

The Code for Sustainable Homes (CSH) A Summary of How the Code Works

Effective from April 2007 in England only

1 Introduction

Although the Code for Sustainable Homes (CSH) is not a regulatory requirement like the Building Regulations, it is arguably going to have at least the same level of impact on dwelling design. This Construction Briefing discusses why.

Effective in England only from April 2007, the Code is the only over-arching tool which will be used to set sustainability standards for those seeking government funding through the Housing Corporation. It will also apply to private housing built on English Partnership land. The government had been adopting this tactic to drive up sustainability standards in government funded social housing for several years before the Code was introduced, using tools like Ecohomes, upon which the Code is largely based.

The government has set an ambitious long-term goal of all new homes being built to 'Zero Carbon' status by 2016. The Code, which is designed to be reasonably future proofed, is intended to assist us in getting there.

The government has also made it clear in documents like *Building A Greener Future: Towards Zero Carbon Development (CLG, Dec 2006)* that the Code signposts the direction that future changes to Building Regulations will take. In other words, the concepts, tools and standards in the CSH will be encompassed in future changes to the England and Wales Building Regulations.

Two documents exist, which set out how the code is to be used:

- A short top level summary of the Code
- A full technical guide

Both are available in pdf format free of charge from <http://www.planningportal.gov.uk/england/professionals/en/1115314116927.html>

The 225-page Technical Guide is not only long but for those not familiar with other similar codes, it is very complex. The purpose of this Briefing is try to help therefore by:



Sigma Home by Stewart Milne Group (achieved Level 5)

- Providing a reasonably simple overview of the Code, without having to read the full Technical Guide
- Explaining some of the background in terms of why and how the Code is used
- Briefly commenting on each of the issues where points can be acquired.

The scope of this Construction Briefing covers:

- Definition of a Zero Carbon home
- Purpose of the Code
- Where the Code applies
- The nine categories and six star ratings
- Certification against the Code
- Allocation of points.

2 'Zero carbon' homes

There are many facets to sustainability and one of the goals of the Code is to try to bring them together in an objective manner. Although one may disagree with the weightings attached to each facet, few would argue that any of the facets should be removed.

Although carbon emissions is just one of these, it has become extremely dominant, to the point of sometimes over-shadowing everything else. One of the reasons has been the challenge to construct all new houses to a 'Zero Carbon' standard from 2016 onwards. The government's heavy use of the term it popularised, long before it provided a clear definition, has been extremely unhelpful. We have reproduced to the right, therefore, a full copy of the definition for 'A True Zero Carbon Dwelling', which is given in the second version (Oct 2007) of the Technical Guide.

This is not a simple definition by any means and is likely to change once work on the revised SAP software proceeds. Please refer to the Technical Guide for an up to date definition.

3 Purpose of the code

The rate of growth of the worldwide population and large economies such as China and India, coupled with finite resources, has caused many national leaders to take the issue of sustainability very seriously. We will not all be able to live at Western standards for very long before many important resources are depleted. A major challenge is to 'decouple' economic growth from resource consumption.

The Labour government has been keen for the UK to take the lead in this regard, creating targets, government bills / acts and codes / regulations as mechanisms for achieving this goal. The CSH is one of the tools developed by government to bring about fairly precisely defined changes in construction design to help achieve the overall goals.

Government is a large housing buyer – purchasing around one-fifth of all new housing annually. It has concluded that one action it can take is to demand much higher sustainability standards when it is the client. The Code is the mechanism for defining progressively higher levels of sustainability and how they can be achieved. A number of other similar tools were being used and it was hoped that this would simplify the market by being the single code.

'Where net carbon dioxide emissions resulting from ALL energy used in the dwelling are zero or better. This includes the energy consumed in the operation of the space heating/cooling and hot-water systems, ventilation, all internal lighting, cooking and all electrical appliances. The calculation can take account of contributions from onsite renewable / low carbon installations.

Off-site renewable contributions can only be used where these are directly supplied to the dwellings by private wire arrangement.

Dwellings must meet the minimum mandatory energy requirements for Level 5. This means that emissions as calculated by SAP, including the contribution from any special cases, should be zero or better.

A 'zero carbon home' is also required to have a Heat Loss Parameter (covering walls, windows, air tightness and other building design issues) of $0.8W/m^2K$ or less, and net zero carbon dioxide emissions from use of the appliances in the homes (ie on average over a year). SAP does not contain any provision for energy consumption of appliances but is likely to be updated to do so in due course. Until SAP is updated, the appliances element of the qualification will be calculated using the formula in the calculations procedures to approximate the average appliance energy consumption. This additional power must be renewable power produced either within the area of the building and its grounds, elsewhere in the development, or elsewhere as long as the developer has entered into arrangements to ensure that the renewable generation is additional to existing plans.

The amount of such additional power can be reduced by any surplus from the arrangements to meet zero carbon on heating, hot water and lighting.'

Definition of a 'true zero carbon home', taken from the CSH Technical Guide, Oct 07

The Code is intended to be future-proofed. By using a points system it is possible to demand higher standards over time, without changing the overall mechanism for defining how points are achieved.

The medium- to long-term goal is to encourage the private sector to use the Code as a voluntary marketing tool. Through the likes of Energy Performance Certificates (see separate TRADA Construction Briefing) the government is pro-actively seeking to educate the public on these matters, so that eventually dwellings with better proven sustainability credentials command higher prices.

4 Where the Code applies

We approve of the government's intention to simplify the use of sustainability codes in the market place. Unfortunately devolution has more than undone government's efforts in this regard. Our understanding of the situation at the time of writing is as shown to the right.

The government is keen to make it mandatory to declare a rating (which may be 'No rating') against the Code for all new homes built in England. A consultation exercise should produce some recommendations in 2008 on this matter. If it proceeds, the certified rating will probably form part of the Home Information Pack (HIP), with the aim of strongly influencing the consumer to want to pay a premium for proven sustainability credentials.

England

All new social housing funded by the Housing Corporation will have to meet a minimum of CSH level 3 (from April 2007).

All housing (private and social) on English Partnership land will equally have to meet this same standard.

Refurbishment work on social housing will be to Eco-homes or other codes as specified.

Scotland

Some of the requirements in CSH have been incorporated into the Scottish Technical Standards.

There is no intention to use the Code itself.

Wales and Northern Ireland

The position was not clear or known at the time of writing.

5 The nine categories and six star ratings

Developments can achieve ratings from one to six stars. All star ratings are calculated on a 'points out of 100' basis across nine categories (see Table 1 below). Varying quantities of points are available in each of the nine categories. Even the lowest level, 1 star, demands an

improvement on the minimum requirements given in Part L1A. The higher star ratings naturally require higher overall point scores. There is flexibility in how points are achieved, but some performance aspects are compulsory, as Table 1 summarises.

Categories	Commentary on the flexibility
1 Energy / CO₂ 2 Water	These two areas are considered the most important and are therefore the least flexible. A minimum performance standard is set for each star rating (see Table 2 below).
3 Materials 4 Surface water run-off 5 Waste	Minimum performance levels are set for 1 star performance only. These are as follows: Materials: Three out of the five major components (roof, external walls, internal walls, upper and ground floors and windows) are to achieve at least a D rating or better as defined by BRE's Green Guide for Sustainable Housing. Surface water run-off: The conditions should be no worse than the previous conditions of the site. Waste: External hardstanding for waste storage is required. In addition a Site Waste Management Plan (SWMP) must be developed. Additional points are available in all three of these categories for going beyond the minimum requirements described above.
6 Pollution 7 Health and well-being 8 Management 9 Ecology	No minimum standards are set. However large point scores are available in these categories making it likely that these categories will be relevant.

Table 1: The nine categories and the extent to which the requirements in each need to be met

Table 2 summarises how each star rating is achieved by meeting defined:

- Minimum energy performance levels
- Maximum water consumption levels
- Additional point scores across all nine categories.

Code level	Energy standard (% better than Pt L 2006) ¹	Energy points awarded	Water standard (litres per person per day)	Water points awarded	Other points required	Total points required
★	10	1.3	120	1.5	33.2	36
★★	18	3.8	120	1.5	42.7	48
★★★	25	6.3	105	4.5	46.2	57
★★★★	44	10.0	105	4.5	55.0	68
★★★★★	100	17.6	80	7.5	58.9	84
★★★★★★	“Zero carbon home”	18.9	80	7.5	63.6	90

Table 2: The points and requirements for each of the six star ratings.

Note 1: In practice the improvements required are greater than the percentage figures given. A 25% reduction in permissible carbon emissions equates to a 33% improvement.

6 Certification against the Code

The four-stage process for achieving certification of Code compliance is as follows:

- 1 The developer produces an initial design for appraisal.
- 2 A trained and certified Code Assessor conducts an initial assessment on the design, recommends a sustainability rating and issues an interim Code Certificate. This is carried out for each house type (but not each dwelling).
- 3 The assessor performs a post completion check on a sample of the development to verify the rating.
- 4 The assessor produces a final report which is submitted to BRE to receive Final Code Certification.

7 Allocation of points

The tables which follow summarise how points can be collected against each of the nine categories. There are often graduations within each area, so that the point value quoted is only achieved by implementing the highest level of action recommended. Obviously one needs to read the Code to establish the exact requirements. The tables are intended to assist by showing the range of issues and the points they can attract.

Points are awarded according to the impact they have rather than the cost of meeting the requirement. This explains why a Home User Guide, which perhaps seems relatively easy and cheap to produce, acquires a generous 3.3 points.

Category 1: Energy / CO₂

Issue ID	Issue	How points are collected	Commentary	Max pts avail.
Ene 1	Target Emission Rate (TER)	By designing to reduce the Carbon Emission level compared to those permitted by Part L1A 2006. For 5* - The dwelling should provide sufficient energy for heating and hot water. For 6* - Ditto 5* plus all lighting and electrical appliance requirements. This is defined as 'Zero Carbon'.	The first issue to tackle is creating a thermally efficient envelope. Mechanical ventilation will be required as air tightness levels increase.	18.9
Ene 2	Building fabric	The Heat Loss Parameter (HLP), as given in the SAP calculation, needs to be better than one of two defined levels.	The HLP is a measure of the thermal efficiency of the building's envelope. The purpose is to discourage thermally inefficient dwellings with very large renewable generation.	2.5
Ene 3	Internal lighting	Provision of fixed low energy internal light fittings.	Supplying low energy light bulbs in standard bayonet light fittings is not acceptable.	2.5
Ene 4	Drying space	Provision of physical space and equipment for natural drying.	Inside and / or outside facilities are encouraged to deter the use of tumble dryers.	1.3
Ene 5	Energy labelled white goods	Provision of high rating equipment or information on the benefits of buying them.		2.5
Ene 6	External lighting	Provision of fixed low energy external light fittings.	Ditto Ene 3	2.5
Ene 7	Low or zero carbon energy technologies	Use of local renewable or low carbon energy sources to provide a minimum of 10% of energy demand.	At 5* and 6* ratings this will necessarily be much higher than 10%.	2.5
Ene 8	Cycle storage	Provision of safe, weatherproof and secure storage.	Space requirements are set to ensure that the garage or shed are adequate for the car(s) or garden tools as well as the bicycles. Typical garage sizes specified in the past will often be inadequate.	2.5
Ene 9	Home office	Provision of space and services such as telephone points.	The room can be used for dual purposes. Minimum dimensions and natural lighting requirements are set.	1.3
			TOTAL	36.4

Category 2: Water

Issue ID	Issue	How points are collected	Commentary	Max pts avail.
Wat 1	Internal potable water	By achieving low predicted consumption levels.	Low flow sanitaryware can assist in reducing consumption down to about 100 litres / person / day. Below this level and grey / rainwater harvesting becomes necessary.	7.5
Wat 2	External water use	Provision of water butts for example.		1.5
			TOTAL	9.0

Category 3: Materials

Issue ID	Issue	How points are collected	Commentary	Max pts avail.
Mat 1	Environmental impact of materials	By using A+, A, B, C or D rated materials for the following major building elements: roofs, external and internal walls, floors and windows. Ratings are derived from the new Green Guide for Sustainable Housing.	The revised BRE Green Guide has yet to be produced. The ratings denote overall environmental impact, taking into account a wide range of 12 issues. They are not only concerned with carbon emissions.	4.5
Mat 2	Responsible sourcing – basic building elements	Proof of responsible sourcing for the major components of the dwelling. Eg walls.	Timber certified under FSC, PEFC, CSA and SFI with CoC acquires maximum points. Materials other than timber can acquire lower points in this category.	1.8
Mat 3	Responsible sourcing – finishing building elements	Proof of responsible sourcing for the more minor components of the dwelling. Eg skirtings.	Ditto Mat 2	0.9
			TOTAL	7.2

Category 4: Surface water run-off

Issue ID	Issue	How points are collected	Commentary	Max pts avail.
Sur 1	Reduction in surface water run-off from site	Reduction of immediate water run-off from hard surfaces and roofs.	The requirements are set at tougher levels for higher flood risk areas.	1.1
Sur 2	Flood risk	By addressing flood risks.	The easiest way to acquire points is to develop in low flood risk areas.	1.1
			TOTAL	2.2

Category 5: Waste

Issue ID	Issue	How points are collected	Commentary	Max pts avail.
Was 1	Household waste storage and recycling facilities	Provision of adequate space for recycling bins.	Dedicated space for both internal and external bins for recycling is encouraged, in addition to space for non-recycling bins.	3.6
Was 2	Construction site management	Production of Site Waste Management Plans (SWMPs) with procedures and commitments for minimising waste generated on site.	SWMPs are likely to become mandatory in the future for all building projects over a modest value.	1.8
Was 3	Composting	Provision of adequate facilities.		0.9
			TOTAL	6.4

Category 6: Pollution

Issue ID	Issue	How points are collected	Commentary	Max pts avail.
Pol 1	Global warming potential of insulants	Avoidance of materials which cause ozone depletion.	This covers the material itself as well as any blowing agents used.	0.7
Pol 2	Nitrous oxide emissions	Avoidance of NOx emissions from space heating and hot water systems.		2.1
			TOTAL	2.8

Category 7: Health and well-being

Issue ID	Issue	How points are collected	Commentary	Max pts avail.
Hea 1	Daylighting	Provision of good daylighting standards. Kitchens, dining rooms, studies / home offices are assessed, including all working planes.	Good day-lighting reduces energy demand for lighting and improves the quality of life for occupants.	3.5
Hea 2	Sound insulation	Provision of higher performance standards than Part E. For 4.7 points an additional 8dB sound reduction must be provided.	In research studies the sound reduction standards set in Part E fail to meet most people's perception of what is a satisfactory standard.	4.7
Hea 3	Private space	Provision of outside private space.	The space req'd is low: 1.5m ² / bedroom.	1.2
Hea 4	Lifetime homes	Ability to cater now and in the future for reducing mobility of dwelling occupants. All 16 of the requirements have to be met. Visit www.lifetimehomes.org.uk .	The Lifetime homes standard requires certain accessibility features to be designed in from the beginning and for adaptability to allow for remaining facilities at a later date if required.	4.7
			TOTAL	14.0

Category 8: Management

Issue ID	Issue	How points are collected	Commentary	Max pts avail.
Man 1	Home user guide	Information on the operation and environmental performance of the dwelling.	Experience shows that good quality user information makes a big difference to the actual energy consumed by a household.	3.3
Man 2	Considerate Contractors Scheme	Independently verified certification scheme.	This is to encourage environmentally and socially considerate building practice.	2.2
Man 3	Construction site impacts	Good site management procedures to minimise impact.	2 or 4 out of 6 areas can be chosen from: CO2 (site and transport), water conservation, dust, water pollution and site timber.	2.2
Man 4	Security	Provision of doorsets and windows to Secured By Design (SBD) standards.	Doorsets and windows must be physically tested and independently certified by a UKAS accredited body.	2.2
TOTAL				10.0

Category 9: Ecology

Issue ID	Issue	How points are collected	Commentary	Max pts avail.
Eco 1	Ecology value of site	Development on land with low value to wildlife.	The checklist provided or a qualified ecologist should be used to confirm that the status is 'low value'.	1.3
Eco 2	Ecological enhancement	Provision of features designed to enhance the existing ecology of the site.	A qualified ecologist is required to make an independent recommendation.	1.3
Eco 3	Protection of ecological features	Protection of the existing ecological features during the whole construction process.	Eg using suitable visible physical barriers.	1.3
Eco 4	Change in ecological value of the site	Minimised reductions and maximised improvements to ecological features.	The changes must be validated using an 'ecological value calculator'.	5.3
Eco 5	Building footprint	Provision of a high combined floor area to footprint ratio.	The levels set means that two-storey dwellings will not achieve any points in this category.	2.7
TOTAL				12.0



Further help

TRADA members may contact the Members' Helpline for free on t: 01494 569601.

Suppliers and manufacturers can obtain advice on proving materials are responsibly sourced from BM TRADA on t: 01494 569700.

For assistance with proving the environmental impact of materials / products, please contact TRADA Technology on t: 01494 569600.

Useful resources

CSH full requirements and building regulations:
www.planningportal.gov.uk

Home Information Packs (HIPs) and Energy Performance Certificates (EPCs):
www.homeinformationpacks.gov.uk

BRE Green Book Live:
www.greenbooklive.com

Lifetime Homes standard:
www.lifetimehomes.org.uk

See also TRADA Construction Briefings on HIPs, EPCs and the Green Guide to Sustainable Housing at www.trada.co.uk

TRADA Construction Briefings

This document is part of a series of briefings for TRADA members on the key elements of building regulations and codes and how they relate to timber construction. Copies of all briefings are available at www.trada.co.uk.

Feedback

We welcome feedback from readers and if you have any comments on the content of this briefing please contact Rupert Scott at rscott@trada.co.uk.

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