11</sup> and energy policies, and in doing so contribute to global sustainability;
- in enabling the provision of new homes, jobs, services and infrastructure and shaping the places where people live and work, secure the highest viable standards of resource and energy efficiency and reduction in carbon emissions;
- deliver patterns of urban growth that help secure the fullest possible use of sustainable transport for moving freight, public transport, cycling and walking; and, overall, reduce the need to travel, especially by car;
- secure new development and shape places resilient to the effects of climate change in ways consistent with social cohesion and inclusion;
- sustain biodiversity, and in doing so recognize that the distribution of habitats and species will be affected by climate change;
- reflect the development needs and interests of communities and enable them to contribute effectively to tackling climate change; and
- respond to the concerns of business and encourage competitiveness and technological innovation.

## **The Code for Sustainable Homes provides a mechanism for developing and demonstrating higher environmental standards**

2.13 As part of this consultation we are publishing the final version of the Code for Sustainable Homes.<sup>12</sup> The aim of the Code is to increase environmental sustainability of homes and give homeowners better information about the running costs of their homes.

2.14 The Code sets sustainability standards which can be applied to all homes. There are six levels of the Code. At each level there are minimum energy efficiency/carbon emissions and water efficiency standards. The minimum energy/carbon standards for Code level 1 are higher than those found in the minimum mandatory standards set in Building Regulations.

2.15 The Code also rewards other environmental considerations, such as sustainable construction materials, and the availability of recycling facilities, cycle spaces and home offices. These and other issues that contribute to a "sustainable home" are awarded "credits" to make up their Code rating. So the Code will contribute towards a number of environmental objectives, including waste and wider ecology issues.

<sup>11</sup> Climate Change – the UK Programme 2006 (March 2006).

<sup>12</sup> *Code for Sustainable Homes* – a step-change in sustainable home building practice (Communities and Local Government, December 2006).

- 2.16 We are proposing that assessment against the Code should start for new homes in April 2007, and we will put in place the accreditation and assessment arrangements to ensure that developers of new homes can choose, on a voluntary basis, to receive a Code assessment from that date. We will support the Code through marketing, training and discrimination activities.
- 2.17 From April 2008, after learning from the voluntary phase, we are currently minded to propose that all new homes should be required to have a mandatory Code rating, indicating whether they have been assessed and the performance of the home against the Code. We believe that mandatory rating of all new homes will encourage take-up of higher environmental standards, and will boost demand for more environmentally friendly technologies and construction methods. Before taking this step we will complete a fuller analysis of the likely costs and benefits, both environmental and economic, and will undertake a further consultation on any specific proposals.
- 2.18 In addition, a preliminary analysis of the costs and benefits of mandatory assessment of all new homes against the full code is set out in the Regulatory Impact Assessment for the Code for Sustainable Homes<sup>13</sup>. A fuller analysis will be presented as part of the proposed further consultation.
- 2.19 New homes (and in due course other homes, when they are sold or leased) will in any event require an Energy Performance Certificate under the Energy Performance in Buildings Directive which is due to be introduced from June 2007. The Certificate will provide key information about the energy/carbon performance of the home, and the methodology used will be the same as that used by the Code. So assessing the home for energy/carbon should not entail additional costs.

## **Building Regulations ensure tougher energy/carbon standards for all new homes**

- 2.20 Whilst a mandatory Code rating would help drive better environmental standards, the Code is essentially a *voluntary* set of environmental standards – we are not proposing that any development or building should be *required* to meet these higher standards (except where public funding is involved, see paragraph 2.31 below).
- 2.21 But because of the urgent and pressing need to reduce our carbon emissions to tackle climate change, as set out above, we have examined the case for making the energy/carbon aspects of the Code mandatory.
- 2.22 If we chose to do so, Building Regulations would provide the obvious route. Building Regulations set baseline mandatory national standards for the health, welfare, safety and convenience of people in and around buildings, for the accessibility of those buildings, and for the reasonable conservation of fuel and power used by those buildings.

<sup>13</sup> For a copy of the final RIA of the Code, published in December 2006, see the Consultation Section of the Department's website: [www.communities.gov.uk](http://www.communities.gov.uk)

- 2.23 Building Regulations set an overall energy/carbon target for the dwelling (known as the ‘SAP’ or Standard Assessment Procedure rating) but allow flexibility in how that standard is met. SAP target ratings can be met by: improving the fabric of the building, e.g. through better insulation and sealing of the fabric, draught-proofing of windows and doors; improving the efficiency of heating and lighting; and through the use of lower carbon fuels and heating appliances. The Code takes a similar approach, but also covers the energy/carbon use for appliances in the home.
- 2.24 Building regulations have already improved energy/carbon performance. Energy efficiency standards for new homes are 40% better than those before 2002 and 70% better than in 1990. But there is still some way to go before the UK meets the standards of the best in Europe, and before we start to move towards zero carbon buildings. We want to set out a timetable for progressively improving Building Regulations over time.
- 2.25 Many housebuilders have told us that they are prepared to deliver higher environmental standards – and indeed, that their customers are starting to demand them. The final version of the Code for Sustainable Homes that we are publishing alongside this consultation should provide a framework for housebuilders that want to deliver higher environmental standards to their customers now.
- 2.26 Many in the housebuilding industry have also made a strong case for providing as much certainty as possible about how far and fast Government wants to go in requiring higher regulatory standards in the future.
- 2.27 We therefore set out here some proposals for improving the energy performance of building regulations so that over time all new homes meet the energy/carbon standards set out in the Code. The table below shows the levels of improved energy/carbon performance that we are proposing over time. We have discussed these changes with the housebuilding industry and we want to continue to work closely with industry, local government and other stakeholders as we move towards implementation.

Date	2010	2013	2016
Energy/carbon improvement as compared to Part L (Building Regulations 2006)	25%	44%	zero carbon
Equivalent energy/carbon standard in the Code	<b>Code level 3</b>	<b>Code level 4</b>	<b>Code level 6</b>

- 2.28 We are proposing that these targets apply to homes only – not to all buildings – at this stage. We will be looking next at the best approach to reducing carbon emissions from the non-residential sector.

## **As a first step we propose a target for 2010**

- 2.29 As shown in the table above, we are proposing that the energy/carbon performance of building regulations improves by 25% by 2010. This is similar to the change proposed in the Forward Thinking and Adaptation Strategy chapters included in the June 2004 Part L consultation document<sup>14</sup> (this document proposed 20-30% improvement to be delivered at the next review) and so should be built into industry expectations.
- 2.30 It should be achievable through some further improvement in the fabric of the dwellings and in the efficiency of heating and lighting. The description of what is required to meet the energy/carbon target for a typical dwelling at Code level 3 is set out in the update of the Forward Thinking paper that will be published at the same time as this consultation.
- 2.31 We are also requiring that all new homes built by Registered Social Landlords (RSLs), or others with Housing Corporation funding, will comply with Level 3 of the Code, together with homes developed by English Partnerships or with the direct funding support from the Department's housing growth programmes. This requirement, which reflects the Labour Party manifesto commitment regarding the Code in 2005, has an important demonstration value, in showing to the wider development industry and public what can be achieved.

## **There would then be a further improvement in 2013**

- 2.32 As a next step, we are proposing that there is a further improvement to the energy/carbon performance of building regulations in 2013. This will require homes to be 44% more energy/carbon efficient as compared to 2006 levels. It will require some form of low or zero carbon energy use, which we believe will help drive the technological innovation required to get us to the next step. This could be at the development level (e.g. CHP) or at the building level (e.g. solar hot water heating). The Code document sets out what this would look like in a typical Code level 4 home.

## **Finally, by 2016, we would get to zero carbon for new homes**

- 2.33 As a final step, we are proposing that all new homes are zero carbon by 2016 – within a decade. 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 – cooking, washing and electronic entertainment appliances as well as space heating, cooling, ventilation, lighting and hot water. This will require renewable or very low carbon energy in addition to high levels of insulation, etc. Again it could be at the development or building level. The Code for Sustainable Homes sets out what this would look like in a typical Code level 6 (zero carbon) home.

<sup>14</sup> Proposals for amending Part L of the Building Regulations and Implementing the Energy Performance of Buildings Directive – A Consultation Document (ODPM, July 2004).

## We have examined the costs and benefits of this approach

- 2.34 Assuming that our new build rates meet the Government's aspirations, the above profile of energy/carbon improvements in the new stock is expected to deliver estimated savings of between 5 and 7 million tonnes of carbon (MtC) in the period to 2020 (total carbon saved between 2007 and 2020). It would be expected to save between 127 and 136 MtC over the entire period to 2050. By 2050 it would be expected to save nearly 7 MtC per annum. This is equivalent to nearly one-quarter of the 30 MtC implied if the domestic sector took a proportionate share of our national 60% emissions reduction target.
- 2.35 In current prices, and given current energy consumption patterns and fuel prices, achieving Code Level 3 will save households around £50 per year, and in achieving Code Level 4 around £100 per year, compared to current consumption levels in new houses (the partial Regulatory Impact Assessment in Annex C sets this out in more detail).
- 2.36 The principal cost comes through the increase in construction costs of meeting the energy standards of the higher levels of the Code. Work has been commissioned by the Housing Corporation and English Partnerships on the costs of delivering Code level 3, or a 25% improvement in energy/carbon levels, which estimates the costs to be around 2–3%, or around £2,000 per dwelling, on the basis of current technologies.
- 2.37 However these are estimates based on the technologies needed to improve energy standards based on conventional (brick and block) methods of construction. Some housebuilders have indicated that such improvements can be achieved without additional cost through new techniques and materials, e.g. using off-site or modern methods of construction using concrete panels. International evidence seems to support this claim (the partial Regulatory Impact Assessment in Annex C sets this out in more detail). One of the purposes of this consultation is to get improved estimates of these costs before a decision is taken about how far and fast we can deliver improved levels of energy efficiency.
- 2.38 As we move on to the higher proposed levels, the costs are inevitably more uncertain, as they will depend on the technologies that the market delivers in response to more demanding requirements, economies of scale and transforming supply chains, and the cost reductions that are thereby realised. We estimate that to reach Code level 4 we might expect additional costs to be between 4–7% of current construction costs.
- 2.39 At higher levels of the Code, newer technologies and construction methods are likely to be required that have uncertain and, at present, relatively high costs. But there is already evidence, both in the UK and internationally, of zero carbon homes being built. And, over time, there are potential opportunities for cost savings.
- 2.40 Experience of low and zero carbon technologies in other fields indicates that costs could be reduced significantly for each doubling of installed capacity.<sup>15</sup> Industry analysts have predicted that if there were 12 million installed Micro-Combined Heat and Power (CHP) units the additional cost might fall from around £2,000 (marginal cost based on a current typical market price) to £400.<sup>16</sup>

<sup>15</sup> Based on research conducted by M. Hinnells, the international Energy Agency and the Government Performance and Innovation Unit, and Code for Sustainable Homes cost review, English Partnerships/Housing Corporation.

<sup>16</sup> For projections of cost reductions across a range of microgeneration technologies, see *Potential for Microgeneration – Study and Analysis* (Energy Saving Trust, December 2005).

- 2.41 The incidence of these additional construction costs will be affected by the timescale of development. It is unlikely that the cost will be passed forward to buyers through a premium on house prices. The price of new housing is determined primarily by the second hand market.
- 2.42 New build does, however, sell at a premium over second-hand housing, but it is not clear whether this premium could be increased with higher environmental standards. Home buyers may be willing to pay an additional premium equivalent to the net present value of savings they might expect from lower fuel bills. This may lead to a small increase in the price of new build, but is likely to be negligible in terms of average house prices.
- 2.43 The remainder of any increase in construction costs would need to be either absorbed by developers or passed back to landowners. In the short-run, where developers hold land-banks,<sup>17</sup> developers have less flexibility in the costs that they face and so may have to absorb the cost themselves, which may have an impact on housing supply.
- 2.44 However, in the longer term and when developers have certainty about the additional costs that they are likely to face, they will be able to pass the cost back to the landowner through a reduction in the land price. Land values are, in effect, arrived at as a residual (i.e. development value less costs, including remediation, constructions costs, Section 106 agreements and normal profit). This should not, therefore, distort investment decisions. Apart from providing certainty for the industry, this is another reason why there is an advantage in setting a clear timetable for future environmental regulation.

## **To deliver these outcomes we will need to reform Building Regulations**

- 2.45 As explained above, building regulations only cover a subset of all the energy use and carbon emissions from a home. They cover the fabric of the buildings and how this modifies winter and summer climate, the space heating and hot water systems and some lighting. 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 – the cooking, washing and electronic entertainment appliances as well. This will require renewable or very low carbon energy in addition to high levels of insulation, etc. The Code for Sustainable Homes sets out what this would look like in a typical Code level 6 (zero carbon) home.
- 2.46 In addition, we want to ensure that Building Regulations allow sufficient flexibility where zero carbon is genuinely impossible to achieve – for example where the technological options are not available because the site is a small infill development. So we will need to define what it is reasonable to expect on a small infill site in the supporting technical guidance at that time.
- 2.47 We recognise that further reform to building and planning regulations is required to achieve zero carbon homes. This will be the subject of further consultation that will ensure that the regulations allow for innovation and for the most cost-effective solutions to energy efficiency/carbon emissions to be deployed in meeting higher standards.

<sup>17</sup> Developers hold land-banks equivalent to 3.5 years of development, according to data from Credit Lyonnais – Top 30 House Builders.

## **Planning, the Code and Building Regulations will work together to achieve the climate change outcomes**

- 2.48 Through the proposed PPS on climate change, the publication of the Code for Sustainable Homes, and through setting a timetable for further strengthening of Building Regulations, we want to bring together a set of policies that provide clarity about our policy framework for achieving zero carbon development, providing certainty for the development industry and other related businesses without over-regulating the sector. We have discussed this approach with the industry and want to continue to work closely with them as we move towards implementation.
- 2.49 So we also want to be clear about the relationship between: planning policies – which regulate the location, siting and design of development; and Building Regulations – which deal with conservation of fuel and power, health and safety, accessibility in buildings; and the Code – which addresses sustainability in homes. To the extent that there is any overlap between the sets of policies we would seek to minimise this and to provide clarity about where it is the role of central government to set standards and where local considerations should prevail.
- 2.50 But, just as it is important to avoid duplicative and conflicting regulation, it is also important to ensure that our policies do not leave gaps that would leave cost-effective carbon reduction solutions untapped. For example, different spatial levels may offer different opportunities for carbon reduction. Whilst the framework we have described should encourage site-specific technologies, such as combined heat and power installations, we should also be looking at technologies such as district heating and district cooling which would serve multiple developments.

## **We will provide as much certainty as possible on the national policy framework**

- 2.51 Historically, Building Regulations have provided a national standard for all buildings, including homes - ensuring their safety, security and latterly, their energy performance. We propose that Building Regulations, and in the case of homes, the Code, should remain a national standard against which to judge the environmental performance of buildings.
- 2.52 If we allowed every local planning authority to set different standards for building methods and materials, so that developers faced hundreds of varying standards across the country, we believe industry would find it extremely difficult to build the capacity it needs and to adapt its supply chains and practices so as to meet the challenging new national framework we are aiming for within the timetable we would like to see. And this could also jeopardise the economies of scale that can be realised by setting national environmental standards. So we might end up with a higher cost to meet our environmental goals, and greater difficulty in achieving them.
- 2.53 Such a variable approach could also mean that prices of new development would rise, and fewer homes would be built – particularly if there is a risk of authorities setting unrealistically high standards.

- 2.54 We hope that the timetable for moving to zero carbon homes we have proposed will provide the certainty and clarity that developers and local authorities have demanded. And we hope that, by showing there is an ambitious national framework in place to strengthen building standards in moving to zero carbon, local planning authorities should not need to devise their own detailed standards for the environmental performance of individual buildings.
- 2.55 However, we believe that planning authorities do have a role to play in setting local policies on the provision of low carbon and renewable sources of energy to provide the platform necessary to accommodate the increasingly high energy/carbon standards required by Building Regulations. And the draft PPS expects a high level of ambition in this regard, providing that local planning authorities should ensure that a significant proportion of the energy supply of substantial new development is gained on-site and renewably and/or from a decentralised, renewable or low-carbon energy supply. Local authorities will therefore wish to encourage the use of new technologies and building systems, and ensure that developers proposing such approaches are not disadvantaged compared to those proposing more conventional types of development.
- 2.56 This approach recognises the important role of local government in leading, shaping and supporting local strategies that help move to low-carbon living and stimulate innovation. Appropriate technologies, and their potential, will vary across different places. Judgements as to how new development should integrate with local potential, and the local vision for securing and delivering this potential, are best made locally and through the preparation of the Local Development Framework as part of the wider consideration of the infrastructure and services needed to secure sustainable communities.
- 2.57 We also understand that many local authorities want to move quickly to ensure new development delivers higher environmental standards and that, in some areas, land values will support a much faster transition than in other areas. And we want to support that effort. The draft PPS encourages local planning authorities to engage constructively and imaginatively with developers to secure the delivery of sustainable buildings and recognises there will be local circumstances that justify higher standards for particular developments.
- 2.58 The draft PPS therefore envisages that where there are demonstrable and locally specific opportunities for requiring higher levels of building performance these should be set out in advance in a development plan document. These could include, for example, where there is significant local opportunity for major development to be delivered at higher levels of the Code for Sustainable Homes. In considering and justifying any local approach, local planning authorities would be expected to have regard to a number of considerations, including whether the proposed approach was consistent with securing the expected supply and pace of housing development shown in the housing trajectory required by PPS3. The soundness of policies set out in a development plan document will be tested thoroughly during its independent examination, after which the inspector will produce a report which will be binding upon the authority.

## **This consultation affects both England and Wales**

- 2.59 This document describes the interface between the Code for Sustainable Homes, Building Regulations and the planning system based on the situation in England. Neither the Code for Sustainable Homes (so long as assessment against the Code remains voluntary) nor the proposed PPS on climate change will apply in other parts of the UK.
- 2.60 Building Regulations cover England and Wales but not Scotland or Northern Ireland. Thus, to the extent that (a) assessment against the Code is mandated under Building Regulations and (b) the Code signals the future direction of Building Regulations, this consultation also has a bearing on Building Regulations in Wales.
- 2.61 The Housing Act applies in England and Wales. Thus, to the extent that it becomes mandatory to include Code assessments in Home Information Packs, this consultation affects both England and Wales.

### **Questions:**

- Q5 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?
- Q6 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 meeting the goals we have set?
- Q7 Do you agree that all new homes should receive a rating against the standards set out in the Code for Sustainable Homes from April 2008?
- Q8 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?
- Q9 Do you think our assessment of the costs of achieving these targets is realistic? Can you offer additional supporting evidence on costs?
- Q10 We believe that a zero carbon target is the most robust framework for reducing the carbon footprint of new development. Do you agree that our 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 (e.g. on small infill developments), is there a case for carbon neutrality (i.e. taking account of offsetting measures)?
- Q11 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 district cooling?

- Q12 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?
- Q13 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 (i.e. Building Regulations and the Code) than through encouraging earlier action by individual local authorities?
- Q14 Given that the proposed PPS on climate change will apply in England but not in Wales, are there any specific implications in Wales for the future direction of Building Regulations implied by this consultation?

## Annex A: Consultation questions

**This document raises some important questions on which we are seeking input. For ease of reference the questions are repeated below.**

- Q1 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?
- Q2 Have we got the assessment of costs and benefits right?
- Q3 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?
- Q4 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?
- Q5 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?
- Q6 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 meeting the goals we have set?
- Q7 Do you agree that all new homes should receive a rating against the standards set out in the Code for Sustainable Homes should be mandatory from April 2008?
- Q8 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?
- Q9 Do you think our assessment of the costs of achieving these targets is realistic? Can you offer additional supporting evidence on costs?
- Q10 We believe that a zero carbon target is the most robust framework for reducing the carbon footprint of new development. Do you agree that our 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 (e.g. on small infill developments), is there a case for carbon neutrality (i.e. taking account of offsetting measures)?

- Q11 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 district cooling?
- Q12 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?
- Q13 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 (i.e. Building Regulations and the Code) than through encouraging earlier action by individual local authorities?
- Q14 Given that the proposed PPS on climate change will apply in England but not in Wales, are there any specific implications in Wales for the future direction of Building Regulations implied by this consultation?

## **Annex B: Consultation criteria**

**The Government has adopted a code of practice on public consultations. This consultation aims to follow the code criteria, which are set out below:**

1. Consult widely throughout the process, allowing a minimum of 12 weeks for written consultation at least once during the development of the policy.
2. Be clear about what your proposals are, who may be affected, what questions are being asked and the timescale for responses.
3. Ensure that your consultation is clear, concise and widely accessible.
4. Give feedback regarding the responses received and how the consultation process influenced the policy.
5. Monitor your department's effectiveness at consultation, including through the use of a designated consultation coordinator.
6. Ensure your consultation follows better regulation best practice, including carrying out a Regulatory Impact Assessment if appropriate.

The complete code is available on the Cabinet Office's website, address:

<http://www.cabinet-office.gov.uk/servicefirst/index/consultation.htm>

# Annex C: Partial Regulatory Impact Assessment

## BUILDING A GREENER FUTURE CONSULTATION DOCUMENT

DECEMBER 2006

### PARTIAL REGULATORY IMPACT ASSESSMENT

#### Title of Proposal

1. Measures to drive higher environmental performance in new homes and to support the UK target to reduce carbon emissions by 60%.

#### Purpose and intended effect of measure

##### *Objective*

2. The objective of the proposal is to set a timetable for moving towards zero carbon development as a contribution to meeting the UK target to reduce carbon emissions by 60% by 2050.
3. We expect that by 2050 about one-third of the housing stock will have been built since 2006. So new homes have a vital role to play in helping the UK meet its target for reducing carbon emissions.
4. We believe that both the planning system and building regulations have a part to play in driving changes in the way we design, build and locate development to achieve this agenda.
5. A key strand in achieving the Government's ambition of delivering zero carbon development is by progressively raising the standards set in Part L of the Building Regulations to be in line with key levels set in the Code for Sustainable Homes.
6. Proposals in the forward look published at the same time as the amendments to Part L in April 2006 suggested that the energy performance of Building Regulations should improve by 25-30% in 2010.
7. The timing of the move to zero carbon is necessarily provisional but we are confident that the timing of the first stage set out is realistic.
8. This partial Regulatory Impact Assessment (RIA) focuses on the rationale for the timetable for amendment of the Building Regulations to achieve Level 3 of the Code for Sustainable Homes by 2010 and zero carbon by 2016. A separate RIA for the implementation of the Code, including the possibility of mandatory assessment, has been prepared separately.

## ***Background***

9. The Stern review<sup>18</sup> reports that there is an overwhelming body of scientific evidence that climate change is already happening: current levels of carbon dioxide have pushed up global temperatures by 0.5°C already.
10. Whilst exact details about the impacts of climate change on the weather we experience and on society still contain some uncertainties, there is a clear body of economic and scientific evidence that continuing along the current path is no longer tenable and that urgent action is needed first to slow the growth in carbon emissions and then reverse it.
11. More than a quarter of the carbon dioxide emissions in the UK come from energy used to heat and light our homes. The available technology can make a significant difference to the amount of energy we use for these purposes – particularly in newly built homes, but it is clear that we need to ensure that the take-up of existing technology is faster and that we encourage the development of new technologies that can meet higher efficiency standards at more reasonable costs.
12. However it is also clear that providing enough new homes to meet demand is an important issue. Increases in longevity and the tendency for people to form more, but smaller, households means that we need additional housing provision. The most recent projections show that the number of households will grow by over 200,000 each year until 2026. Yet in 2004/05 we built only 168,000 new homes.
13. It is important that we take steps to ensure that this essential growth in housing provision is sustainable. The Code for Sustainable Homes considers the sustainability of homes in the round – setting minimum standards for energy and water efficiency as well as options on waste and materials. Standards are set above the minimum mandatory requirements in the Building Regulations and they will form the basis for the next wave of amendments to Building Regulations.
14. Building Regulations, including Part L, also apply to existing buildings in some circumstances and to commercial buildings. Many of the generic issues relating to improvements in the energy efficiency of dwellings will also apply to buildings other than dwellings. However, the characteristics of buildings that are not dwellings are much more variable, as are issues around internal heat loads, the balance between heating and cooling and so on. We will want to engage with developers and property owners in due course on how we might apply the same principles to commercial and retail developments.

## ***Rationale for Government Intervention***

15. Sir Nicholas Stern's review shows that business as usual is not a viable option. He has warned that climate change could shrink the global economy by between 5% and 20%. However, if we take action now, it would cost just 1% of global gross domestic product.

<sup>18</sup> Stern Review on the Economics of Climate Change (October 2006).

16. One of the factors that influenced the decision to revise Part L of the Building Regulations in 2005 was the need to transpose the Energy Performance of Buildings Directive into UK law by January 2006. The Directive requires that the energy performance standards should be reviewed every five years. This requirement signals further amendments in (at least) 2010 and 2015.
17. Government has an obligation to take steps to minimise the environmental impact of its ambition to improve the affordability and availability of homes. By setting a new and ambitious direction we feel that we can also help the emerging market in new technologies. By helping to drive the demand for new technologies we can help to drive innovation and reduce costs.
18. By setting a framework for amendments to Building Regulations we believe we can ensure that national standards for building performance and fabric match and support ambitions amongst local authorities and consumers. A perceived gap between building standards and these ambitions has led to planners developing local planning requirements which have blurred the lines between the spatial planning system and Building Regulations which focus on building fabric and design. By setting out the pace with which we want to move to zero carbon development we hope that we will support those ambitions, reduce the need for local policies on carbon from buildings and provide greater clarity and certainty for developers.
19. The regulatory impact assessment used to support the amendments of Part L in 2005 also took a forward look at the likely direction of future developments. It seemed likely that the level of performance improvement sought at each review would be in order of 25–30%. We would expect that four successive relative improvements of 25% would mean that by 2015 emissions would be around 30% of the levels produced by buildings to 1995 standards.

## Consultation

20. This RIA is very much an exploratory document responding to feedback received during consultation on the Code for Sustainable Homes in 2005 and on proposals to amend Part L of the Building Regulations in 2004.
21. Before any of the proposals contained within this document are implemented, a further round of formal consultation will be undertaken.

## *Within Government*

22. The Buildings Regulation Advisory Group, Defra and DTI were actively involved in the amendments to Part L which were implemented in 2005.
23. Defra, DTI, the Office of Government Commerce and the Environment Agency continue to be represented on the Code's Senior Steering Group.

## **Public**

24. Comprehensive public consultations were carried out on both the amendments to Part L of the Building Regulations and on the Code for Sustainable Homes.
25. The majority of respondents were in favour of the Code, but they wanted it to be more ambitious and proposed a range of measures that would strengthen it. As a result a number of changes were made to the Code that would strengthen it, including:
  - setting minimum standards for energy and water efficiency at every level of the Code
  - rewarding the use of low and zero carbon technologies through additional points
  - ensuring that the Code will form the basis for the next wave of improvements to the Building Regulations.
26. This partial RIA supporting the Building a Greener Future document is being used to flush out any issues surrounding this new approach to flagging up the direction of travel and key milestones in improving Building Regulations standards to support zero carbon development.
27. There will be full consultations on changes to Part L to meet Code level 3 closer to the target date to capture any emerging issues and lessons learned in the intervening period.

## **Options**

### ***What options have been identified?***

28. This RIA will be developed to examine three options for the next wave of amendments to Part L of the Building Regulations.

**Option 1** Do Nothing, i.e. do not raise the standards in 2010

**Option 2** Raise performance standards in Part L to those at Code Level 3 in 2010 and to Code Level 6 in 2016

**Option 3** As Option 2, but add a further stage of improvement in around 2013 to Code Level 4.

### ***Do nothing***

29. Option 1: This is a baseline against which the costs and benefits of Options 2 and 3 will be assessed. It effectively represents a business as usual situation. However, as set out below, there are a number of reasons why this is not considered to be a viable option.

30. The Forward Thinking and Adaptation Strategy chapters included in the June 2004 Part L consultation document proposed to move to a 20-30% improvement in the energy efficiency standards in Building Regulations at the next review. So this has already been foreshadowed by Government and should be built into industry expectations.
31. Implementation of the Energy Performance of Buildings Directive (EPBD) requires a five yearly review of standards and also seeks to “raise energy standards over the next decade, learning lessons from the standards in comparable European countries”.
32. The Stern Review has made it clear that early action is needed to reduce carbon emissions and hence minimise the impact of climate change on the global economy.
33. There is a growing imperative to constrain growth in energy demand in response to concerns about energy security. The Energy Review<sup>19</sup>, published in July 2006 explained that the UK will soon be a net importer of oil, and dependent on imported gas at a time when global demand and prices are increasing. Many of the measures needed to cut carbon emissions to address climate change also contribute to creating a healthy diversity of energy supply, and address fuel poverty through lower bills for householders.

### Code level 3 by 2010 and Code level 6 by 2016

34. Option 2 is broadly in line with Option 3b contained in the Code for Sustainable Homes consultation document<sup>20</sup> which considers costs and benefits on the basis that an announcement has been made which sets expectations about the future development of the Building Regulations. The main concerns with the proposal for a two-stage increase with a gap of eight years between the first and second amendments are that:
  - the gap between the two increments is too long to ensure that the momentum in developing cost-effective new solutions is maintained and
  - we may find ourselves out of step with changes made on the European mainland and unable to seize opportunities to be the driving force behind new technologies.

### Code level 3 by 2010, Code level 4 by 2013 and Code level 6 by 2016

35. Option 3 is a variation on Option 2 which would see a three step approach to achieving zero carbon development. The purpose of the interim step would be to provide an ongoing incentive to transform the market in renewables and low carbon technology. Using Code level 4 as an interim step also has the advantage that it is the point at which costs currently rise significantly to achieve further reductions in carbon and is the barrier that needs to be overcome.

<sup>19</sup> The Energy Challenge – Energy Review Report 2006 (DTI, July 2006).

<sup>20</sup> Proposals for introducing a Code for Sustainable Homes – A consultation paper (Office of the Deputy Prime Minister, December 2005).

## Alternative options

36. None considered at this stage

## Costs and benefits

37. This section will discuss the broad issues and assumptions in developing a full cost-benefit analysis and wherever possible provide indicative ranges. This preliminary consultation on the options for environmental performance timetable will be used to gather further quantitative evidence where available. Further elaboration of the impacts will be presented in the full RIA.
38. The preparation of this RIA is subject to a number of constraints, particularly in the context of climate change. Although there is an increasing body of scientific and economic research on the impacts of global warming, the costs of climate change remain uncertain. It is therefore difficult to determine the benefits of reducing carbon emissions with any precision. In monetising the carbon savings we have assumed the social cost of carbon to be £70 per tonne in 2000 prices.<sup>21</sup> However, the Stern Review suggested that the figure for this may be higher so we have also used the upper bound of £140 per tonne in 2000 prices as means of sensitivity testing our results.
39. Moving towards the highest performance standards is likely to involve the application of emerging technologies that have uncertain costs and applicability, leading to uncertainties about the costs of possible carbon savings. As the markets mature it is likely that costs will fall and greater certainty will be available.
40. Any assessment of the costs and benefits associated with higher standards in housebuilding in the long term is also constrained by uncertainties associated with the level of housebuilding, particularly any estimates beyond the Government's projections to 2016.
41. Finally, the higher environmental targets for Building Regulations complement a range of other government initiatives to address the challenges of climate change, including initiatives aimed at the planning system, at encouraging the adoption of technologies required to meet these standards and improving energy efficiency of buildings and policies aimed at encouraging energy efficient behaviour by consumers. Therefore, while the potential impacts can be identified, it is difficult to separate out the additional impacts of this proposal from the effects of other Government measures. Any possible quantitative and qualitative impacts identified in this RIA must therefore be viewed as indicative.

<sup>21</sup> HM Treasury and Defra, "Estimating the Social Cost of Carbon Emissions" 2002.

## Sectors Affected

42. All aspects of the housebuilding industry will be affected by the proposed options. Developers would have to make decisions about how they plan developments so as to meet the various Building Regulations targets. Housebuilders will have to adopt new technologies and techniques to meet the demands for different Code levels and the real estate sector may have to adapt to marketing homes of different standards. However, the building industry is having to do this in any case to meet new demands from customers and to match international competitors. Policy changes will contribute to increasing the rate of innovation and will provide the clarity and long-range certainty that the sector is calling for. Landowners may also be affected depending upon the degree to which costs of meeting the various Code levels are passed back to landowners through lower land prices.
43. Outside of the housebuilding industry, there are likely to be other sectors affected too. Occupants of the homes will benefit from the improvements, both financial and non-monetary, that they will receive from living in more sustainable homes. More generally the environmental benefits of reduced carbon emissions from improving the energy performance of new build will affect wider society.
44. The energy sector will be indirectly affected as improvements in energy performance of buildings will reduce the demand for energy within the domestic sector compared to the do-nothing scenario. Another sector that will be affected would be manufacturers of sustainable technologies as a result of the impact on demand for these technologies from differing levels of take-up of the Code.
45. Altering the levels of Building Regulations will have an impact on the public sector, in particular on local government, who will need to implement and monitor building standards against the new regulations.
46. There are unlikely to be any specific impacts on the voluntary and community sectors, nor are these proposals likely to adversely affect any specific group in terms of race, gender or disability. Impacts on the rural economy in the longer term are expected to be negligible but there may be some impact at the margin where rural dwellings struggle to meet Building Regulation standards due to their location, such as being off the gas network.

## Benefits

47. The benefits of these proposals can be broadly categorised into three groups: economic; social; and environmental benefits. Within these groups there are certain sectors identified that will specifically benefit. Where possible estimates of the magnitudes of the benefits have been used, drawing on available research and evidence available.

## Economic

48. The main economic benefit of options 2 and 3, compared with the do-nothing base case, is the financial savings for households of reduced energy bills as a result of the improvements in energy efficiency of the new buildings.
49. The savings to households from achieving Code level 3 range from between £30 and £75 per year, compared to the baseline, depending largely upon the size of the property. Reaching Code level 4 saves between £65 and £130 per annum compared to current standards. Achieving these standards can mainly be achieved through the adoption of high standards of insulation, improvements in heating and lighting and through the installation of renewable energy technologies such as wind turbines.
50. These estimates are based on the likely savings that could be achieved in a Code level 3 or 4 home today. Over time, however, the saving accrued will be subject to unknown variations in fuel prices, and the fuel supply mix. At higher levels of the Code, alternative fuels may be used, which will have varying prices. Biomass, for example, is currently more expensive than standard fuels such as gas, making the possible fuel bill savings relatively smaller than they might otherwise be. However, given the increased scarcity of fossil fuels and issues over energy security, the relative prices of different fuel types may change over time and the fuel bill savings from moving to renewable sources could potentially be higher in the future than indicated here. There are a number of emerging technologies that could be applied to meet the highest standards, each with variable capital costs of installation and variable running costs.
51. It is unlikely that the financial benefit to householders of lower energy bills will be offset by developers passing forward additional construction costs to buyers. The price of new housing is determined primarily by the second-hand market.
52. New-build does, however, sell at a premium over second-hand housing, but it is not clear whether this premium could be increased with higher environmental standards. Home buyers may be willing to pay an additional premium equivalent to the net present value of savings they might expect from lower fuel bills. This may lead to a small increase in the price of new-build, but is likely to be negligible in terms of average house prices.
53. There will also be economic benefits to manufacturers of sustainable technologies. Higher energy standards will require the housebuilding industry to adopt newer technologies and this increase in demand is likely to lead to increases in profit and in international competitiveness for businesses within this sector.

## Social

54. The social benefits of the proposed options are likely to be very difficult to quantify. However, experience from programmes such as Decent Homes and Warm Front suggests that improving the thermal comfort of dwellings has direct health benefits and can improve the quality of life for the occupants of the dwellings.
55. Higher environmental standards may also contribute to reducing fuel poverty. After allowing for improved thermal comfort, fuel bill savings may be made over and above comfort-taking, particularly at the higher levels of energy performance.

## Environmental

56. The key benefit of the proposal will be the reduction in carbon emissions of achieving the Code standards through Building Regulations. Compared to the baseline do-nothing case of maintaining Building Regulations at current levels, reaching Code level 3 will save for each new home built between 0.09 and 0.16 tonnes of carbon per year. Code level 4 will additionally save between 0.09 and 0.26 tonnes of carbon. Achieving Code level 6 will save between 0.08 and 0.5 tonnes of carbon per house additional to Code level 4 (between 0.4 and 0.8 tonnes compared to baseline).<sup>22</sup>
57. Assuming that new build rates meet Departmental aspirations then, by 2020 and compared to the do-nothing baseline, Option 2 has the potential to save 4.0 MtC (total carbon savings between 2007 and 2020). This is a lower bound, where energy standards are assumed to be flat and then make a step improvement in line with the dates identified. Assuming a steady progression between the target dates gives an upper bound of potential carbon savings by 2020 of 7.5 MtC (total carbon savings between 2007 and 2020) tonnes of carbon.
58. A similar assessment of Option 3 compared to the baseline do-nothing has the potential at the lower end to save 5.1 MtC tonnes of carbon and at the upper end to save 7.0 MtC tonnes of carbon (total carbon savings between 2007 and 2020).
59. By 2050, both options 2 and 3 are expected to save between 6.5 and 7.0 MtC per annum compared to the do-nothing baseline of new homes being built to current Building Regulations standards. Assuming everything else stays constant, by 2050 this reduction represents nearly one-quarter of the way towards a 60% reduction (assuming the domestic sector takes a proportionate share of our national emission reduction target). However, this figure should be treated with some caution due to the uncertainties with forecasting over such long time horizons and the possibility that other factors, such as the increasing trend in carbon emissions from domestic appliances, may mean that more is needed to be done to reach 60%.

<sup>22</sup> Cyril Sweet (2006). A Cost Review of the Draft Code for Sustainable Homes: Report for English Partnerships and the Housing Corporation.

60. Monetising these carbon savings using the central estimate of £70 per tonne (2000 prices) along with a £1 real increase per annum for the social cost of carbon gives a Net Present Value (NPV) of savings over the entire period to 2050 of approximately £5 billion. By way of a sensitivity test, if we used the upper end estimate of £140 per tonne (2000 prices) this gives a NPV of approximately £10 billion.

## Costs

61. The major cost of the options is the increase in construction costs of meeting the energy standards of the higher levels of the Code. Some work has been commissioned by the Housing Corporation and English Partnerships on the costs of delivering Code level 3, or a 25% improvement in energy/carbon levels, which estimates the costs to be around 2-3%, or around £2,000 per dwelling, on the basis of current technologies.
62. However, these are estimates based on the technologies needed to improve energy standards based on conventional (brick and block) methods of construction. Some developers have indicated that such improvements can be achieved without additional cost through new techniques and materials, e.g. using off-site or modern methods of construction using concrete panels. One of the purposes of this consultation is to get improved estimates of these costs before a decision is taken about how far and how fast we can deliver improved levels of energy efficiency.
63. Estimates of the cost of reaching Code level 4 range between 4-7% of construction costs. This largely corresponds to similar estimates in other countries although there is some anecdotal evidence to suggest that these costs could be reduced through the adoption of different construction methods.
64. Within these ranges the variability is driven by different dwelling sizes and types, the technologies used in construction to meet the different standards (some of which are more easily applied in some cases than others), the use of emerging technologies such as microgeneration and whether these are applied at district/development or individual property level, and construction methods.
65. At the higher levels, newer technologies and construction methods are likely to be required that have uncertain and, at present, relatively high costs. Over time, there are potential opportunities for cost savings relative to the costs presented in this RIA. These could include: identification of more innovative approaches; discounts arising from bulk purchases; reduction in cost of existing materials and products arising from their widespread adoption; or emergence and development of new technologies and construction methods better suited to meeting the required performance standards.
66. The incidence of additional construction costs may fall on different groups, depending on the timescale of development. As has been discussed, it is possible that some of the cost may be passed forward to households through a price premium on houses but that this is unlikely as the price of new housing is determined primarily by the second-hand market.

67. The remainder of any increase in construction costs would need to be either absorbed by developers or passed back to landowners. In the short-run, where developers hold land-banks, developers have less flexibility in the costs that they face and so may have to absorb the cost themselves, which may have an impact on housing supply.
68. However, in the longer term (after around three years, when developers have used up their landbanks) and when developers have certainty about the additional costs that they are likely to face, they will be able to pass the cost back to the landowner through a reduction in the land price. Land values are, in effect, arrived at as a residual (i.e. development value less costs, including remediation, constructions costs, Section 106 agreements and normal profit). This should not, therefore, distort investment decisions.
69. Another cost of these options is the reduction in revenue for energy companies as a result of the reduction in demand for domestic energy compared with the do-nothing scenario. The total loss of revenue will be equivalent to the aggregate savings made by households, although the impact on profits will be offset by the reduction in costs of supplying the electricity.
70. A further cost of the policy will be in implementing, monitoring and enforcing the new Building Regulations. Given that the systems are already in place, the additional costs to local authorities of implementing these new standards is not expected to be too great. The main cost will be in supplying guidance on what is expected and training in assessing the new standards.

## International Comparison

71. The UK is often regarded as lagging behind its European neighbours in the energy standards set for dwellings. However the methodologies used to determine standards differ widely and their expression in a variety of measurement units make direct comparison complex.
72. What is clear is that most European countries have been steadily raising the standards for the energy efficiency of dwellings in recent years and it seems that they are likely to continue to do so for the foreseeable future, in part to achieve environmental and social policy goals (emissions reduction, affordable energy services) and in part for reasons of energy policy (reductions in demand for fossil fuels).

73. The costs of achieving the improvement in standards is in most cases modest. Increases in building costs in the order of a few percentage points are typical. Estimates for the premium required for construction of low-carbon / low-energy houses of different types vary from zero to around 7 per cent. In some cases the balance between the increase in the cost of the building and the time taken for the householder to recoup that increase in costs is used as a benchmark. Payback periods of 3-5 years have been quoted. There is widespread agreement from exemplar sustainable housing projects in numerous countries (eg Sweden, Germany, USA) that savings in energy consumption and other running costs considerably outweigh any premium paid in initial construction costs. See box below.
74. There is clearly scope for work to achieve a better understanding of how standards differ and what the costs of achieving these have been as part of future assessments of the standards adopted in the UK.

**Examples of international developments: costs and benefits**

1. Recent Swedish sustainable building projects reported on by the Energy Saving Trust (<http://www.ukswedensustainability.org/lessonslearnt.jsp>) show that:

- very highly insulated/airtight buildings can do without conventional space heating, allowing diversion of investment to insulation and window quality and to renewables
- construction costs for sustainable homes are comparable to those for conventional developments, and running costs are lower; lifetime savings are projected to outweigh greatly any premium costs in construction
- energy consumption in new-build terrace houses in Gothenburg is one-third of that in comparable conventional houses, while construction cost is said to be ‘about the same’.

2. There are now some 6000 buildings (including many homes) built to the voluntary German Passivhaus standard. This is ultra-low energy design, with no conventional space heating and energy demand lower than 15 kilowatt-hours per square metre per year. The Passivhaus standard relies on very high levels of insulation and airtightness and on passive heating/cooling.

The Vauban housing development in Freiburg is based on the Passivhaus standard and is said to have had similar construction costs to homes built to German national Building Regulations.

The Passivhaus technical website estimates the average premium in construction cost over conventional build at 7%, with the savings coming in much reduced energy demand and reductions in other running costs.

## **Small Firms' Impact Test**

75. A full SFIT will be completed before any decision is taken on the future shape of these policies.

## **Competition Assessment**

76. Not completed. The aim is to encourage efficiency and innovation in renewable energy technologies and in materials used in construction to improve energy efficiency of dwellings.
77. This will be achieved by setting performance standards and allowing business to develop approaches to meet performance standards.
78. Setting a clear time frame for changes in standards should encourage investment in research and development and minimise the risk of inappropriate innovation.

## **Enforcement, Sanctions and Monitoring**

79. No changes should be required as these proposals would use the existing building control mechanisms and require no additional work.



