



Progress towards the sustainability of the building  
stock in England and Wales: Third Parliamentary  
Report

**Sustainable and Secure Buildings Act 2004**



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stock in England and Wales: Third Parliamentary  
report

**Presented to Parliament pursuant to section 6 of the  
Sustainable and Secure Buildings Act 2004**

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# 1. Executive summary

Section 6 of the Sustainable and Secure Buildings Act 2004 (the Act) requires that a biennial report is produced on the sustainability of the building stock in England and Wales covering progress during the preceding two years in connection with the following purposes<sup>1</sup>:

- furthering the conservation of fuel and power
- preventing waste, undue consumption, misuse or contamination of water
- furthering the protection or enhancement of the environment
- facilitating sustainable development

The first biennial report was laid before Parliament in February 2007 as part of the report *Monitoring the Sustainability of Buildings*<sup>2</sup> and covered progress made between 16 November 2004 and 15 November 2006. The second report<sup>3</sup> was laid before Parliament in February 2010 and covers progress made in the period between 16 November 2006 and 15 November 2008.

This third report covers progress made in the period between 16 November 2008 and 15 November 2010. Where documents or announcements published after this period subsequently update policy or regulatory information relevant to this report appropriate references are included.

Section 6 of the Act specifies the areas that the report must cover and these include building regulations made over the period and their expected impact, any planned legislation, and proposals for the setting of targets in relation to sustainable buildings. The report must also cover changes in the energy and carbon efficiency of the building stock, the extent to which buildings have their own facilities for generating energy, and the recycling and reuse of construction materials over the period; and an estimate of the number of dwellings in England and Wales at the end of the reporting period.

The following legislative changes to building regulations, relevant in terms of sustainability, were made in the two year period of this report:

- The Energy Performance of Buildings (Certificates and Inspections) (England and Wales)(Amendment) Regulations 2008 (SI 2008/647)
- The Building and Approved Inspectors (Amendment) Regulations 2009 (SI 2009/1219)\*

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<sup>1</sup> The purposes are those mentioned in section 1(1)(b) to (e) of the Building Act 1984 (as amended)

<sup>2</sup> *Monitoring the Sustainability of Buildings: Progress reports to Parliament on sustainability and measures to improve compliance with Part L of the Building Regulations*, CLG, February 2007

<sup>3</sup> *Progress towards the sustainability of the building stock in England and Wales: Second Parliamentary Report*

- The Building and Approved Inspectors (Amendment) Regulations 2010 (SI 2010/719)\*
- The Building Regulations 2010 (SI 2010/2214) and The Building (Approved Inspectors etc.) Regulations 2010 (SI 2010/2215)

(\*these Regulations, together with all previous amendments since the 2000 Regulations, have now been revoked and consolidated into the Building Regulations 2010 and the Building (Approved Inspectors etc) Regulations 2010).

The key effects of the legislative changes, relevant to this report, are the introduction of new water efficiency requirements and the amendment of the energy efficiency requirements to the Building Regulations. To provide technical and practical advice on meeting these requirements new statutory guidance - *Approved Document G: Sanitation, hot water safety and water efficiency* and *Approved Document L: Conservation of fuel and power* (in four parts<sup>4</sup>) - was also published.

The *Future of Building Control Implementation Plan* published by the previous Government in September 2009 proposed a periodic review approach to Building Regulation amendments with improvements to the energy efficiency requirements in 2010, 2013, 2016 and 2019. In July 2010 the new Government initiated an exercise with external partners to develop proposals for changes in 2013 to the Building Regulations regime to ensure they remain fit for the purpose of securing proportionate baseline standards for buildings of the future. In December 2010 the Government published its work programme for changes to the Building Regulations in 2013. Whilst much of the programme of work is deregulatory it includes work to deliver the Government's commitment to increase energy efficiency changes to Part L (Conservation of Fuel and Power) of the Building Regulations.

This report provides details of the effects or likely effects of the changes made to the building regulations and the proposals for future change identified above. The report also outlines the proposals considered by the Secretary of State for the setting of targets. In November 2008, the UK Government established a long-term national framework to tackle the dangers of climate change through the Climate Change Act. At the heart of the Act is a legally binding target to reduce the UK's greenhouse gas emissions to at least 80 per cent below 1990 levels by 2050.

To drive progress towards this target, the Act introduced 'carbon budgets' covering consecutive five-year periods, which define the emissions pathway

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<sup>4</sup> Approved Document L is split into four parts:  
*Approved Document L1A: Conservation of fuel and power (New dwellings)* (2010 edition)  
*Approved Document L1B: Conservation of fuel and power (Existing dwellings)* (2010 edition)  
*Approved Document L2A: Conservation of fuel and power (New buildings other than dwellings)* (2010 edition)  
*Approved Document L2B: Conservation of fuel and power (Existing buildings other than dwellings)* (2010 edition)

to the 2050 target by limiting the total greenhouse gas emissions allowed in each period, beginning in 2008. The first three carbon budgets (for 2008-12, 2013-17, and 2018-22) were set in May 2009, and require reductions in emissions on 1990 levels of 22 per cent, 28 per cent, and 34 per cent respectively. Following approval by Parliament, the level of the fourth carbon budget (for the period 2023 - 2027) was set in law at 1,950 million tonnes of carbon dioxide equivalent (MTCO<sub>2</sub>e) at the end of June 2011.

This report also considers the *Code for Sustainable Homes*, a voluntary outcome-based standard which aims to support reducing carbon emissions and creating homes that are more sustainable.

This report presents, where figures are already available, changes in relation to sustainable performance of buildings in England and Wales covering:

- energy efficiency
- greenhouse gas emissions
- on-site energy generation
- recycling and re-use of materials in construction
- the number of dwellings

This report is not a statistical product but, where appropriate, it incorporates publicly available 'official statistics'<sup>5</sup> as a source of measurement of change for the above. The statistics and information used are the latest available for the period of the report. Where relevant official statistics are not available to provide measurement of overall change the report relies on alternative data sources that have been judged fit for purpose. In some instances figures are only available for Great Britain or the United Kingdom.

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<sup>5</sup> The Statistics and Registration Service Act 2007 defines 'official statistics' as all those statistical outputs produced by the UK Statistics Authority's executive office (the Office for National Statistics), by central Government departments and agencies, by the devolved administrations in Northern Ireland, Scotland and Wales, and by other Crown bodies and by any other organisation named as a 'producer of official statistics' by Order in Parliament

## 2. Purpose of the report

Section 6 of the Sustainable and Secure Buildings Act 2004 requires a report to be laid before Parliament once every two years on progress made with regard to sustainability in the building stock of England and Wales.

The scope of this biennial report as set out in section 6 of the Act:

### **6 Secretary of State to report on building stock**

*(1) The Secretary of State must –*

*(a) for the period of two years beginning with the commencement of this section, and*

*(b) for each succeeding period of two years,*

*prepare a report on progress during the period in connection with the purposes mentioned in section 1(1)(b) to (e) of the Building Act 1984 in the context of the building stock in England and Wales.*

*(2) A report under this section must (in particular) deal with –*

*(a) building regulations made during the period for any of those purposes;*

*(b) proposals current at the end of the period to make building regulations for any of those purposes;*

*(c) effects or likely effects of regulations or proposals dealt with in the report under paragraphs (a) and (b);*

*(d) proposals considered by the Secretary of State during the period for the setting of targets for any of those purposes in relation to –*

*(i) buildings in England and Wales; or*

*(ii) services, fittings or equipment provided in or in connection with such buildings;*

*(e) overall changes during the period in –*

*(i) the efficiency with which energy is used in buildings in England and Wales;*

*(ii) levels of emissions from such buildings that are emissions considered by the Secretary of State to contribute to climate change;*

*(iii) the extent to which such buildings have their own facilities for generating energy;*

*(iv) the extent to which materials used in constructing, or carrying out works in relation to, such buildings are recycled or re-used materials.*



- (3) *A report under this section must contain an estimate, as at the end of the period, of the number of dwellings in England and Wales.*
- (4) *The Secretary of State must lay before Parliament each report he prepares under this section.*

The purposes mentioned in section 1(1)(b) to (e) of the Building Act 1984 are:

- (b) Furthering the conservation of fuel and power;*
- (c) Preventing waste, undue consumption, misuse or contamination of water;*
- (d) Furthering the protection or enhancement of the environment;*
- (e) Facilitating sustainable development.*

### 3. Sustainable and Secure Buildings Act 2004: Biennial report to Parliament

This third report covers the two-year period from 16 November 2008 to 15 November 2010. Where documents or announcements published after this period subsequently update policy or regulatory information relevant to this report appropriate references are included. The report is structured in accordance with the paragraphs of Section 6 of the Act.

#### 3.1 Section 6(2)(a): “building regulations made during the period for any of those purposes”

The following legislative changes to building regulations, relevant in terms of sustainability, were made in the two year period of this report (their effects or likely effects are discussed in 4.3):

- **The Energy Performance of Buildings (Certificates and Inspections) (England and Wales)(Amendment) Regulations 2008** (SI 2008/647)
- **The Building and Approved Inspectors (Amendment) Regulations 2009** (SI 2009/1219)\*
- **The Building and Approved Inspectors (Amendment) Regulations 2010** (SI 2010/719)\*
- **The Building Regulations 2010** (SI 2010/2214) and **The Building (Approved Inspectors etc.) Regulations 2010** (SI 2010/2215)

\* these Regulations, together with all previous amendments since the 2000 Regulations, have now been revoked and consolidated into the Building Regulations 2010 and the Building (Approved Inspectors etc) Regulations 2010.

#### 3.2 Section 6(2)(b): “proposals current at the end of the period to make building regulations for any of those purposes”

The *Future of Building Control Implementation Plan*<sup>6</sup> published in September 2009 by the previous Government proposed a periodic review approach to Building Regulation amendments with improvements to the energy efficiency requirements in 2010, 2013, 2016 and 2019.

The current Government initiated an exercise with external partners in July 2010 to develop proposals for changes in 2013 to the Building Regulations regime to ensure they remain fit for the purpose of securing proportionate baseline health, safety, accessibility and sustainability (including energy efficiency) standards for buildings of the future.

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<sup>6</sup> *Future of Building Control Implementation Plan* was published on 1 September 2009 and is available on the Department for Communities and Local Government’s website at: [www.communities.gov.uk/publications/planningandbuilding/buildingcontrolimplementation](http://www.communities.gov.uk/publications/planningandbuilding/buildingcontrolimplementation)

As part of this the *Future Changes to Building Regulations – Next Steps*<sup>7</sup> was published in December 2010 outlining the Government’s work programme on changes to the Building Regulations. Whilst much of the programme of work is deregulatory in nature, it includes work to deliver the Government’s commitment to increase energy efficiency through Part L (Conservation of fuel and power), delivering the next steps to zero carbon for homes and non-domestic buildings, and supporting wider policy for the retrofit of existing buildings. At the same time it will seek to guard against any adverse consequences arising from more airtight and better-insulated buildings and to improve their energy performance in practice.

### 3.3 Section 6(2)(c): “effects or likely effects of regulations or proposals dealt with in the report under paragraphs (a) and (b)”

#### **The Energy Performance of Buildings (Certificates and Inspections) (England and Wales)(Amendment) Regulations 2008 (SI 2008/647)**

These make changes to the purposes for which certificates and recommendation reports may be disclosed, and to fees for entering documents on the register.

#### **The Building and Approved Inspectors (Amendment) Regulations 2009 (SI 2009/1219)**

These make changes relating to water efficiency in the Building Regulations. The Regulations have now been revoked and consolidated into the 2010 Regulations (see below).

#### **The Building and Approved Inspectors (Amendment) Regulations 2010 (SI 2010/719)**

These make amendments to the energy efficiency requirements in regard to CO<sub>2</sub> emission rate calculations. The Regulations introduce further Competent Person Schemes to contribute towards compliance with the energy efficiency provisions in the Regulations. The Regulations have now been revoked and consolidated into the 2010 Regulations (see below).

#### **The Building Regulations 2010 (SI 2010/2214) and The Building (Approved Inspectors etc.) Regulations 2010 (SI 2010/2215)**

These consolidate the Building Regulations 2000 and the Building (Approved Inspectors etc.) Regulations 2000 incorporating all of the amendments made

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<sup>7</sup> *Future Changes to Building Regulations – Next Steps* was published after the period that this report covers but reference has been included as the information is relevant. This is available on the Department for Communities and Local Government’s website at: <http://www.communities.gov.uk/publications/planningandbuilding/buildingregsnextsteps>

since 2000. The Building Regulations 2010 also introduce further Competent Person Schemes to contribute towards compliance with the energy efficiency provisions in the Regulations.

The key effects of the above regulatory changes relevant to this report relate to water efficiency and energy efficiency requirements<sup>8</sup>. To support these regulatory changes new statutory technical guidance *Approved Document G: Sanitation, hot water safety and water efficiency* and *Approved Document L: Conservation of fuel and power* (in four parts<sup>9</sup>) were also published. The provisions in Parts F (ventilation) and J (combustion safety) of Schedule 1 to the Building Regulations were also amended to ensure that indoor air quality is not adversely affected and that combustion appliances can continue to function safely in more airtight homes.

### **Water efficiency**

On 6 April 2010 amendments came into force (SI 2009/1219 – see above) which introduced new water efficiency requirements for dwellings (now regulations 36 and 37 in the Building Regulations 2010) and also into Part G (Sanitation, hot water safety and water efficiency) of Schedule 1 to the Building Regulations. On the same date new statutory technical guidance - *Approved Document G: Sanitation, hot water safety and water efficiency* came into effect.

The water efficiency requirements seek to reduce the average consumption of wholesome water from an existing average baseline of 150 litres per person per day to 125 litres. This is intended to drive the installation of more water efficient fittings and appliances through the overall estimated usage limit, whilst allowing designers flexibility in deciding how to achieve that standard.

The Department for Communities and Local Government (DCLG) published in September 2009 *The Water Efficiency Calculator for New Dwellings* which sets out the methodology to be followed in calculating the potential consumption of wholesome water<sup>10</sup>.

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<sup>8</sup> “energy efficiency requirements” means the requirements of regulations 23 (thermal elements), 26 (CO2 emission rates for new buildings), 28 (consequential improvements to energy performance) and 29 (Energy performance certificates) and Part L of Schedule 1 of the Building Regulations

<sup>9</sup> Approved Document L is split into four parts:

*Approved Document L1A: Conservation of fuel and power (New dwellings)* (2010 edition)

*Approved Document L1B: Conservation of fuel and power (Existing dwellings)* (2010 edition)

*Approved Document L2A: Conservation of fuel and power (New buildings other than dwellings)* (2010 edition)

*Approved Document L2B: Conservation of fuel and power (Existing buildings other than dwellings)* (2010 edition)

<sup>10</sup> Details of the water efficiency calculator and methodology can be found on the Planning Portal website at: [http://www.planningportal.gov.uk/uploads/br/water\\_efficiency\\_calculator.pdf](http://www.planningportal.gov.uk/uploads/br/water_efficiency_calculator.pdf) and the water calculator tool is on the Department for Communities and Local Government website at: <http://www.communities.gov.uk/documents/planningandbuilding/xls/1795613>

The amendments now explicitly allow the use of alternative sources of water, such as harvested rainwater or re-used grey-water, for flushing sanitary conveniences, in order to reduce the demand for wholesome water.

The Department for Environment, Food and Rural Affairs' planned Water white paper will focus on the challenges facing the water industry, including water efficiency, climate change and population growth and their effects on future water resources and infrastructure. It aims to provide a clear direction and policy framework for the future.

### **Energy efficiency requirements**

On 1 October 2010 legislation came into force (SI 2010/719 – see above) which amended the energy efficiency requirements of the Building Regulations. On the same date new statutory technical guidance - *Approved Document L: Conservation of fuel and power* (in four parts) also came into force. This statutory guidance was accompanied by two new compliance guides:

- *Domestic Building Services Compliance Guide* (2010 Edition)<sup>11</sup>
- *Non-Domestic Building Services Compliance Guide* (2010 Edition)<sup>12</sup>

For new buildings a new requirement was introduced for energy performance (CO<sub>2</sub> emission rate) calculations to be carried out and given to Building Control along with a list of specifications to which the building is to be constructed not later than a day before the work starts. This is in addition to the calculation required to be submitted not later than five days after completion of the work.

New *Approved Document L: Conservation of fuel and power* set out updated practical and technical guidance with respect to the energy efficiency requirements of the Building Regulations. For new homes, energy performance is now calculated using Standard Assessment Procedure 2009 and must not exceed the target set by reference to a 2002 standard notional dwelling of the same size and shape as the actual dwelling but with an additional improvement of 25 per cent relative to 2006 standards. The improvement of 25 per cent is in addition to treating party walls between connected homes against heat loss.

For new non-domestic buildings, energy performance is calculated using 2010 versions of the Simplified Building Energy Model or other approved software tools and must not exceed the target set by reference to a notional building of the same size and shape as the actual building, constructed to a 2010 specification with no improvement factor. This concurrent specification takes

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<sup>11</sup> Available online and to download from the Planning Portal website at:  
<http://www.planningportal.gov.uk/buildingregulations/approveddocuments/partl/bcassociateddocuments9/further>

<sup>12</sup> Available online and to download from the Planning Portal at:  
<http://www.planningportal.gov.uk/buildingregulations/approveddocuments/partl/bcassociateddocuments9/further>

into account the difficulties/opportunities of improving energy performance in different types of building based on relative cost effectiveness of making improvements to typical components. This means some buildings will deliver more than 25 per cent relative to 2006 standards, some less, but overall the improvements are optimised to deliver 25 per cent when applied across the national new non-domestic build mix.

For all new buildings, the limits of design flexibility were further strengthened to effectively ensure minimum standards of energy efficiency are achieved in all cases. Fabric insulation “backstops” which prescribe a minimum standard of performance are set out in the Part L Approved Documents and the “backstops” for fixed building services can be found in the supporting Building Service Compliance Guides.

The sampling rate for air-tightness testing of housing developments was increased and the guidance on selection of housing to be tested and what to do when a house fails was strengthened.

There was a general strengthening of the energy efficiency standards for building work to existing properties with the standards for replacement boilers being strengthened to ‘A’ rated and windows strengthened to ‘C’ rated. The guidance on the renovation of thermal elements has been clarified in relation to what constitutes ‘renovation’, and the extent of work on individual thermal elements that are captured by the requirement.

The exemption from the energy efficiency requirements for conservatories and porches has been clarified and a new provision for insulation of swimming pool basins was introduced.

In the period covered by this report proposals to amend the energy efficiency requirements and strengthen the standards set out in Part L of the Building Regulations and further improve compliance with these standards were publicly consulted upon.

### 3.4 Section 6(2)(d): “proposals considered by the Secretary of State during the period for the setting of targets for any of those purposes in relation to (i) buildings in England and Wales; or (ii) services, fittings or equipment provided on or in connection with such buildings”

In November 2008, the UK Government established a long-term national framework to tackle the dangers of climate change through the Climate Change Act. At the heart of the Act is a legally binding target to reduce the UK’s greenhouse gas emissions to at least 80 per cent below 1990 levels by 2050.

To drive progress towards this target, the Act introduced ‘carbon budgets’ covering consecutive five-year periods, which define the emissions pathway

to the 2050 target by limiting the total greenhouse gas emissions allowed in each period, beginning in 2008. The first three carbon budgets (for 2008-12, 2013-17, and 2018-22) were set in May 2009, and require reductions in emissions on 1990 levels of 22 per cent, 28 per cent, and 34 per cent respectively. Following approval by Parliament, the level of the fourth carbon budget (for the period 2023 - 2027) was set in law at 1,950 million tonnes of carbon dioxide equivalent (MTCO<sub>2</sub>e) at the end of June 2011.

### **Zero Carbon Homes**

In December 2008 the previous Government published a consultation on its policy approach - the 'definition' - for zero carbon homes from 2016, supported by a regulatory impact assessment giving the costed evidence base to support the options considered. In response to this consultation, Government published a further statement in July 2009 of its policy intent in this area, again supported by a detailed assessment of impact. In July 2010 the new Government affirmed its commitment to zero carbon new homes from 2016. As part of the Growth Review update at Budget 2011, it announced that the 2016 standard would require a 100 per cent reduction of emissions from energy use covered by the Building Regulations.

Of these, a minimum proportion would have to be delivered on the site of the home itself. The Zero Carbon Hub, a cross-industry partnership body, led detailed research as to what this proportion should be, and the Government has endorsed their recommendations as the basis for future consultation.

Where remaining emissions reductions cannot be achieved on site, house builders will have access to cost-effective options for delivering carbon reductions away from the site of the home.

The Government is developing the Green Deal scheme to support energy efficiency improvements in existing homes, and it has said that it will consider whether and how to extend the principle to cover new homes, dependent on industry interest.

### **Zero Carbon Non-Domestic Buildings**

In November 2009 the previous Government issued a consultation on policy options for working towards an ambition that all new non-domestic buildings should be zero carbon from 2019, with the public sector leading the way from 2018.

The current Minister for Housing confirmed in December 2010 that this Government will follow a similar process for new non-domestic buildings as for new homes. The Government's policy is progressively to raise the national regulatory requirements for non-domestic buildings between now and 2019, enabling them to be zero carbon from 2019. Consistency will be maintained between the domestic and non-domestic frameworks as far as it is practical, but a different approach will be considered on some elements,

where the diversity of the non-domestic stock or the nature of the commercial market justifies that.

### **Code for Sustainable Homes**

Although not part of Building Regulations, the *Code for Sustainable Homes* (the Code) is a voluntary outcome-based standard managed by Department for Communities and Local Government for designing and assessing sustainable homes. The Code aims to support reducing carbon emissions, improving water efficiency and creating homes that are more sustainable. It applies in England, Wales and Northern Ireland.

Some elements of the Code show the expected future direction of building and other regulations. The Code measures the sustainability of a home against 9 different categories: energy/CO<sub>2</sub>, water, waste, materials, surface water run-off, pollution, ecology, health and well being, and management. Points are awarded depending on performance achieved in each area. These are added to give a rating between 1, which is a basic entry level, and 6, the highest level. The energy requirements of Code Level 3 have been incorporated in the most recent changes to the Building Regulations. All other requirements in the Code are above current Building Regulations requirements. The Code does not specify specific approaches or technologies and developers tend to gain points from across all nine categories.

An updated edition of the Code technical guide was published on 11 November 2010, following an extensive consultation process with industry and stakeholders. The main focus of the consultation was on streamlining and simplifying the Code to make it more useable and understandable by industry and practitioners, and to align it with the new requirements of the Building Regulations, including energy efficiency and water efficiency.

Use of the Code is voluntary for private sector housing unless local authorities specify a level of the Code as a planning condition, to meet particular local needs or circumstances. All homes built with public funding secured through the Housing and Communities Agency must currently be built to Code Level 3. Statistics on Code design and completion certifications are published quarterly on the DCLG website<sup>13</sup>. As of March 2011, there were over 25,000 completed Code homes across all Code levels and over 58,000 design stage certificates issued.

### **Central Government**

In May 2010 the Prime Minister set a target for central government departments to achieve a 10 per cent reduction in their carbon emissions by May 2011.

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<sup>13</sup> Code for Sustainable Homes quarterly statistics can be found on the DCLG website at: <http://www.communities.gov.uk/housing/housingresearch/housingstatistics/housingstatisticsby/environmentalperformance/>



### 3.5. Section 6(2)(e): “Overall changes during the period in ...”

The Act does not stipulate how to measure the factors listed in subparagraphs (i) to (iv) of section 6(2)(e). Where appropriate this report incorporates publicly available ‘official statistics’<sup>14</sup> as a source of measurement of change but the report is not an official statistics product. The statistics and information used are the latest available for the period of the report and references to source data are given. Where relevant official statistics are not available to provide measurement of overall change the report relies on alternative data sources that have been judged fit for purpose.

Some of the statistics used in this report have been drawn from new data sources not available for the First and Second report. This will mean some discontinuity in the data provided in this report from the previous reports. Where possible, historic data for the periods covered by the First and Second reports has been provided.

- (i) “the efficiency with which energy is used in buildings in England and Wales”

#### **Domestic properties/dwellings**

Since April 2008 all new homes have had to have an Energy Performance Certificate. Energy Performance Certificates provide a rating of the energy use of the home, using the Standard Assessment Procedure which is the Government’s methodology for assessing and comparing the energy and environmental performance of dwellings. Its purpose is to provide accurate and reliable assessments of dwelling energy performances that are needed to underpin energy and environmental policy initiatives.

Standard Assessment Procedure quantifies a dwelling’s performance in terms of a fuel cost based energy efficiency rating - the SAP rating. SAP rating is expressed on a scale from 1 (highly inefficient) to 100 (highly efficient with 100 representing zero energy cost).

Since the beginning of 2010 the Government has used the average SAP ratings of new homes as its measure for the efficiency with which energy is used in new homes. The data series begins with [fourth quarter] October-December quarter 2008 data.

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<sup>14</sup> The Statistics and Registration Service Act 2007 defines ‘official statistics’ as all those statistical outputs produced by the UK Statistics Authority’s executive office (the Office for National Statistics), by central Government departments and agencies, by the devolved administrations in Northern Ireland, Scotland and Wales, and by other Crown bodies and by any other organisation named as a ‘producer of official statistics’ by Order in Parliament.

**Table 1: Average Energy Efficiency (SAP) ratings of new homes (England and Wales)**

	Average SAP rating for new homes at Q4 2008 (earliest available data)	Average SAP rating for new homes at end Q4 2010
<b>England</b>	79.1	81.7
<b>Wales</b>	77.8	80.6

Source: National Energy Performance Certificate Register, statistics published on DCLG website

There has been an improvement in 2.6 SAP points for new homes in England during the period and 2.8 SAP points for homes in Wales.

**Table 2: Average Energy Efficiency (SAP) rating of all dwellings (England and Wales)**

The English Housing Survey<sup>15</sup> and the Living in Wales Survey<sup>16</sup> collect information about people's housing circumstances and the condition and energy efficiency of housing, including a SAP rating.

	Average SAP rating for all dwellings			
	2004	2006	2008	2009
<b>England*</b>	47.4	48.7	51.4	53.1
<b>Wales**</b>	46	Data not available	50	Data not available

Source – England: English Housing Survey Headline Report 2009-10, published February 2011\*

Source – Wales: Living in Wales 2008 Energy Efficiency of Dwellings, published November 2008\*\*

<sup>15</sup> The English Housing Survey is a continuous national survey commissioned by DCLG, which can be found on the DCLG website at: <http://www.communities.gov.uk/housing/housingresearch/housingsurveys/englishhousingsurvey/>

<sup>16</sup> The Living in Wales survey is a household survey for Wales commissioned by the Welsh Assembly Government. *Living in Wales 2008: Heating and Energy Measures* provides analysis of the 2008 Living in Wales household and property data relating to the households heating and energy measures. The full report is available on the Welsh Assembly Government website at: <http://wales.gov.uk/topics/statistics/headlines/housing2010/1011262/?lang=en>

In England there has been an improvement of 5.7 points in the SAP ratings since 2004, with an improvement of 1.7 points between 2008 and 2009; in Wales, there has been an improvement of 4 SAP points between 2004 and 2008, the latest date for which data is available.

## Heating and insulation measures

For a dwelling to provide optimum energy performance, a high level of thermal insulation needs to be present alongside an efficient heating system. The English Housing Survey<sup>17</sup> and the Living in Wales Survey<sup>18</sup> also collect information about insulation measures and double glazing. The English Housing Survey also collects information on boiler types.

### England

The table below, taken from data in the English Housing Survey Headline Report 2009-10, shows the changes in the percentage of dwellings with given insulation measures in England from 2003 to 2009 which have all shown year on year improvements:

**Table 3: Percentage of Homes with Insulation Measures (England)**

	Percentage of homes with measure						
	2003	2004	2005	2006	2007	2008	2009
<b>Cavity walls with insulation</b>	24.8	27.0	27.4	30.2	32.7	33.4	34.5
<b>200mm or more of loft insulation</b>	9.5	11.7	13.4	16.0	19.2	21.1	24.0
<b>Entire house double glazing</b>	55.5	59.4	61.9	63.3	66.9	70.8	72.9

*Note: Percentages are based on all dwellings, including those with no loft or no cavity walls. Only 88% of all dwellings have lofts, and 69% have cavity walls.*

*Source: English House Condition Survey 1996-2007, English Housing Survey 2008 onwards, dwelling sample*

<sup>17</sup> The English Housing Survey is a continuous national survey commissioned by DCLG, which can be found on the DCLG website at: <http://www.communities.gov.uk/housing/housingresearch/housingsurveys/englishhousingsurvey/>

<sup>18</sup> The Living in Wales survey is a household survey for Wales commissioned by the Welsh Assembly Government. *Living in Wales 2008: Heating and Energy Measures* provides analysis of the 2008 Living in Wales household and property data relating to the households heating and energy measures. The full report is available on the Welsh Assembly Government website at: <http://wales.gov.uk/topics/statistics/headlines/housing2010/1011262/?lang=en>

Condensing boilers are generally the most efficient boiler type and are recommended for new and replacement boilers. The table below, taken from data in the English Housing Survey Headline Report 2009-10, shows the changes in the percentage of dwellings with different boiler types in England from 2003 to 2009. It shows the less efficient standard and back boilers decreasing over the period and the percentage of dwellings with combination boilers fell from a peak of 29 per cent in 2006 to 25 per cent in 2009. The percentage of dwellings with condensing, and particularly, condensing-combination boilers continued to increase and in 2009 almost a quarter of the housing stock (5.4 million dwellings) had one of these types of boiler.

**Table 4: Percentage of Homes with Boilers (England)**

	Percentage of homes						
	2003	2004	2005	2006	2007	2008	2009
<b>Standard boiler (floor or wall)</b>	44.9	44.6	43.3	41.0	39.6	36.3	32.7
<b>Back boiler (to fire or stove)</b>	12.0	11.1	10.0	9.7	8.8	7.6	6.6
<b>Combination boiler</b>	25.6	27.5	28.7	28.7	28.3	27.3	24.6
<b>Condensing boiler</b>	0.7	0.9	1.4	2.1	3.1	4.3	6.0
<b>Condensing-combination boiler</b>	1.7	1.9	3.3	5.9	8.3	12.5	18.2
<b>No boiler</b>	15.1	14.0	13.3	12.6	11.9	12.0	11.9

*Source: English Housing Survey Headline Report 2009-10*

## **Wales**

The *Living in Wales 2008* survey asked respondents about insulation measures implemented in their properties, including roof / loft insulation, cavity wall insulation and double glazing.

### **ROOF INSULATION**

In 2008, 91 per cent of respondents who could have roof insulation knew if their roof was insulated. Considering only those who could have insulation and knew whether their roof was insulated, 84 per cent of properties had the entire roof space insulated and a further 7 per cent had some roof insulation. This is broadly similar to the results observed in 2004, where the figures were 86 per cent and 5 per cent respectively. As part of the property survey, surveyors inspected the roof space to establish the thickness of the loft insulation installed. In 27 per cent of households, the insulation was over 200mm thick, with a further 28 per cent of households having between

125mm and 200mm of insulation. Surveyors found that 40 per cent of households had 100mm of insulation or less.

### CAVITY WALL INSULATION

The property survey reported that a third of all properties had cavity wall insulation present. In properties where the construction was masonry box-wall cavity, 52 per cent had signs of cavity wall insulation, compared to 42 per cent in 2004.

### DOUBLE GLAZING

The survey showed that the presence of double glazing varies with age of the property. Around 90 per cent of post-1964 properties had full double-glazing, whereas only 68 per cent of pre-1919 properties did. In addition, the older a property is, the more likely it is to be partially double-glazed.

**Table 5: Percentage of Homes in Wales with double glazing, by age of property**

	Percentage of Homes					
	2004			2008		
	All double-glazed	Some double-glazed	None double-glazed	All double-glazed	Some double-glazed	None double-glazed
<b>Pre-1919</b>	59	21	20	68	18	15
<b>1919-1944</b>	71	14	16	81	12	8
<b>1945-1964</b>	77	8	15	85	7	8
<b>After 1964</b>	84	6	10	90	5	5
<b>All dates</b>	74	12	15	81	10	9

*Note: weighted total 1,195,000 and 1,239,700 (2008)*

*Source: Living in Wales 2004 and 2008*

### Non-Domestic Buildings

The Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations 2007 (Energy Performance of Buildings Regulations) require that:

- every building constructed, sold or rented out must have a valid Energy Performance Certificate showing the energy performance of the fabric of the building
- Display Energy Certificates, which show the energy performance of a building based on actual energy consumption, be prominently displayed in buildings over 1,000m<sup>2</sup> which are occupied by a public authority and frequently visited by the public; and

- air conditioning systems over 12kW must have been inspected by January 2011. All new air conditioning installations must also have been inspected within five years of coming into service, and inspections should be carried out every five years thereafter.

Energy Performance Certificates and Display Energy Certificates must be lodged on a central register controlled by a Register Administrator on behalf of Government. There is currently no statutory requirement to lodge Air Conditioning Reports on the register but this is due to change in summer 2011. At present Energy Performance of Buildings Regulations specify that data in the register can only be disclosed to a prescribed list of recipients.

However, the Energy Bill, currently before Parliament, includes clauses which would, subject to parliamentary clearance, enable DCLG to amend regulations to widen access to the data. The intention is to make the data publicly available, and allow certain groups, including researchers, access to multiple data records. These regulations are expected to come into force in spring 2012. Given these changes, it is expected that at the time of the next report statistical analysis of Energy Performance Certificate, Display Energy Certificate and Air Conditioning Report data sets will be available to be published.

For the purposes of this report, therefore, data on the energy use in the UK's service sector buildings has been used as the best available proxy, as well as Display Energy Certificate data for Government Departments.

**Table 6: Average energy consumption per unit floor area for service sector buildings 1998 to 2008 (UK)**

	Energy consumption	Floor area	Average energy consumption per unit floor area
	(Thousand tonnes of oil equivalent)	(Thousand square metres)	(Thousand tonnes of oil equivalent)
<b>2003</b>	18,735	814	23.0
<b>2004</b>	19,389	826	23.5
<b>2005</b>	19,357	841	23.0
<b>2006</b>	18,267	858	21.3
<b>2007</b>	17,711	873	20.3
<b>2008</b>	17,718	870	20.4

*Note: Energy Consumption includes renewables and heat sold but excludes agriculture consumption. The floor area measurements are derived from the Building Research Establishment's (BRE) estimates of floor area space for office, retail and warehouse buildings which, according to the BRE, account for around 50 per cent of all service sector buildings. Therefore, these totals were obtained by scaling the data provided by the BRE. Source: 'Energy Consumption in the United Kingdom' Service Sector Data Tables (DECC, July 2010)<sup>19</sup>*

<sup>19</sup> Energy Consumption in the United Kingdom and its associated data tables are available on the DECC website at:

<http://www.decc.gov.uk/en/content/cms/statistics/publications/ecuk/ecuk.aspx>

Since 2004, there has been an improvement in average energy consumption from 23,000 tonnes of oil equivalent per thousand square metres to 20,400 tonnes of oil equivalent per thousand square metres in 2008.

**Table 7: Display Energy Certificates for Government departments 2009**

Number of properties	Number of properties requiring a DEC	Number of properties with a DEC	Percentage of properties with a DEC that have Operational Rating						
			A	B	C	D	E	F	G
2,448	1,639	1,395	0.3%	3.4%	17.4%	28.4%	14.4%	8.2%	27.9%

*Note: 4. The Operational Rating is a numerical indicator of the actual annual carbon dioxide emissions from the building, which is shown on a scale from A to G, where A is the lowest (best) and G is the highest (worst).*

*Source: 'Energy Consumption in the United Kingdom' Service Sector Data Tables (DECC, July 2010), original source Office of Government Commerce.*

- (ii) “levels of emissions from such buildings that are emissions considered by the Secretary of State to contribute to climate change”

Carbon dioxide (CO<sub>2</sub>) is the main greenhouse gas, accounting for about 85 per cent of the UK total, and the vast majority of CO<sub>2</sub> emissions come from the burning of fossil fuels.

The Department of Energy and Climate Change publishes an annual statistical release aiming to provide the most reliable and consistent possible breakdown of CO<sub>2</sub> emissions across the country, using nationally available data sets. Figures shown below have been taken from the 2008 Local Authority Carbon Dioxide figures published on 16 September 2010, further information can be found on the Department's website at:

[http://www.decc.gov.uk/en/content/cms/statistics/climate\\_change/gg\\_emissions/uk\\_emissions/2008\\_local/2008\\_local.aspx](http://www.decc.gov.uk/en/content/cms/statistics/climate_change/gg_emissions/uk_emissions/2008_local/2008_local.aspx)

**Table 8: Estimated total annual domestic CO<sub>2</sub> emissions (England and Wales)**

	Total domestic emissions (million tonnes CO <sub>2</sub> )			
	2005	2006	2007	2008
<b>England</b>	124.9	125.5	121.8	122.0
<b>Wales</b>	8.0	8.1	7.6	7.8

Source: 2008 CO<sub>2</sub> emissions at Local Authority and Government Office Region Level statistical release and full dataset, published September 2010 (DECC). Available at: [http://www.decc.gov.uk/en/content/cms/statistics/climate\\_stats/gg\\_emissions/uk\\_emissions/2008\\_local/2008\\_local.aspx](http://www.decc.gov.uk/en/content/cms/statistics/climate_stats/gg_emissions/uk_emissions/2008_local/2008_local.aspx)

**Table 9: Estimated total annual industrial, commercial and public sector CO<sub>2</sub> emissions (England and Wales)**

	Total industrial, commercial & public sector emissions (million tonnes CO <sub>2</sub> )			
	2005	2006	2007	2008
<b>England</b>	143.9	144.6	138.9	137.2
<b>Wales</b>	10.5	10.4	9.9	9.7

Note: CO<sub>2</sub> emissions for industry, commercial and public sector above includes electricity, gas and other fuel related emissions, but does *not* include emissions from large industrial installations agricultural combustion or diesel railways.

Source: 2008 CO<sub>2</sub> emissions at Local Authority and Government Office Region Level statistical release and full data, published September 2010 (DECC). Available at [http://www.decc.gov.uk/en/content/cms/statistics/climate\\_stats/gg\\_emissions/uk\\_emissions/2008\\_local/2008\\_local.aspx](http://www.decc.gov.uk/en/content/cms/statistics/climate_stats/gg_emissions/uk_emissions/2008_local/2008_local.aspx)

The above data are the most up to date for England and Wales. More recent data for 2009 and 2010 (provisional data) are UK wide only.

**Table 10: Sources of UK carbon dioxide emissions, 2005-2010 (provisional) (million tonnes CO<sub>2</sub>)**

	Sources of UK carbon dioxide emissions (million tonnes CO <sub>2</sub> )					
	2005	2006	2007	2008	2009	2010 (p)
<b>Energy Supply</b>	216	20	216	209	185	191
<b>Transport</b>	129	130	131	126	121	121
<b>Residential</b>	84	82	78	80	75	85
<b>Business</b>	94	91	89	87	76	78
<b>Other</b>	26	24	24	22	17	17
<b>Total</b>	550	546	538	525	474	492

(p) 2010 estimates are provisional.

All figures are for the UK and crown dependencies only and exclude overseas territories.

Source: UK 2010 Greenhouse Gas emissions, provisional figures and 2009 Greenhouse Gas emissions, final figures by fuel type and end-user DECC, March 2011

[http://www.decc.gov.uk/assets/decc/Statistics/climate\\_change/1515-statrelease-ghg-emissions-31032011.pdf](http://www.decc.gov.uk/assets/decc/Statistics/climate_change/1515-statrelease-ghg-emissions-31032011.pdf) - See Tables 2 and 4.



More specific analysis on emissions from non-domestic buildings can be found in the report *Building the future, today. Transforming the economic and carbon performance of the buildings we work in*<sup>20</sup> published by the Carbon Trust in December 2009.

(iii) “the extent to which such buildings have their own facilities for generating energy”

The Department of Energy and Climate Change produces statistics on the number of sites generating electricity from renewable sources:

**Table 11: Sites generating electricity from renewable sources (England and Wales)**

	Number of sites generating electricity from renewable sources				
	2005	2006	2007	2008	2009
<b>England</b>	705	714	847	879	939
<b>Wales</b>	105	102	119	127	143

*Source: Energy Trends articles “Renewable electricity in Scotland, Wales, Northern Ireland and the regions of England” (published annually by DECC, Sept 2010 & Sept 2009 and by BERR Sept 2007, Sept 2006 & Sept 2005)*

The above data includes major renewable energy installations (not just buildings) but does not include renewable energy from solar photovoltaics and micro-wind because at present they are estimated on a UK-wide basis that can not readily be broken down into regional components. Data on small scale installations that are supported by the new Feed in Tariff scheme will in the future be incorporated in the Department of Energy and Climate Change’s energy statistics.

The Feed in Tariff scheme was introduced on 1 April 2010 and is a financial support scheme for eligible low-carbon electricity technologies, aimed at small-scale installations up to a maximum capacity of 5 Megawatts (MW). Quarter 1 2011 was the fourth quarter, and the end of the first full year, of the Feed in Tariff scheme. At the end of this quarter, 108 MW of capacity across 30,140 installations, had been included under the Feed in Tariff scheme. This is an increase in capacity of 60 per cent on the total at the end of 2010 Q4 (67.9 MW), and over double the amount included at the end of 2010 Q3 (43.9 MW).

The 108 MW was split by technology as follows: 77.8 MW of Solar Photovoltaics, 18.9 MW of Wind, 9.9 MW of Hydro capacity, 1.8 MW of Anaerobic Digestion, and 0.1 MW of Micro Combined Heat and Power had joined the scheme. Of the total capacity, 82.3 MW of this was in the domestic

<sup>20</sup>*Building the future, today. Transforming the economic and carbon performance of the buildings we work in* can be found at:

<http://www.carbontrust.co.uk/Publications/pages/publicationdetail.aspx?id=CTC765>

sector, while 26.2 MW was in non-domestic sectors. Of the total number of schemes, over 29,229 (97 per cent) were domestic installations, with just 911 non-domestic (3 per cent).

The table below shows the number and capacity of Feed in Tariff installations at the Q1 2011.

**Table 12: Number and Capacity of Feed in Tariff installations (Great Britain)**

Technology	Number		Capacity	
	N	%	KW	%
Anaerobic digestion	3	0.0	1766	1.6
Hydro	205	0.7	9866	9.1
Photovoltaic	28505	94.6	77848	71.7
Wind	1329	4.4	18917	17.4
Micro Combined Heat & Power	98	0.3	98	0.1
Total	30140	100 %	108495	100 %

*Note: The figures include installations that were installed prior to the launch of the FiT scheme on 1st April 2010. There were 3,674 schemes (14.3 MW) that were installed prior to 15th July 2009 and were transferred onto the ex-Renewable Obligation tariff. An additional 2,690 (17.9 MW) were installed between 15th July 2009 and 31st March 2010*

*Source: Energy Trends, Feed in Tariff Capacity - table ET 5.6, Quarterly table (DECC, 28 April 2011) available at: [http://www.decc.gov.uk/assets/decc/Statistics/source/electricity/et5\\_6.xls](http://www.decc.gov.uk/assets/decc/Statistics/source/electricity/et5_6.xls)*

- (iv) “the extent to which materials used in constructing, or carrying out works in relation to, such buildings are recycled or re-used materials”

The Government’s Review of Waste Policy in England, launched on 14 June 2011, included a Waste Framework Directive target to recover at least 70 per cent of construction and demolition waste by 2020. Government will be working with industry on data to measure progress against this target.

Pending this work, the best available current data is on construction, demolition and excavation waste arisings, use and disposal<sup>21</sup>.

The relevant figures for 2008 are that 43.52 million tonnes of recycled aggregate materials were produced, up from 42.07 million tonnes in 2005, despite total inert arisings declining over this period. For recycled soil, the figures were 9.21 million tonnes in 2008, up from 4.36 million tonnes in 2005.

<sup>21</sup> Construction, demolition and excavation waste arisings, use and disposal for England, 2008. Waste Resources Action Programme, Final Report April 2010

The proportion of construction, demolition and excavation waste arisings recycled as aggregates and soil in 2005 was 52 per cent of the total arisings and in 2008 was 63 per cent of the total arisings.

These figures relate to all construction activity. They cannot be broken down between different types of construction activity.

### 3.6. Section 6(3) “an estimate, as at the end of the period, of the number of dwellings in England and Wales”

The estimated number of dwellings in England and Wales stood at 24,037,000 on 31 March 2010.

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