



# The Code for Sustainable Homes

## **Setting the standard in sustainability for new homes**



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# Introduction

The Code for Sustainable Homes (the Code) was introduced in England<sup>1</sup> in April 2007 following extensive consultation with environmental groups and the home building and wider construction industries.

The Code is a voluntary standard designed to improve the overall sustainability of new homes by setting a single framework within which the home building industry can design and construct homes to higher environmental standards and offers a tool for developers to differentiate themselves within the market. Where it is used the Code also gives new homebuyers better information about the environmental impact of their new home and its potential running costs.

The Code complements the system of Energy Performance Certificates for new homes, which will be introduced in April 2008 under the Energy Performance of Buildings Directive (EPBD).

## What is this document?

This document sets out the assessment process and the performance standards required for the Code for Sustainable Homes (the Code). It covers those elements of the Code that will not change over time unless they are subject to consultation.

The performance standard is reproduced in the Technical Guidance document, and supported in that document by more detailed information on the evidence required to meet the performance standard. The Technical Guidance also provides assessment methodologies and relevant references. The Technical Guidance is amended as necessary on a six-monthly basis (April and October) to reflect changes in materials, building techniques and as a result of feedback from assessors and industry.

It is worth noting that our launch document '*The Code for Sustainable Homes – A step change in sustainable home building practice*' published in December 2006 is now out of date and should no longer be referred to.

## What has changed since the Code was launched?

In July 2007 we consulted on the future of the Code including whether it should become mandatory for all new homes to be rated against the Code. This would not mean that every new home had to be assessed against Code but that everyone interested in buying a new home would be able to see information saying whether it had been assessed, and if so, what star rating it had achieved.

<sup>1</sup> The Code does not apply in Scotland. The National Assembly for Wales recently announced that they would be adopting the Code in the near future, and Northern Ireland will be requiring Code Level 3 for all public sector housing from April 2008.

This consultation also asked whether the optional Lifetime Homes element of the Code should be made compulsory at Code level 6 from 2008 onwards.

As a result of the positive response to the consultation we will be introducing mandatory ratings against the Code from May 2008. This means that while it remains voluntary to design and build a home to meet the standards set out in the Code, regulations will mean that from May 2008 those selling new homes will be required to provide information to any prospective purchaser on the sustainability of the home. Where a home is designed and built to the Code and assessed against it, a Code certificate will be provided. Otherwise, a statement of non assessment (a nil-rated certificate) will be provided.

This decision does not require and has not resulted in any changes to the Code itself.

The consultation responses were also positive about our proposals in relation to Lifetime Homes. As a result the performance standard has been amended (both in this document and the Technical Guidance) to reflect the mandatory status of the Lifetime Homes element at Code level 6 from April 2008.

Following consultation on introducing site waste management plans, Defra have made regulations to require these for developments over £300,000. The Code threshold limit for developments requiring site waste management plans has been increased from £250,000 to £300,000 in line with the regulations. This change will be reflected in the next version of the Technical Guidance in April 2008.

The National Assembly of Wales announced in December 2007 that it will be adopting the Code for all new social housing. Welsh Ministers are expected to confirm shortly the timing and Code level. New build homes in the private sector may also choose to have an assessment done against the Code. The Code will also be required for all new build social housing at Code Level 3 from 1 April 2008.

There will be a review of the Code, followed by a full public consultation, at the same time as the consultation on the next planned changes to Part L of the Building Regulations<sup>2</sup> relating to energy efficiency standards. The performance standards set out in this document will be updated in light of this consultation in 2010.

## Suppliers of Code services

The implementation of the Code is managed by BRE Global Ltd (formerly BRE Certification Ltd) under contract to Communities and Local Government, and under arrangements based on the EcoHomes<sup>3</sup> operating systems. BRE Global is the main license holder. Under the terms of the agreement with Communities and Local Government, BRE Global issues licenses to both assessors and other Code service providers.

<sup>2</sup> The Building Regulations set minimum performance standards for building in England and Wales. More information can be found at [www.communities.gov.uk/planningandbuilding/buildingregulations/](http://www.communities.gov.uk/planningandbuilding/buildingregulations/)

<sup>3</sup> (Yates et al, 2004).

Code service providers are licensed organisations offering Code services including assessor training, registration and monitoring, quality assurance of assessments, certification, investigation and resolution of complaints, and maintenance of records.

At time of publication Stroma Ltd is the only other organisation licensed to provide all Code services although several others are in discussions with BRE Global.

Further information about the Code including the Technical Guidance and Code service providers can be found at [www.communities.gov.uk/thecode](http://www.communities.gov.uk/thecode).

## What is the Code for Sustainable Homes?

The Code measures the sustainability of a home against nine design categories, rating the 'whole home' as a complete package. The design categories are:

- Energy and CO<sub>2</sub> Emissions
- Water
- Materials
- Surface Water Run-off
- Waste
- Pollution
- Heath and Wellbeing
- Management
- Ecology

Each category includes a number of environmental issues (see Table 1 in Annex A) which have a potential impact on the environment. The issues can be assessed against a performance target and awarded one or more credits. Performance targets are more demanding than the minimum standard needed to satisfy Building Regulations or other legislation. They represent good or best practice, are technically feasible, and can be delivered by the building industry.

More details about how the Code works is set out in Annex A. The Code performance standard is set out in Annex B.

## A mark of quality

In this era, with a more environmentally-conscious public, aware of the urgent need to limit their effects on climate change, there is a growing appetite amongst consumers for more sustainable products and services. With greater demand for homes that offer reduced environmental impact, lower running costs and features that enhance health and well-being, there is an increased need for home builders to demonstrate their capacity in sustainable home building, and to market the sustainability of their homes to homebuyers. The Code offers a tool for home builders to demonstrate the sustainability performance of their homes, and to differentiate themselves from their competitors.

## A signal for the future

The Code is closely linked to Building Regulations, which are the minimum building standards required by law. Minimum standards for Code compliance have been set above the requirements of Building Regulations. The Code signals the future direction of Building Regulations in relation to carbon emissions from, and energy use in homes, providing greater regulatory certainty for the homebuilding industry.

## The sustainability rating system

The Code uses a sustainability rating system – indicated by ‘stars’, to communicate the overall sustainability performance of a home. A home can achieve a sustainability rating from one (★) to six (★★★★★★) stars depending on the extent to which it has achieved Code standards. One star (★) is the entry level – above the level of the Building Regulations; and six stars (★★★★★★) is the highest level – reflecting exemplar development in sustainability terms.

## Achieving a sustainability rating

The sustainability rating which a home achieves represents its overall performance across the nine Code design categories.

Minimum standards exist for a number of categories – these must be achieved to gain a one star (★) sustainability rating. Energy efficiency and water efficiency categories also have minimum standards that must be achieved at every level of the Code, recognising their importance to the sustainability of any home.

Apart from these minimum requirements the Code is completely flexible; developers can choose which and how many standards they implement to obtain ‘credits’ under the Code in order to achieve a higher sustainability rating.

The table below shows the nine design categories and the degree of flexibility afforded by each.

| Flexibility of the Code                                    |   |
|--|---|
| Categories   | Flexibility                                 |
| Energy/CO <sub>2</sub><br>Water                            | Minimum standards at each level of the Code |
| Materials<br>Surface water run-off<br>Waste                | Minimum standard at Code entry level        |
| Pollution<br>Health and wellbeing<br>Management<br>Ecology | No minimum standards                        |

## Assessing the sustainability rating

Assessment procedures are based on BRE's EcoHomes System which depends on a network of specifically trained and accredited independent assessors. Currently BRE and Stroma can offer training and accreditation of Code assessors.

Code assessors can conduct an initial design stage assessment, recommend a sustainability rating, and issue an interim Code certificate. A final Code certificate of compliance is issued after a post-completion check to verify the rating has taken place.

A design stage assessment may only need to be carried out on each specific environmental issue within any development – not every single home. Post-completion checks will be carried out on a sample basis.

Builders whose home designs and completed work are assessed under the Code will receive a certificate showing the overall sustainability rating for the home, and a breakdown of how that rating has been achieved.

From May 2008 homes that are not assessed will have a nil-rated certificate which is produced by the seller of property. Examples of both a Code certificate and a nil rated certificate showing that a home had not been assessed against the Code can be found at Annexes C and D. A nil-rated certificate can be downloaded from the HIP and BRE websites:

**[www.homeinformationpacks.gov.uk](http://www.homeinformationpacks.gov.uk)**

**[www.bre.co.uk](http://www.bre.co.uk)**

# Annex A

## How the Code works

The Code for Sustainable Homes is an environmental assessment rating method for new homes in England which:

- identifies a set of issues which are known to impact on the environment
- establishes performance measures which:
  - are known to reduce environmental impacts
  - exceed the requirements of legislation and regulations
  - can be objectively assessed, evaluated and delivered in a practical and cost effective way by the construction industry.
- identifies environmental issues for which mandatory minimum performance must be achieved in order to gain a Code rating
- assesses environmental performance in a two stage process (Design stage and Post construction) using objective criteria and verification
- records results of the Code assessment on a certificate assigned to the dwelling.

The *Code for Sustainable Homes: A step-change in sustainable home building practice*<sup>4</sup> defined a set of nine categories of environmental impact as outlined in Table 1.

<sup>4</sup> Communities and Local Government, 2006.

| <b>Table 1: Summary of Environmental impact categories and issues</b> |   |
|---|---|
| <b>Categories</b>   | <b>Issues</b>   |
| Energy and CO <sub>2</sub> emissions                                  | Dwelling emission rate (M)<br>Building fabric<br>Internal lighting<br>Drying space<br>Energy labelled white goods<br>External lighting<br>Low or Zero Carbon (LZC) technologies<br>Cycle storage<br>Home office |
| Water   | Internal water use (M)<br>External water use  |
| Materials   | Environmental impact of materials (M)<br>Responsible sourcing of materials – building elements<br>Responsible sourcing of materials – finishing elements  |
| Surface water run-off   | Management of surface water run-off from developments (M)<br>Flood risk   |
| Waste   | Storage of non-recyclable waste and recyclable household waste (M)<br>Construction waste management (M)<br>Composting   |
| Pollution   | Global Warming Potential (GWP) of insulants<br>NO <sub>x</sub> emissions  |
| Health and wellbeing  | Daylighting<br>Sound insulation<br>Private space<br>Lifetime homes (M)  |
| Management  | Home user guide<br>Considerate constructors scheme<br>Construction site impacts<br>Security   |
| Ecology   | Ecological value of site<br>Ecological enhancement<br>Protection of ecological features<br>Change in ecological value of site<br>Building footprint   |

(M) denotes issues with mandatory elements.

The Code assigns one or more performance requirements (assessment criteria) to all of the environmental issues. When each performance requirement is achieved, a credit is awarded (except for the four mandatory requirements with no associated credits). The total number of credits available to a Category is the sum of credits available for all the issues within it.

Mandatory minimum performance standards are set for some issues. For four of these, a single mandatory requirement is set which must be met, whatever Code level is sought. Credits are not awarded for these issues. Confirmation that the performance requirements are met for all four is a minimum entry requirement for achieving a level 1 rating. The four un-credited issues are within:

- Environmental impacts of materials
- Management of surface water run-off from developments
- Storage of non recyclable waste and recyclable household waste
- Construction site waste management.

If the mandatory minimum performance standard is met for the four un-credited issues, two further mandatory issues need to be considered. These are agreed to be such important environmental issues that separate government policies are being pursued to mitigate their effects. Credits are awarded for every level of achievement recognised within the Code, and minimum mandatory standards increase with increasing rating levels. The two issues with increasing mandatory minimum standards are:

- Dwelling emission rate
- Indoor water use.

Tables 2 and 3 below illustrate how for the creditable mandatory issues the minimum mandatory standards increase with increasing rating levels. For CO<sub>2</sub> emissions there are increased mandatory minimum standards for each increase in Code Level.

| <b>Table 2: Code Levels for Mandatory Minimum Standards in CO<sub>2</sub> Emissions</b> |   |
|---|---|
| <b>Code Level</b>   | <b>Minimum Percentage reduction in Dwelling Emission Rate Over Target Emission Rate</b> |
| Level 1 (★)   | 10  |
| Level 2 (★★)  | 18  |
| Level 3 (★★★)   | 25  |
| Level 4 (★★★★)  | 44  |
| Level 5 (★★★★★)   | 100   |
| Level 6 (★★★★★★)  | 'Zero Carbon' Home  |

For Indoor water use there are mandatory minimum standards at all levels of the Code.

**Table 3:** Code Levels for Mandatory Maximum Standards in Potable Water Consumption

| Code Level       | Maximum Potable Water Consumption<br>in litres per person per day |
|------------------|---|
| Level 1 (★)      | 120   |
| Level 2 (★★)     | 120   |
| Level 3 (★★★)    | 105   |
| Level 4 (★★★★)   | 105   |
| Level 5 (★★★★★)  | 80  |
| Level 6 (★★★★★★) | 80  |

Further credits are available on a free-choice or tradable basis from other issues so that the developer may choose how to add performance credits (converted through weighting to percentage points) achieve the rating that they are aiming for.

The environmental impact categories within the Code are not of equal importance. Their relative value is conveyed by applying a consensus-based environmental weighting factor (see details below) to the sum of all the raw credit scores in a category, resulting in a score expressed as percentage points. The points for each category add up to 100. (See Table 4).

## Weightings, credits and percentage points

The weighting factors used in the Code have been derived from extensive studies involving a wide range of stakeholders who were asked to rank (in order of importance) a range of environmental impacts (BRE, work in progress). Stakeholders included international experts and industry representatives.

The results take account of:

- the contribution of new housing in the UK to each Code category of environmental impact; and
- the potential to mitigate environmental impacts at both the design and construction stages.

Table 4 shows how weightings are applied across all Code categories of environmental impact to adjust the relative values of credits within different categories. Within each category credits are awarded for achieving specified degrees of performance. The weighting factors show the contribution made by each category to the total performance recognised and rewarded by the Code. The total available contribution is expressed as 100 per cent. The weighting of each category is expressed as a fraction of this, such that the sum of all the category contributions equals 100 per cent.

As an example, the 29 credits available for Energy and CO<sub>2</sub> emissions contribute to 36.4 per cent of the total available performance. Similarly, the 4 credits available for pollution contribute to 2.8 per cent of the total available performance. By dividing the weighting factor by the number of credits for each category, we arrive at an approximate weighted value for each credit. For instance within the Energy and CO<sub>2</sub> category, 36.4 per cent contribution to the total, divided by the 29 credits available, means that each credit in this category is worth about 1.26. Similarly, for the Pollution category, 2.8 per cent contribution to the total, divided by the 4 credits available, means that each credit in this category is worth about 0.70.

It is important to note that weightings apply at the category level and not for individual credits to avoid rounding errors.

| <b>Table 4: Total Credits available, Weighting Factors and Points</b> |                                       |   |  |
|---|---------------------------------------|---|--|
| <b>Categories of Environmental Impact</b>                             | <b>Total Credits in each Category</b> | <b>Weighting factor (% points contribution)</b> | <b>Approximate weighted value of each credit</b> |
| Category 1 – Energy and CO <sub>2</sub> Emissions                     | 29                                    | 36.4%   | 1.26   |
| Category 2 – Water  | 6                                     | 9.0%  | 1.50   |
| Category 3 – Materials  | 24                                    | 7.2%  | 0.30   |
| Category 4 – Surface Water Run-off                                    | 4                                     | 2.2%  | 0.55   |
| Category 5 – Waste  | 7                                     | 6.4%  | 0.91   |
| Category 6 – Pollution  | 4                                     | 2.8%  | 0.70   |
| Category 7 – Health and Wellbeing                                     | 12                                    | 14.0%   | 1.17   |
| Category 8 – Management   | 9                                     | 10.0%   | 1.11   |
| Category 9 – Ecology  | 9                                     | 12.0%   | 1.33   |
| <b>Total</b>  | –                                     | <b>100.0%</b>                                   | –  |

Table 5 summarises the environmental impact categories, issues, credits and weighting factors

| <b>Table 5: Summary of environmental impact categories, issues, credits and weighting</b> |                          |                                  |
|---|--------------------------|----------------------------------|
| <b>Code Categories</b>  | <b>Available Credits</b> | <b>Category Weighting Factor</b> |
| <b>Energy and CO<sub>2</sub> Emissions</b>  |                          |                                  |
| Dwelling Emission Rate  | 15                       |                                  |
| Building Fabric   | 2                        |                                  |
| Internal Lighting   | 2                        |                                  |
| Drying Space  | 1                        |                                  |
| Energy Labelled White Goods   | 2                        |                                  |
| External Lighting   | 2                        |                                  |
| Low or Zero Carbon (LZC) Energy Technologies  | 2                        |                                  |
| Cycle Storage   | 2                        |                                  |
| Home Office   | 1                        |                                  |
|   | <b>Category Total 29</b> | <b>36.40</b>                     |
| <b>Water</b>  |                          |                                  |
| Indoor Potable Water Use  | 5                        |                                  |
| External Water Use  | 1                        |                                  |
|   | <b>Category Total 6</b>  | <b>9.00</b>                      |
| <b>Materials</b>  |                          |                                  |
| Environmental Impact of Materials   | 15                       |                                  |
| Responsible Sourcing of Materials – Basic Building Elements                               | 6                        |                                  |
| Responsible Sourcing of Materials – Finishing Elements                                    | 3                        |                                  |
|   | <b>Category Total 24</b> | <b>7.20</b>                      |
| <b>Surface Water Run-off</b>  |                          |                                  |
| Management of surface water run-off from developments                                     | 2                        |                                  |
| Flood Risk  | 2                        |                                  |
|   | <b>Category Total 4</b>  | <b>2.20</b>                      |

**Table 5:** Summary of environmental impact categories, issues, credits and weighting  
(cont.)

| <b>Code Categories</b>   | <b>Available Credits</b> | <b>Category Weighting Factor</b> |
|--|--------------------------|----------------------------------|
| <b>Waste</b>   |                          |                                  |
| Storage of non-recyclable waste and recyclable household waste | 4                        |                                  |
| Construction Site Waste Management                             | 2                        |                                  |
| Composting   | 1                        |                                  |
| <b>Category Total</b>  | <b>7</b>                 | <b>6.40</b>                      |
| <b>Pollution</b>   |                          |                                  |
| Global Warming Potential (GWP) of insulants                    | 1                        |                                  |
| NOx Emissions  | 3                        |                                  |
| <b>Category Total</b>  | <b>4</b>                 | <b>2.80</b>                      |
| <b>Health &amp; Wellbeing</b>                                  |                          |                                  |
| Daylighting  | 3                        |                                  |
| Sound Insulation   | 4                        |                                  |
| Private Space  | 1                        |                                  |
| Lifetime Homes   | 4                        |                                  |
| <b>Category Total</b>  | <b>12</b>                | <b>14.00</b>                     |
| Management   |                          |                                  |
| Home User Guide  | 3                        |                                  |
| Considerate Constructors Scheme                                | 2                        |                                  |
| Construction Site Impacts                                      | 2                        |                                  |
| Security   | 2                        |                                  |
| <b>Category Total</b>  | <b>9</b>                 | <b>10.00</b>                     |
| <b>Ecology</b>   |                          |                                  |
| Ecological value of site                                       | 1                        |                                  |
| Ecological enhancement   | 1                        |                                  |
| Protection of ecological features                              | 1                        |                                  |
| Change in ecological value of site                             | 4                        |                                  |
| Building footprint   | 2                        |                                  |
| <b>Category Total</b>  | <b>9</b>                 | <b>12.00</b>                     |
| <b>Total</b>   | <b>104</b>               | <b>100.00</b>                    |

## Calculating an assessment score

The assessment process should proceed in a logical order through the environmental impact categories and issues, summarised in Figure 1 below:

- It should begin with a check that the four mandatory issues for which no credits are awarded have been achieved
- The mandatory credits for CO<sub>2</sub> emissions and for Internal water use should be checked and confirmed at the minimum values required to meet the Code level sought
- The remaining tradable credits should be checked and confirmed so that they too contribute to the required Code level.

If any of the standards for the four non-creditable issues are not met, then a zero rating will result, regardless of the other credits achieved, including the creditable mandatory issues.

If all the non-creditable mandatory standards are met, but one or other of the creditable mandatory issues fails to reach the minimum for a higher required level, the rating achieved will be determined by the lowest level which all the mandatory issues meet. For instance, if you are using biomass for your heating demand, this may get you points for energy and renewables credit but cannot achieve the NO<sub>x</sub> credit. Achieving a high performance in one category of environmental impact can sometimes result in a lower level of performance for another. It is therefore impossible to achieve a Total percentage points score of 100.

## Total percentage points score and resulting Code Level

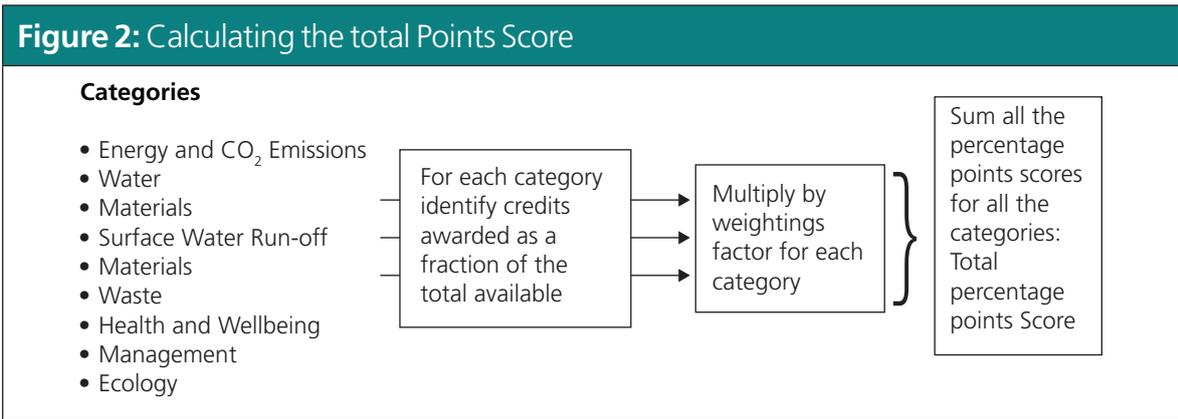
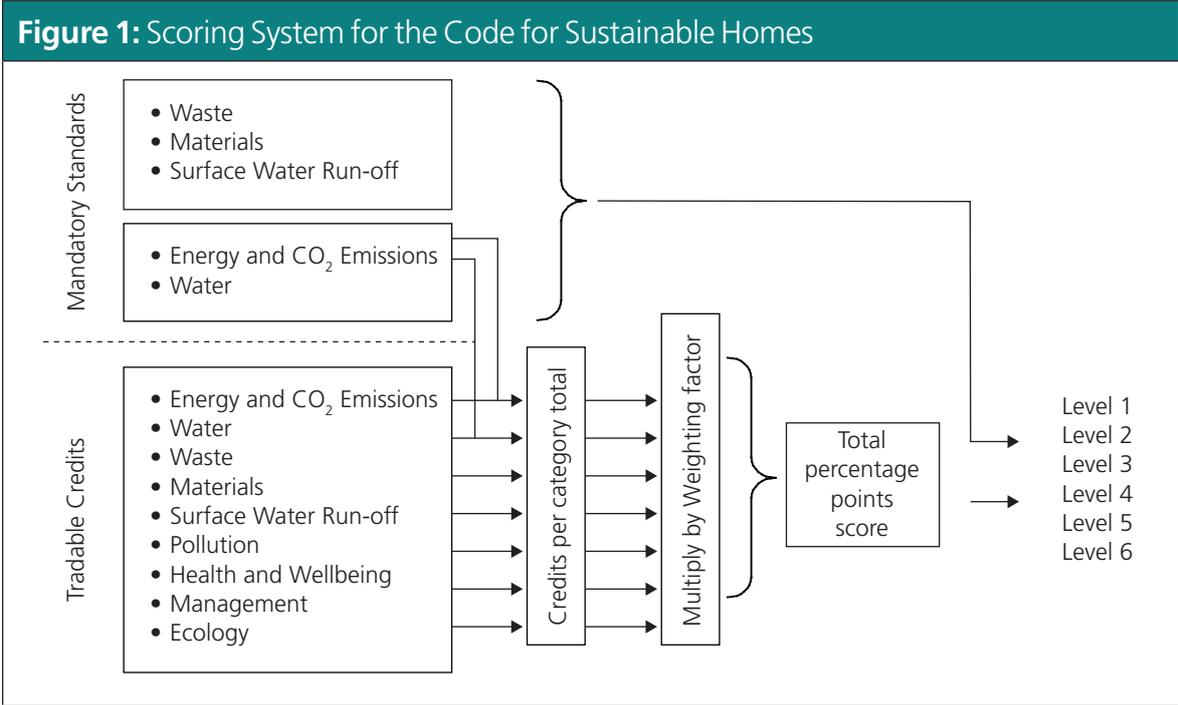
Figure 2 illustrates the calculation method to obtain a Total percentage points score. For every category, the number of credits achieved is divided by the total available and multiplied by the category weighting factor to give a percentage point score for the category. **This number should be rounded down to two decimal places before the next step.**

The rounded percentage point scores for each category are then summed to arrive at the Total percentage points score for the dwelling. **The Total percentage point score must be rounded down to the nearest whole number.**

The Code Level is then derived from the Total percentage points according to Table 6. Each Code Level is represented on the certificate by an equivalent number of Stars from 1 to 6.

| <b>Table 6: Relationship between Total percentage points score and Code Level</b> |                    |
|---|--------------------|
| <b>Total percentage points score<br/>(equal to or greater than)</b>               | <b>Code Levels</b> |
| 36 Points   | Level 1 (★)        |
| 48 Points   | Level 2 (★★)       |
| 57 Points   | Level 3 (★★★)      |
| 68 Points   | Level 4 (★★★★)     |
| 84 Points   | Level 5 (★★★★★)    |
| 90 Points   | Level 6 (★★★★★★)   |

Figure 1 summarises the process of arriving at a Total percentage points score and then converting that to a Code Level.



The Report Submission Tool (available for assessors from the Code service provider) should be used to determine an accurate score for an assessment.

# Annex B

## The Standard

This section sets out the elements that the Code looks at, what it aims to achieve in relation to each and whether it is a mandatory element. Full details of how to assess a home against the Code is set out in the Technical Guidance.

The list of issues:

| Issue   |
|---|
| <p><b>Energy and CO<sub>2</sub> Emissions</b></p> <ul style="list-style-type: none"> <li>Dwelling Emission Rate</li> <li>Building Fabric</li> <li>Internal Lighting</li> <li>Drying Space</li> <li>Energy Labelled White Goods</li> <li>External Lighting</li> <li>Low or Zero Carbon (LZC) Technologies</li> <li>Cycle Storage</li> <li>Home Office</li> </ul> |
| <p><b>Water</b></p> <ul style="list-style-type: none"> <li>Internal Potable Water Use</li> <li>External Water Use</li> </ul>  |
| <p><b>Materials</b></p> <ul style="list-style-type: none"> <li>Environmental Impact of Materials</li> <li>Responsible Sourcing of Materials – Basic Building Elements</li> <li>Responsible Sourcing of Materials -Finishing Elements</li> </ul>   |
| <p><b>Surface Water Run-off</b></p> <ul style="list-style-type: none"> <li>Management of surface water run-off from developments</li> <li>Flood Risk</li> </ul>   |
| <p><b>Waste</b></p> <ul style="list-style-type: none"> <li>Storage of non-recyclable waste and recyclable household waste</li> <li>Construction Site Waste Management</li> <li>Composting</li> </ul>  |
| <p><b>Pollution</b></p> <ul style="list-style-type: none"> <li>Global Warming Potential (GWP) of insulants</li> <li>NO<sub>x</sub> Emissions</li> </ul>   |

**Issue (*continued*)**

**Health & Wellbeing**

Daylighting  
Sound Insulation  
Private Space  
Lifetime Homes

**Management**

Home User Guide  
Considerate Constructors Scheme  
Construction Site Impacts  
Security

**Ecology**

Ecological value of site  
Ecological enhancement  
Protection of ecological features  
Change in ecological value of site  
Building footprint

# Category 1

## Energy and Carbon Dioxide Emissions

| Issue ID | Description            | No. of credits available | Mandatory Elements |
|----------|------------------------|--------------------------|--------------------|
| Ene 1    | Dwelling Emission Rate | 15                       | Yes                |

### Aim

To limit emissions of carbon dioxide (CO<sub>2</sub>) into the atmosphere that arise from the operation of a dwelling and its services.

### Assessment criteria

Credits are awarded based on the percentage improvement in the Dwelling Emission Rate (*DER*), (estimated carbon dioxide emissions in kg per m<sup>2</sup> per annum arising from energy use for heating, hot water and lighting for the actual dwelling), over the Target Emission Rate (*TER*) (the maximum emission rate permitted by Building Regulations), for the dwelling where DER and TER are as defined in AD L1A 2006<sup>5</sup> Edition of the Building Regulations. The table below sets out the improvement of DER over TER and the corresponding level of the Code. Note that to reach Level 6 (zero carbon) there are additional requirements.

| Criteria                               |                  |
|--|------------------|
| Percentage improvement of DER over TER | Mandatory levels |
| ≥10                                    | <b>Level 1</b>   |
| ≥14                                    |                  |
| ≥18                                    | <b>Level 2</b>   |
| ≥22                                    |                  |
| ≥25                                    | <b>Level 3</b>   |
| ≥31                                    |                  |
| ≥37                                    |                  |
| ≥44                                    | <b>Level 4</b>   |
| ≥52                                    |                  |
| ≥60                                    |                  |
| ≥69                                    |                  |

<sup>5</sup> Communities and Local Government. *Approved Document L1A Conservation of fuel and power (New dwellings) (2006 edition)*. Communities and Local Government, London, 2006. Available from [www.planningportal.gov.uk/approveddocuments](http://www.planningportal.gov.uk/approveddocuments)

| Criteria ( <i>continued</i> ) |                |
|-------------------------------|----------------|
| ≥79                           |                |
| ≥89                           |                |
| ≥100                          | <b>Level 5</b> |
| <b>'Zero Carbon Home'</b>     | <b>Level 6</b> |

### Background

CO<sub>2</sub> has a direct environmental impact and is a major greenhouse gas, contributing to climate change. The credit scale relates to the operational energy requirements of the home under standard occupancy assumptions – rather than actual energy use. It should be noted that the actual energy consumption may be markedly different, as a range of user-specific issues will affect it, such as the hours of operation of space heating, type and size of household, use of white goods, etc.

| Issue ID | Description     | No. of credits available | Mandatory elements |
|----------|-----------------|--------------------------|--------------------|
| Ene 2    | Building fabric | 2                        | No                 |

### Aim

To future proof the energy efficiency of dwellings over their whole life by limiting heat losses across the building envelope

### Assessment criteria

Credits are awarded based on the Heat Loss Parameter for each dwelling.

### Background

This issue assesses the thermal performance of the building envelope on its own. Although innovative systems for provision of services to the building may reduce the energy consumption, it is the building envelope that can have the most significant long-term effect, as the envelope is unlikely to be radically altered during its life, other than where extensions are added.

The Heat Loss Parameter is a statistic which combines the impact of both external surface area, insulation value of construction and airtightness. Rewarding a lower value for Heat Loss Parameter encourages the design of efficient built form such as flats and terraces as well as increased levels of insulation and airtightness.

Further information on reducing the energy use in buildings to the point at which almost no energy is used in heating, known as the 'PassivHaus'<sup>6</sup> concept can be found in the *References and Further Information* section in the Code Technical Guidance.

<sup>6</sup> PassivHaus: [www.passivhaus.org.uk](http://www.passivhaus.org.uk)

| Issue ID | Description       | No. of credits available | Mandatory elements |
|----------|-------------------|--------------------------|--------------------|
| Ene 3    | Internal lighting | 2                        | No                 |

### Aim

To encourage the provision of energy efficient internal lighting, thus reducing the CO<sub>2</sub> emissions from the dwelling.

### Assessment criteria

*Credits are awarded for the provision of fixed dedicated energy efficient internal light fittings.*

### Background

The Building Regulations England and Wales, Part L1A<sup>7</sup> requires fixed dedicated energy efficient light fittings to be installed in the most frequented locations in the dwelling to a number not less than one per 25m<sup>2</sup> floor area or one per four fixed light fittings.

Under SAP 2005<sup>8</sup>, 30 per cent of the internal lighting is assumed to be low energy by default. The Code for Sustainable Homes requires a greater amount of fixed low energy light fittings to be installed for additional credits to be awarded. All internal fixed light fittings are assessed in this Issue.

The requirement is to provide energy efficient lighting to minimise energy consumption. In most homes, lighting accounts for around 10-15 per cent of an electricity bill. Traditional bulbs waste a lot of their energy. Each energy-saving bulb can reduce a household electricity bill by up to £7 a year. This equates to a reduction in CO<sub>2</sub> emissions of approximately 43 kg/yr. Compact fluorescent light bulbs (CFLs) use around 60 per cent less electricity than traditional incandescent lights, while lasting ten to twelve times as long. Their long life means they need replacing less often and so are particularly suitable for use in inaccessible fixtures.

<sup>7</sup> For further information on Building Regulations for England and Wales please see [www.communities.gov.uk/planningandbuilding/buildingregulations/](http://www.communities.gov.uk/planningandbuilding/buildingregulations/)

<sup>8</sup> SAP is the Government's Standard Assessment Procedure, the method for calculating predicted energy use and CO<sub>2</sub> emissions recommended for use in determining compliance with Building Regulations.

| Issue ID | Description  | No. of credits available | Mandatory elements |
|----------|--------------|--------------------------|--------------------|
| Ene 4    | Drying space | 1                        | No                 |

### Aim

To provide a reduced energy means of drying clothes.

### Assessment criteria

Credits are awarded based on the provision of adequate secure drying space for each dwelling type.

### Background

This issue was introduced to encourage the drying of clothes 'naturally' rather than using a tumble dryer. It has become increasingly common practice to include a place for a tumble dryer without necessarily attempting to design in a space for natural drying. This Issue is especially important for those dwellings without a large garden.

Ventilation for indoor spaces supplied with drying fixings should conform to the recommendations of the Energy Savings Trust (EST)<sup>9</sup> and will depend on the airtightness strategy.

<sup>9</sup> Energy Saving Trust [www.energysavingtrust.org.uk/housingbuildings/standards/](http://www.energysavingtrust.org.uk/housingbuildings/standards/)

| Issue ID | Description                 | No. of credits available | Mandatory elements |
|----------|-----------------------------|--------------------------|--------------------|
| Ene 5    | Energy labelled white goods | 2                        | No                 |

### Aim

To encourage the provision or purchase of energy efficient white goods, and so reduce the CO<sub>2</sub> emissions from appliances in the dwelling.

### Assessment criteria

Credits are awarded where information is provided relating to the provision of energy efficient white goods under the EU Energy Efficiency Labelling Scheme, or where energy efficient white goods are supplied for each dwelling, including A+ rating for fridges and freezer or fridge/freezers, an A rating for Washing machines and dishwashers and a B rating for washer-dryers or tumble dryers.

### Background

For a typical new semi-detached dwelling built to Part L of the Building Regulations the CO<sub>2</sub> emissions from lights and appliances will make up about 43 per cent of the total CO<sub>2</sub> emissions. Emissions from lights and appliances (including cooking) are now higher than both space and water heating emissions. In such a typical semi, space heating would account for 26 per cent of the CO<sub>2</sub> emissions, water heating 22 per cent and cooking 9 per cent.

The choice of appliances will therefore play an important role in terms of reducing total CO<sub>2</sub> emissions. Up to 190kg per year of CO<sub>2</sub> can be saved by each household for choosing an energy efficient fridge freezer compared to a more 'traditional' model. This equates to a monetary saving of around £35 a year.

Lights and appliances represent the area of greatest growth in residential energy use. Over the past 30 years the energy used for lights and appliances has increased at around 2 per cent per annum.

It is increasingly likely that when occupants choose their own white goods they will consider the energy consumption, especially for products of equal price. To encourage this, where no white goods are provided, the developer should supply information on the EU Energy Efficiency Labelling Scheme of efficient white goods.

| Issue ID | Description       | No. of credits available | Mandatory elements |
|----------|-------------------|--------------------------|--------------------|
| Ene 6    | External lighting | 2                        | No                 |

### Aim

To encourage the provision of energy efficient external lighting, and reduce associated CO<sub>2</sub> emissions.

### Assessment criteria

Credits are awarded where all external lighting within the development is provided by dedicated energy efficient fittings including space and security lighting.

### Background

The requirement is to provide energy efficient lighting that is adequately controlled to minimise energy consumption.

Domestic security lighting for deterring intruders is normally fitted with bright tungsten or halogen luminaires. These are not particularly energy efficient, but there are few alternatives. The main objective of this issue is to ensure that appropriate fittings are installed to avoid excessive energy use.

The current Building Regulations England, Part L1A<sup>10</sup>, requires fixed external lighting ie lighting fixed to an external surface of the dwelling, to be either fixed low energy light fittings or, for security lighting, max 150 W with PIR and daylight cut off sensors. However, garage lighting, lighting on outbuildings, security lighting, feature lighting or lighting in communal areas in blocks of flats are not covered. Neither are they included in SAP and the DER which is why this component of external lighting is covered under the Code.

<sup>10</sup> *Approved Document L1A Conservation of fuel and power (New dwellings) (2006 edition)*. Communities and Local Government, 2006. Available from: [www.planningportal.gov.uk/approveddocuments](http://www.planningportal.gov.uk/approveddocuments)

| Issue ID | Description                           | No. of credits available | Mandatory elements |
|----------|---------------------------------------|--------------------------|--------------------|
| Ene 7    | Low or Zero Carbon (LZC) technologies | 2                        | No                 |

### Aim

To reduce carbon emissions and atmospheric pollution by encouraging local energy generation from renewable sources to supply a significant proportion of the energy demand.

### Assessment criteria

Credits are awarded based on the percentage reduction in total carbon emissions that result from using Zero or Low Carbon (LZC) Energy Technologies for each dwelling using the calculation method detailed in *the Technical Guidance*.

### Background

The use of zero and low emission energy sources will not only lead to reduced emissions of greenhouse gases and other pollutants, but will also help to conserve the finite global fossil fuel resources and develop a market for such technologies.

The government has set a target that 10 per cent of energy in the UK should be generated from renewable sources by 2010<sup>11</sup>. The greater the number of individual buildings that obtain 10 per cent or more of their energy from renewable sources, the easier this target will be to achieve.

This credit rewards energy efficient design in addition to the inclusion of renewable energy technology. Supplying energy efficient buildings with 10 per cent of their energy demand from zero or low carbon sources will be easier than for less energy efficient buildings since their total demand is lower.

<sup>11</sup> *Building Regulations: Energy efficiency requirements for new dwellings – A forward look at what standards may be in 2010 and 2013*, Communities and Local Government, July 2007.

| Issue ID | Description   | No. of credits available | Mandatory elements |
|----------|---------------|--------------------------|--------------------|
| Ene 8    | Cycle storage | 2                        | No                 |

### Aim

To encourage the wider use of bicycles as transport by providing adequate and secure cycle storage facilities, thus reducing the need for short car journeys.

### Assessment criteria

Credits are awarded where adequately sized, safe, secure, convenient and weather-proof cycle storage are provided for each dwelling. If individual or communal cycle storage is provided (as defined in the *Relevant Definitions section of Ene 8 in the Technical Guidance*) credits are also awarded.

### Background

The majority of all car journeys made are less than five miles. One viable alternative for those journeys is the bicycle. This will not only reduce air/noise pollution and provide more space on the streets, but also improve the health and fitness of the cyclist. In order to make cycling a practical alternative, people need somewhere convenient and safe to store their bicycles when they are at home. The Code therefore encourages the developer to provide such a space.

| Issue ID | Description | No. of credits available | Mandatory elements |
|----------|-------------|--------------------------|--------------------|
| Ene 9    | Home Office | 1                        | No                 |

### Aim

To reduce the need to commute to work by providing residents with the necessary space and services to be able to work from home.

### Assessment criteria

Credits are awarded on the basis of the provision of space and services that enable a suitable quiet room to be used effectively as a home office.

### Background

The number of self-employed people is increasing, as is the number of people who work from home. Many job functions can readily be performed remotely, so it is quite feasible for individuals to work from home (or elsewhere) on either a full or part time basis. Currently there are 1.1 million people in the UK who have such non-traditional work patterns. Information from social trends indicates that 29 per cent and 24 per cent of employed men and women respectively have, at some time, worked from home. The benefits of working from home include reductions in transport movements, increased time available for the home worker and greater opportunities to participate within community activities.

Working from home for many people requires a telephone line as well as a connection to the internet for data transference and even video conferencing. Two telephone points or broadband will enable residents to use the telephone and the computer at the same time.

## Category 2

### Water

| Issue ID | Description        | No. of credits available | Mandatory elements |
|----------|--------------------|--------------------------|--------------------|
| Wat 1    | Internal water use | 5                        | Yes                |

#### Aim

To reduce the consumption of potable water in the home.

#### Assessment criteria

Credits are awarded based on the predicted average household water consumption (calculated using the Code Water Calculator - see Technical Guidance - Calculation Procedures) for the Dwelling type. The mandatory minimum standards and corresponding predicted average household water consumption are show in the table below:

| Maximum water consumption (litres/person/day) | Mandatory levels |
|---|------------------|
| 120   | Levels 1 and 2   |
| 110   |                  |
| 105   | Levels 3 and 4   |
| 90  |                  |
| 80  | Levels 5 and 6   |

#### Background

Climate change may result in increased variability in weather patterns increasing both the risk of flooding and extended dry spells. Water consumption is likely to become an increasing national problem. Water is becoming more scarce at the same time as population and demand for water is increasing, the development of practical ways to reduce water demand is very important.

In the South East of England, water demand exceeds the volume licensed for abstraction, with the shortfall being met from ground water. Twenty per cent of the UK's water is used domestically with over 50 per cent of this used for flushing WC's and washing (source: Environment Agency<sup>12</sup>). Most of which comes from drinking quality standard or potable water.

<sup>12</sup> The Environment Agency [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

The amount of potable water used within the dwelling can be reduced by using fixed fittings which reduce water use in WC's, taps and showers. Further reductions could be achieved by installing Grey water or Rain water collection and treatment systems.

Following consultation Communities and Local Government announced in July 2007 that it was minded to regulate on water efficiency in homes. Further information can be found on the Communities and Local Government Website<sup>13</sup>

<sup>13</sup> [www.communities.gov.uk/publications/planningandbuilding/](http://www.communities.gov.uk/publications/planningandbuilding/)

| Issue ID | Description        | No. of credits available | Mandatory elements |
|----------|--------------------|--------------------------|--------------------|
| Wat 2    | External water use | 1                        | No                 |

### Aim

To encourage the recycling of rainwater and reduce the amount of mains potable water used for external water uses.

### Assessment criteria

A credit is awarded for providing a system to collect rainwater for use in irrigation where a correctly specified system to collect rainwater for external/internal irrigation use has been provided to a dwelling with a garden, patio or communal garden space (examples of such systems include rainwater butts and central rainwater collection systems). If no individual or communal garden spaces are specified or if only balconies are provided, the credit can be awarded by default.

### Background

Water is an increasingly scarce resource and more and more homes have metered water supplies with householders having to pay for any water they use.

Rainwater could be collected to reduce:

- the amount of water being discharged into drains and watercourses
- the risk of localised flooding
- overall water bills for householders.

The simplest and most cost-effective system for rainwater collection is the water butt. More complex central collection communal systems (using the same principles as the water butt) are available for apartment blocks.

The collection of rainwater for use in the dwelling, eg for WC flushing, is covered in Category 2: Wat 1 – Potable Water.

## Category 3

### Materials

| Issue ID | Description                       | No. of credits available | Mandatory elements |
|----------|-----------------------------------|--------------------------|--------------------|
| Mat 1    | Environmental impact of materials | 15                       | Yes                |

#### Aim

To encourage the use of materials with lower environmental impacts over their lifecycle.

#### Assessment criteria

Credits are awarded where the *Mat 1 Calculator* (see Technical Guidance) is used to assess the number of credits awarded in at least three of the following five key elements achieve a relevant Green Guide rating<sup>14</sup> from the 2007 version of *The Green Guide* of A+ to D:

- Roof
- External Walls
- Internal Walls (including separating walls)
- Upper and Ground Floors (including separating floors)
- Windows.

Note: These criteria are assessed at the building envelope level.

Between 1 and 15 credits are available depending on the Green Guide ratings and relative distributions of different materials across the five main elements of the building envelope. The method for determining the credits to award for any given situation is complex. It is described in detail in the current version of the Technical Guide.

#### Background

The production, use and disposal of building materials accounts for significant quantities of energy and resources, both internationally and in the UK. The Green Guide provides a simple tool to aid specifiers in considering the environmental implications of their choices. The Green Guide and BRE's Environmental Profiles<sup>15</sup> Methodology are based on life cycle assessment (LCA), an approach which measures and assesses a range of environmental impacts from 'cradle to grave'. The Green Guide uses LCA data gathered from the majority of UK construction products' trade associations.

<sup>14</sup> The 2008 (or latest if 2008 has been superseded) version of *The Green Guide to specification* see [www.bre.co.uk](http://www.bre.co.uk)

<sup>15</sup> BRE Environmental Profiles [www.bre.co.uk/envprofiles](http://www.bre.co.uk/envprofiles)

The environmental issues considered reflect the generally accepted areas of concern related to the production of building materials used in the UK. The same weighting system that underpins the Code scoring procedure is used to calculate a summary score, on a scale from A+ to E, with A+ rated specifications having the lowest overall environmental impact.

It is these summary Green Guide ratings that the Code considers for the five key elements above. Materials and components are presented in their typical, as-built elemental form. They are compared on a like-for-like basis, as specifications that fulfil similar functions; important variables such as the mass of a material required to fulfil a particular function are taken into account. The specifications are compared over a 60-year study period. Included in this is any repair and maintenance over the 60-year life, and impacts relating to an assumed dismantling/demolition of the building at the end of its life which may occur at any point after 60 years.

| Issue ID | Description   | No. of credits available | Mandatory elements |
|----------|---|--------------------------|--------------------|
| Mat 2    | Responsible sourcing of materials – basic building elements | 6                        | No                 |

### Aim

To recognise and encourage the specification of responsibly sourced materials for the basic building elements.

### Assessment criteria

Points are awarded where materials used in key building elements are responsibly sourced, where 80 per cent of the *assessed materials* in the following *Building Elements* are responsibly sourced:

- a. Frame
- b. Ground floor
- c. Upper floors (including separating floors)
- d. Roof
- e. External walls
- f. Internal walls (including separating walls)
- g. Foundation/substructure (excluding sub-base materials)
- h. Staircase.

Additionally, 100 per cent of any timber in these elements must be legally sourced.

Note: These criteria are assessed at the *Building Envelope* Level

### Background

Up to 6 credits are awarded for responsible sourcing of materials through auditable third party certification schemes.

Responsible sourcing of materials is based on the fundamental principle of life cycle stewardship which is at the heart of the Brundtland<sup>16</sup> definition of sustainable development as 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs'.

<sup>16</sup> Brundtland G.H. *Our Common Future: The UN World Commission on Environment and Development*. United Nations. 1987.

This means that the consequences and impacts of using materials must be considered from the point at which they are mined or harvested in their raw state, through manufacture and processing, through use, reuse and recycling, until their final disposal as waste with no further value.

Responsible sourcing of materials has environmental social and economic dimensions. Supply chain management and material stewardship are essential elements of responsible sourcing. Certification by independent, licensed competent bodies confirms compliance with the required standards.

| Issue ID | Description  | No. of credits available | Mandatory elements |
|----------|--|--------------------------|--------------------|
| Mat 3    | Responsible sourcing of materials – finishing elements | 3                        | No                 |

### Aim

To recognise and encourage the specification of responsibly sourced materials for the finishing elements.

### Assessment criteria

Credits are awarded on the basis, where 80 per cent of the assessed materials in the following *Finishing Elements* are responsibly sourced:

- a. Stair
- b. Window
- c. External & internal door
- d. Skirting
- e. Panelling
- f. Furniture
- g. Fascias
- h. Any other significant use.

Additionally, 100 per cent of any timber in these elements must be legally sourced.

### Background

Up to 6 credits are awarded for responsible sourcing of materials through auditable third party certification schemes.

Responsible sourcing of materials is based on the fundamental principle of life cycle stewardship which is at the heart of the Brundtland<sup>17</sup> definition of sustainable development as 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs'.

This means that the consequences and impacts of using materials must be considered from the point at which they are mined or harvested in their raw state, through manufacture and processing, through use, reuse and recycling, until their final disposal as waste with no further value.

<sup>17</sup> Brundtland G.H. *Our Common Future: The UN World Commission on Environment and Development*. United Nations. 1987.

## Category 4

### Surface Water Run-off

| Issue ID | Description   | No. of credits available | Mandatory elements |
|----------|---|--------------------------|--------------------|
| Sur 1    | Management of surface water run-off from developments | 2                        | Yes                |

#### Aim

To design housing developments which avoid, reduce and delay the discharge of rainfall to public sewers and watercourses. This will protect watercourses and reduce the risk of localised flooding, pollution and other environmental damage.

#### Assessment criteria

It is mandatory at all levels to ensure that the peak rate of run-off into watercourses is no greater for the developed site than it was for the pre-development site<sup>18</sup>. This should comply with the Interim Code of Practice for Sustainable Drainage systems (SUDS) (CIRIA, 2004), or for at least the 1 year in 100 year return period events.

For sites of less than 200ha, the calculation of Greenfield run-off rates should be in accordance with Flood estimation for small catchments (Marshall and Bayliss, 1994).

For sites of 200ha and more, the calculation of Greenfield run-off rates should be in accordance with the Flood estimation handbook (Centre for Ecology and Hydrology, 1999)

An allowance for climate change should be made in accordance with current best practice (Lancaster et al, 2004).

It is mandatory at all levels to ensure that the additional predicted volume of rainwater discharge caused by the new development, for a 1 in 100 year event of 6 hour duration including an allowance for climate change (Lancaster et al, 2004), should be reduced using infiltration and/or made available for use in the dwelling as a replacement for potable water in WC flushing or operating a washing machine.

Where this additional rainwater volume cannot be prevented from being discharged for any reason, for all events up to the 100 year return period, the peak discharge rate from the site should be reduced to either:

- the pre-development site's estimated mean annual flood (Qbar); or

<sup>18</sup> The state of a site immediately before the development under assessment ie brownfield or greenfield.

- 2l/s/ha; or
- a minimum flow rate (litres per second), based on good practice guidelines to prevent easy blockage, by ensuring the outlet throttle is not too small.

If rainwater is discharged to a public sewer, flow rate requirements will be defined by the Sewerage undertaker<sup>19</sup>.

Credits are available for using SUDS to improve management of rainfall run-off and water quality of the rainwater discharged or for protecting the quality of the receiving waters by:

1. Ensuring no discharge to the watercourse for rainfall depths up to 5mm (follow guidance in the Interim Code of Practice for Sustainable Drainage systems (SUDS)<sup>20</sup> (CIRIA, 2004).

**or**

2. Establish agreements for the ownership, long term operation and maintenance of all sustainable drainage elements used.

Credits can be awarded by default if the site discharges rainwater directly to a tidal estuary or the sea, because compliance with discharge flow rate requirements will not be required.

## Background

Around five million people, in two million properties, live in flood risk areas in England and Wales. Changes in climate, such as more severe storms will increase that risk (Environment Agency website [www.environment-agency.gov.uk/youenv/eff](http://www.environment-agency.gov.uk/youenv/eff)).

The main intention of this issue is to reduce the overall discharge of rainwater from impervious hard landscaped surfaces and roofs within the development. In housing developments, this can be usually be done by designing Sustainable Drainage Systems (SUDS), which might include specifying rainwater recycling, pervious paving for all hard surfaces in the development, the use of green roofs, soakaways or other systems that help reduce surface water loads.

<sup>19</sup> This is a water company with statutory responsibility for provision of sewerage for disposal of sewage and also surface water from roofs and yards of premises.

<sup>20</sup> *Interim Code of Practice for Sustainable Drainage systems (SUDS)*. CIRIA, London. 2004. Available to download from [www.ciria.org.uk/suds/icop.htm](http://www.ciria.org.uk/suds/icop.htm)

| Issue ID | Description | No. of credits available | Mandatory elements |
|----------|-------------|--------------------------|--------------------|
| Sur 2    | Flood risk  | 2                        | No                 |

### Aim

To encourage housing development in low flood risk areas, or to take measures to reduce the impact of flooding on houses built in areas with a medium or high risk of flooding.

### Assessment criteria

Credits are awarded where the assessed dwelling is located either in an area of low annual probability of flooding, or where a flood risk assessment shows that appropriate measures have been taken to ensure safe access and escape routes and flood resilient and resistant construction.

The Flood Risk Assessment (FRA) accompanying the planning application must demonstrate to the satisfaction of the local planning authority and statutory body that the development has a low risk of flooding from all sources, or is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed.

### Background

Flooding in the United Kingdom is increasing due to increasing development encroaching on areas prone to flooding and more extreme weather patterns brought about by global warming. Other reasons may have to do with increased run-off from hard surfaces and from some agricultural land. Coastal flooding is exacerbated by rising sea levels, also a result of global warming.

Other sources of flooding include rivers, land/overland flow, groundwater reservoirs and sewers. Sewer flooding is a major cause of flooding in urban areas, which may not necessarily be assessed through the use of flood risk maps or flood risk assessment.

Floods are now on average nearly twice as frequent as they were 100 years ago. Over 7 per cent of the land area of England and Wales is at risk from flooding and around five million people, (ie, two million properties), live in flood risk areas in England and Wales.

The Meteorological Office predicts a very significant increase in the incidence of flooding over the next century as a result of climate change. If property development continues to increase in high-risk areas, the frequency and intensity of natural catastrophes will inevitably increase too - even if the number of natural events remains constant.

## Category 5

### Waste

| Issue ID | Description  | No. of credits available | Mandatory elements |
|----------|--|--------------------------|--------------------|
| Was 1    | Storage of non-recyclable waste and recyclable household waste | 4                        | Yes                |

#### Aim

To recognise and reward the provision of adequate indoor and outdoor storage space for non-recyclable waste and recyclable household waste.

#### Assessment criteria

The first issue **non-recyclable waste storage** sets a mandatory performance requirement with no available credits. This requirement must be met if a Code rating is to be achieved. Adequate internal space and adequate external space are defined in the Glossary of definitions and terms.

There are credits available for provision of storage space for household recyclable materials. In the absence of both a local authority collection facility, and also adequate external storage space further credits are available for appropriate combinations of adequate internal space for storage of recyclable materials with either a local authority collection scheme, or adequate external space for storage.

Care should be taken to make sure that facilities are accessible to disabled people.

#### Background

*"It is established that nearly 36 million tonnes of municipal waste was generated in the UK in 2004/05. A total of 30 million tonnes of this was collected from households, which is approximately half a tonne of household waste per person. Waste from homes is generally collected by Local Authorities through regular waste collections or recycling schemes. There must be adequate storage provision for waste to enable its appropriate management."*

Cited from **www.wasteonline.com**

The legal requirements are set out in the Household Waste Recycling Act<sup>21</sup>. The size, type and number of containers may be set out by the Waste collection Authority using their powers in section 46 of the Environmental Protection Act 1991.

<sup>21</sup> Household Waste Recycling Act; 2003

| Issue ID | Description                        | No. of credits available | Mandatory elements |
|----------|------------------------------------|--------------------------|--------------------|
| Was 2    | Construction site waste management | 2                        | Yes                |

### Aim

To promote reduction and effective management of construction related waste by improving on performance which meets the *Site Waste Management Plan* (SWMP) regulations.

### Assessment criteria

It is mandatory at all levels of the Code for a Site Waste Management Plan to be developed and implemented. This will require monitoring and reporting of waste generated on site in defined waste groups and compliance with legal requirements as set in SWMP regulations 2008 for and with best practice. The plan should include the setting of targets to promote resource efficiency in accordance with guidance from WRAP<sup>22</sup>, Envirowise<sup>23</sup>, BRE<sup>24</sup> and DTI<sup>25</sup>. Specific targets are not required.

For a development where the cost of construction is less than £300,000, this element will be awarded by default.

The Site Waste Management Plan must include procedures and commitments for reducing waste generated on site in accordance with the best practice and the defined waste groups.

It must also include procedures and commitments to sort and divert waste from landfill (reuse, recycle, compost or otherwise recover) according to the defined waste groups. This must be performed either on site or through a licensed external contractor, in accordance with best practice.

### Background

Waste management on site can have significant impacts especially at a local level. From April 2008, SWMP is a legal requirement for all construction projects exceeding £300,000 (DEFRA, 2008)<sup>26</sup>.

Over 100 million tonnes of construction and demolition waste is generated in the UK annually and an estimated 13 million tonnes of unused building materials are discarded as waste (see [www.smartwaste.co.uk](http://www.smartwaste.co.uk)). To promote greater construction resource efficiency

<sup>22</sup> WRAP: *The Requirements suite for setting SWMPs early within projects (client summary and waste minimisation and management guidance for delivering on the requirements)*: [www.wrap.org.uk/construction](http://www.wrap.org.uk/construction)

<sup>23</sup> Envirowise: *GG642 An Introduction to Site Waste Management Plans* [www.envirowise.gov.uk](http://www.envirowise.gov.uk)

<sup>24</sup> BRE: *SMARTWaste Plan (Site waste management planning tool), SMARTStart, waste benchmarks/EPIs and guidance: Reduction of Site Construction Waste, Recycling and Reuse of materials: A Site Guide and A Project Management Guide*: [www.smartwaste.co.uk](http://www.smartwaste.co.uk)

<sup>25</sup> Site Waste Management Plans, Guidance for Construction Contractors and Clients, Voluntary Code of Practice, DTI, 2004

<sup>26</sup> DEFRA: *Site Waste Management Plans Regulations 2008 (to be added: SI number and ops link to the final version of the regulations)*

*“the Government is considering in conjunction with the construction industry, a target to halve the amount of construction, demolition and excavation wastes going to landfill by 2012 as a result of waste reduction, re-use and recycling”* (DEFRA, 2007).

Guidance on waste minimisation is available from DEFRA, BRE, WRAP, Envirowise and others (referenced below). SMARTWaste plan is a site waste management planning tool (see [www.smartwaste.co.uk](http://www.smartwaste.co.uk)) which monitors construction and demolition waste, including the amount and type generated and segregation/recycling rates. It also calculates Environmental Performance Indicators (EPIs). The system identifies opportunities for re-use and recycling and the location of suitable facilities for this via BREMAP, an online geographical information system.

Significant reductions in waste and better management can be achieved by good design, improved logistics, better on-site construction practices and re-use/recycling wherever possible. Segregation of waste for re-use or recycling will depend on the construction process as waste will vary in type and amount. It will also depend on the amount of space available on-site.

The removal of construction waste from site is subject to legislative requirements. It is not the responsibility of the assessor to ensure compliance with such legislation; however compliance should be apparent within the SWMP.

## Targets

Targets are specific to individual projects. For guidance on setting targets, refer to the Construction Industry KPI Pack, [www.constructionexcellence.org.uk](http://www.constructionexcellence.org.uk).

A Site Waste Management Plan is an important tool for managing site construction waste. Data obtained from monitoring site construction waste can be used to check performance against benchmarks and the effectiveness of any solutions implemented.

Two environmental performance indicators are typically used for waste generated from the construction process; waste generated in m<sup>3</sup> per 100m<sup>2</sup> of floor area and waste generated in m<sup>3</sup> per £100,000 of project value. Constructing Excellence and SMARTWaste™ produce annual benchmarks for these KPIs; these are still evolving. Benchmarks are being developed for different types of construction and waste. Details of these are shown on the SMARTWaste™ website [www.smartwaste.co.uk](http://www.smartwaste.co.uk).

This system automatically calculates the Environmental performance indicators for a project from the waste data collected and input into the system. Environmental performance indicators have been used to benchmark waste minimisation for a number of schemes, including Greenwich Millennium Village and Chiswick Park where waste reduction by 50 per cent was achieved.

| Issue ID | Description | No. of credits available | Mandatory elements |
|----------|-------------|--------------------------|--------------------|
| Was 3    | Composting  | 1                        | No                 |

### Aim

To encourage developers to provide the facilities to compost household waste, reducing the amount of household waste sent to landfill.

### Assessment criteria

Credits are awarded where home composting facilities are provided in houses with gardens or local authority kitchen waste collection/communal/community composting service in other dwelling types. The composting facilities should be suitable for normal domestic, non-woody garden, food and other compostable household waste. All facilities should be accompanied by information explaining how they work.

### Background

Composting at home is one of the easiest, most effective and environmentally friendly ways of recycling organic waste. Organic waste in a landfill site degrades to form leachate and methane gas. Leachate is a toxic liquid, which can pollute water and soil. Methane is explosive and is also a green house gas (27 times more powerful than carbon dioxide). Over 30 per cent of household waste can be diverted from landfill by composting, which avoids the production of methane and does not contaminate water supplies.

Compost can be used in the garden as a conditioner and mulch as an alternative to peat-based compost extracted from natural wildlife sites.

## Category 6

### Pollution

| Issue ID | Description                                 | No. of credits available | Mandatory elements |
|----------|---|--------------------------|--------------------|
| Pol 1    | Global warming potential (GWP) of insulants | 1                        | No                 |

#### Aim

To reduce global warming from blowing agent emissions that arise from the manufacture, installation, use and disposal of foamed thermal and acoustic insulating materials.

#### Assessment criteria

Credits are awarded where all insulating materials in the elements of the dwelling listed below avoid the use of substances that have a GWP less than or equal to 5 (manufacture or installation):

- Roofs: Including loft access
- Walls: internal and external including lintels and all acoustic insulation)
- Floors: (including ground and upper floors)
- Hot water cylinder, pipe insulation and other thermal stores
- Cold water storage tanks where provided
- External doors.

#### Background

Global warming is the name given to the phenomenon whereby trace 'greenhouse' gases in the atmosphere absorb infra-red radiation emitted by the earth's surface, causing a warming of the atmosphere. Radiation from the sun in the form of light (short wave solar radiation) that reaches the Earth is absorbed by the surface and warms it up. The surface re-radiates heat or infra-red (long-wave radiation) which is absorbed by 'greenhouse gases' in the atmosphere. It is this natural effect which is responsible for maintaining temperatures at the Earth's surface, allowing life to flourish.

This is known as the 'greenhouse effect' as in a greenhouse, where the glass lets in light, but stops heat (infrared long wave radiation) being lost.

The actions of mankind, in industrialisation, have disrupted this natural balance by adding increased levels of greenhouse gases to the atmosphere. The main greenhouse gases being emitted today are carbon dioxide from the burning of fossil fuels, methane (from

agriculture) and nitrous oxide (from agriculture). Global Warming Potential (GWP) is a relative measure of how effective a gas is at absorbing infra-red radiation compared to CO<sub>2</sub>. The GWP measures the total energy absorbed by 1 kg of released gas over a hundred years, relative to CO<sub>2</sub>, (which is given a GWP of 1.0).

The Kyoto Protocol has set limits on six specific gases that contribute towards global warming. These are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride. The table below shows the GWP for each of these gases.

| Gas                        | GWP         |
|----------------------------|-------------|
| Carbon Dioxide             | 1           |
| Methane                    | 21          |
| Nitrous oxide              | 310         |
| Hydrofluorocarbons - HFC's | 140-11,700  |
| Perfluorocarbons -PFC's    | 6,500-9,200 |
| Sulphurhexafluoride -SF6   | 23,900      |

| Issue ID | Description               | No. of credits available | Mandatory elements |
|----------|---------------------------|--------------------------|--------------------|
| Pol 2    | NO <sub>x</sub> emissions | 3                        | No                 |

### Aim

To reduce the emission of nitrogen oxides (NO<sub>x</sub>) into the atmosphere.

### Assessment criteria

Credits are awarded on the basis of NO<sub>x</sub> emissions arising from the operation of space heating and hot water systems for each *Dwelling Type*, with more credits awarded for lower levels of NO<sub>x</sub> emissions.

Note: No credits may be awarded for open flue heating or hot water systems.

### Background

Nitrogen oxides (NO<sub>x</sub>) are emitted from the burning of fossil fuels and contribute to both acid rain and to global warming in the upper atmosphere. NO<sub>x</sub> formation, which is highly temperature dependent, arises when combusting natural gas. NO<sub>x</sub> are believed to aggravate asthmatic conditions, react with the oxygen in the air to produce ozone, which is also an irritant and eventually form nitric acid when dissolved in water. When dissolved in atmospheric moisture the result is acid rain which can damage both trees and entire forest ecosystems.

Burners in domestic heating systems are a significant source of low-level NO<sub>x</sub>, while power stations (and therefore electric heating) are a significant source of NO<sub>x</sub> in the upper atmosphere.

The amount of NO<sub>x</sub> emissions varies from product to product. This credit rewards developers who include low- NO<sub>x</sub> boilers or other low NO<sub>x</sub> systems, such as renewables, in their schemes.

## Category 7

### Health and well-being

| Issue ID | Description | No. of credits available | Mandatory elements |
|----------|-------------|--------------------------|--------------------|
| Hea 1    | Daylighting | 3                        | No                 |

#### Aim

To improve the quality of life in homes through good daylighting and to reduce the need for energy to light the home.

#### Assessment criteria

Credits are awarded where kitchens, all living rooms, dining rooms and studies (including any room designated as a home office under Ene 9 - Home Office) achieve a minimum average daylight factor; and a percentage of the working plane in kitchens, living rooms, dining rooms and studies (including any room designated as a home office under Ene 9 - Home Office) receive direct light from the sky. Further information is in the Technical Guidance.

#### Background

People expect good natural lighting in their homes. Daylight makes an interior look more attractive and interesting, as well as providing light to work or read by and is also beneficial to health. Access to sunlight and daylight also helps to make a building energy efficient; effective daylighting will reduce the need for electric lighting, while winter solar gain can meet some of the heating requirements.

The quality and quantity of natural light in an interior depends both on the design of the interior environment (size and position of windows, depth and shape of rooms, colours of internal surfaces) and the design of the external environment (obstructing buildings and objects).

If obstructing buildings are large in relation to their distance from the room the distribution of light in the room will be affected, as well as the total amount received.

BS 8206 describes good practice in daylighting design and presents criteria intended to enhance the wellbeing and satisfaction of people in buildings, recognising that the aims of good lighting go beyond achieving minimum illumination for task performance.

The Code awards credits for meeting the minimum average daylight factor suggested by BS 8206-2. The BS together with further guidance given in Littlefair (1998) is widely accepted as the authoritative guidance for use in daylighting the UK.

| Issue ID | Description      | No. of credits available | Mandatory elements |
|----------|------------------|--------------------------|--------------------|
| Hea 2    | Sound insulation | 4                        | No                 |

### Aim

To ensure the provision of improved sound insulation to reduce the likelihood of noise complaints from neighbours.

### Assessment criteria

Credits are awarded for achieving higher standards of sound insulation than those given in Approved Document E<sup>27</sup> of the Building Regulations and demonstrating it by either using post completion testing (called pre-completion testing in Approved Document E and in the text below) or Robust Details<sup>28</sup>.

### Background

One of the most common causes for disputes between neighbours is noise. Environmental Health Officers in England and Wales received nearly 6000 noise complaints per million people in 2003/2004 from domestic premises. This accounts for 75 per cent of all noise complaints received.

The purpose of this credit is to encourage higher standards of sound insulation through a commitment to design and build constructions that exceed the minimum performance standards in Approved Document E of the Building Regulations.

Section 0: Performance, *Approved Document E* (2003 Edition with amendments 2004) Resistance to the passage of sound, contains performance standards in terms of airborne and impact sound insulation for walls, floors and stairs that have a separating function.

To ensure that the design intent for sound insulation is achieved on site, sound insulation testing is covered by Regulation 20A of the Building Regulations (2000) or Regulation 12A of the Approved Inspector Regulations (2000). The normal way of satisfying Regulation 20A or 12A is to implement a programme of sound insulation testing, called pre-completion testing, according to the guidance set out in Section 1: Pre-completion testing, *Approved Document E* (2003 Edition with amendments 2004). This guidance describes the normal programme of testing, based on at least one set of tests for every 10 houses, flats or rooms for residential purposes in a group or subgroup.

From 1st July 2004, Robust Details have been introduced as an alternative to pre-completion testing for demonstrating compliance with Part E. Robust details have been developed for separating wall and floor constructions. These have been tested in the field against the performance standards in *Approved Document E*. The constructions are described in guidance produced by Robust Details Ltd ([www.robustdetails.com](http://www.robustdetails.com)). Not all

<sup>27</sup> Department for Communities and Local Government. *Building Regulations Approved Document E – Resistance to the passage of sound* (2003 edition incorporating 2004 amendments).

<sup>28</sup> Robust Details Limited. [www.robustdetails.com](http://www.robustdetails.com)

RDs are able to meet levels of performance above ADE requirements in accordance with the Code criteria. Information on compliance is available from RDL on this issue if in doubt.

BS 8233.1999 – Sound Insulation and Noise Reduction for Buildings - Code of Practice – sets out guidance on good acoustic planning in section 7.6.1.3. The following principles are recommended for minimising disruption from noise in dwellings (see the standard for full details):

1. Keep services away from bedrooms in houses and flats
2. Keep stairs, lifts and circulation areas in apartment buildings away from sensitive rooms such as bedrooms
3. Corridors in apartment buildings should have acoustically absorbent ceilings. Carpets can also help to reduce disturbance, particularly from footsteps, in adjacent apartments
4. Separating walls between bathrooms and sensitive areas should be designed to minimize acoustic transmission
5. Isolate pipework and ductwork from the building structure to avoid vibration being transmitted and all penetrations of services should be sealed.

| Issue ID | Description   | No. of credits available | Mandatory elements |
|----------|---------------|--------------------------|--------------------|
| Hea 3    | Private space | 1                        | No                 |

### Aim

To improve the occupiers' quality of life by providing an outdoor space for their use, which is at least partially private.

### Assessment criteria

The credit is awarded where outdoor space (private or semi-private) has been provided that is:

- of a minimum size that allows all occupants to sit outside
- allows easy access to all occupants, including wheelchair users
- accessible only to occupants of designated dwellings.

### Background

The provision of secure private space is an effective way to improve the quality of the occupier's life. The adaptability of private space serves as a multi-purpose area and can be utilised by any occupant, for example, as a secure playing space for children, for horticultural purposes, or simply as a convenient place for fresh air.

*"It seems important that the open space directly connected to dwellings should be demonstrably private, no matter what tenure arrangements apply, and that the territorial rights of the occupiers should be clearly marked."*

*Gardens and balconies are popular but only if they are a reasonable size. A flat located near the centre of a city may be preferred to a house with a garden away from the centre, even for a proportion of families with older children, especially if a usable balcony is available."*

**New Metric Handbook, Section 2.09, p302<sup>29</sup>**

*"Intuitively, we all understand the benefits of open space: a walk, a breath of fresh air, a change of scene. We know we feel better for it and research from Japan goes to show that good neighbourhood green spaces promote longer life expectancy for local people."*

**CABE – The Value of Public Space<sup>30</sup>**

<sup>29</sup> Architectural Press. *New Metric Handbook – Planning and Design Data, Section 2.09, (1999)*

<sup>30</sup> CABE – The Value of Public Space [www.cabe.org.uk](http://www.cabe.org.uk)

| Issue ID | Description    | No. of credits available | Mandatory elements |
|----------|----------------|--------------------------|--------------------|
| Hea 4    | Lifetime Homes | 4                        | Yes                |

### Aim

To encourage the construction of homes that are accessible to everybody and where the layout can easily be adapted to meet the needs of future occupants.

### Assessment criteria

The credits are awarded where all the principles of Lifetime Homes have been complied with. The Lifetime Homes standards are mandatory at Code level 6. From 2010 they will be mandatory at Code level 4 and in 2013 at Code level 3.

### Background

The Lifetime Homes concept was developed by Habinteg Housing Association<sup>31</sup>, the Helen Hamlyn Foundation and the Joseph Rowntree Foundation<sup>32</sup> in the early 1990's. The resultant 16 design criteria aim to produce homes that are accessible to a wide range of occupants and able to be easily adapted to meet the changing needs of a household.

'Lifetime Homes' is currently a voluntary standard. Some elements of the standards were introduced into the Building Regulations Part M<sup>33</sup> in 1999.

Lifetime Homes will be suitable for older people and for the vast majority of disabled people, as well as non-disabled people; they will have a wider market of potential buyers and residents, most likely increasing their value and the ease with which they can be re-sold.

The Chartered Institute of Housing in Northern Ireland and the Joseph Rowntree Foundation conducted a comparative study into the cost of meeting Building Regulations and Lifetime Home standards. The additional cost of building Lifetime Homes ranged from £165 to a maximum of only £545 per dwelling, depending on the size, layout and specification of the property. In addition, Lifetime Homes bring about many savings and cost benefits in adaptations and flexibility in use as well as increasing the marketability of the property.

<sup>31</sup> Habinteg Housing Association: [www.habinteg.org.uk/](http://www.habinteg.org.uk/)

<sup>32</sup> Joseph Rowntree Foundation. Lifetime Homes. 2006 [www.jrf.org.uk/housingandcare/lifetimehomes/](http://www.jrf.org.uk/housingandcare/lifetimehomes/)

<sup>33</sup> Building Regulations Part M and Approved Document M – Access and facilities for disabled people (1999)

# Category 8

## Management

| Issue ID | Description     | No. of credits available | Mandatory elements |
|----------|-----------------|--------------------------|--------------------|
| Man 1    | Home User Guide | 3                        | No                 |

### Aim

To recognise and encourage the provision of guidance to enable home owners/occupiers to understand and operate their home efficiently and to make the best use of local facilities.

### Assessment criteria

Credits are awarded for the provision of a simple user guide which covers information relevant to the 'non-technical' tenant/owner on the operation and environmental performance of their home.

### Background

The Building Regulations Part L1A requires on handover the provision of information on the operation and maintenance of the heating and hot water systems and any mechanical ventilation and/or cooling system. The aim is that this information will eventually form part of the Home Information Pack.

The Code for Sustainable Homes additionally requires a 'Home User Guide' that contains the necessary details about the everyday use of the home in a form that is easy for the intended users to understand.

Without the provision of adequate information and guidance it is likely that the home may be used inappropriately, leading to the dissatisfaction of occupants and the waste of resources.

| Issue ID | Description                     | No. of credits available | Mandatory elements |
|----------|---------------------------------|--------------------------|--------------------|
| Man 2    | Considerate Constructors Scheme | 2                        | No                 |

### Aim

To recognise and encourage construction sites managed in an environmentally and socially considerate and accountable manner.

### Assessment criteria

Credits are awarded where there is a commitment to comply with best practice site management principles including a commitment to meet or exceed Best Practice under a nationally or locally recognised certification scheme such as the Considerate Constructors Scheme (CCS).

### Background

The Considerate Constructors Scheme<sup>34</sup> is a UK certification scheme that encourages the considerate management of construction sites. It has been in operation since 1997 and was developed from local schemes in the City of London and City of Westminster. The City of London developed a scheme called Considerate Contractors<sup>35</sup>. It had the same basic layout as CCS does now.

Around the same time Westminster Council had a similar problem and developed Considerate Builders for use in their borough. Later, there were several construction management reviews ie the Latham Report (Constructing the Team) and the Egan Report (Rethinking Construction). One of the actions of the Egan Report was to set up a task force to improve the image of the construction industry—consequently the Considerate Constructors Scheme was developed.

The Scheme is concerned about any area of construction activity that may have a direct or indirect impact on the image of the industry as a whole. The main areas of concern fall into three main categories: the environment, the workforce and the general public. The very best performing sites are recognised with annual national awards.

<sup>34</sup> Considerate Constructors Scheme [www.ccscheme.org.uk](http://www.ccscheme.org.uk)

<sup>35</sup> Considerate Contractor Scheme [www.cityoflondon.gov.uk/corporation/ccsims/](http://www.cityoflondon.gov.uk/corporation/ccsims/)

| Issue ID | Description               | No. of credits available | Mandatory elements |
|----------|---------------------------|--------------------------|--------------------|
| Man 3    | Construction site impacts | 2                        | No                 |

### Aim

To recognise and encourage construction sites managed in a manner that mitigates environmental impacts.

### Assessment criteria

Credits are awarded where there is a commitment and strategy to operate site management procedures including where there are procedures that cover two or more of the following items:

- a. Monitor, report and set targets for CO<sub>2</sub> production or energy use arising from site activities
- b. Monitor and report CO<sub>2</sub> or energy use arising from commercial transport to and from site
- c. Monitor, report and set targets for water consumption from site activities
- d. Adopt best practice policies in respect of air (dust) pollution arising from site activities
- e. Adopt best practice policies in respect of water (ground and surface) pollution occurring on the site
- f. Eighty per cent of site timber is reclaimed, re-used or responsibly sourced.

### Background

Construction sites are responsible for significant impacts, especially at a local level. These arise from disturbance, pollution and waste. Impacts such as energy and water use are also significant (although minor in relation to the overall impacts of the building).

### **POLLUTION**

Construction has the potential for major pollution, largely through pollution to air (through dust emission), and to water (via watercourses and ground water). BRE publishes guidance on construction site dust management<sup>36</sup>, whilst the Environment Agency<sup>37</sup> publishes guidance on water pollution control measures. There are significant statutory requirements in this area under environmental health legislation and the Environmental Protection Act. The Environment Agency and local Environmental Health Officers police these issues.

<sup>36</sup> *Control of Dust from Construction and Demolition Activities*; BRE (Feb 2003) Pollution Control Guide Parts 1-5; BRE (2003)

<sup>37</sup> Environment Agency: [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

**ENERGY**

Energy management on site has been a key focus for the Construction Confederation, and they have published specific guidance (referenced below) to help achieve this. Monitoring and reporting at site level are the key factors in raising awareness of the impacts of energy consumption. Whilst total energy is frequently monitored, this information is predominantly used to feedback into the tendering process and is seldom used to seek improvements on the site in question.

**TARGETS**

Targets are requested under the Code to promote the process of setting, monitoring and achieving targets. However, the Code does not set targets, as these are project specific. For guidance on setting targets refer to DTI's Construction Industry KPI Pack<sup>38</sup>, this series of documents guides the reader through how to set targets for their own projects.

<sup>38</sup> DTI Construction Industry KPI Pack, includes Methods of Measurement, Handbook, KPI Wall Chart, 2006 [www.kpizone.com](http://www.kpizone.com)

| Issue ID | Description | No. of credits available | Mandatory elements |
|----------|-------------|--------------------------|--------------------|
| Man 4    | Security    | 2                        | No                 |

### Aim

To encourage the design of developments where people feel safe and secure; where crime and disorder, or the fear of crime, does not undermine quality of life or community cohesion.

### Assessment criteria

Credits are achieved by complying with Section 2 – Physical Security from ‘Secured by Design New Homes’. Where an Architectural Liaison Officer (ALO) or Crime Prevention Design Advisor (CPDA) from the local police force is consulted at the design stage and their recommendations are incorporated into the design of the dwelling an actual *Secured by Design Certificate* is not required.

### Background

*“Safety and security are essential to successful, sustainable communities. Not only are such places well-designed, attractive environments to live and work in, but they are also places where freedom from crime, and from the fear of crime, improves the quality of life.”*

*Sustainable communities are communities which succeed now, economically, socially and environmentally, and respect the needs of future generations. They are well-designed places where people feel safe and secure; where crime and disorder, or the fear of crime, doesn’t undermine quality of life or community cohesion.”*

#### **(Safer Places – The Planning System & Crime Prevention, 2004, ODPM)**

‘Secured by Design’<sup>39</sup> is a free certification scheme run by the police, who provide an Architectural Liaison Officer to give advice to a developer. The ‘Secured by Design’ award does not signify that premises are crime proof, but that they have been subjected to a minimum standard of security that, in the experience of the police service and other agencies, can significantly reduce the risk of crime. Local conditions may require additional or alternative measures.

<sup>39</sup> Secured by Design [www.securedbydesign.com](http://www.securedbydesign.com)

## Category 9

### Ecology

| Issue ID | Description              | No. of credits available | Mandatory elements |
|----------|--------------------------|--------------------------|--------------------|
| Eco 1    | Ecological value of site | 1                        | No                 |

#### Aim

To encourage development on land that already has a limited value to wildlife, and discourage the development of ecologically valuable sites.

#### Assessment criteria

Credits are awarded where the site is defined as land of inherently low ecological value:

*Either:*

- By meeting the criteria for low ecological value (using Checklist Eco 1 – Land of Low Ecological Value in the Technical Guidance);

*or*

- By being confirmed by a *Suitably Qualified Ecologist*;

*or*

- Where an independent ecological report of the site, prepared by a *Suitably Qualified Ecologist*, states that '*The construction zone* is of low or insignificant ecological value'.

**and**

- Any land of ecological value outside the *construction zone* but within the *development site* will remain undisturbed by the construction works.

#### Background

Wherever possible there is a benefit in development being restricted to land that already has a limited value to wildlife. The ecological value of a site is affected by previous uses and the presence of ecological features such as trees, hedges, watercourses, wetlands, meadows, etc. Therefore, the re-use of existing sites will help to slow down the destruction of natural habitats and the wildlife they support, as well as preventing loss of land used for agriculture, parkland, etc.

Wherever homes are constructed, there is always a risk that however environmentally benign the building or development itself is, it may present a threat to local ecology or areas of natural beauty. The principle here is to minimise the damage to existing local ecology and then, where possible, to enhance it.

Damage can be minimised either by selecting a site of low ecological value or by developing a site in a way that protects the most important ecological features. House building need not reduce the ecological value of the site; it may enhance it in many cases. There will always be some temporary disturbance to the local ecology, but wildlife will return once construction is complete, providing an appropriate habitat is provided.

Whilst it may be an attractive option to build on and revitalise a previously derelict site, care must be exercised if it has been derelict for some time. The site may be inhabited by rare, protected or locally important species and, therefore have high, but hidden, ecological value.

| Issue ID | Description            | No. of credits available | Mandatory elements |
|----------|------------------------|--------------------------|--------------------|
| Eco 2    | Ecological enhancement | 1                        | No                 |

### Aim

To enhance the ecological value of a site.

### Assessment criteria

Where there is a commitment to enhance the ecological value of the development site in accordance by appointing a *Suitably Qualified Ecologist* to recommend appropriate ecological features that will positively enhance the ecology of the site and where the developer adopts all key recommendations and 30 per cent of additional recommendations.

### Background

In many cases it is possible to improve the ecological value of the site. However, this requires careful consideration of the existing and neighbouring features in addition to careful selection of plant species and habitats. This is an area of specialist expertise and requires input from experts at both site master planning and detailed design stages.

| Issue ID | Description                       | No. of credits available | Mandatory elements |
|----------|-----------------------------------|--------------------------|--------------------|
| Eco 3    | Protection of ecological features | 1                        | No                 |

### Aim

To protect existing ecological features from substantial damage during the clearing of the site and the completion of construction works.

### Assessment criteria

The credit is awarded where all existing features of ecological value on the development site potentially affected by the works, are maintained and adequately protected during site clearance, preparation and construction works. The credit can be awarded by default where the site has been classified as having low ecological value in accordance with Eco 1 – Ecological Value of the Site and no features of ecological value have been identified.

Additionally if a *Suitably Qualified Ecologist* has confirmed a feature can be removed due to insignificant ecological value or poor health/condition (eg diseased trees which require felling, either for health and safety and/or conservation reasons), the credit can be achieved provided all other features are adequately protected in accordance with the ecologist's recommendations.

### Background

Construction sites often contain existing ecological features that need to be protected from damage (both direct and indirect). Such damage can be caused by impacts, fires, pollution, soil compaction, changes in the water table, etc. Steps need to be taken to minimise the risk of such damage.

Protecting the ecological features on site can ensure that the local 'wild' areas are sustained. Maintaining native species can lead to reduced maintenance and reduced risk of liabilities under wildlife legislation, as well as increasing and maintaining the aesthetic qualities of a development.

Good practice dictates that ecological features need to be linked to reach their full potential; therefore links to features external to the site should be made whenever possible. Knowledge of existing species movements, and predictions of potential new species movements, is required to fully integrate and support ecological features and their associated species.

| Issue ID | Description                        | No. of credits available | Mandatory elements |
|----------|------------------------------------|--------------------------|--------------------|
| Eco 4    | Change in ecological value of site | 4                        | No                 |

### Aim

To reward steps taken to minimise reductions and to encourage an improvement in ecological value.

### Assessment criteria

Credits are awarded where the ecological value before and after development is measured using the calculation procedure in the Technical Guidance and the overall change in species per hectare is:

- Minor negative change: between -9 and -3
- Neutral: between -3 and +3
- Minor enhancement: between +3 and +9
- Major enhancement: greater than +9.

### Background

Any development of land will potentially affect its ecological value. This section of the Code is designed to reward steps taken to minimise reductions in ecological value and to encourage improvement. This is done by comparing the value of a site before and after development and making a direct comparison in terms of plant species (which is used as a proxy for biodiversity). The method takes account of the local landscape type and the different habitats that exist to calculate an average value for the site.

### ***Eco 4 and the environment KPIs***

The construction industry's Environmental Key Performance Indicator (KPI)<sup>40</sup> on 'Area of Habitat Retained/Created' adopts the same approach as the credit above. It subtracts the area of ecologically valuable habitat after development from that before development, and expresses the change as a percentage of total site area. The difference between this credit and the KPI is that the KPI does not assign specific ecological values to habitat types (for simplicity).

In the KPI approach both the vegetation groups and derelict urban/industrial land with a more diverse number of species, fall into the category of 'ecologically valuable habitat'. This makes it possible to also use the figures derived for this credit, to determine the project's KPI score.

<sup>40</sup> Construction Industry Key Performance Indicators [www.kpizone.com](http://www.kpizone.com)

| Issue ID | Description        | No. of credits available | Mandatory elements |
|----------|--------------------|--------------------------|--------------------|
| Eco 5    | Building footprint | 2                        | No                 |

### **Aim**

To promote the most efficient use of a building's footprint by ensuring that land and material use is optimised across the development.

### **Assessment criteria**

Credits are awarded where the ratio of combined internal floor area of all dwellings on the site to their footprint (as measured by the total ground floor internal area) as set out in the Technical Guidance

### **Background**

Land available for development will become increasingly expensive as land resources come under pressure. Use of 'greenfield' sites is already being limited and developers are likely to experience hostility from the local community. To make best use of the available land and other resources, including materials and energy, it is important to ensure effective use of the building footprint by maximising the usable space.

# Annex C

## Example Code Certificate

| THE CODE FOR SUSTAINABLE HOMES  |  |  |
|---|--|--|
| <b>FINAL CERTIFICATE</b><br>(Issued at the Post Construction Stage)   |  |  |
|    |  |  |
| <b>ISSUED TO:</b><br><b>Test House, 1 Test Street,</b><br><b>Test Town, Test Country</b><br><b>TE1 ST1</b>  |  |  |
| <p>The sustainability of this home has been independently assessed at the Post Construction Stage and has achieved a Code rating of 5 out of 6 stars under the April 2007 version.</p>  |  |  |
|   |  |  |
| Above<br>Regulatory<br>Standards  | Current<br>Best<br>Practice                          | Highly<br>Sustainable<br>and Zero Carbon |
| <p>The next page sets out how this home achieved its rating in the nine categories.</p>   |  |  |
| Licensed Assessor<br><b>Mr L Assessor</b>   | Assessor Organisation<br><b>The Assessors</b>        |  |
| Client<br><b>C L lent Ltd</b>   | Developer<br><b>D E Veloper Inc</b>                  |  |
| Architect<br><b>Arc I Tects</b>   | Certificate Number<br><b>TEST – Certificate No 1</b> |  |
| Date<br><b>12 Never 2008</b>  | Signed for and on behalf of BRE Global Ltd           |  |
|    |  |  |
| <p>This certificate remains the property of [Code Service Provider] and is issued subject to terms and conditions. Copies can be made for the purposes of the Home Information Packs. It is produced from data supplied by the licensed Code assessor. To check the authenticity of this certificate please contact BRE Global Ltd.</p> |  |  |
| Code Service<br>Provider logo   |  |  |

# THE CODE FOR SUSTAINABLE HOMES



## FINAL CERTIFICATE

(Issued at the Post Construction Stage)

**Certificate Number: TEST – Certificate No 1**

**Score: 150**

### What Your Code Star Rating Means

|                       |              |              |              |              |              |               |
|-----------------------|--------------|--------------|--------------|--------------|--------------|---------------|
| <b>Combined Score</b> | <b>36-47</b> | <b>48-56</b> | <b>57-67</b> | <b>68-83</b> | <b>84-89</b> | <b>90-100</b> |
| <b>Stars</b>          | <b>1</b>     | <b>2</b>     | <b>3</b>     | <b>4</b>     | <b>5</b>     | <b>6</b>      |

The Code for Sustainable Homes considers the effects on the environment caused by the development and occupation of a home. To achieve a star rating a home must perform better than a new home built to minimum legal standards, and much better than an average existing home.

| How this home scored  |                                       |  | What is covered in the category  |
|-----------------------|---------------------------------------|--|--|
| Category              | Percentage of Category Score attained |  |  |
|                       | 0 10 20 30 40 50 60 70 80 90 100      |  |  |
| Energy                | 50                                    |  | Energy efficiency and CO <sub>2</sub> saving measures  |
| Water                 | 25                                    |  | Internal and external water saving measures  |
| Materials             | 66                                    |  | The sourcing and environmental impact of materials used to build the home                                    |
| Surface Water Run-off | 43                                    |  | Measures to reduce the risk of flooding and surface water run-off, which can pollute rivers                  |
| Waste                 | 100                                   |  | Storage for recyclable waste and compost, and care taken to reduce, reuse and recycle construction materials |
| Pollution             | 77                                    |  | The use of insulation materials and heating systems that do not add to global warming                        |
| Health & Wellbeing    | 16                                    |  | Provision of good daylight quality, sound insulation, private space, accessibility and adaptability          |
| Management            | 59                                    |  | A Home User Guide, designing in security, and reducing the impact of construction                            |
| Ecology               | 37                                    |  | Protection and enhancement of the ecology of the area and efficient use of building land                     |

Further detailed information regarding The Code for Sustainable Homes can be found at [www.communities.gov.uk/thecode](http://www.communities.gov.uk/thecode)



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# Annex D

## Nil-Rated Certificate



This Home

**Address**  
**Address**

This home is designed to meet the requirements of current building regulations.

It is not assessed against the Code for Sustainable Homes. The Code sets higher standards for a range of environmental sustainability features than current Building Regulations. It covers issues such as energy/carbon dioxide emissions, water efficiency and the use of materials.

As this home is not assessed against the Code for Sustainable Homes it can not be certified to meet the enhanced environmental performance standards set out in the Code.

The energy performance of this home will be shown on the Energy Performance Certificate.

### NIL RATED

-----  
Developer

-----  
Date

#### Rating system:

**Nil rating:** A home that has not been designed and built to meet the standards set out in the Code for Sustainable Homes. It has therefore not been formally assessed against the Code and has a 'Nil rating'

**1-6 star rating:** A home that has been designed and built to the sustainability standards set out in the Code for Sustainable Homes. A 1 star home is entry level and a 6 star home being a highly sustainable, zero carbon home.

More information can be found at [www.communities.gov.uk/thecode](http://www.communities.gov.uk/thecode)