Communities and Local Government

Code for Sustainable Homes

A step-change in sustainable home building practice

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A step-change in sustainable home building practice

As the Stern Review highlighted, there is now an overwhelming body of scientific evidence showing that climate change is a serious and urgent issue. In 2004, more than a quarter of the UK's carbon dioxide emissions – a major cause of climate change – came from the energy we use to heat, light and run our homes. So it's vital to ensure that homes are built in a way that minimises the use of energy and reduces these harmful emissions.

Construction and use of our homes has a range of other environmental impacts, created for example through water use, waste generation and use of polluting materials, which can be significantly reduced through the integration of higher sustainability performance standards within the design of a home. More sustainable homes can also provide us with improved overall well-being and quality of life.

The Code for Sustainable Homes has been introduced to drive a step-change in sustainable home building practice. It is a standard for key elements of design and construction which affect the sustainability of a new home. It will become the single national standard for sustainable homes, used by home designers and builders as a guide to development, and by home-buyers to assist in their choice of home.

It will form the basis for future developments of the Building Regulations in relation to carbon emissions from, and energy use in homes, therefore offering greater regulatory certainty to developers. And in this era of environmental awareness amongst consumers and increasing demand for a more sustainable product, it will offer a tool for developers to differentiate themselves.

If we build the homes we need, then by 2050, as much as one-third of the total housing stock will have been built between now and then. Current house building plans therefore offer an important opportunity to build high standards of sustainability into the homes we will use in the future. The Code for Sustainable Homes will play a key role in enabling us to seize this opportunity, and to build a future housing stock which both meets our needs and protects the environment.

This booklet explains what the Code for Sustainable Homes is and how it works. It also includes tables showing the criteria that assessors will use to measure achievement of sustainability performance under the Code.

CONTENTS

What Is the Code for Sustainable Homes?

A NEW NATIONAL STANDARD

The Code for Sustainable Homes has been developed to enable a step change in sustainable building practice for new homes. It has been prepared by the Government in close working consultation with the Building Research Establishment (BRE) and Construction Industry Research and Information Association (CIRIA), and through consultation with a Senior Steering Group consisting of Government, industry and NGO representatives.

The Code is intended as a single national standard to guide industry in the design and construction of sustainable homes. It is a means of driving continuous improvement, greater innovation and exemplary achievement in sustainable home building.

The Code will complement the system of Energy Performance Certificates which is being introduced in June 2007 under the Energy Performance of Buildings Directive (EPBD). The EPBD will require that all new homes (and in due course other homes, when they are sold or leased) have an Energy Performance Certificate providing key information about the energy efficiency/carbon performance of the home. Energy assessment under the Code will use the same calculation methodology therefore avoiding the need for duplication.

In the short-term, Code compliance is voluntary but home builders are encouraged to follow Code principles set out in this publication because the Government is considering making assessment under Code standards mandatory in the future.

A SET OF SUSTAINABLE DESIGN PRINCIPLES

The Code measures the sustainability of a home against design categories, rating the 'whole home' as a complete package. Those familiar with building regulations, will recognise this as a major and welcome departure from current practice.

The design categories included within the Code are:

- energy/CO_2
- water
- materials
- surface water run-off
- waste
- pollution
- health and well-being
- management
- ecology

A STANDARD WHICH BUILDS UPON EXISTING SYSTEMS

The Code for Sustainable Homes has been developed using the Building Research Establishment's (BRE) EcoHomes System, which has already achieved success in reducing the impact of affordable housing projects, in particular within the social housing sector.

The Code builds upon EcoHomes in a number of ways, for example:

- the Code introduces minimum standards for energy and water efficiency at every level of the Code, therefore requiring high levels of sustainability performance in these areas for achievement of a high Code rating;
- the Code uses a simpler system of awarding points, with more complex weightings removed;
- the Code includes new areas of sustainability design, such as Lifetime Homes and inclusion of composting facilities;

BRE will continue to maintain and operate the EcoHomes scheme during the transition to the Code. The Code sits alongside the planning system which guides sustainability in broader locational and aesthetic issues.

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 for Sustainable Homes 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. It is intended that the Code will signal 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.

How Does the Code Work?

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 'points' 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_2	Minimum standards at each level of the Code
Water	
Materials	Minimum standard at Code entry level
Surface water run-off	
Waste	
Pollution	No minimum standards
Health and well-being	
Management	
Ecology	

So, in order to achieve a particular code level and the associated sustainability rating, a home must integrate minimum standards, and additional points for other design features must be attained.

The table below shows the minimum standards, and number of points required in order to achieve each level of the Code:

Achieving a sustainability rating

	Minimum Standards				
	Energy		Water		
Code Level	**Standard (Percentage better than Part L[1] 2006)**	**Points Awarded**	**Standard (litres per person per day)**	**Points Awarded**	**Other Points[4] Required**
1(★)	10	1.2	120	1.5	33.3
2(★★)	18	3.5	120	1.5	43.0
3(★★★)	25	5.8	105	4.5	46.7
4(★★★★)	44	9.4	105	4.5	54.1
5(★★★★★)	100[2]	16.4	80	7.5	60.1
6(★★★★★★)	A zero carbon home[3]	17.6	80	7.5	64.9

Notes

1. Building Regulations: Approved Document L (2006) – 'Conservation of Fuel and Power.'
2. Zero emissions in relation to Building Regulations issues (i.e. zero emissions from heating, hot water, ventilation and lighting).
3. A completely zero carbon home (i.e. zero net emissions of carbon dioxide (CO_2) from **all** energy use in the home).
4. All points in this document are rounded to one decimal place.

ASSESSING THE SUSTAINABILITY RATING

Assessment procedures will be transparent and technically rigorous, whilst at the same time straightforward and beneficial to all parties.

The method will be similar to BRE's EcoHomes System which depends on a network of specifically trained and accredited independent assessors. BRE will retrain and accredit assessors for the new Code. Code assessors will conduct initial design stage assessments, recommend a sustainability rating, and issue an interim Code certificate. They will perform a post-completion check to verify the rating before a final Code certificate of compliance is issued.

A design stage assessment will only need to be carried out on each home type 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.

Summary of Code benefits

BENEFITS FOR THE ENVIRONMENT

- **Reduced greenhouse gas emissions:** With minimum standards for energy efficiency at each level of the Code, there will be a reduction in greenhouse gas emissions to the environment. This will enable us to reduce the threat from climate change.

- **Better adaptation to climate change:** The Building Regulations (Approved Document L – 2006) already limit the effects of solar gains in Summer. With minimum standards for water efficiency at each level of the Code, and other measures in the Code, including better management of surface water run-off, our future housing stock will be better adapted to cope with the impacts of climate change which are already inevitable.

- **Reduced impact on the environment overall:** Inclusion of measures which, for example, promote the use of less polluting materials, and encourage household recycling, will ensure that our future housing stock has fewer negative impacts overall on the environment.

BENEFITS FOR HOME BUILDERS

- **A mark of quality:** Increasing media attention and public concern over environmental issues, notably climate change, has given rise to a growing appetite among consumers for more sustainable products and services. The Code for Sustainable Homes can be used by home builders to demonstrate the sustainability performance of their homes, and to differentiate themselves from their competitors.

- **Regulatory certainty:** The levels of performance for energy efficiency indicate the future direction of building regulations, bringing greater regulatory certainty for home builders, and acting as a guide to support effective business and investment planning.

- **Flexibility:** The Code is based on performance which means it sets levels for sustainability performance against each element but does not prescribe how to achieve each level. Home builders can innovate to find cost-effective solutions to meet and exceed minimum requirements.

BENEFITS FOR SOCIAL HOUSING PROVIDERS

- **Lower running costs:** Homes built to Code standard will have lower running costs through greater energy and water efficiency than homes not built to the Code standard, so helping to reduce fuel poverty.

- **Improved comfort and satisfaction:** Homes built to the Code will enhance the comfort and satisfaction of tenants. Costs may be saved in dealing with complaints.

- **Raised sustainability credentials:** The Code will enable social housing providers to demonstrate their sustainability credentials to the public, tenants and funding bodies.

BENEFITS FOR CONSUMERS

- **Assisting choice:** The Code will provide valuable information to homebuyers on the sustainability performance of different homes, assisting them in their choice of a new home.

- **Reducing environmental 'footprint':** By asking for a new home which meets the Code standard, consumers will be able to encourage industry to build more sustainable homes, and reduce their own 'footprint' on the environment.

- **Lower running costs:** Homes built to Code standard will have lower running costs through greater energy and water efficiency than homes not built to the Code standard, so helping to reduce fuel poverty.

- **Improved well-being:** Homes built to Code standard will provide a more pleasant and healthy place to live, for example with more natural light, and adaptability for future needs.

Code standards

This section lists the issues under each of the sustainability categories included within the Code, the minimum standards where applicable, and the points available for each issue.

SUMMARY OF MINIMUM STANDARDS

The table below summarises all of the minimum standards which exist under the Code:

Minimum standards

Code Level	Category	Minimum Standard
	Energy/CO_2	
1(★) 2(★★) 3(★★★) 4(★★★★) 5(★★★★★) 6(★★★★★★)	Percentage improvement over Target Emission Rate (TER) as determined by the 2006 Building Regulation Standards	10% 18% 25% 44% 100% A 'zero carbon home' (heating, lighting, hot water and **all** other energy uses in the home)
	Water	
1(★) 2(★★) 3(★★★) 4(★★★★) 5(★★★★★) 6(★★★★★★)	Internal potable water consumption measured in litres per person per day (l/p/d)	120 l/p/d 120 l/p/d 105 l/p/d 105 l/p/d 80 l/p/d 80 l/p/d
	Materials	
1(★)	Environmental impact of materials†	At least three of the following 5 key element of construction are specified to achieve a BRE Green Guide 2006 rating of at least D – Roof structure and finishes – External walls – Upper floor – Internal walls – Windows and doors
	Surface Water Run-off	
1(★)	Surface water management	Ensure that peak run-off rates and annual volumes of run-off will be no greater than the previous conditions for the development site

† A probable future development regarding the environmental impact of materials is to reward resource efficiency, as well as the use of resources that are more sustainable, by developing 'Ecopoints per m^2' as a measure for this item. However, it may be that the 'Green Guide' route will remain as a simple route for smaller developments.

Minimum standards *(continued)*

Code Level	Category	Minimum Standard
	Waste	
1(★)	Site waste management	Ensure there is a site waste management plan in operation which requires the monitoring of waste on site and the setting of targets to promote resource efficiency
	Household waste storage	Where there is adequate space for the containment of waste storage for each dwelling. This should allow for the greater (by volume) of the following EITHER accommodation of all external containers provided under the relevant Local Authority refuse collection/recycling scheme. Containers should not be stacked to facilitate ease of use. They should also be accessible to disabled people, particularly wheelchair users and those with a mobility impairment OR at least 0.8m^3 per dwelling for waste management as required by BS 5906 (Code of Practice for Storage and On-site Treatment of Solid Waste from Buildings)

DETAILED POINTS SCORING SYSTEM

Category 1 – Energy/CO_2

Issue	Measurement Criteria	Points Awarded
Target Emission Rate (TER) as defined by 2006 Building Regulation Standards	Points for percentage improvement over Building Regulations Approved Document L (2006) – Conservation of Fuel & Power; calculated using SAP:2005	**One** of the following Point scores
	10%	1.2
	14%	2.4
	18%	3.5
	22%	4.7
	25%	5.8
	31%	7.0
	37%	8.2
	44%	9.4
	52%	10.5
	60%	11.7
	69%	12.9
	79%	14.0
	89%	15.2
	100%	16.4
	a 'zero carbon home'	17.6
Building fabric	Heat Loss Parameter (HLP) EITHER ≤1.3	 EITHER 1.2
	OR ≤1.1	OR 2.4
Internal lighting	Where the following percentage of fixed fittings are dedicated energy efficient fittings EITHER ≥40% of fittings	 EITHER 1.2
	OR ≥75% of fittings	OR 2.4
Other Energy		
Drying space	For providing space and posts, footings and fixings for drying clothes in a secure environment for each unit on the site	1.2

Category 1 – Energy/CO_2 *(continued)*

Issue	Measurement Criteria	Points Awarded
Ecolabelled white goods	EITHER Where fridges, freezers and fridge/freezers have an A+ rating under EU Energy Efficiency Labelling Scheme	EITHER 1.2
	AND OPTIONALLY Where washing machines and dishwashers have an A rating and/or washer driers and tumble driers have a B rating under EU Energy Efficiency Labelling Scheme	AND OPTIONALLY +1.2
	OR Information is provided on purchasing and benefits of efficient white goods, where such goods are not supplied with the new home	OR 1.2
External lighting	Where all space lighting is provided by dedicated energy efficient fittings, taking into account the needs of people who have visual impairments	1.2
	AND OPTIONALLY Where all burglar security lighting is: • A maximum of 150W • Fitted with movement detecting and daylight shut-off devices Where all other security lighting is provided with energy efficient fittings and daylight shut-off devices	AND OPTIONALLY +2.4

Category 1 – Energy/CO_2 *(continued)*

Issue	Measurement Criteria	Points Awarded
Low or Zero Carbon Energy Technologies	EITHER Where at least 10% of total energy demand is supplied from local renewable or low carbon energy sources	EITHER 1.2
	OR Where at least 15% of total energy demand is supplied from local renewable or low carbon energy sources	OR 2.4
Cycle storage	Where provision is made for the safe, weather-proof and secure storage of cycles as follows: • 1 and 2 bedroom dwellings – storage for 1 cycle • 3 bed dwellings – storage for 2 cycles • 4 bed dwellings and larger – storage for 4 cycles	
	EITHER In 50% or more of dwellings in a development	EITHER 1.2
	OR In 95% or more of dwellings in a development	OR 2.4
Home office	For the provision of a space and services which allows the occupants to set up a home office in a quiet room	1.2

Category 2 – Water

Issue	Measurement Criteria	Points Awarded
Internal potable water consumption	Where predicted water consumption (calculated using the Code water calculator) accords with the following levels:	**One** of the following point scores
	≤120 l/p/d	1.5
	≤110 l/p/d	3
	≤105 l/p/d	4.5
	≤90 l/p/d	6
	≤80 l/p/d	7.5
External potable water consumption	For providing a system to collect rain water for use in external irrigation/watering e.g. water butts	1.5

Category 3 – Materials

Issue	Measurement Criteria	Points Awarded
Environmental impact of materials	Where the total building points achieved under the CSH materials calculator is as follows: • Score of at least 3 points • Score of at least 6 points • Score of at least 9 points • Score of at least 12 points • Score of 15 points Scores are achieved as follows for each of the specifications: • A+ rating = 3 • A rating = 2 • B rating = 1 • C, D or E = 0 Scores achieved for each of the following elements are added to give the total building score: • Roof • External Walls • Internal Walls (incl. party walls and partitions) • Floors – upper and ground floors • Windows	**One** of the following point scores 0.9 1.8 2.7 3.6 4.5
Responsible sourcing of materials – basic elements	Where materials used in key building elements are responsibly sourced (e.g. timber certification, EMS etc.)	Between 0.3 points and 1.8 points (for details see Technical Guidance Manual)
Responsible sourcing of materials – finishing elements	Where materials used in secondary building and finishing elements are responsibly sourced (e.g. timber certification, EMS etc.)	Between 0.3 Points and 0.9 Points (for details see Technical Guidance Manual)

Category 4 – Surface Water Run-off

Issue	Measurement Criteria	Points Awarded
Reduction of surface water run-off from site	Where rainwater holding facilities/ sustainable drainage (SUD) is used to provide attenuation of water run-off to either natural water courses or municipal systems. Points for attenuation covering • Hard surfaces	0.5
	AND OPTIONALLY • Roofs The percentage peak time attenuation should be provided as follows • 50% in low flooding risk areas • 75% in medium flooding risk areas • 100% in high flooding risk areas	AND OPTIONALLY +0.5
Flood risk	Where evidence is provided to demonstrate that the assessed development is located in an area of EITHER • low annual probability of flooding	EITHER 1
	OR • medium/high annual probability of flooding (subject to plans being approved by the relevant statutory bodies) and where • the ground level of buildings, car parks and access routes are above the flood level; • an appropriate assessment of how the building will react to flooding (including the use of resilient construction where necessary) to mitigate residual risk	OR 0.5

Category 5 – Waste

Issue	Measurement Criteria	Points Awarded
Household recycling facilities	EITHER Where the following recycling facilities are provided: • 3 internal storage bins for recyclable waste with – min total capacity of 60ltr – no individual bin smaller than 15ltr – all bins in a dedicated position that is accessible to disabled people	EITHER 1.8
	OR Where full recycling facilities are provided: • 3 internal storage bins with – min total capacity of 30ltr – no individual bin smaller than 7ltr – all bins in a dedicated position that is accessible to disabled people AND EITHER • A Local Authority collection scheme for recyclable materials covering at least three streams of waste with sufficient space for the storage of the bins provided without stacking (within 10m of an external door) and which is accessible to disabled people OR • Where there is not a Local Authority collection scheme for recyclable materials, 3 external bins with: – min total capacity of 180ltr – no individual bin smaller than 40ltr • All bins to be in a dedicated position (within 10m of an external door), which is accessible to disabled people	OR 3.6

Category 5 – Waste *(continued)*

Issue	Measurement Criteria	Points Awarded
Construction waste	EITHER Where the site waste management plan includes procedures and commitments that minimise waste generated on site in accordance with WRAP/Envirowise guidance	EITHER 0.9
	OR Where the above is achieved and the plan includes procedures and commitments to sort, reuse and recycle construction waste either on site or through a licensed external contractor	OR 1.8
Composting facilities	Where home composting facilities are provided in houses with gardens or a communal/community composting service provided in other dwelling types suitable for normal domestic non-woody garden, food and other compostable household wastes. Account should be taken concerning the accessibility of these facilities to disabled people	0.9

Category 6 – Pollution

Issue	Measurement Criteria	Points Awarded
Global warming potential (GWP) of insulant	Where all insulating materials avoid the use of substances that have a global warming potential (GWP) of 5 or more (and an Ozone Depleting Potential of zero) in either their manufacture or composition for the following elements • Roof (including loft access) • Walls internal and external (including doors, lintels and all acoustics insulation) • Floor (including foundations) • Hot water cylinder, pipe insulation and other thermal stores	0.5
Nitrous Oxide (NOx) emissions	Where NOx emissions from any space heating and hot water systems accord with the following EITHER • Dry NOx level <=100mg/KWh OR • Boiler class 4 under BS EN 297:1994	Between 0.5 points and 2 points (for details see Technical Guidance Manual)

Category 7 – Health and well-being		
Issue	**Measurement Criteria**	**Points Awarded**
Daylight	Homes must meet the following standards before points can be awarded: • Kitchen to achieve minimum average daylight factor of at least 2% • Living rooms, dining rooms and studies to achieve a minimum average daylight factor of at least 1.5% • Kitchens, living rooms, dining rooms and studies to be designed to have a view of the sky	Up to 4 points (for details see Technical Guidance Manual)
Sound insulation	Points are awarded for achieving higher standards of sound insulation than required by Part E of the Building Regulations, and demonstrating it by either using post-completion testing (PCT) or Robust Details (RD)	Between 1 and 4 points (for details see Technical Guidance Manual)
Private space	For the provision of outside space that is at least partially private, and that is accessible to disabled people	1
Lifetime Homes	Where **all** the standards of Lifetime Homes have been complied with, that is: • access to the dwelling (Standards 1-5); • general standards of accessibility within the dwelling (Standards 6-7, 11, 14, 15 and 16); • potential future adaptability of the dwelling (Standards 8, 9, 10, 12 and 13)	4

Category 8 – Management		
Issue	**Measurement Criteria**	**Points Awarded**
Home user guide	Where there is provision in each home of a simple user guide that covers information relevant to the 'non-technical' tenant/ occupant on the operation and environmental performance of their home, together with information that the user guide is available in alternative accessible formats	2.2
	AND OPTIONALLY Where the guide also covers information relating to the site and its surroundings	AND OPTIONALLY +1.1
Considerate Constructors Scheme	EITHER Where there is a commitment to comply with best practice site management principles and a regular audit under a nationally or locally recognised independent certification scheme such as or comparable to the Considerate Contractors Scheme	EITHER 1.1
	OR Where the commitment is to go significantly beyond best practice including a regular audit under a nationally or locally recognised independent certification scheme such as, or comparable to, the Considerate Contractors Scheme	OR 2.2

Category 8 – Management *(continued)*

Issue	Measurement Criteria	Points Awarded
Construction site impacts	EITHER Where there is a commitment and strategy to operate site management procedures on site that cover 2 or more of the following items: • CO_2 or energy arising from site activities • CO_2 arising from transport to and from site • Water consumption arising from site activities • Best practice air pollution controls • Best practice water pollution controls • 80% of site timber is reclaimed, reused or responsibly sourced	EITHER 1.1
	OR Where there is a commitment as above that covers 4 or more of the items listed	OR 2.2
Security	Points are achieved by complying with 'Secured by Design – New Homes' (Section 2: Physical Security). This will include working closely with an Architectural Liaison Officer or Crime Prevention Design Advisor from the local Police Force	2.2

Category 9 – Ecology

Issue	Measurement Criteria	Points Awarded
Ecological value of the site	Where development land is of low ecological value as defined by either • The BRE Ecological Value Checklist	1.2
	OR • A report prepared by a suitably qualified ecologist	
	OR Where a suitably qualified ecologist confirms that the site will remain undisturbed by the works	
Ecological enhancement	Where ecological features have been designed for positive enhancement in accordance with the recommendations of a suitably qualified ecologist	1.2
Protection of ecological features	Where all existing features of ecological value are maintained and adequately protected from damage during site preparation and construction works	1.2
Change in ecological value of the site	Where the resulting change in ecological value is as follows calculated using the Code Change (see Technical Guidance Manual for details) in Ecological Value Calculator • Minor negative change (-9 to -3) • Neutral (<-3 to +3) • Minor enhancement (<+3 to +9 • Major enhancement (>+9	**One** of the following point scores 1.2 2.4 3.6 4.8
Building footprint	EITHER Where the total combined floor area: footprint ratio for all houses on the site is greater than 2.5:1; *and* Where the total combined floor area: footprint ratio for all flats on the site is greater than 3.5:1	EITHER 1.2
	OR Where the total combined floor area: footprint ratio for all dwellings on the site is greater than 3.5:1	OR 2.4

Practical Examples

Practical examples of home design to meet code levels 1, 3 and 6 are illustrated in this section. It should be noted that code levels may be achieved through a variety of different issue combinations. These examples should therefore not be used as definitive guides for meeting any particular Code level.

Code Level 1 – an illustrated example

A home meeting any level of the Code will have to meet certain minimum standards. For Level 1 this means:

The home will have to be 10% more energy efficient than one built to the 2006 Building Regulations standards. This could be achieved by:

- Improving the thermal efficiency of the walls, windows, and roof (by using more insulation or better glass for example);
- Reducing air permeability, that is by improving the control of the fresh air into a home, and the stale air out of a home. (A certain amount of air ventilation is needed in a home for health reasons);
- Installing a high efficiency condensing boiler;
- Carefully designing the fabric of the home to reduce thermal bridging (thermal bridging allows heat to easily escape between the inner walls and the outer walls of a home).

The home will have to be designed to use no more than about 120 litres of water per person per day. This could be achieved by fitting a number of items such as:

- 6/4 Dual Flush WC;
- Flow Reducing/Aerating taps throughout;
- 6-9 litres per minute shower (note that an average electric shower is about 6/7 litres per minute;
- 18ltr maximum volume dishwasher;
- 60ltr maximum volume washing machine.

Other minimum requirements are required for:

- Surface water management – this may mean the provision of soakaways and areas of porous paving;
- Materials – this means a minimum number of materials meeting at least a 'D' grade in the Building Research Establishment's Green Guide (the scale goes from A+ to E);
- Waste management – this means having a site waste management plan in place during the home's construction, and adequate space for waste storage during its use.

But to get to Level 1 you need a further 33.3 points. So the builder/developer must do other things to obtain the other points such as:

- Providing accessible drying space (so that tumble dryers need not be used);
- Providing more energy efficient lighting (taking into account the needs of disabled people with visual impairments);
- Providing cycle storage;
- Providing a room that can be easily set up as a home office;
- Reducing the amount of water than runs off the site into the storm drains;
- Using environmentally friendly materials;
- Providing recycling capacity either inside or outside the home.

Code Level 3 – an illustrated example

A home meeting any level of the Code will have to meet minimum standards for certain items depending on what level is desired. For Level 3 this means:

The home will have to be 25% more energy efficient than one built to the 2006 Building Regulations standards. This could be achieved by:
- Improving the thermal efficiency of the walls, windows, and roof as far as is practically possible (by using more insulation or better glass for example);
- Reducing air permeability to the minimum consistent with health requirements (a certain amount of air ventilation is needed in a home for health reasons);
- Installing a high efficiency condensing boiler;
- Carefully designing the fabric of the home to reduce thermal bridging (thermal bridging allows heat to easily escape between the inner walls and the outer walls of a home);
- Possibly using district heating systems or low and zero carbon technologies such as solar thermal panels or biomass boilers to help heat the hot water.

The home will have to be designed to use no more than about 105 litres of water per person per day. This could be achieved by fitting a number of items such as:
- 6/4 Dual Flush WC;
- Flow Reducing/Aerating taps throughout;
- 6-9 litres per minute shower (note that an average electric shower is about 6/7 litres per minute);
- a smaller, shaped bath – still long enough to lie down in, but less water required to fill it to a level consistent with personal comfort;
- 18ltr maximum volume dishwasher;
- 60ltr maximum volume washing machine.

Other minimum requirements are required for:
- Surface water management – this may mean the provision of soakaways and areas of porous paving;
- Materials – this means a minimum number of materials meeting at least a 'D' grade in the Building Research Establishment's Green Guide (the scale goes from A+ to E);
- Waste management – this means having a site waste management plan in place during the home's construction, and adequate space for waste storage during its use.

But to get to Level 3 you need a further 46.7 points. So the builder/developer must do other things to obtain the other points such as:
- Providing drying space (so that tumble dryers need not be used);
- Providing more energy efficient lighting (both internally and externally);
- Providing cycle storage;
- Providing a room that can be easily set up as a home office;
- Reducing the amount of water than runs off the site into the storm drains;
- Using much more environmentally friendly materials;
- Providing recycling capacity either inside or outside the home;
- Enhancing the security of the home;
- Enhancing the sound insulation used in the home.

Code Level 6 – an illustrated example

A home meeting any level of the Code will have to meet minimum standards for certain items depending on what Level is desired. For Level 6 this means:

The home will have to be completely zero carbon (i.e. zero net emissions of carbon dioxide (CO_2) from all energy use in the home). This could be achieved by:
- Improving the thermal efficiency of the walls, windows, and roof as far as is practically possible (by using more insulation or better glass for example);
- Reducing air permeability to the minimum consistent with health requirements (a certain amount of air ventilation is needed in a home for health reasons);
- Installing a high efficiency condensing boiler, or being on a district heating system;
- Carefully designing the fabric of the home to reduce thermal bridging (thermal bridging allows heat to easily escape between the inner walls and the outer walls of a home);
- Using low and zero carbon technologies such as solar thermal panels, biomass boilers, wind turbines, and combined heat and power systems (CHP). It would mean for example that energy taken from the national grid would have to be replaced by low or zero carbon generated energy, so that over a year the net emissions were zero.

The home will have to be designed to use no more than about 80 litres of water per person per day. This could be achieved by fitting such items as:
- 6/4 Dual Flush WC;
- Flow Reducing/Aerating taps throughout;
- 6-9 litres per minute shower (note that an average electric shower is about 6/7 litres per minute);
- a smaller, shaped bath – still long enough to lie down in, but less water required to fill it to a level consistent with personal comfort;
- 18ltr maximum volume dishwasher;
- 60ltr maximum volume washing machine.

To achieve the standard would also mean that about 30% of the water requirement of the home was provided from non-potable sources such as rainwater harvesting systems or grey water recycling systems.

Other minimum requirements are required for:
- Surface water management – this may mean the provision of soakaways and areas of porous paving;
- Materials – this means a minimum number of materials meeting at least a 'D' grade in the Building Research Establishment's Green Guide (the scale goes from A+ to E);
- Waste management – this means having a site waste management plan in place during the home's construction, and adequate space for waste storage during its use.

But to get to Level 6 you need a further 64.9 points. So the builder/developer must do many other things to obtain the other points. In fact they will need to do 90% of everything in the Code to achieve Level 6, including:
- Energy efficient appliances, and lighting;
- Supplying accessible water butts;
- Reducing surface water run-off as much as possible;
- Using highly environmentally friendly materials;
- Minimising construction waste;
- Maximum, accessible provision for recycling;
- Improved daylighting, sound insulation and security;
- Building to the Lifetime Homes standard;
- Assessing and minimising the ecological impact of the construction of the home.

This booklet introduces the Code for Sustainable Homes – the new national standard for designing and constructing homes to a higher standard of sustainability. It will be useful for all those involved in the home building industry, including designers, builders, product manufacturers, and assessors, to understand what the Code is, how it works, and what benefits it brings. This booklet will also be of interest to members of the wider public with an interest in sustainability.

This booklet is **not** a comprehensive technical guide for contractors seeking to achieve Code compliance. Detailed technical guidance is being prepared by and will be published by April 2007.