Latest Government Drivers for Sustainability

Ant Wilson
Director and Fellow
Building Engineering

12th September 2012
What is Sustainable Development?

“Sustainable Development is meeting the needs of the present generation, without prejudicing the ability of future generations to meet their own needs.”

The Brundtland Report: Our Common Future, World Commission on Development
Oslo, 20 March 1987
Win, Win, Win – The Triple Bottom Line

How Today's Best-Run Companies Are Achieving Economic, Social, and Environmental Success—and How You Can Too

Andrew W. Savitz
WITH KARL WEBER
Drivers 4 Sustainability

Rio Earth Summit 1992 to Johannesburg Earth Summit 2002

**The Rio ‘Earth Summit’, 1992**

**Events:** The UN Conference on Environment and Development, more widely known as the Earth Summit, was held in Rio de Janeiro, Brazil, during 3–14 June 1992. The Rio Earth Summit was unprecedented for a UN conference, in terms of both its size and the scope of its concerns. Some 172 countries were represented at Rio, 108 by their head of state or government. This made the Earth Summit the largest gathering of state leaders in history. In addition, some 2,400 representatives of NGOs were present, and about 17,000 people attended a parallel NGO ‘Global Forum’. Almost 10,000 on-site journalists helped to convey the Summit’s message around the world. With the involvement of about 30,000 people in total, the Earth Summit was the largest environmental conference ever held. The Earth Summit resulted in two international agreements, two statements of principles, and an action agenda on worldwide sustainable development:

- The Convention on Biological Diversity
- The Framework Convention on Climate Change (FCCC)
- The Principles for the Sustainable Management of Forests
- The Rio Declaration on Environment and Development
- Agenda 21 (the UN’s programme of action from Rio).

**Briefing**

**Earth Summit**

from Rio to Johannesburg

**Basic texts**

**Agenda 21** provides a comprehensive action programme to attain sustainable development and address both environmental and developmental issues in an integrated manner at global, national and local levels.

**Chapter 14 of Agenda 21** recognizes and confirms the importance of the sustainable agriculture and rural development (SARD) concept. Adopted at the Rio Earth Summit in 1992, it sets out the programmes and specific actions needed to promote SARD, and represents the commitment of UN member nations to implement these programmes and actions.
DECC - The Road to Copenhagen


- Energy supply: 25.9%
- Transport: 13.4%
- Agriculture: 13.5%
- Forestry: 17.4%
- Waste and wastewater: 2.8%
- Residential and commercial buildings: 7.9%
- Industry: 19.4%
Who Leads the Current Policy Mix?
Coaltion Government to be “Greenest Ever”

This Government is committed to becoming the ‘greenest ever.’ In support of our wider policy goals we need to be leading by example. This action plan sets out our priorities around leadership, efficiency transparency and accountability that will underpin the reform of Government’s operations and procurement.

Our Objectives

• To drive the agenda on transparency in the environmental performance of government by facilitating the release of departmental and supplier data;

• To improve the sustainability of the supply base so that government builds stronger relationships with its suppliers and manages risk and cost effectively;

• To reform government sustainable delivery by developing new tools and solutions which deliver greater efficiency and provide a lead across government and other sectors.
Drivers 4 Sustainability

Rio Earth Summit +20 at Rio de Janeiro, Brazil, on June 20-22, 2012

Following negotiations by 193 countries, the Deputy Prime Minister has set out the UK’s ambition to build on the Rio+20 agreement. Key points from the agreement for the UK are:

- Agreement to establish Sustainable Development Goals (SDGs). The UN General Assembly will appoint a group of representatives from 30 countries by September to develop the goals, with the UK’s aim for these goals to focus on food, water and energy.
- Recognition of the importance of the green economy as a way to help nations to grow sustainably, and to help eradicate poverty.
- A call from all nations at Rio+20 for businesses to adopt ways of reporting on their sustainability performance.
- Recognition by all nations at Rio+20 of the importance of including the value of natural capital and social wellbeing into decision making will be given real force by having a UN commission undertake the work on GDP plus.
- Oceans to be given greater prominence with a commitment to extend marine conservation to on the high seas.
Government Policy
The Governments Push for Sustainable Development is Not New

Environment and Quality of Life
‘Our future, our choice!’

GREEN WEEK
Conference and Exhibition
Brussels, 24-28 April 2001
Second announcement

DON’T CHOOSE BRITAIN

Planning for Sustainable Development: Towards Better Practice
Drivers 4 Sustainability

10 Themes for Action in Construction
Re-use existing built assets
Design for minimum waste
Aim for lean construction
Minimise energy in construction
Minimise energy in use
Do not pollute
Preserve and enhance bio-diversity
Conserve water resources
Respect people and their local environment
Set Targets
UK Government’s Headline Sustainability Indicators

<table>
<thead>
<tr>
<th>Economy</th>
<th>Society</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic prosperity</td>
<td></td>
<td>Natural resource use</td>
</tr>
<tr>
<td>Long term unemployment</td>
<td></td>
<td>Life &amp; biodiversity</td>
</tr>
<tr>
<td>Poverty</td>
<td></td>
<td>Water availability</td>
</tr>
<tr>
<td>Knowledge &amp; skills</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example of traffic light assessments

<table>
<thead>
<tr>
<th>Greenhouse gas emissions from UK production</th>
<th>Long term</th>
<th>Since 2000</th>
<th>Latest year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenhouse gas emissions</td>
<td>December 1990</td>
<td>Increased (2011)</td>
<td></td>
</tr>
</tbody>
</table>
What is... Sustainable Development?

Sustainable development is the blending of economic development, social justice and environmental quality to create maximum public benefit over the long term.

Sustainability cannot ever be fully achieved; improvement is always possible. Sustainable development questions traditional assumptions and approaches, broadening perspectives and seeking new ways of doing things to create a ‘win,win,win’ situation.
Sustainable and Secure Building Act 2004

2004 Chapter 22

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To ensure fast access over slow connections, large documents have been segmented into 'chunks'. Where you see a 'continue' button at the bottom of the page of text, this indicates that there is another chunk of text available.
Atmospheric CO2 at Mauna Loa Observatory

June CO2 | Year Over Year | Mauna Loa Observatory
Data: NOAA-ESRL

CO2 Goal = 350

CO2 in Atmosphere:
395.77 ppm
June 2012

June 1986 = 349.90

data posted July 5, 2012

CO2Now.org
The scientific evidence is now overwhelming: Climate change presents very serious global risks, and it demands an urgent global response.

The benefits of strong, early action on climate change outweigh the costs.

The damages from climate change will accelerate as the world gets warmer.

There is still time to avoid the worst impacts of climate change if strong collective action starts now.
### Strategy For Sustainable Construction – June 2008

<table>
<thead>
<tr>
<th>Chapter Headings</th>
<th>Overarching Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procurement</td>
<td>To achieve improved whole life value through the promotion of best practice construction procurement and supply side integration, by encouraging the adoption of the Construction Commitments in both the public and private sectors and throughout the supply chain.</td>
</tr>
<tr>
<td>Design</td>
<td>The overall objective of good design is to ensure that buildings, infrastructure, public spaces and places are buildable, fit for purpose, resource efficient, sustainable, resilient, adaptable and attractive. Good design is synonymous with sustainable construction. Our aim is to achieve greater use of design quality assessment tools relevant to buildings, infrastructure, public spaces and places.</td>
</tr>
<tr>
<td>Innovation</td>
<td>To enhance the industry’s capacity to innovate, thereby increasing the sustainability of both the construction process and resultant assets.</td>
</tr>
<tr>
<td>People</td>
<td>An increase in organisations committing to a new approach to training (e.g. Skills Pledges, training for Investors in People or other business support) and Continuous Professional Development (CPD). Reduce the incidence rate of fatal and major injury by 10% year on year from 2000 levels.</td>
</tr>
<tr>
<td>Better Regulation</td>
<td>A 25% reduction in the administrative burden to the private and third sectors, a 30% reduction in the public sector by 2010.</td>
</tr>
</tbody>
</table>

### The ‘Ends’

<table>
<thead>
<tr>
<th>Climate Change Mitigation</th>
<th>Climate Change Adaptation</th>
<th>Water</th>
<th>Biodiversity</th>
<th>Waste</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducing total UK carbon dioxide (CO2) emissions by at least 60% on 1990 levels by 2050 and by at least 26% by 2020. Within this, Government has already set out its policy that new homes will be zero carbon from 2016, and an ambition that new schools, public sector non-domestic buildings and other non-domestic buildings will be zero carbon from 2016, 2018 and 2019 respectively.</td>
<td>To develop a robust approach to adaptation to climate change, shared across Government.</td>
<td>To assist with the Future Water vision to reduce per capita consumption of water in the home through cost effective measures, to an average of 130 litres per person per day by 2030, or possibly even 120 litres per person per day depending on new technological developments and innovation.</td>
<td>That the conservation and enhancement of biodiversity within and around construction sites is considered throughout all stages of a development.</td>
<td>By 2012, a 50% reduction of construction, demolition and excavation waste to landfill compared to 2008.</td>
<td>That the materials used in construction have the least environmental and social impact as is feasible both socially and economically.</td>
</tr>
</tbody>
</table>
Global CO₂ Emissions From Fossil Fuels and Cement Production

CO₂ Emissions per Country From Fossil Fuels and Cement Production


Top 25 CO₂-emitting countries in 1990, 2000 and 2011
## CO₂ Emissions per Person in Different Counties

<table>
<thead>
<tr>
<th></th>
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<tr>
<td></td>
<td></td>
<td>1990</td>
<td>2000</td>
<td>2010</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>Annex I*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>5420</td>
<td>19.7</td>
<td>20.8</td>
<td>17.8</td>
<td>17.3</td>
<td>-2.4</td>
</tr>
<tr>
<td>EU27</td>
<td>3790</td>
<td>9.2</td>
<td>8.4</td>
<td>7.8</td>
<td>7.5</td>
<td>-1.7</td>
</tr>
<tr>
<td>Germany</td>
<td>810</td>
<td>12.9</td>
<td>10.5</td>
<td>10.2</td>
<td>9.9</td>
<td>-3</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>470</td>
<td>10.3</td>
<td>9.3</td>
<td>8.1</td>
<td>7.5</td>
<td>-2.8</td>
</tr>
<tr>
<td>Italy</td>
<td>410</td>
<td>7.5</td>
<td>8.1</td>
<td>6.9</td>
<td>6.7</td>
<td>-0.8</td>
</tr>
<tr>
<td>France</td>
<td>360</td>
<td>6.9</td>
<td>6.9</td>
<td>6.1</td>
<td>5.7</td>
<td>-1.2</td>
</tr>
<tr>
<td>Poland</td>
<td>350</td>
<td>8.2</td>
<td>7.5</td>
<td>8.8</td>
<td>9.1</td>
<td>0.9</td>
</tr>
<tr>
<td>Spain</td>
<td>300</td>
<td>5.9</td>
<td>7.6</td>
<td>6.3</td>
<td>6.4</td>
<td>0.5</td>
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<tr>
<td>Netherlands</td>
<td>160</td>
<td>10.8</td>
<td>10.9</td>
<td>10.5</td>
<td>9.8</td>
<td>-1</td>
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<tr>
<td>Russian Federation</td>
<td>1830</td>
<td>16.5</td>
<td>11.3</td>
<td>12.4</td>
<td>12.8</td>
<td>-3.7</td>
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<tr>
<td>Japan</td>
<td>1240</td>
<td>9.5</td>
<td>10.1</td>
<td>10</td>
<td>9.8</td>
<td>0.3</td>
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<tr>
<td>Canada</td>
<td>560</td>
<td>16.2</td>
<td>17.9</td>
<td>16</td>
<td>16.2</td>
<td>0</td>
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<tr>
<td>Australia</td>
<td>430</td>
<td>16.0</td>
<td>18.6</td>
<td>17.9</td>
<td>19.0</td>
<td>3</td>
</tr>
<tr>
<td>Ukraine</td>
<td>320</td>
<td>14.9</td>
<td>7.2</td>
<td>6.7</td>
<td>7.1</td>
<td>-7.8</td>
</tr>
</tbody>
</table>

Source of population data: UNPD, 2010 (WPP Rev. 2010)
* Annex I countries: industrialised countries with annual reporting obligations under the UN Framework Convention on Climate Change (UNFCCC) and emission targets under the Kyoto Protocol. The United States has signed but not ratified the protocol, and thus the US emission target in the protocol has no legal status.
# Drivers 4 Sustainability

## CO₂ Emissions per Person in Different Counties

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<tr>
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<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>9700</td>
<td>2.2</td>
<td>2.8</td>
<td>6.6</td>
<td>7.2</td>
<td>5</td>
<td>227%</td>
<td>287%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>1970</td>
<td>0.8</td>
<td>1.0</td>
<td>1.5</td>
<td>1.6</td>
<td>0.8</td>
<td>100%</td>
<td>198%</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>South Korea</td>
<td>610</td>
<td>5.9</td>
<td>9.7</td>
<td>12.2</td>
<td>12.4</td>
<td>6.5</td>
<td>110%</td>
<td>141%</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>490</td>
<td>0.9</td>
<td>1.4</td>
<td>2</td>
<td>2</td>
<td>1.1</td>
<td>122%</td>
<td>210%</td>
<td>24%</td>
<td></td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>460</td>
<td>10.2</td>
<td>13.0</td>
<td>15.8</td>
<td>16.5</td>
<td>6.3</td>
<td>62%</td>
<td>181%</td>
<td>43%</td>
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<tr>
<td>Brazil</td>
<td>450</td>
<td>1.5</td>
<td>2</td>
<td>2.2</td>
<td>2.3</td>
<td>0.8</td>
<td>53%</td>
<td>106%</td>
<td>24%</td>
<td></td>
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<tr>
<td>Mexico</td>
<td>450</td>
<td>3.7</td>
<td>3.8</td>
<td>3.9</td>
<td>3.9</td>
<td>0.2</td>
<td>5%</td>
<td>45%</td>
<td>27%</td>
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</tr>
<tr>
<td>Iran</td>
<td>410</td>
<td>3.7</td>
<td>5.2</td>
<td>5.4</td>
<td>5.5</td>
<td>1.8</td>
<td>49%</td>
<td>100%</td>
<td>27%</td>
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<tr>
<td>South Africa</td>
<td>360</td>
<td>7.3</td>
<td>6.9</td>
<td>7.1</td>
<td>7.2</td>
<td>-0.1</td>
<td>-1%</td>
<td>35%</td>
<td>27%</td>
<td></td>
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<tr>
<td>Taiwan</td>
<td>270</td>
<td>6.2</td>
<td>10.5</td>
<td>11.7</td>
<td>11.8</td>
<td>5.6</td>
<td>90%</td>
<td>119%</td>
<td>13%</td>
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<tr>
<td>Thailand</td>
<td>230</td>
<td>1.6</td>
<td>2.7</td>
<td>3.3</td>
<td>3.3</td>
<td>1.7</td>
<td>106%</td>
<td>155%</td>
<td>18%</td>
<td></td>
</tr>
</tbody>
</table>

Source of population data: UNPD, 2010 (WPP Rev. 2010)

* Annex I countries: industrialised countries with annual reporting obligations under the UN Framework Convention on Climate Change (UNFCCC) and emission targets under the Kyoto Protocol. The United States has signed but not ratified the protocol, and thus the US emission target in the protocol has no legal status.
UK Environmental Tax Will Increase
The Treasury has identified the following taxes as environmental, and these will comprise the baseline against which the Government’s commitment to increase the proportion of environmental tax revenue will be measured.

- Climate Change Levy
- Aggregates Levy
- Landfill Tax
- EU Emissions Trading System (EU ETS)
- Carbon Reduction Commitment (CRC-EES)
- Carbon Price Support
Mandatory Green House Gas (GHG) Reporting Announced
All businesses listed on the Main Market of the London Stock Exchange will have to report their levels of greenhouse gas emissions from the start of the next financial year under plans announced by the Deputy Prime Minister at the Rio+ 20 Summit.

The UK is the first country to make it compulsory for companies to include emissions data for their entire organisation in their annual reports.

The new regulations will be introduced from April 2013.

They will be reviewed in 2015, before ministers decide whether to extend the approach to all large companies from 2016.
Drivers 4 Sustainability

Greenhouse Gas Emissions Regulation 2013


DRAFT STATUTORY INSTRUMENTS

2013 No. 0000

COMPANIES

CLIMATE CHANGE

The Greenhouse Gas Emissions (Directors’ Reports) Regulations 2013

Made - - - - ***

Coming into force - - ***

The Secretary of State makes the following Regulations in exercise of the powers conferred by sections 416(4) and 1292(1) of the Companies Act 2006(a).

In accordance with sections 473(3)(b) and (c) and 1290 of the Companies Act 2006 a draft of this instrument has been laid before Parliament and approved by a resolution of each House of Parliament.

Citation, commencement and expiry

1.—(1) These Regulations may be cited as the Greenhouse Gas Emissions (Directors’ Reports) Regulations 2013 and come into force on [**********]

(2) They cease to have effect on [**********]

Interpretation

2. In these Regulations—

"company" means a quoted company within the meaning of section 385(2) of the Companies Act 2006;

"emissions" has the meaning given in section 97 of the Climate Change Act 2008(b);

"relevant information" means information about emissions required to be included in a directors’ report under regulation 3.

"Some of carbon dioxide equivalent" has the meaning given in section 93(2) of the Climate Change Act 2008.

(a) 2006 c. 45.
(b) 2008 c. 37.
Coalition Government is Mainstreaming Sustainable Government

Mainstreaming sustainable development

The Government’s vision and what this means in practice

Department for Environment, Food and Rural Affairs
February 2011

The coalition Government is committed to sustainable development (SD). This means making the necessary decisions now to realise our vision of stimulating economic growth and tackling the deficit, maximising wellbeing and protecting our environment, without negatively impacting on the ability of future generations to do the same. These are difficult times and tough decisions need to be made. This Government believes in going beyond the short term with eyes fixed firmly on a long term horizon shift in relation to our economy, our society and the environment.

This refreshed vision and our commitments build on the principles that underpinned the UK’s 2005 SD strategy, by recognising the needs of the economy, society and the natural environment, alongside the use of good governance and sound science.

Sustainable development recognises that the three ‘pillars’ of the economy, society and the environment are interconnected. The Government has initiated a series of growth reviews to put the UK on a path to strong, sustainable and balanced growth. Our long term economic growth relies on protecting and enhancing the environmental resources that underpin it, and paying due regard to social needs. As part of our commitment to enhance wellbeing, we will start measuring our progress as a country, not just by how our economy is growing, but by how our lives are improving; not just by our standard of living, but by our quality of life.

2.1 Sustainable Development in Government

Good progress has been made in the last 16 years since the first UK SD strategy was published. However, the time has come to move SD beyond being considered as a separate, ‘green’ issue which is a priority for only a few Government departments. Just as leading businesses recognise that sustainability is a core strategic issue and not just a ‘nice to have’, this Government wants to mainstream SD so that it is central to the way we make policy, run our buildings and purchase goods and services.

Ministers have agreed an approach for mainstreaming SD which in broad terms consists of providing Ministerial leadership and oversight, leading by example, embedding SD into policy and transparent and independent scrutiny.
Mainstreaming Sustainable Development
The Government’s vision and what this means in practice:

The coalition Government is committed to sustainable development. This means making the necessary decisions NOW to realise our vision of stimulating economic growth and tackling the deficit, maximising wellbeing and protecting our environment, without negatively impacting on the ability of future generations to do the same. These are difficult times and tough decisions need to be made. This Government believes in going beyond the short term with eyes fixed firmly on a long term horizon shift in relation to our economy, our society and the environment.

The Government has initiated a series of growth reviews to put the UK on a path to strong, sustainable and balanced growth. Our long term economic growth relies on protecting and enhancing the environmental resources that underpin it, and paying due regards to social needs. As part of our commitment to enhance well being, we will start measuring our progress as a country, not just by how our economy is growing, but by how our lives are improving; not just by our standard of living, but by our quality of life.
Better Government Regulations

Regulation

23. Regulation has been, and will remain, an important tool in encouraging businesses to develop greener products and services.

24. The Government will work to ensure that the system of environmental regulation is effective, proportionate, coherent, clear and implemented in a way that minimises burdens on businesses, in line with the principles of better regulation.
Drivers 4 Sustainability

ZERO Carbon Building Definition

Policy based on a 3-fold mix of:

**Fabric Energy Efficiency** – reducing energy demand through eg high insulation, glazing, efficient lighting

**On site measures** – microgeneration and connected heat (‘Carbon Compliance’); and

**Off-site measures** – to make up for carbon which can’t be mitigated in or on the home (‘Allowable Solutions’).

- Allowable solutions to be priced relative to long term cost of carbon
- Regulation threshold to cover emissions from heating, hot water, lighting but not appliances.
- Govt will use ZC Hub report as basis for consultation on future Building Regs.
- Govt will introduce ZC Hub fabric energy efficiency standard in future Building Regs.
**Drivers 4 Sustainability**

**England 2013 Part L Consultation – New Non-domestic Buildings**

<table>
<thead>
<tr>
<th>Target aggregate reduction</th>
<th>8% Resultant target reduction</th>
<th>11% Resultant target reduction</th>
<th>14% Resultant target reduction</th>
<th>20% Resultant target reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warehouse (distribution)</td>
<td>A2 5.6%</td>
<td>B2 8.9%</td>
<td>C3 16.1%</td>
<td>C3+1.6% 20.1%</td>
</tr>
<tr>
<td>Office (Deep-plan, AN)</td>
<td>A2 11.9%</td>
<td>A2 11.9%</td>
<td>A2 11.9%</td>
<td>A3+1.6% 23.4%</td>
</tr>
<tr>
<td>Warehouse (Retail)</td>
<td>A2 6.8%</td>
<td>B2 8.0%</td>
<td>C3 13.6%</td>
<td>C3+1.6% 16.2%</td>
</tr>
<tr>
<td>Office (Shallow-plan, AN)</td>
<td>A2 12.2%</td>
<td>A2 12.2%</td>
<td>A2 12.2%</td>
<td>A3+1.6% 23.1%</td>
</tr>
<tr>
<td>Hotel (5-star)</td>
<td>A2 8.8%</td>
<td>C2 11.0%</td>
<td>C2 11.0%</td>
<td>C3+1.6% 15.0%</td>
</tr>
<tr>
<td>Secondary School</td>
<td>A2 8.3%</td>
<td>C2 11.0%</td>
<td>C2 11.0%</td>
<td>C3+1.6% 17.4%</td>
</tr>
<tr>
<td>PV required on notional building</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Panel area equivalent to 1.6% of floor area applied to roof of each building</td>
</tr>
</tbody>
</table>

Panel area equivalent to 1.6% of floor area applied to roof of each building.
Criterion 5: Provision of Information
• Regulations require that information on how to use the building efficiently should be made available
  • New guidance suggests this should include the data used to calculate the DER & TER
    – To facilitate any future analysis that may be required by the owner when altering the building
    – E.g. electronic copy of TER/DER input file
• Improvement recommendations to be provided with the on-construction EPC to identify how dwelling may be further improved
Background to Existing Non-Domestic Buildings

- CO₂ emissions by end use (2005)
- CO₂ emissions by end use sectors (2005)
Drivers 4 Sustainability

New Dwellings EPC from 6th April 2012 – Pages 1 & 2
Drivers 4 Sustainability

New Dwellings EPC from 6th April 2012 – Pages 3 & 4

[Energy Performance Certificate page]

Recommendations
The measures below will improve the energy performance of your dwelling. The performance ratings after improvements listed below are cumulative, that is, they assume the improvements have been installed in the order that they appear in the table. Further information about the recommended measures and other simple actions you could take today to save money is available at www.direct.gov.uk/savingenergy. Before installing measures, you should make sure you have secured the appropriate permissions, where necessary. Such permissions might include permission from your landlord (if you are a tenant) or approval under Building Regulations for certain types of work.

Measures with a green tick are likely to be fully financed through the Green Deal, when the scheme launches. Since the cost of the measures should be covered by the energy they save. Additional support may be available for homes where solid wall insulation is recommended. If you want to take up measures with an orange tick be aware you may need to contribute some payment up-front.

<table>
<thead>
<tr>
<th>Recommended measures</th>
<th>Indicative cost</th>
<th>Typical savings per year</th>
<th>Rating after improvement</th>
<th>Green Deal finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase loft insulation to 270 mm</td>
<td>£100 - £350</td>
<td>£47</td>
<td>E 51</td>
<td>✔</td>
</tr>
<tr>
<td>Cavity wall insulation</td>
<td>£500 - £1,500</td>
<td>£179</td>
<td>D 50</td>
<td>✔</td>
</tr>
<tr>
<td>Draught proofing</td>
<td>£80 - £120</td>
<td>£26</td>
<td>D 40</td>
<td>✔</td>
</tr>
<tr>
<td>Low energy lighting for all fixed outlets</td>
<td>£50</td>
<td>£43</td>
<td>C 79</td>
<td>✔</td>
</tr>
<tr>
<td>Replace boiler with new condensing boiler</td>
<td>£2,200 - £3,000</td>
<td>£339</td>
<td>C 79</td>
<td>✔</td>
</tr>
<tr>
<td>Solar water heating</td>
<td>£4,000 - £6,000</td>
<td>£34</td>
<td>C 79</td>
<td>✔</td>
</tr>
<tr>
<td>Replace single glazed windows with low-E</td>
<td>£3,300 - £6,500</td>
<td>£41</td>
<td>C 79</td>
<td>✔</td>
</tr>
</tbody>
</table>

Alternative measures
There are alternative measures below which you could also consider for your home:
- External insulation with cavity wall insulation
- Biomass boiler (Exempted Appliance if in Smoke Control Area)
- Air or ground source heat pump
- Micro CHP

Choosing the right package
Visit www.epcadvisor.direct.gov.uk, our online tool which uses information from this EPC to show you how to save money on your fuel bills. You can use this tool to personalise your Green Deal package.

Green Deal package
Loft insulation: Total savings of £587
Cavity wall insulation
Draught proofing
Condensing boiler
Electricity/gas / other fuel savings £587 / £587 / £587

About this document
The Energy Performance Certificate for this dwelling was produced following an energy assessment undertaken by a qualified assessor, accredited by AAA Energy Assessors Ltd. You can get contact details of the accreditation scheme at www.aaa.co.uk, together with details of their procedures for confirming authenticity of a certificate and for making a complaint. A copy of this EPC has been lodged on a national register. It will be publicly available and some of the underlying data may be shared with others for the purposes of research, compliance and direct mailing of relevant energy efficiency information. The current property owner and/or tenant may opt out of having this information disclosed.

Assessor's accreditation number: AAA_123456
Assessor's name: John Smith
Phone number: 030 5555 1234
E-mail address: john.smith@aa.com
Related party disclosure: No related party

Further information about Energy Performance Certificates can be found under Frequently Asked Questions at www.epcregister.com.

About the impact of buildings on the environment
One of the biggest contributors to global warming is carbon dioxide. The energy we use for heating, lighting and power in homes produces over a quarter of the UK’s carbon dioxide emissions.

The average household causes about 6 tonnes of carbon dioxide every year. Based on this assessment, your home currently produces approximately 9.5 tonnes of carbon dioxide every year. Adopting the recommendations in this report will reduce emissions and protect the environment. If you were to install these recommendations you could reduce this amount by 5.5 tonnes per year. You could reduce emissions even more by switching to renewable sources.

The environmental impact rating is a measure of a home’s impact on the environment in terms of carbon dioxide (CO2) emissions. The higher the rating the less impact it has on the environment.

Your home’s heat demand
For most homes, the vast majority of energy costs derive from heating the home. Where applicable, this table shows the energy that could be saved in this property by insulating the loft and walls, based on typical energy use (shown within brackets as it is a reduction in energy use).

Heat demand                Existing dwelling | Impact of loft insulation | Impact of cavity wall insulation | Impact of solid wall insulation
Space heating (kWh per year) | 22,154 | (1179) | (4535) | N/A
Water heating (kWh per year) | 2,792  | N/A   | N/A    | N/A

Addendum
This dwelling may have narrow cavities and so requires further investigation to determine which type of cavity wall insulation is best suited.
Driving Sustainability

Welsh Building Regulations Part L in Consultation

Llywodraeth Cymru
Welsh Government

Home > Consultation > Building Regulations Part L Review

Open  Closed

Consultation

Building Regulations Part L Review

We want your views on changes to Part L – the Conservation of Fuel and Power - of the Building Regulations and changes to the Approved Documents.

Start of consultation: 31/07/2012
End of consultation: 23/10/2012

The Building Regulations control certain types of building work and ensure that buildings meet certain standards of health, safety, welfare, convenience and sustainability.

In setting standards for building work the Building Regulations influence emission reductions in new buildings and existing buildings in Wales.

We want to improve the energy performance of buildings in Wales through the Building Regulations. This will help Wales

Related Links

Building Regulations
Energy
Sustainable development

Search open consultations:

Browse open consultations:

1 Closing soon (8)
Recently added (10)

Business and economy (0)
Children and young people (0)
Culture and sport (0)
Education and skills (9)
Environment and countryside (3)
Equality and diversity (0)
Scotland’s National Performance Framework

National Performance Framework – Measurement Set

<table>
<thead>
<tr>
<th>Purpose Targets</th>
<th>Increase Scotland’s Economic Growth</th>
<th>Improve Productivity</th>
<th>Improve Economic Participation</th>
<th>Increase Population Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategies</td>
<td>Increase the number of businesses</td>
<td>Increase exports</td>
<td>Improve skills and training</td>
<td>Improve productivity and efficiency</td>
</tr>
<tr>
<td>National Indicators</td>
<td>Improve economic performance</td>
<td>Reduce alcohol related hospital admissions</td>
<td>Reduce the percentage of adults who smoke</td>
<td>Reduce crime victimisation rates</td>
</tr>
<tr>
<td>National Outcomes</td>
<td>Increase the proportion of young people in learning, training or work</td>
<td>Improve health and well-being</td>
<td>Reduce the proportion of individuals living in poverty</td>
<td>Reduce deaths on Scotland’s roads</td>
</tr>
</tbody>
</table>

Visiting the website www.scotlandperforms.com to track latest progress.
Drivers 4 Sustainability

Scotland’s Own Planning and Building Regulations

Climate Change (Scotland) Act 2009
2009 asp 12
CONTENTS

PART I
EMISSIONS REDUCTION TARGETS
1 The 2050 target
2 The interim target

3 Annual targets
4 Setting annual targets
5 Advice before setting annual targets
6 Modifying annual targets etc.
7 Advice before modifying annual targets etc.

8 The domestic effort target
9 Progress towards targets
10 Greenhouse gases

11 The baseline
12 Baselines for additional greenhouse gases

13 The net Scottish emissions account
14 Restriction on use in 2010-2017 of carbon units purchased by Scottish Ministers
15 Attribution of emissions to Scotland

Building Standards Division Circular
NOTES ON THE IMPLICATIONS OF DIRECTIVE 2010/31/EU ON THE ENERGY PERFORMANCE OF BUILDINGS (RECAST)
JULY 2011
Drivers 4 Sustainability

Five Key Sustainability Areas

- Living Within Environmental Limits
  Respecting the limits of the planet’s environment, resources and biodiversity – to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations.

- Ensuring a Strong, Healthy and Just Society
  Meeting the diverse needs of all people in existing and future communities, promoting personal wellbeing, social cohesion and inclusion, and creating equal opportunity for all.

- Achieving a Sustainable Economy
  Building a strong, stable and sustainable economy which provides prosperity and opportunities for all, and in which environmental and social costs fall on those who impose them (polluter pays), and efficient resource use is incentivised.

- Promoting Good Governance
  Actively promoting effective, participative systems of governance in all levels of society – engaging people’s creativity, energy, and diversity.

- Using Sound Science Responsibly
  Ensuring policy is developed and implemented on the basis of strong scientific evidence, whilst taking into account scientific uncertainty (through the precautionary principle) as well as public attitudes and values.
The Energy, Climate Change and Planning Acts 2008

The Climate Change Act sets a mandatory carbon emissions reduction targets of 80% on 1990 levels by 2050, a move the UK has led the world on. It also sets up a new Climate Change Committee, regular 5 year carbon budgets, the potential for the inclusion of shipping and aviation emissions in targets, charges on single-use carrier bags, and regular mandatory reporting of progress towards climate change adaptation.
Low Carbon Transition Plan

The UK Government has a five point plan to tackle climate change.

1. Protecting the public from immediate risk
Climate change is already happening in the UK - the ten hottest years on record have all been since 1990. The Government has more than doubled spending on flood protection since 1997, developed a heat wave plan in the NHS and is helping communities affected by coastal erosion.

2. Preparing for the future
Whatever is done to reduce emissions in the future, past emissions mean that some climate change is already inevitable. The UK Climate Projections will be used to help plan for a future with a changing climate. Factoring climate risk into decision making means, for example, changing the way we build our houses and infrastructure, managing water better and adjusting farming practices.

3. Limiting the severity of future climate change through a new international climate agreement
To limit global temperature increase to

4. Building a low carbon UK
To play our part in reducing global emissions, Britain needs to become a low carbon country. The 2008 Climate Change Act made Britain the first country in the world to set legally binding ‘carbon budgets’, aiming to cut UK emissions by 34% by 2020 and at least 80% by 2050 through investment in energy efficiency and clean energy technologies such as renewables, nuclear and carbon capture and storage.

This White Paper sets out the UK’s transition plan for building a low carbon UK: cutting emissions, maintaining secure energy supplies, maximising economic opportunities and protecting the most vulnerable.

5. Supporting individuals, communities and businesses to play their part
Everyone has a role to play in tackling climate change, from reducing their own emissions to planning for adaptation. Building on our ‘Act on CO2’ Information campaign, the Government is providing...
Drivers 4 Sustainability

Delivering Low Carbon Buildings

• UK low carbon transition plan – key targets

<table>
<thead>
<tr>
<th>Year</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>Wind onshore and offshore production over 4GW of power</td>
</tr>
<tr>
<td>2010</td>
<td>Government publishes a high level vision for a future smart grid</td>
</tr>
<tr>
<td>2011</td>
<td>Third round of leases for 250GW offshore wind sites awarded</td>
</tr>
<tr>
<td>2012</td>
<td>Shortlist of possible Severn Tidal schemes published</td>
</tr>
<tr>
<td>2013</td>
<td>New planning regime for infrastructure planning</td>
</tr>
<tr>
<td>2014</td>
<td>Commission begins</td>
</tr>
<tr>
<td>2015</td>
<td>Anticipated first deployment of wave and tidal energy demonstration projects under the Marine Renewables Deployment Fund</td>
</tr>
<tr>
<td>2016</td>
<td>Returns to the Renewables Obligation are introduced</td>
</tr>
<tr>
<td>2017</td>
<td>Government makes a decision on Severn Tidal scheme</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>Levy on electricity suppliers to fund CCG demonstration projects in place</td>
</tr>
<tr>
<td>2010</td>
<td>Commissioning of Wave Hub energy sourcing centre in Cornwall and first deployment of wave energy devices</td>
</tr>
<tr>
<td>2011</td>
<td>Expansion of wave and tidal energy sourcing sites in Northumbria and Orkney completed</td>
</tr>
<tr>
<td>2012</td>
<td>The cap for the EU Emissions Trading System starts to be tightened every year from now</td>
</tr>
<tr>
<td>2013</td>
<td>The power sector starts paying for every tonne of carbon emitted by purchasing allowances in the EU Emissions Trading System auctions</td>
</tr>
<tr>
<td>2014</td>
<td>Construction of first new nuclear power stations expected to be underway</td>
</tr>
<tr>
<td>2015</td>
<td>First UK commercial scale carbon capture and storage demonstration projects for support across the EU</td>
</tr>
<tr>
<td>2016</td>
<td>The EU will have selected 12 carbon capture and storage demonstration projects by 2015</td>
</tr>
<tr>
<td>2017</td>
<td>Plans show first new nuclear power station operational</td>
</tr>
<tr>
<td>2018</td>
<td>Around 30% of electricity is generated from renewable sources</td>
</tr>
<tr>
<td>2019</td>
<td>Up to four carbon capture and storage demonstration projects operational in the UK</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>880,000 people work in the green sector</td>
</tr>
<tr>
<td>2010</td>
<td>Government provides £14 billion of targeted support for low carbon industries in the world</td>
</tr>
<tr>
<td>2011</td>
<td>Central Government departments take on carbon budgets for their own estates and operations</td>
</tr>
<tr>
<td>2012</td>
<td>First sale of allowances for the Carbon Reduction Commitment begins</td>
</tr>
<tr>
<td>2013</td>
<td>Central government buildings will be 16% more efficient than in 1999/00</td>
</tr>
<tr>
<td>2014</td>
<td>Emissions from large businesses and public sector become capped under the Carbon Reduction Commitment</td>
</tr>
<tr>
<td>2015</td>
<td>Current Climate Change Agreements begin</td>
</tr>
<tr>
<td>2016</td>
<td>1.2m people could be working in the green sector</td>
</tr>
<tr>
<td>2017</td>
<td>Low carbon economy could be worth £160bn a year in UK and £4.3trn a year globally</td>
</tr>
<tr>
<td>2018</td>
<td>The NHS expects to have reduced its carbon footprint by 10% compared to today</td>
</tr>
<tr>
<td>2019</td>
<td>All new schools proposed to be zero carbon (subject to consultation and confirmation)</td>
</tr>
<tr>
<td>2020</td>
<td>Climate Change Agreements extension to 2017 and 2018</td>
</tr>
<tr>
<td>2021</td>
<td>Carbon Reduction Commitment second capped phase starts</td>
</tr>
<tr>
<td>2022</td>
<td>Government ambition for all new non-domestic buildings to be zero carbon (subject to further work)</td>
</tr>
<tr>
<td>2023</td>
<td>New nuclear power stations could create or sustain up to 9000 jobs during the course of construction and operation (including supply chains)</td>
</tr>
<tr>
<td>2024</td>
<td>Carbon Reduction Commitment second capped phase starts</td>
</tr>
<tr>
<td>2025</td>
<td>Government ambition for all new public sector (non-domestic) buildings to be zero carbon (subject to further work)</td>
</tr>
<tr>
<td>2026</td>
<td>Up to half a million additional jobs in the UK renewable energy sector, including supply chains</td>
</tr>
<tr>
<td>2027</td>
<td>Central government departments and wider public sector will have cut their greenhouse gas emissions by 30% from 1990/00</td>
</tr>
</tbody>
</table>
Drivers 4 Sustainability

Innovation & Growth Team Low Carbon Construction

Final Report

Autumn 2010

For photo credits, see back cover
Fit-for Purpose Building Regulations

6.3.4.2 Fit-for-purpose building regulations

Developments in Building Regulations are driving unprecedented change in the new building industry, through the zero carbon target for housing and the forthcoming revisions to Part L in 2013 and 2016. They are likely to drive similar change in the new non-domestic buildings, given the Coalition Government’s support for the aspiration that all new non-domestic buildings should be zero carbon from 2019.

However, regulation has not had the same impact on existing buildings. As a result it is likely that opportunities to make significant improvements in the performance of existing buildings – at a change of tenancy for example – are being missed, and higher carbon emissions are being “locked-in”.
Government Carbon Plan – March 2011

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Chapter 10: Building the case for global ambition with key countries and international institutions 62

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Chapter 13: Action in Northern Ireland, Scotland and Wales 79
Saving Energy and Reducing Emissions in all Buildings

CHAPTER 3: SAVING ENERGY IN HOMES AND COMMUNITIES

CHAPTER 4: REDUCING EMISSIONS FROM BUSINESS AND INDUSTRY
## Carbon Plan 2011 Statements

<table>
<thead>
<tr>
<th>Date</th>
<th>Date</th>
<th>Description</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr 2011</td>
<td>Apr 2011</td>
<td>Subject to consultation, publish detailed implementation plan leading to full roll out [of Smart Meters], * beginning in summer 2012</td>
<td>DECC</td>
</tr>
<tr>
<td>Oct 2011</td>
<td>Jan 2012</td>
<td>Consult on secondary legislation to enable the Green Deal, including the new obligation on energy companies</td>
<td>DECC</td>
</tr>
<tr>
<td>2016</td>
<td>Ongoing</td>
<td>Introduction of zero carbon build standard for new homes</td>
<td>DCLG</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Date</th>
<th>Description</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 2012</td>
<td>Oct 2012</td>
<td>Extend Display Energy Certificates to commercial buildings</td>
<td>DCLG/DECC</td>
</tr>
<tr>
<td>Apr 2011</td>
<td>Apr 2011</td>
<td>Develop policies to enable application of Green Deal to the commercial sector, alongside household offer</td>
<td>DECC</td>
</tr>
<tr>
<td>Apr 2011</td>
<td>Apr 2011</td>
<td>Publish report outlining abatement potential, barriers and opportunities for key energy intensive sectors</td>
<td>BIS/DECC</td>
</tr>
<tr>
<td>Apr 2011</td>
<td>Apr 2011</td>
<td>Provide certainty and clarity for business and investors by launching a roadmap to a green economy with BIS and DECC, including by using insights from behavioural science</td>
<td>Defra</td>
</tr>
<tr>
<td>Apr 2011</td>
<td>May 2011</td>
<td>Publish a Natural Environment White Paper setting out measures to: protect wildlife, promote green spaces and wildlife corridors; value natural capital, complementing national accounts; and produce an analysis of the state of the UK's natural asset base (the National Ecosystems Assessment)</td>
<td>Defra</td>
</tr>
<tr>
<td>May 2011</td>
<td>May 2011</td>
<td>Design of Green Investment Bank complete and published</td>
<td>BIS</td>
</tr>
</tbody>
</table>

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Developing Carbon Measurement Tools

WHOLE LIFE CARBON

- Products Components Process Buildings → Raw Data
- Standard Methodology ‘Calculators’ e.g. CEN TC350 → Performance Data
- Design tools created by industry
- Standard adopted across industry

OPERATIONAL CARBON

- Products Components Buildings → Raw Data
- Standard Methodology ‘Calculators’ e.g. SAP and S-BEM → Performance Data

Activities completed

Activities underway or to be completed
BSRIA’s New Embodied Carbon – January 2011
Low Carbon Innovation Group

Drivers 4 Sustainability
Box 5.3  Review of Building Regulations

The review of Part L of the Building Regulations (due to be completed 2013) takes forward the Government commitments towards zero carbon new buildings and to improving the energy efficiency of existing buildings. The review will look specifically at:

- performance standards for dwellings and non-domestic buildings
- improving compliance
- ‘as built’ performance
- whether to require additional energy efficiency improvement to existing buildings as a consequence of undertaking other major works (e.g. an extension).

A public consultation is planned for December 2011 and DCLG has set-up four working groups to bring together initial views from across industry and consumer groups and submit their proposals to Government by July.
**Measures to Maximise the Benefits of Low Carbon Construction**

<table>
<thead>
<tr>
<th>Measures</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating, ventilation and air conditioning</td>
<td>Condensing boilers, Heating controls, Under-floor heating, Heat recovery systems, Mechanical ventilation (non-domestic), Flue gas recovery devices</td>
</tr>
<tr>
<td>Building fabric</td>
<td>Cavity wall insulation, Loft insulation, Flat roof insulation, Internal wall insulation, External wall insulation, Draught proofing, Floor insulation, Heating system insulation (cylinder, pipes), Energy efficient glazing and doors</td>
</tr>
<tr>
<td>Lighting</td>
<td>Lighting fittings, Lighting controls</td>
</tr>
<tr>
<td>Water heating</td>
<td>Innovative hot water systems, Water efficient taps and showers</td>
</tr>
</tbody>
</table>
**The Carbon Plan: Delivering Our Low Carbon Future – December 2011**

Even in these tough times, moving to a low carbon economy is the right thing to do, for our economy, our society and the planet. This plan sets out how Coalition Government policies put us on track to meet our long term commitments. The Green Deal will help cut energy bills, the Green Investment Bank will attract new investment, and our reforms to the electricity market will generate jobs in new low carbon industries. Climate change requires global action; every country needs to play its part. This Carbon Plan shows that the UK is prepared to govern in the long term interests of the country and build a coalition for change.

David Cameron
Prime Minister

Nick Clegg
Deputy Prime Minister

In June 2011, the Coalition Government enshrined in law a new commitment to have greenhouse gas emissions, on 1990 levels, by the mid-2020s. This Carbon Plan sets out how we will meet this goal in a way that protects consumer bills and helps to attract new investment in low carbon infrastructure, industries and jobs.

By 2020, we will complete the ‘easy wins’ that have helped emissions to fall by a quarter since 1990. By insulating all remaining cavity walls and loft, while continuing to roll out more efficient condensing boilers, we will cut the amount consumers spend on heating by around £2 billion a year. Having fallen by a quarter in the last decade, average new car emissions will fall by a further third in the next, as internal combustion engines continue to become more efficient. Emissions from power stations, already down a quarter since 1990, will fall a further 40%, with most existing coal-fired power stations closing.

Over the next decade, we must also prepare for the future. The 2020s will require a change of gear. Technologies that are being demonstrated or deployed on a small scale now will need to move towards mass deployment. By 2030, up to around a half of the heat used in our buildings may come from low carbon technologies such as air- or ground-source heat pumps. Electric or hydrogen fuel cell cars will help to reduce vehicle emissions to less than half today’s levels. Now low carbon power stations – a mix of carbon capture and storage, renewables and nuclear power – will be built. In the 2020s, we will run a technology race, with the least-cost technologies winning the largest market share. Before then, our aim is to help a range of technologies bring down their costs so they are ready to compete when the starting gun is fired.

The transition to a low carbon economy will require investment. But by insulating our homes better, and driving more fuel efficient cars, we will use less energy, offsetting the funding needed for low carbon energy. By investing in more diverse energy sources, we will be less vulnerable to fossil fuel price spikes. And by investing in industries that suit our geography and skills, such as offshore wind and carbon capture and storage, we will gain a long-term comparative advantage in industries with a big future.

This plan shows that moving to a low carbon economy is practical, achievable and desirable. It will require investment in new ways of generating energy, not a sacrifice in living standards. But turning it into reality will require business, government and the public pulling in the same direction. We face big choices on infrastructure and investment. I hope over the next year this plan can help us to forge a new national consensus on our energy future.

Chris Huhne
Secretary of State for Energy and Climate Change
The Climate Change Act 2008 and the Carbon Budget Framework

The Climate Change Act established a legally binding target to reduce the UK’s greenhouse gas emissions by at least 80% below base year levels by 2050, to be achieved through action at home and abroad. To drive progress and set the UK on a pathway towards this target, the Act introduced a system of carbon budgets which provide legally binding limits on the amount of emissions that may be produced in successive five-year periods, beginning in 2008. The first three carbon budgets were set in law in May 2009 and require emissions to be reduced by at least 34% below base year levels in 2020.

The fourth carbon budget, covering the period 2023–27, was set in law in June 2011 and requires emissions to be reduced by 50% below 1990 levels.

This report sets out the proposals and policies for meeting the first four carbon budgets.

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<tr>
<td>Carbon budget level (million tonnes carbon dioxide equivalent (MtCO₂eq))</td>
<td>3,018</td>
<td>2,782</td>
<td>2,544</td>
<td>1,950</td>
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<tr>
<td>Percentage reduction below base year levels</td>
<td>23%</td>
<td>29%</td>
<td>35%</td>
<td>50%</td>
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Changes to Planning Policy for Climate Change – Nov 2010

planning for climate change -
guidance and model policies for local authorities

Planning & Climate Change Coalition
November 2010

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18. Planning Policy Statement 23: Planning and Pollution Control (3 November 2004)
34. Letter to Chief Planning Officers: Planning Obligations and Planning Registers (3 April 2002)
39. Letter to Chief Planning Officers: The Planning Bill – delivering well designed homes and high quality places (23 February 2009)
41. Letter to Chief Planning Officers: New powers for local authorities to stop ‘garden-grabbing’ (15 June 2010)
42. Letter to Chief Planning Officers: Area Based Grant: Climate Change New Burdens (14 January 2010)
43. Letter to Chief Planning Officers: The Localism Bill (15 December 2010)
44. Letter to Chief Planning Officers: Planning policy on residential parking standards, parking charges, and electric vehicle charging infrastructure (14 January 2011)
1.2. EU policy objectives and the buildings sector

In January 2007, the Commission proposed a comprehensive climate and energy package\(^2\) containing targets of 20-20-20% reduction of energy consumption and greenhouse gas emissions, and increased share of renewables by 2020. This was endorsed by the 2007 Spring European Council. These targets have been adopted in the light of the mounting scientific evidence of climate change, high energy prices and the growing import energy dependency and its possible geo-political repercussions. The reduction of energy consumption can clearly make a significant contribution to achieving these targets. The buildings sector provides many cost-efficient opportunities for action, while at the same time contributing to the welfare of EU citizens.
Drivers 4 Sustainability

European 2020 Vision for Energy

MEETING ALL THREE “20-20-20 BY 2020” GOALS BECOMES A MATTER OF URGENCY

- Reduce greenhouse gas levels by 20%
- Increase share of renewables to 20%
- Reduce energy consumption by 20%

Current trend to 2020: 20%
Energy Performance of Buildings - What Does It Do For You?

The EPBD drives requirements for Building Regulations, Energy Performance and Display Energy Certificates, Plant inspections. The recent ‘recast’ places additional requirements on both the public and private sector to be implemented soon.

Recast is 31 Articles over 16 pages
And five annexes over 7 pages
Drivers 4 Sustainability

EPBD – Recast 2010 Articles 3 - 10

Article 3
Adoption of a methodology for calculating the energy performance of buildings

Article 4
Setting of minimum energy performance requirements

Article 5
Calculation of cost-optimal levels of minimum energy performance requirements

Article 6
New buildings

Article 7
Existing buildings

Article 8
Technical building systems

Article 9
Nearly zero-energy buildings

Article 10
Financial incentives and market barriers
EPBD2 Article 9 – Nearly Zero-Energy Buildings

Article 9

Nearly zero-energy buildings

1. Member States shall ensure that:

(a) by 31 December 2020, all new buildings are nearly zero-energy buildings; and

(b) after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings.

Member States shall draw up national plans for increasing the number of nearly zero-energy buildings. These national plans may include targets differentiated according to the category of building.

2. Member States shall furthermore, following the leading example of the public sector, develop policies and take measures such as the setting of targets in order to stimulate the transformation of buildings that are refurbished into nearly zero-energy buildings, and inform the Commission thereof in their national plans referred to in paragraph 1.

3. The national plans shall include, inter alia, the following elements:

(a) the Member State’s detailed application in practice of the definition of nearly zero-energy buildings, reflecting their national, regional or local conditions, and including a numerical indicator of primary energy use expressed in kWh/m² per year. Primary energy factors used for the determination of the primary energy use may be based on national or regional yearly average values and may take into account relevant European standards;

(b) intermediate targets for improving the energy performance of new buildings, by 2015, with a view to preparing the implementation of paragraph 1;

(c) information on the policies and financial or other measures adopted in the context of paragraphs 1 and 2 for the promotion of nearly zero-energy buildings, including details of national requirements and measures concerning the use of energy from renewable sources in new buildings and existing buildings undergoing major renovation in the context of Article 13(4) of Directive 2009/28/EC and Articles 6 and 7 of this Directive.
Draft Energy Bill 22nd May 2012

Contents

Foreword by the Secretary of State for Energy and Climate Change

Section 1 - Summary

Section 2 - Introduction

Section 3 - Key elements of the Bill

- Electricity Market Reform
- Energy Strategy and Policy Statement
- Office of Nuclear Regulation
- Offshore Transmission
- Government Pipeline and Storage System

Section 4 - Draft Energy Bill

Section 5 - Explanatory Notes

Section 6 - Summary Impact Assessment

Glossary
The Government is committed to achieving its climate change and renewables targets, including a 34 per cent reduction in its CO2 emissions by 2020 (relative to 1990); at least an 80 per cent reduction by 2050; and ensuring that by 2020, 15 per cent of the energy consumed in the United Kingdom comes from renewable sources.

Moving to a secure, more efficient, low-carbon energy system in a cost-effective way is extremely challenging, but is achievable. It will require major investment in modern technologies: to renovate our buildings; to provide for the electrification of much of our heating, industry and transport; and to move to cleaner power generation. It will also require major changes in the way energy is used by individuals, by industry, and by the public sector.

The Energy Bill will implement the Electricity Market Reforms (EMR); clarify the role of the regulator, Ofgem; establish an Office for Nuclear Regulation (ONR); make changes to the offshore transmission regulatory framework; and make provisions for the potential sale of Government Pipeline and Storage System (GPSS).
Adapting to Climate Change – June 2009

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Adapting to a Changing Climate

Climate change is already happening so we must adapt

- Warmer, wetter winters
- Hotter, drier summers
- More uncertainty
- More extreme weather

Maximum mean summer temperatures: Central estimate, high emissions
Annual Mean Temperature for Three UK Regions

- London
- North West England
- North Scotland

Year


Mean temperature (°C)

6 7 8 9 10 11 12
Reduction in Heating Demand from Weather over 45 Years
Drivers 4 Sustainability

Increase in Cooling Demand from Weather over 45 Years

The graph illustrates the increase in cooling degree days for different regions over a 45-year period, from 1961 to 2006. The regions include:

- London
- East of England
- South East England
- East Midlands
- West Midlands
- Yorkshire and Humberside
- South West England
- North West England
- Wales
- North East England
- Northern Ireland
- West Scotland
- North Scotland
- East Scotland

The data shows a significant increase in cooling demand over time, especially in regions like London and the East of England.
The main points for the first quarter of 2012:

- Total energy production was 11% per cent lower than in the first quarter of 2011. This decline in output is due to falls in petroleum and gas production as a result of maintenance work and slowdowns on a number of fields, which resulted in net import dependency of total energy of 38 per cent. In addition nuclear output was down but there was strong growth in renewables.

- Oil production fell by 13 per cent when compared with the first quarter of 2011.

- Natural gas production was 14 per cent lower than the first quarter of 2011. Gas imports fell by 6 per cent, reflecting lower demand, with shipped imports of LNG falling by 50 per cent, due to increased production from Norwegian fields.

- Coal production in the first quarter of 2012 was 12 per cent lower than the first quarter of 2011. Coal imports were 21 per cent higher and generators’ demand for coal was up by 19 per cent.

- Total primary energy consumption for energy uses fell by 2 1/2 per cent. However, when adjusted to take account of weather differences between the first quarter of 2011 and the first quarter of 2012, primary energy consumption fell by 1 per cent.

- Final energy consumption was provisionally 2 1/2 per cent lower than in the first quarter of 2011. Transport consumption rose by 1 1/2 per cent, whilst industrial consumption fell by 8 per cent, domestic consumption fell by 2 1/2 per cent and other final users consumption fell by 1 1/2 per cent.

- Total deliveries of the key transport fuels were up 1 per cent when compared to the same period last year. In particular, sales of DERV and motor spirit both increased, which reflects increased demand in March in anticipation of a potential tanker drivers’ strike.

- Electricity generated in the first quarter of 2012 fell by 3 1/2 per cent, from 103.1 TWh a year earlier to 99.5 TWh, the lowest first quarter level of generation since 1998.

- Of electricity generated in the first quarter of 2012, gas accounted for 27 per cent (its lowest share in the last fourteen years) due to high gas prices, whilst coal accounted for 42 per cent. Nuclear generation accounted for 17 per cent of total electricity generated in the first quarter of 2012, a decrease from the 19 per cent share in the first quarter of 2011.

- Renewables’ share of electricity generation increased to 11 per cent from the 8 per cent share in the first quarter of 2011. Hydro generation increased by 43 per cent on the first quarter of 2011 as a result of very high winter rainfall. Over the same period, offshore wind generation increased by 50 per cent, whilst onshore wind generation rose by 51 per cent due to higher wind speeds on average than the same quarter in the previous year. Overall renewable generation was up 39 per cent.

- In the first quarter of 2012, 432 MW of capacity joined the Feed in Tariff scheme, increasing the total by two-thirds, to 1,091 MW, approximately 8% per cent of all renewable installed capacity. Of this increase, sub-4 kW retrofitted solar P/Vs contributed 279 MW.
The UK Production and Consumption of Energy 1970-2010
The UK Production of Primary Fuels 1995-2011
The UK Value of Net Exports of Fuel 1970-2010 (Economic)

) ‘Free on board’ basis and at current prices.
Production and Consumption of Primary Fuels in the UK in 2011

Note: Includes non-energy use of petroleum and gas. Differences between consumption and production are made up by foreign trade, marine bunkers and stock changes.
Final Energy Consumption for UK in 2011 (Dukes - 26/7/2012)

by user:
- Iron and steel industry 1%
- Transport sector 37½%
- Other final users 11½%
- Other industries 17½%

by fuel:
- Petroleum 48%
- Natural gas 29¼%
- Electricity 18½%
- Other 4½%
The UK Percentage Shares of Energy 1970-2011
UK Heat and Electricity Demand in 2010

- **Heat**
- **Electricity**

**GW**

Heat/Electricity (GW)

January - December
Electricity Demand and Generation in Great Britain

GB Electricity Demand and Generation, w/c Monday 12 July 2010

- Pumped Storage
- Wind
- Hydro
- Interconnector
- Oil
- Coal
- Gas
- Nuclear
Changes in Electrical Demand on the National Grid

England v Germany Sunday 27th June 2010 ko 15:00
Result 1-4

National Grid Demand (MW)

Time

1430 1445 1500 1515 1530 1545 1600 1615 1630 1645 1700 1715 1730

15:00 Kick-off

15:45 Half Time 1020MW

16:49 Full Time 640MW
Drivers 4 Sustainability

UK Electricity Generation by Fuel Type – Changes Within a Year

ELECTRICITY: QUARTER 1 2012

Electricity generated

Q1 2011

- Renewables 7.7%
- Other 1.2%
- Coal 34.1%
- Gas 37.2%
- Oil 0.8%
- Nuclear 18.9%

Q1 2012

- Renewables 11.1%
- Other 1.3%
- Coal 42.3%
- Gas 26.8%
- Oil 1.2%
- Nuclear 17.3%
Renewable Electricity Generation in the UK 2000 – 2011

- Total Hydro
- Landfill Gas
- Other Bioenergy
- Onshore Wind
- Offshore Wind

Contribution of renewable sources to electricity generated (TWh)

Renewables’ share of electricity generation provisionally fell from 6.7 per cent in 2009 to 6.6 per cent in 2010.

On the 2008 EU Renewable Energy Directive basis, renewables’ share of gross electricity consumption increased from 6.6 per cent in 2009 to 7.3 per cent in 2010. On the 2001 EU Renewables Directive basis, renewables’ share is 7.2 per cent (in these measures, hydro and wind generation have been normalised 2).

Total renewable electricity generation rose by 0.4 per cent in 2010. Offshore wind generation increased by 74.8 per cent. Onshore wind generation fell by 7.7 per cent due to low wind speeds (ten months of 2010 saw lower wind speeds than the 10-year average), whilst hydro fell by 32.4 per cent due to low rainfall.

Total renewable electricity capacity increased by 12 per cent between 2009 and 2010. Onshore wind capacity increased by 14 per cent (476 MW) and offshore wind capacity increased by 42 per cent (400 MW).
Projected New Electrical Energy Generation in UK to 2015

Chart 6.1 Projected cumulative new build by plant type for MPPs, 2010 to 2025.
Drivers 4 Sustainability

BP’s Energy Outlook 2030

World energy demand (billions of tonnes of oil equivalent)

<table>
<thead>
<tr>
<th>Year</th>
<th>1990</th>
<th>2010</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.1bn</td>
<td>12.0bn</td>
<td>16.6bn</td>
</tr>
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</table>

World energy demand: OECD/Non-OECD (tonnes of oil equivalent)

<table>
<thead>
<tr>
<th>Year</th>
<th>OECD</th>
<th>Non-OECD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>5.6bn</td>
<td>6.4bn</td>
</tr>
<tr>
<td>2030</td>
<td>5.8bn</td>
<td>10.9bn</td>
</tr>
</tbody>
</table>

Energy Outlook 2030
Data at a glance

January 2012

Transport fuel 2030
Breakdown of energy type making up transport fuel

- Oil 87%
- Biofuels 7%
- Gas 4%
- Coal 1%
- Electricity 1%

Average fuel economy of new cars (miles per US gallon)

- 2010: 35
- 2030: 55

Share of fuel 1990-2030
(% shares of world energy use)

<table>
<thead>
<tr>
<th>Year</th>
<th>Renewables*</th>
<th>Nuclear</th>
<th>Hydroelectric</th>
<th>Coal</th>
<th>Natural gas</th>
<th>Oil</th>
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<tbody>
<tr>
<td>1990</td>
<td>0.4</td>
<td>5.6</td>
<td>6.0</td>
<td>27.3</td>
<td>21.8</td>
<td>38.9</td>
</tr>
<tr>
<td>2030</td>
<td>6.3</td>
<td>6.0</td>
<td>6.8</td>
<td>27.7</td>
<td>25.9</td>
<td>27.2</td>
</tr>
</tbody>
</table>

China and India’s share of world energy (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>China</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>2030</td>
<td>34%</td>
<td></td>
</tr>
</tbody>
</table>

Annual rate of increase in renewable energy* use 2010-2030

8%

*Renewable energy includes biofuels

Projections taken from BP’s Energy Outlook 2030. The full report is available at www.bp.com/energyoutlook
BREEAM New Construction 2011 and RIBA Work Stages
Change to Energy Credits in BREEAM 2011

Assessment Criteria

The following is required to demonstrate compliance:

1. Calculate an Energy Performance Ratio for New Constructions \( \text{EPR}_{\text{NC}} \) using BREEAM’s Ene 01 calculator.
2. The \( \text{EPR}_{\text{NC}} \) calculation takes account of the following parameters:
   a. the building’s operational energy demand,
   b. the energy delivered (consumption) and
   c. the total resulting \( \text{CO}_2 \) emissions.
3. The calculation is determined using the following performance data from modelling:
   i. Building floor area (m\(^2\))
   ii. Notional building energy demand (MJ/m\(^2\))
   iii. Actual building energy demand (MJ/m\(^2\))
   iv. Notional building energy consumption (kWh/m\(^2\))
   v. Actual building energy consumption (kWh/m\(^2\))
   vi. Target Emission Rate (kg\text{CO}_2/m\(^2\))
   vii. Building Emission Rate (kg\text{CO}_2/m\(^2\))
Soft Landings Framework

the SOFT LANDINGS FRAMEWORK
for better briefing, design, handover and building performance in-use
Drivers 4 Sustainability

Soft Landings

Commissioning management plan

Inception and briefing
Commissioning team process and strategy

Design and construction
Reviews of commissionability

Initial commissioning
Pre-handover
Training and familiarisation

Initial aftercare
De-bugging

Continuous and seasonal commissioning
Extended aftercare
Fine tuning and structured POE with energy and occupant surveys

Practical completion
Month 12

The Soft Landing process
Traditional commissioning effort

Month 24
Month 36
Drivers 4 Sustainability

Energy Using Appliances and Products

Long term energy performances for energy-using domestic and commercial appliances and products

AECOM
A research report completed for the Department for Environment, Food and Rural Affairs

June 2011

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Old Oscar Faber Slide on Electrical Consumption in Homes

The total amount of electricity consumed by domestic household appliances increased by 85% between 1970 and 1998.
Predicted Energy Reduction by 2020 over 2011

Predicted % reductions in energy use for different products

- Heat pump
- Air conditioner
- Commercial refrigeration
- Domestic refrigeration
- Fuel cell CHP
- Motors
- Pumps
- Washing machine
- Dishwasher
- Computers
- TV
- Set-Top Boxes
- LED
Growth in Domestic Heat and Comfort in the UK

Source: Department of Energy and Climate Change
# Reclaimed Water Systems – CIBSE Knowledge Series 1

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<td>Filtration</td>
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Drivers 4 Sustainability

Domestic Water Per Capita Consumption (PCC) England and Wales

Table 2: PCC (l/h/d) for unmetered and metered households as submitted by the various water companies in England and Wales for 2006-07 (from Ofwat, 2007b)

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<th>Unmetered households</th>
<th>Metered households</th>
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<td>Anglian Water Services</td>
<td>155.8</td>
<td>136.9</td>
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<tr>
<td>Bournemouth &amp; West Hampshire Water</td>
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<td>149.5</td>
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<tr>
<td>Bristol Water</td>
<td>160.6</td>
<td>129.3</td>
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<td>Cambridge Water Company</td>
<td>148.8</td>
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<td>Dee Valley Water</td>
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<td>Essex &amp; Suffolk Water</td>
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<td>Folkestone &amp; Dover Water Services</td>
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<td>South East Water</td>
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<td>131.5</td>
<td>113.7</td>
</tr>
<tr>
<td>Thames Water Utilities</td>
<td>156.8</td>
<td>142.7</td>
</tr>
<tr>
<td>Three Valleys Water</td>
<td>177.0</td>
<td>143.4</td>
</tr>
<tr>
<td>United Utilities Water</td>
<td>143.5</td>
<td>121.8</td>
</tr>
</tbody>
</table>

Table 11: Consumption for toilet flushing and baths/showers and their combined percentage of the total PCC

<table>
<thead>
<tr>
<th>Country</th>
<th>Toilet flushing (l/h/d)</th>
<th>Baths/Showers (l/h/d)</th>
<th>Percentage of total PCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>29.7</td>
<td>45.9</td>
<td>65.7</td>
</tr>
<tr>
<td>Belgium</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Denmark</td>
<td>30.1</td>
<td>48.5</td>
<td>60.0</td>
</tr>
<tr>
<td>Finland*</td>
<td>16.0</td>
<td>**57.0</td>
<td>63.5</td>
</tr>
<tr>
<td>Germany</td>
<td>36.8</td>
<td>34.5</td>
<td>62.0</td>
</tr>
<tr>
<td>Netherlands</td>
<td>37.1</td>
<td>52.3</td>
<td>70.1</td>
</tr>
<tr>
<td>United Kingdom***</td>
<td>51.0</td>
<td>33.0</td>
<td>56.0</td>
</tr>
</tbody>
</table>
Heat Strategy Timeline for Constraining Demand

- Zero Carbon Homes
- Smart Meters
- The Green Deal and ECO
- The Green Deal
- Zero Carbon Non-domestic
- Energy Efficiency Directive
- Energy Efficiency Directive
- EU ETS / Carbon price floor
- Climate Change Agreements / levy

Timeline:
- 2012
- 2015
- 2020
- 2025
- 2030
Drivers 4 Sustainability

Heat Strategy Timeline for Moving to Low Carbon Heat

- RHPP / RHI domestic
- CRCs
- RHI
- EU ETS / Carbon price floor
Drivers 4 Sustainability

The Green Deal

GREEN DEAL

The Energy Act 2011 includes provisions for the new ‘Green Deal’, which intends to reduce carbon emissions cost effectively by revolutionising the energy efficiency of British properties.

The new innovative Green Deal financial mechanism eliminates the need to pay upfront for energy efficiency measures and instead provides reassurances that the cost of the measures should be covered by savings on the electricity bill.

ECO

A new Energy Company Obligation will integrate with the Green Deal, allowing supplier subsidy and Green Deal Finance to come together into one seamless offer to the consumer.
The Green Deal – Who Does What?

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How Green Deal Schemes Work

Oversight Body manages standards on behalf of Government

Scheme Owner (DECC)

UKAS

Green Deal Scheme Standard

UKAS accredit against the standard for Certification Bodies - BS EN 45011 as well as additional Green Deal requirements

Accredited Certification Bodies

Certification Bodies certify organisations (whether sole traders or larger) against the standard for provision of Green Deal Advice Services

Self-funding through certification fees

Qualified Green Deal Advisor acting a sole trader and certified as an organisation

Organisation providing Green Deal Advice Services i.e. employing Green Deal Advisors to carry out Green Deal assessments

Qualified Green Deal Advisor contracted by organisation

Figure 2: Parties involved in third party assurance and Oversight and Registration of the Service
Design and Detailing for Deconstruction

1. Introduction
   1.1 Aims of this Guide
   1.2 Target audience
   1.3 How to use this guide
   1.4 Scope and definitions
   1.5 The economics of deconstruction
   1.6 Responsibilities, roles and principles

3. Building Resource Efficiency
   3.1 Ecological principles
   3.2 Natural and recycled resources
   3.3 Energy
   3.4 Waste: closing the loop
   3.5 Regionalism

4. Design Approach
   4.1 Strategy: re-use or recycle?
   4.2 Strategic deconstruction
   4.3 Deconstruction in detail
   4.4 The Deconstruction Plan
   4.5 Moving on: ownership and responsibilities

5. Deconstruction Detailing Principles
   5.1 Adaptability
   5.2 Layering
   5.3 Access
   5.4 Connections
   5.5 Durable components
   5.6 Structure
   5.7 Insulation & airtightness
   5.8 Skins
   5.9 Services
   5.10 Key construction materials: re-use potential
   5.11 Risk & safety issues
   5.12 Existing building stock
Drivers 4 Sustainability

Reduce Pollution to the Air – Air Quality Strategy

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3.1 Actions underway or planned
3.2 Policies and proposals
3.3 Encouraging smarter choices and sustainable travel - Why we need change
3.4 Encouraging smarter choices and sustainable travel - What needs to be done
3.5 Promoting technological change and cleaner vehicles – Why we need change
3.6 Promoting technological change and cleaner vehicles - What needs to be done
3.7 Identifying priority locations and improving air quality through a package of local measures - Why we need change
3.8 Identifying priority locations and improving air quality through a package of local measures - What needs to be done
3.9 Reducing emissions from public transport - Why we need change
3.10 Reducing emissions from public transport - What needs to be done
3.11 Schemes that control emissions to air - Why we need change
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4.4 Reducing emissions from construction and demolition sites - What needs to be done
4.5 Using the planning process to improve air quality - Why we need change
4.6 Using the planning process to improve air quality - What needs to be done
4.7 Maximising the air quality benefits of low to zero carbon energy supply - Why we need change
4.8 Maximising the air quality benefits of low to zero carbon energy supply - What needs to be done
THANK YOU FOR LISTENING

CIBSE Low Carbon Building of the Year 2009
UK – winner of BREEAM 2008 award
DEFRA Alnwick