Since 2000, when the previous report was published, there have been significant policy developments relating to construction and so I see this review as having two aims. One is to pull together in one source document the current main strands of Government policy and industry initiatives related to Sustainable Construction. The other is to encourage industry to respond positively and propose its own targets - where industry should go and what industry can do. This then provides an effective basis to guide future government policies where they are relevant to construction. Such a framework will focus on the principle of Sustainable Development to which the Government as a whole is signed up.

The Review has embraced the views and input from many within the construction industry and from other interested parties, and I thank them for their contributions. Particular thanks goes to the Sustainability Forum under the chairmanship of Ian Coull, and the Sustainable Development Commission, particularly its Business Commissioner, Dr Stewart Davies for their active involvement in the review. This represents the kind of partnership that I had hoped to see.

The publishing of the Review is not the end product. It is a first step in the development of industry targets for the future which will be carried out with the assistance of the Sustainability Forum. I wish the targets, once refined, to be seen as challenging and realistic; and ones which will encourage industry to respond positively to some of the big issues it faces. They will also help Government identify how it can better support change in the industry to deliver sustainable construction. In doing this, Government will continue to work with industry to reduce the need for further regulation by application, where appropriate, of voluntary mechanisms.

I therefore invite all interested parties to take part in the development of these targets. Together we can move towards an improved application the principles of Sustainable development within construction.

Rt Hon Margaret Hodge MBE MP
Minister of State
Industry and the Regions
# Contents

1. **Introduction** 6  
1.1 A Review of Sustainable Construction 6  
1.2 What is sustainable development? 8  
1.3 Importance of the construction sector 9  
1.4 NAO Report on construction 10  

2. **The People Agenda** 14  
2.1 The image of skills in construction 14  
2.2 Employment and training 16  
2.3 Sustainability skills 17  
2.4 Ambition Construction 19  
2.5 Rethinking Construction – Respect for People 19  
2.6 Equal opportunities and diversity 20  
2.7 Supporting local communities 20  
2.8 Academy for Sustainable Communities 21  
2.9 Health and safety and welfare 21  

3. **Managing the Environment and Resources** 24  
3.1 Energy and climate change 24  
3.2 Waste 35  
3.3 Water Issues 47  
3.4 The Built Environment 47  

4. **Government Procurement** 60  
4.1 Public Sector Construction Clients Forum 61  
4.2 Sustainable Procurement Task Force 62  
4.3 Common Minimum Standards 65  
4.4 Government’s response to the Biomass Task Force Report 66  
4.5 Sustainable Construction on the Defence Estate 66  
4.6 Sustainable Design and Construction of Schools 68  

5. **Overseas Dimension** 70  

6. **Initiatives** 72  
6.1 TrustMark 72  
6.2 Research Programmes 73  
6.3 Sustainable Construction within the Regions 75  
6.4 The Olympics 2012 80  
6.5 Sustainable Development Plans for Government Departments 81  
6.6 Sector Sustainability Challenge 82  
6.7 Key Performance Indicators 83  
6.8 Constructing Excellence 84  
6.9 Sustainability Checklists 85  
6.10 Small and Medium sized Enterprises (SMEs) 86  

7. **Industry Involvement** 88  
7.1 Work of the Sustainability Forum 90  
7.2 Facilities Management 92  
7.3 Development of Sector Sustainability Strategies 94  
7.4 Benchmarking house-builders on sustainability 95  

8. **The Future** 98  

**Annexes**  
A Listing of other organisations relevant to sustainable construction 110  
B Building Regulations 112  
C Main Contributors to the preparation of the consultation document 116
1 Introduction

1.1 A Review of Sustainable Construction

The future of our planet depends on our willingness now to ensure that the actions we take and developments we pursue, as a nation and internationally, improve the quality of life today without compromising that of future generations.

The UK Government is committed to the principles of sustainable development. As one of the UK’s leading industries, responsible for over 8% of GDP and employing 2.1 million people, construction can lead the way in considering sustainable development in all of its activities.

In 2000, the Government published its Strategy for Sustainable Construction Building A Better Quality of Life which presented a way forward for Government and industry. This Review highlights many of the activities undertaken by industry and Government during the past five years that have contributed to that agenda. It aims to provide a listing of current work, initiatives and Government policies relevant to sustainable construction, in order to increase awareness of sustainability in the context of construction. It also aims to provide an effective basis to guide future government policies where they are relevant to construction and to outline where the industry wishes to see itself going in its future development.

Sustainable Construction builds upon the principles of sustainable development which the Government as a whole is committed to support. These are outlined in the UK Strategy for Sustainable Development published in March 2005, [http://www.sustainable-development.gov.uk/publications/uk-strategy/index.htm](http://www.sustainable-development.gov.uk/publications/uk-strategy/index.htm), which sets the agenda to deliver a better quality of life using long-term solutions that will benefit everyone.

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**Living Within Environmental Limits**

Respecting the limits of the planet’s environment resources and biodiversity to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations.

**Ensuring a Strong Healthy and Just Society**

Meeting the diverse needs of all people in existing and future communities, promoting personal wellbeing, social cohesion and inclusion, and creating equal opportunity for all.

**Achieving a Sustainable Economy**

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

**Promoting Good Governance**

Actively promoting effective participative systems of governance in all levels of society – engaging people’s creatively, energy and diversity.

**Using Sound Science Responsibly**

Ensuring policy is developed and implemented on the basis of strong scientific evidence, whilst taking into account scientific uncertainty (through the precautionary principle) as well as public attitudes and values.

![Figure 1 The five guiding principles of sustainable development](http://www.sustainable-development.gov.uk/publications/uk-strategy/index.htm)
1.2 What is sustainable development?

The goal of sustainable development is to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life, without compromising the quality of life of future generations. It involves balancing and integrating the economic, social and environmental considerations for any policy or decision.

The UK Government and Devolved Administrations will pursue this goal in an integrated way by driving forward a sustainable, innovative and productive economy that delivers high levels of employment, together with a just society that promotes social inclusion, sustainable communities and personal wellbeing. This will be done in ways that protect and enhance the physical and natural environment, and use resources and energy as efficiently as possible. Government must promote a clear understanding of, and commitment to, sustainable development so that all people can contribute to the overall goal through their individual decisions.

To ensure the UK makes progress in all areas of sustainable development, the Government has established a series of UK Framework Indicators which are monitored and reported on annually.

These Indicators cover many issues relating to construction, including carbon dioxide emissions by industry, household energy use, road freight, stone, sand and gravel extraction, manufacturing sector emissions, water resource use, waste created by the construction and demolition sector, brownfield land use, dwelling density, emission of air pollutants, employment, local environmental quality, housing conditions, productivity.

An important element in achieving sustainable development is to promote a built environment that:
- minimises adverse impacts on the environment, during construction and in use, whilst enhancing the natural surroundings;
- maximises the positive contribution to business activity through the whole life of the building;
- helps to encourage productivity through being flexible for future use, building cost-efficiently and improving people’s working environment;
- takes fully into account the impact of construction on the surrounding environment by seeking to maintain biodiversity within the location and avoiding any unnecessary pollution;
- wherever possible makes use of modern methods of construction to improve building efficiency and minimise environmental effects on construction sites.

1.3 Importance of the construction sector

For the purpose of this review the construction sector is defined as including: the production and supply of construction materials and products; building services manufacturers, providers and installers; contractors, sub-contractors; professionals, advisors and construction clients; and organisations relevant to the design, build, operation and refurbishment of civil engineering works and buildings.

The construction industry employs some 2.1 million people and accounts for at least 8.2% of GDP. It uses around six tonnes of material for construction each year for every man, woman and child in the UK.

Construction has a huge contribution to make to everyone’s quality of life and in achieving the positive impacts of its work in a more sustainable manner. Construction affects the nature, function and appearance of the towns and countryside in which we live and work.

Waste from construction sector generates 92 million tonnes of waste a year, of which 13 million tonnes are unused new materials, i.e. materials delivered to the site, unused and then sent away for disposal. Demolition materials (and soil) amounts to 91 million tonnes in England and Wales annually (2003 figures). Over 90% of non-energy minerals extracted in the UK are supplied as construction materials, and the industry annually produces three times the amount of waste generated by all UK households combined.

The construction, occupation and maintenance of building account for around 50 per cent of UK emissions of carbon dioxide, thus contributing to climate change, the depletion of non-renewable resources and adding to pollution. This needs to be addressed if the Government’s target of a 60% reduction in the 1990 level of emissions by 2050 is to be achieved.

Just over 30% of the sector’s output by value is bought by the public sector. The Government is the industry’s leading client and recognises its responsibility to set an example in the sustainable procurement, maintenance and operation of its built assets.

Construction has a poor record in relation to people, especially for health and safety. Apart from the sufferings caused, this impacts the businesses not only in costly lost workdays, but sometimes leads to enforcement actions such as prosecution and site closure.

The industry is characterised as white and male, and an ageing workforce makes it necessary to attract and retain younger skilled people.

There has been much progress in moving towards the overall goal set out by the 2000 strategy, but more is required. A good indicator of the current state of the sector is the 2005 National Audit Office report on construction.

Introduction
1.4 NAO Report on construction

In March 2005 the National Audit Office (NAO) published its report Improving Public Services through better construction (HC 364-1 Session 2004-05), along with an associated volume containing 10 case studies of good practice.


The document reports good progress towards the Government’s Achieving Excellence in Construction targets for improved delivery of projects to time and cost, and that tangible value for money gains from partnering and integrated project teams are already being delivered in specific programmes including streamlined procurement processes, fewer legal claims and reduced environmental impacts.

More needs to be done and the NAO identifies potential annual savings of between £2.6 billion and £500 million through the implementation of good practice across all central and local government construction activity.

On sustainability, the report finds that while government departments recognise the need to procure on the basis of whole-life value, it is difficult given the:

- lack of clarity and understanding of whole-life value;
- absence of tools to assist design and evaluation on a whole-life value basis (though the report does highlight the benefits achievable through use of the Construction Industry Council’s Design Quality Indicators and the Building Research Establishment’s Environmental Assessment Method);
- absence of robust historic benchmark data on the costs of running and maintaining built assets;
- lack of tangible evidence of the benefits of adopting a whole-life approach, with both clients and suppliers therefore unwilling to invest time and resources in delivering what they see as inherently risky sustainable solutions.

The report concludes that there are six main areas where public sector organisations need to do more to improve their construction performance.

Six areas for improvement

1. Establishing effective construction programmes. This requires:
   - planning and management of construction programmes and projects across the organisation as whole;
   - development of timely and robust information on the value, condition and fitness for purpose of existing built assets;
   - provision of certainty and stability in the profiling of work and funding and communicating this as early as possible to suppliers.

2. Developing and supporting well focused and capable public sector clients. This needs:
   - ‘intelligent’ central support for infrequent clients in particular;
   - boards with relevant commercial skills to provide commercial and professional leadership for programme and project managers and effective and consistent leadership throughout the course of construction projects.

3. Designing and decision making based on ‘whole-life value’. This calls for:
   - investment of more time and resources in the design phase of the construction process before key decisions are made and the subjection of proposals to independent challenge;
   - business cases that assess whether the running costs of the proposed built asset are affordable over its whole-life, and including a broader assessment of the potential wider economic, social and environmental impact.

4. Using the appropriate procurement and contracting strategies. This requires:
   - understanding by clients of which procurement route best suits their circumstances and capabilities;
   - clients using their considerable leverage and communicating clear tender evaluation criteria only to select suppliers with a proven commitment to collaborative working, health and safety, sustainable construction and developing the skills of their workforce;
   - use of contracts that support collaborative working;
   - a well developed capability to identify and manage the construction project risk.

5. Working collaboratively through fully integrated teams. This demands:
   - cultural change to allow new ways of working to be embedded across the entire client organisation and supply chain;
   - early contractor involvement at the earliest stages in projects, including contractors with significant design responsibilities;
   - maintenance of an element of competitive tension partnering arrangements;
   - certainty of payment from the client to all in the supply chain;
   - management of the risk of failure at the handover phase of the construction project in an integrated and planned way.

6. Evaluating performance and embed project learning. This needs:
   - establishment of the appropriate measures and targets for improvement from the outset;
   - repeat evaluations of the achievement of all key targets and benefits, including whole-life costs, improvements in public services and environmental benefits;
   - an honest assessment of the level of performance delivered by all parties during the course of the project.
The NAO report makes 10 recommendations to government departments. Of particular relevance to sustainable construction are:

- **Recommendation d:** Consider the development of a sustainability action plan to cover all aspects of construction activity, and to demonstrate how the department is contributing to the Government’s objectives for sustainable development. In particular, the development of appropriate project-specific key performance indicators such as reduced carbon dioxide emissions and reduced waste to landfill.

- **Recommendation e:** Make decisions about construction projects based on sustainable whole-life value, using a structured and robust decision-making process from the outset that identifies the trade-offs between capital costs, running costs, and social and environmental impacts.

- **Recommendation i:** Evaluate the post-completion and occupancy performance of the projects in terms of the Achieving Excellence in Construction strategic targets, whole-life value – including financial performance and delivery of better public services and sustainable development – and embed the lessons in future projects. As part of this, departments should consider linking suppliers’ contract incentives to the delivery of post-completion improvements, which should include assessment of environmental impacts such as carbon dioxide emissions, energy and water usage, waste, and workforce wellbeing.

**Recommendation j:** In support of the Government’s Sustainable Development Strategy and the commitments made in the White Paper Energy Efficiency: The Government’s Plan for Action (Department for Environment, Food and Rural Affairs (DEFRA), April 2004, Cm 6168), relevant departments and authorities should consider developing quantifiable cross-government strategic targets focused on sustainable construction.

The NAO is working with the Office of Government Commerce in taking forward the recommendations and to assess progress and impacts.

**NAO study on Sustainable Buildings on the Government Estate**

The NAO has recently embarked on a study entitled ‘Sustainable Buildings on the Government Estate’. The study will examine whether buildings on the government estate are designed and built to be sustainable, whether sustainable buildings provide value for money, and whether ‘unsustainable’ buildings could improve value for money by incorporating more sustainable features.

The NAO expects to publish their report in spring 2007; this will be available to be taken by the House of Commons Committee of Public Accounts.
Over the last few years, a good deal of attention has been paid to tackling the poor image of construction. The construction market continues to be buoyant, and brings with it recruitment and skills needs. It is therefore necessary to address ‘image’, alongside the reality behind that image, so that young people consider construction as a top choice career.

For most people, their impression of construction is shaped by contacts with trades-people and general builders who carry out work in their homes. A measure of the extent of improvement in the image on construction is the level of applications to built environment college courses. Further education establishments are currently attracting just under 50,000 students to building-related courses each year across the UK, although only about 30,000 attain qualifications. Data from ConstructionSkills and the Learning and Skills Council show that about half of all new entrants at S/NVQ Level 2-3 are apprentices, with the remainder either studying Level 1 courses, or going through the traditional further education route.

In higher education, there has been a slight increase in the number of students on built environment courses from 10,630 in 1998/99 to 10,800 in 2003/04, although this includes an 11% increase on 2002/03 (source, Higher Education Statistics Agency, HESA). Building has reversed a recent decline in student numbers, while over the same period architecture has experienced consistent increases. A positive image of the industry is vital as an influence on career decisions and the advice and guidance given by parents, peers and career teachers. For that reason, for some years CITB-ConstructionSkills (the lead partner in ConstructionSkills, the lead Sector Skills Council for construction) has devoted considerable resources to showcasing the opportunities the industry can provide. A major annual Positive Image campaign, alongside a series of regional events each October as part of the National Construction Week (NCW), have served to introduce young people to the many possibilities construction can offer new recruits. NCW 2005 was the ninth such campaign.
2.2 Employment and training

As part of its high-level policy for tackling the nation’s skills gap, the Government has licensed a network of 25 Sector Skills Councils (SSCs) to develop and implement strategies at a sector level throughout the regions as outlined in the Skills White Paper 2003. The SSCs have a particularly important role in increasing employer demand for training, and setting standards as the basis for national vocational qualifications. Four of the SSCs have remits which touch on the built environment industries: ConstructionSkills (mainly building and civil engineering trades and professions); SummitSkills (building services); AssetSkills (including facilities management) and ProSkills (including construction products).

The built environment industries all share common challenges. All need to encourage young people to choose built environment as a career, and the SSCs aim to take forward initiatives to address this in collaboration with their stakeholders such as National Construction Week. Licensed in 2004 as a ‘pathfinder’ SSC, ConstructionSkills has now drawn up a Sector Skills Agreement (SSA), which sets out how it will work with its stakeholders and partners to respond to the sector’s key skills challenges. The ConstructionSkills SSA covers the whole of the construction industry – from craft to professional, new build, and repair and maintenance across the whole of the UK, with separate agreements for England, Scotland, Wales and Northern Ireland. It is intended to influence public provision of education and training, in line with employment needs.

At the core of the Agreement are the collective Action Plans. These cover policy issues, along with raft of programmes and pilots to be being taken by the respective stakeholders – employers, industry bodies, unions, training providers and the Government. There are also a number of challenging targets to reach if recruitment and skills needs are to be met. These include boosting the number of apprenticeships in training from 3,000 to 13,000 per annum; a three-fold increase in the number of small and medium-sized employers investing in training; and a fully qualified workforce (reaching a standard equivalent to NVQ 2) by 2010. At graduate level, employers and ConstructionSkills have begun a new drive to attract recruits through the Inspire Scholarships programme.

A key strand of the ConstructionSkills’ strategy includes tackling the low level of qualification in construction. Given the important link between skills and business performance, ConstructionSkills has been working with stakeholders to help improve management capability in such areas as lean manufacturing (the Construction Lean Improvement Programme - CLIP see www.bre.co.uk/service.jsp?id=265) and sustainability-related skills. Other important aspects include fostering management and leadership skills, and addressing the disproportion between men and women in the industry, and the low proportion of those from ethnic minorities.

A joint programme involving CITB-ConstructionSkills, the Housing Forum and Constructing Excellence aims to address the particular needs of communities. Launched in late 2003, Sustainable Training for Sustainable Communities aims to identify best practice and address the housing sector’s labour and skills gap by:

- exploring the experiences of a number of Housing Forum Demonstration Projects;
- establishing the business case for diversity in recruitment and for investing in workforce training;
- facilitating a context and a network in which learning can be shared between projects.

In collaboration with other industry bodies and stakeholders, ConstructionSkills has established the Construction Skills Network. Having both a national and regional dimension, the Network brings together those involved in developing or using sector intelligence and forecasting data on capacity and manpower requirements, to adopt agreed priorities for action. This work is particularly relevant in the context of the successful London bid for Olympics 2012.

All the SSCs are developing programmes to address the diversity issue, largely from a recruitment standpoint. There are also a number of organisations that have been established solely to help and encourage women to enter the industry, and mentor those working within it, to enable them to achieve their potential.

2.3 Sustainability skills

Without the necessary skill sets, construction will be ill equipped to meet the challenge of the sustainable construction agenda. Trades-people, technicians, administrators and managers at all levels need awareness, knowledge, capabilities and behaviours appropriate to their function to make sustainable construction a reality in their organisation. It is essential that the industry understands fully what this means in practice, so that decision-makers and training providers can implement programmes to meet their needs.
ConstructionSkills is aiming to provide the strategic leadership necessary to support the industry in becoming more sustainable.

An important tool for the delivery of sustainable construction is the Sustainability Skills Matrix for the Built Environment. The Matrix was developed by the Sustainability Forum’s Skills Working Group (chaired by ConstructionSkills) which involved relevant stakeholders, including Sector Skills Councils working in other built environment sectors. It is a high-level framework that will be used by ConstructionSkills and others to map existing competencies, identify skills gaps, measure industry progress in sustainability skills development and assist in future joint working. Launched in June 2005, it is anticipated that this will facilitate a coherent approach to sustainability skills development in built environment industries.

Since 2004, ConstructionSkills has been developing a Strategic Plan for Sustainability Skills to address skills needs and actions to overcome barriers to change for sustainable development over the next 10 years. In early 2004, CITB-ConstructionSkills commissioned initial research to identify the key drivers, barriers, practice and change required for sustainable development to take a firm hold in construction. ConstructionSkills consulted widely with industry, and organised a number of workshops and seminars as part of its policy development process.

The sustainability agenda must be one of the key drivers for construction over the next 10 years. ConstructionSkills has recognised its importance, as recognised by its Strategic Plan for Sustainability Skills. This was formally launched in December 2005, and will underpin its programme of work in this area. The need for further skills development is clear, so that industry is capable of translating commitments into action. All the Sector Skills Councils are seeking to engage their SME communities, and particular attention will need to be made to ensure that their training and other needs are understood and met. The implications for training providers cannot be overlooked. It is essential that policy-makers and training/service providers collaborate, so that relevant and accessible training products are delivered in line with industry’s needs.

The 2005 Skills White Paper brought into greater focus management and leadership skills aspects covering all sectors. Again, the role of the Sector Skills Council will be vital to ensure that managers at all levels keep up to speed with emerging technologies, modern methods of construction and associated management practices.

2.4 Ambition Construction

Ambition Construction was launched by the Department of Works and Pensions in 2002 as part of the Government’s overall welfare-to-work agenda and the next phase of New Deal. It aims to train and place 1,000 New Deal clients in skilled jobs as carpenters and joiners, bricklayers, painters and decorators, plasterers, roofers, and glaziers. Trainees would receive appropriate level Construction Skills Certification Scheme cards to prove their competence and make them more employable.

The scheme, supported by £3 million in funding from CITB-ConstructionSkills and £1 million from the New Deal Innovation Fund, in addition to regular New Deal client funding, was scheduled to run for up to three years beginning with 10 pilot locations in England and Scotland. A review in 2005 decided not to extend the pilots and the programme ended.

2.5 Rethinking Construction - Respect for People

Respect for People is a key strand of the Rethinking Construction industry improvement initiative identified in the 2000 Strategy for Sustainable Construction. Respect for People focuses on the business case for getting the best out of people by developing a culture of openness, honesty, trust and respect that encourages and facilitates contributions from all participants in the successful delivery of projects, to the mutual benefit of all involved. Since the first report, there has also been a good deal of work to embed Respect for People as a mainstream business approach within construction.

An interim statement from the Rethinking Construction working group set up to cover the ‘people’ issues of the Strategy was published in November 2000. This set the scene for the final report of the Steering Group A Framework for Action, published in October 2002. This document sets out key recommendations addressed to industry, Government and others connected with construction, covering all aspects of the Respect for People agenda. The main deliverable from this work was a Respect for People toolkit and set of Key Performance Indicators to enable companies to assess and benchmark their performance against industry standards. Since 2002, Constructing Excellence has carried out a series of regional workshops and other events for companies providing information and guidance on the use of this material.

The Strategic Forum for Construction has also established a SME Strategic Forum group to
consider issues of particular relevance to SMEs, a particularly hard-to-reach group. It is also developing proposals to target information about Respect for People to SMEs.

In September 2006, DTI and Constructing Excellence produced a short leaflet targeted specifically at small firms. This sets out a case for Respect for People as a core business value, including a company’s relations with the community and wider environment.

Details are available from the DTI’s Construction Sector Unit website http://www.dti.gov.uk/sectors/construction/peopleissues/respect/page10919.html

2.6 Equal opportunities and diversity

Construction remains an overwhelmingly white, male-dominated industry. By the end of 2005, some 10% of all construction workers were females, but they represented only 1% of manual employees. Interestingly, women accounted for 3% of all trainees entering craft and technical construction courses. 31% were engaged in non-manual employment, with 11% in professional occupations – architecture, surveying and management (National Statistics, Labour Force Survey, Autumn 2005).

With concerns about capacity and skills needs, the case for the industry needing to recruit from the widest possible labour pool has become stronger. Even though women represented 50% of the indigenous workforce in the UK, most construction firms still opted to recruit in line with traditional patterns, that is more men, from the wider EU labour pool enlarged since 2004.

2.7 Supporting local communities

Corporate Social Responsibility (CSR) is in part the business community’s response to the challenges presented by sustainable development. Views vary on the business case for CSR, but it is increasingly becoming a key business value for some major construction players, both contractors and clients. To a large extent, engagement in CSR is being driven by organisations’ shareholders, but typically it is founded on the company’s business rationale. It is not merely a response to external pressures, but a proactive approach based on a perceived business opportunity. More contractors, both large and small, are now giving CSR a high strategic priority, although the construction sector as a whole has yet to embrace fully the CSR agenda.

It is only right that a 21st Century industry should be sensitive to the local environment around its project sites, and seek to minimise any disturbance in terms of noise, dust and dirt caused to the immediate neighbourhood. This is why the Government supports the aims of the Considerate Constructors Scheme and similar initiatives. The Considerate Constructors Scheme is a voluntary Code of Practice launched in July 1997. Adopted by clients and contractors, it is designed to improve the image of construction through better management and presentation of construction sites over and above the statutory requirements, with the emphasis on improving relationships with the local community. In 2005 over 8,000 sites from all over the UK were registered with the Scheme.

In 2005, evidence from employers’ surveys about labour and recruitment needs, the buoyant state of order books, and major infrastructure projects in the pipeline, including Olympics 2012, all point to skills and recruitment needs being a major concern for the industry for the foreseeable future. Those involved in delivering UK plc’s building programme, especially the Sustainable Communities initiative, and delivering energy efficiency commitments, have particular concerns about the industry’s ability to deliver in terms of capacity and appropriate skill sets.

2.8 Academy for Sustainable Communities

The Academy is acting as a catalyst for improving the attainment of the skills and knowledge needed to ensure the creation and maintenance of sustainable communities. Working in partnership with a wide range of organisations, it is seeking solutions to existing shortages, improving the sharing of best practice and raising the profile of careers. It will not be a major skills provider, but will identify gaps and commission ground-breaking occupational learning and generic skills materials. It will breakdown silo working by encouraging greater cross-occupational working, and will raise awareness and understanding of the issues amongst communities and young people.

2.9 Health and safety and welfare

All of the above indicators show a general downward trend since 2000/01. The total fatal injuries to workers in 2003/04 were 70, the same as for 2002/3. Of these, 51 people were employees and 19 self-employed. However, taking account of the fact that there were more workers in the industry and potentially at risk, the rate was 3.5 per 100,000, the lowest rate on record.

The estimated number of working days lost from ill health is 2.8 million per annum, over twice as many as for accidents. Occupational health problems such as vibration white finger, musculoskeletal problems, noise-induced hearing loss and asbestos-related diseases are far more prevalent in construction than in other industrial sectors.

Over the years, the construction industry has not tackled occupational health issues in a radical way. To address the problem, an innovative industry-led initiative was launched in Leicester in October 2004, to pilot an occupational health support service for the construction industry. Facilitated by the Health and Safety Executive, ‘Constructing Better Health’ has been a welcome development for the industry.

Progress in meeting the industry’s health and safety targets was reviewed at the 2005 Construction Health and Safety Summit, which concluded that the industry is making real progress, but that the current rate of change is not sufficient to meet targets set for 2010. It was clear that the industry needed to do more, particularly through integrated working, and a focus was provided through the Respect for People Code of Good Working Health and Safety Practices. This was developed by the industry and launched at the Construction Health and Safety Summit in February 2005. Stakeholders across the industry were invited to sign up to the principles of the Code and to take action on its eight leading issues. The next five years will show how successful industry has been in addressing the leading issues identified in the Respect for People Code of Good Working Health and Safety Practice and in working in a more integrated, cross-industry way to better manage risk and influence health and safety culture.

Early signs are encouraging and show that the industry itself is taking the initiative forward, showing ownership and leadership through the newly formed Strategic Forum for Construction Health and Safety Group that will support and promote the principles of contained in the Code.
Managing the Environment and Resources

Another of the five guiding principles of the UK Strategy for Sustainable Development is living within environmental limits. This involves respecting the limits of the planet’s environment, resources, and biodiversity – to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations. Three key aspects of this for the Construction Industry are the efficient management of energy resources, waste and the built environment.

3.1 Energy and climate change – Living within our environmental limits by conserving resources

Climate change
The urgent need to reduce the emissions of carbon dioxide, which are largely responsible for causing climate change, is a major factor behind the Government’s drive to raise standards of construction. The Prime Minister recently remarked that, “Climate change is probably the greatest long-term challenge facing the human race. That is why I have made it a top priority for this government at home and internationally”.1

With the construction, occupation and maintenance of buildings being responsible for around half of the UK’s emissions of carbon dioxide – by far the most important greenhouse gas – it is critical that we design and construct buildings in a way which will minimise resultant emissions. This of course not only applies to the creation of new buildings, but the refurbishment and redevelopment of existing ones. The UK has set itself demanding but necessary targets and goals to reduce emissions of greenhouse gases. We are committed to reducing emissions of a basket of greenhouse gases by 12.5% below 1990 levels by 2008-12 under the Kyoto Protocol on climate change.

On current projections we will meet and exceed this target, but more needs to be done if we are to achieve the Government’s challenging domestic goals for cutting carbon dioxide emissions. If dangerous climate change is to be avoided, the Government believes that the UK would need to achieve a 60% reduction of carbon emissions from 1990 levels by 2050. In addition to setting as a long-term goal, the Government has a shorter-term goal to reduce emissions by 20% by 2010 and to achieve real progress towards the 2050 goal by 2020. The Government is under no illusion that achieving these goals is going to be easy, and that it will require a major effort from all sectors of the economy.

The new UK Climate Change Programme (CCP), which was published in March 2006, contains a large number of commitments for delivering both the UK’s Kyoto Protocol commitment, and the UK’s domestic goals to reduce emissions of carbon dioxide. The new programme contains a number of new policies in addition the original CCP.

There are a number of provisions in the new climate change programme of direct relevance to the construction in the industry. Prime among these is the update of the Building Regulations which, taken together with the 2002 and 2006 revisions, will result in a 40% saving of carbon emissions from homes built from 2006 compared to pre-April 2006 new build. Government’s review of the sustainability of the existing building stock, including energy efficiency, the results of which are expected to be announced later this year. Equally important, the Code for Sustainable Homes will set out voluntary standards beyond those required by Building Regulations, and will form the basis for the next set of improvements to them.

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1 Climate change: the UK Programme 2006.
The Government also intends to prepare and consult on a new Planning Policy Statement on climate change in which it will set out how it expects participants in the planning process to work towards the reduction of carbon emissions in the location, siting and design of new development. This construction industry will need to adapt to the lower carbon development that the planning system will require.

Climate Change Levy
The Climate Change Levy came into effect on 1 April 2001 and applies to energy used in the non-domestic sector (industry, commerce, and the public sector). The aim of the levy is to encourage these sectors to improve energy efficiency and reduce emissions of greenhouse gases. The levy is administered by HM Revenue and Customs and further information can be obtained from its website.http://www.hmrc.gov.uk/

Energy Efficiency Action Plan
The Government has introduced a wide range of policies and measures to drive energy efficiency improvements across all sectors of the economy, including buildings. As set out in the 2004 Energy Efficiency Action Plan, the package consists of regulatory measures, fiscal incentives, public sector leadership, and support programmes led by the Carbon Trust and Energy Saving Trust. The Government has continued to build on this package with additional cost effective measures for energy efficiency introduced in the new Climate Change Programme.

Key policies include:
- the Energy Efficiency Commitment (EEC) (an obligation on energy suppliers to encourage household energy efficiency);
- Climate Change Agreements (in which eligible businesses can secure an 80% discount from the Climate Change Levy in return for meeting targets to reduce energy consumption and carbon emissions);
- the UK and EU Emissions Trading Schemes;
- tighter Building Regulations;
- the Code for Sustainable Homes and minimum standards for products and product labelling.

Fiscal measures include Enhanced Capital Allowances, which incentivise companies to invest in energy saving equipment; reduced VAT on certain energy-saving products; and the Landlord’s Energy Saving Allowance. Overall, the policies and measures in the Action Plan are currently (2006) projected to save around 12 million tonnes of carbon per year by 2010, saving households and businesses £3 billion per year on their energy bills.

Energy Efficiency Innovation Review

The purpose of the Review was to examine how a step-change in energy efficiency in the domestic, business and public sectors in the UK could be delivered cost-effectively, and how energy efficiency improvement could be embedded into decision-making across the economy. The conclusions and evidence base provided by the Review, form part of the Climate Change Programme. The Energy Efficiency Innovation Review also looked at technologies required to sustain efficiency savings into the future, beyond the period 2005-2015, which is the principal scope of the Climate Change Programme. This work is feeding into wider consideration of how best to focus government research funds, under the management of the Carbon Trust.

The Energy Review 2006
The report of the Energy Review, The Energy Challenge, published 11 July 2006, sets the framework for delivering the Government’s two key energy objectives: secure, affordable energy supplies; and cutting carbon emissions.

In addition to allowing new nuclear power stations to be built (provided the private sector wholly finances them), the Review gives a major push to both renewable energy sources, such as wind power, and energy efficiency, including a major focus on buildings and the way they are used.

The last of these is obviously very pertinent to the Review of Sustainable Construction. For new buildings, the proposals can be summarised as follows:

1) Carbon neutral developments
As was recently announced^2, the Government’s long-term intention is to provide the framework to support a move towards making all new developments carbon neutral. While the onus will initially be on housing, this might in time include emissions from business and transport connected with new developments.

Obviously this will take time to

^2 In speech by Yvette Cooper, Minister for Housing and Planning, to the Green Alliance, 17/5/06.  
^1 See: www.communities.gov.uk/index.asp?id=1500138
compliance with the Regulations.
• Requiring all Government-funded new housing in England (such as English Partnerships and Housing Corporation developments) to meet the EcoHomes’ “Very Good” standard (equivalent to Level 3 of the CSH). Government is leading the way with this measure. It is also helping to develop the necessary skills and capacity in the industry to raise standards for all new houses.
• Introducing energy performance certificates, for both new and existing buildings. These will show how energy efficient a house is, and therefore how high the fuel bills are likely to be. They will therefore act as a powerful new indicator for buyers, significantly raising the profile of energy efficiency.
• Developing a new Planning Policy Statement (PPS) on Climate Change. Government plans to consult on this later in 2006, and introduce it in 2007. Complementing the CSH, which covers the fabric of new developments, the new PPS will make clear that the location and design of new developments should also promote the reduction of carbon emissions. This will be done through, for example, mixed-use developments and reducing the need to travel. The new PPS will also encourage the use of more sustainable energy sources, including microgeneration, and combined heat and power.
• Strongly urging local planning authorities in England to set ambitious policies for the percentage of energy in new developments to come from on-site renewable energy sources. PPS 22 gives them the power to do this. The Housing and Planning Minister made it clear in a statement to Parliament in June 2006 that all English planning authorities should include policies in their development plans that require a percentage of the energy in new developments to come from on-site renewables, wherever viable. Among those authorities who already have such policies (and 90% of recent plans have included such a requirement) many have chosen a 10% target. However, PPS22 does not set a limit on this, and we would urge local authorities to consider, where feasible, setting a higher, more challenging, percentage.
• Consolidating all these measures in a series of demonstration projects. Again, this shows Government leading the way, showing what can be achieved in new developments. These include:
  (i) A demonstration project by English Partnerships, working with local partners, in Northstowe, Cambridgeshire, to create a new settlement of 10,000 homes, which will aim to achieve a 50% reduction on energy use compared with conventional housing;
  (ii) English Partnerships running a second phase of the Design to Manufacture competition, building on the lessons learnt from the £60k house, and pushing the boundaries further. English Partnerships is challenging the industry to build low cost, low carbon and zero carbon homes, but this time looking at whole developments rather than individual homes;
  (iii) Undertaking a feasibility study into the Thames Gateway becoming a low carbon development area within a decade, and whether and how fast we can move towards zero carbon thereafter.

2) Ensuring compliance with Building Regulations (see box overleaf)
The Review also includes measures to address energy use in existing buildings. For domestic properties, these include:
Ensuring compliance with Building Regulations
As noted above, the Government recognises that ensuring full compliance with Building Regulations – particularly Part L on energy efficiency – is an issue. We took steps to address this when the new standards for Part L were brought in in April this year. The Government:

- introduced mandatory air pressure testing for new homes;
- launched the largest ever training programme for new Building Regulations, including “train the trainer” events, regional road shows, and sending an e-learning pack to every Building Control Surveyor; and
- extended self-certification schemes to reduce burdens on local authorities.

And since then, the Government has gone further. We have:

- taken powers in the recent Climate Change and Sustainable Energy Act 2006 to extend the time period for local authorities to prosecute breaches of energy efficiency standards. This used to be possible only within 6 months of completion of the work. Now authorities can prosecute within 6 months of discovering a breach (provided proceedings begin within 2 years). This is a very significant change;
- used that same Act to mandate a report to Parliament on compliance with Part L standards, to ensure they are given proper scrutiny; and
- worked with the industry to develop 7 Building Control Performance Indicators, of which ensuring compliance is one. These will give building control bodies a framework to monitor and improve their performance in key areas, such as ensuring compliance.

These measures are all in addition to our review of Building Regulations guidance, referred to in the previous section. Together they form a comprehensive package, and demonstrate our ongoing commitment to addressing this issue.

3) Maintaining some form of household obligation (such as the Energy Efficiency Commitment) until at least 2020, and looking at the scope to move towards a scheme under which each energy supplier would have an obligation to achieve a reduction in energy use or carbon emissions, with the possibility of trading these obligations. This would focus EEC not just on the technical means for achieving energy efficiency (such as providing insulation and efficient light bulbs), but on the end goals themselves, in line with Government’s objectives.

4) Working to improve the energy efficiency of products and to limit the use of stand-by power consumption. We will work through EU legislation, voluntary agreements, labelling schemes, and building standards. The Government’s Market Transformation Programme supports this work.

In particular, this work will target:
- domestic lighting;
- consumer electronics such as set top boxes, television sets and chargers;
- white goods such as fridges, freezers and washing machines;
- static electric motors and drives used in machinery such as pumps and fans (as used, for example, in air conditioning systems); and
- office equipment such as computer, printers and photocopiers.

5) Better metering and billing for domestic energy customers
This will include work to assess the viability of installing smart meters in domestic properties.

6) Reviewing the planning arrangements for installing microgeneration technologies on existing domestic properties – with a view to ensuring that (as far as possible) such installations are exempt from the need for a planning application.

Energy use in businesses and the public sector will benefit also from better metering and billing, and from more efficient products. But for this sector, the Energy Review also includes:

7) Consultation on a domestic emissions trading scheme, which might be called an Energy Performance Commitment. This will target emissions from energy use by large organisations whose electricity consumption is greater than 3000MWh/yr and which are not included in the EU ETS and Climate Change Agreements. This would involve some 5,000 organisations in total, comprising sectors such as supermarket chains, hotel chains, government departments and large local authorities.

8) A new emphasis on the ensuring better energy efficiency in Government procurement, to drive the market in energy efficient products and services. This will include measures to ensure that the buildings Government procures are more energy efficient.

9) Various measures for specific parts of Government – such as a commitment to carbon neutrality on the Government’s central estate of buildings; new powers and duties for the Mayor of London to tackle carbon emissions in the capital; and new incentives for local authorities in regard to climate change, to be announced in the Local Government White Paper in the autumn.

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3 The Government’s Market Transformation Programme works with industry and other stakeholders to drive and underpin sustainable improvements in the energy efficiency and other environmental characteristics of products. (www.mtprog.com/).

The DTI’s Micro-generation Strategy

Micro-generation is generally defined as the small-scale production of heat and/or electricity from a low carbon source. The suite of technologies caught by this definition includes solar (PV to provide electricity and thermal to provide hot water), micro-wind (including the new rooftop mounted turbines), micro-hydro, heat pumps, biomass, micro combined heat and power and small-scale fuel cells.

A study commissioned by the DTI from the Energy Saving Trust (EST) suggested that by 2050, micro-generation could provide 30-40% of the UK’s electricity needs and help to reduce household carbon emissions by 15% per annum. In 2004 there were approximately 82,000 micro-generation installations in the UK, so there is clearly some way to go to achieve this potential.

A range of constraints is currently affecting the wide-scale deployment of micro-generation. The upfront cost of an installation can be off-putting. And even where there is demand for some form of micro-generation inadequate promotion and poor information may be preventing that demand being converted into actual purchase. There is also a range of technical issues that mean that the installation of a micro-generation technology is not quite as straightforward as, for example, changing a boiler. They also mean that access to the rewards for electricity generating micro-generators is more difficult than it should be. Finally, planning policy and Building Regulations both provide opportunities and act as constraints.

The objective of the micro-generation strategy is to create conditions under which micro-generation becomes a realistic alternative or supplementary energy generation source for the householder, for the community and for small businesses. If this can be achieved we will start to see the level of growth in installations required for micro-generation to make the significant contribution to our energy goals that is its potential. To deliver this objective a number of actions are required to address the various constraints outlined above. A wide range of actions is required to address all areas, varying from the Low Carbon Buildings capital grant programme, improvements to existing communications activity, a review of the permitted development regime to a pilot to assess the benefits of smart metering combined with micro-generation.

Low Carbon Buildings Programme

The Low Carbon Buildings Programme (covering the UK) encourages both energy efficiency and micro-generation technologies in buildings and will allocate £80m of grants over a period of three years (between 2006-09) through two phases.

The original £30m fund was supplemented by the announcement in Budget 2006 of a further £50m to help fund the installation of micro-generation technologies in a range of buildings including schools, social and local authority housing, businesses and public buildings.

The £30m programme has two streams. Stream 1 will provide grants to household and small community projects, whereas Stream 2 will fund larger-scale projects. Stream 1 will continue the support for projects at the individual and community level that has been started under previous capital grant programmes (Clear Skies and the Major PV Demonstration Programme). The larger projects funded under Stream 2 will incorporate advice from the Carbon Trust on optimising energy efficiency and micro-generation technologies in buildings. The projects will help to raise the profile of micro-generation, bringing it to the attention to a wider audience. They will also encourage the construction industry to make use of micro-generation with a focus on projects that can be replicated, with the aim of helping to generate the levels of demand that will see costs fall.

With regards to the £50m programme, it is hoped that a framework type agreement is set up whereby a few suppliers of micro-generation installations agree to provide products at reduced prices, secure in the knowledge that they will have access to the market guaranteed by the £50m grant funding. A condition of the grant award will be that equipment is purchased from signatories of the framework agreement.

Expressions of interest were published mid-June, and it is hoped that the programme will be up and running by November 2006.

European Union (EU) Emissions Trading Scheme (ETS)

One of the means by which the international community proposes to cut greenhouse gas emissions is through emissions trading, one of the so-called ‘flexible mechanisms’ established by the Kyoto Protocol. In advance of a global scheme, the EU ETS allows company-level trading across its Member States. In summary, the EU ETS is a market-based instrument which, by allowing trading of emissions ‘allowances’ between operators across the EU, should lead to emissions reductions being achieved where they are most cost-effective to do so. The Scheme also aims to encourage technological
Phase I of the Scheme runs from 2005 to 2007. The first year of the Scheme has now passed and on 15 May 2006 the Year 1 results were published. These showed that across the EU the Scheme has got off to a good start, with the infrastructure functioning well and forming a solid foundation on which to build for the future. In the UK, installations emitted 27 million tonnes more than the total allocation. The net total reduction in emissions from UK installations (incumbent and new entrants) was approximately 5 million tonnes of CO2 between 2003 and 2005. These results were broadly within the expected range and will contribute to the achievement of the national goal of a 20% reduction of CO2 emissions below 1990 levels by 2010. However, it is still early days for this innovative scheme and Phase I is a learning phase. The UK Government will take the lessons learned from the first year results and work with the European Commission, other Member States and industry in order to strengthen the Scheme for future phases.

The second phase coincides with the first Kyoto commitment period (2008 to 2012), and NAPs for the second trading period will have a significant part to play in ensuring the UK meets its targets under the Protocol. The UK is proposing to reduce emissions in Phase I by 8MtC (or 29.3 MtCO2) against projected business as usual emissions (BAU). This is equivalent to 238 million allowances. Responses to consultations together with a significant amount of further research, and views from other Members States and stakeholders are feeding into the development of Phase II policy and the NAP. The Government is aiming to submit a final NAP to the Commission by 31 December 2006.

### 3.2 Waste – Living within our environmental limits by reducing pollution

Pollution has major sources in the construction process: waste materials, noise, vehicle emissions, and contaminant release into the atmosphere, ground and water. Construction and demolition produced waste of 91 million tonnes in England and Wales in 2003. Of this, 40 million tonnes (44%) was used as recycled aggregate and a further six million tonnes (6.5%) as recycled soil for landfill engineering or restoration. The remaining 45 million tonnes was either spread on registered exempt sites, used to backfill quarry voids or disposed of at landfill sites. 13 million tonnes of this consists of material delivered to sites but never used. For further details see the Department of Communities and Local Government (DCLG) website: www.communities.gov.uk.

The EU Framework Directive on Waste continues to cause concern within the construction industry, including the aggregates and construction products sectors. The European Commission has issued a consultation paper to Member States seeking views on how waste matters can be improved.

In December 2005 the European Commission published its Waste Thematic Strategy and associated legislation. The latter includes a proposal to revise of the Waste Framework Directive. The revised Directive includes a proposal which would enable the Commission to adopt by comitology, environmental, and quality criteria for specified waste streams and, if these criteria are met, the specified waste would be deemed to have been fully recovered and to have ceased to be waste.

In achieving sustainable waste management government is working closely with organisations such as the Environment Agency, Waste and Resources Action Programme (WRAP) and local authorities. The need to reduce the amount of illegal activity, or waste crime, that currently is a feature of this sector. Construction and demolition waste accounts for 16% of all fly tipping incidents reported to Flycapture – the national fly tipping database – and 30% of all incidents dealt with are by the Environment Agency. The Environment Agency is involved in many initiatives, often working with industry sectors including construction. This includes determining when waste has ceased to be waste – the Quality Protocol for the Production of Aggregates from Inert Waste, developed with the Agency and published by WRAP for example – and working out new approaches to low risk waste.
businesses to work with other sectors on a co-ordinated basis, on issues such as the recovery and reuse of wastes, to increase the benefits:
- how to identify the best practicable environmental options. The plan will be building on and complementing existing initiatives. It will focus on flexible ways to achieve the best outcomes for the environment that can be monitored with performance indicators based on published data wherever possible.

Environment Agency’s Building and Construction Projects

The Environment Agency seeks to demonstrate good practice in its new construction projects. This is supported by its sustainable procurement practices and by incorporation of sustainable construction principles into its specifications. The annual Environmental Report also highlights the ways the Agency has reduced resource impacts and raised the efficiency of resource use, for example driving down energy and water use in buildings, reducing waste, having Waste Management Plans on all new construction sites and maximising the use of recycled aggregates. Red Kite House, the new Thames Region West Area offices at Wallingford, opened in 2005 is an example of sustainable office design that can be achieved. It features a range of best practice measures including natural ventilation and cooling, energy efficiency, use of renewable energy, rainwater harvesting, water efficiency and sustainable drainage. See State of the Environment Report web link : www.environment-agency.gov.uk/yourenv/1088978/

Site Waste Management Plans

Following consultations within a Cabinet Office Sub-Group on Fly-tipping and Clean Neighbourhoods in February 2004, DTI agreed to chair, through its Sustainability Forum, a Working Group to develop the Site Waste Management Plans – Guidance for Construction Contractors and Clients. The guidance was prepared as a voluntary code of practice for the construction industry and published in July 2004. It has been extensively trialled by industry in England and Wales, and many companies that have adopted the plans have reduced their costs significantly as a result of more effective resource management and reductions in the amount of waste sent to landfill. They have also reduced their risk of being involved in illegal activity. The Department for Environment, Food and Rural Affairs (DEFRA), which leads on waste management topics, took powers in the Clean Neighbourhoods and Environment Act 2005 to make the Site Waste Management Plans as a statutory requirement for construction projects above a specified value. Defra will be formally consulting the industry on proposals for the scale and scope of regulations later in 2006.

Fly-tipping

Construction and demolition waste accounts for 16% of all fly-tipping incidents reported to Flycapture – the national fly tipping database. The EU Commission is also considering action under the forthcoming EU Urban Thematic Strategy to provide support to industry using certain mechanisms yet to be agreed with HM Treasury involving distribution of funds from the Landfill Tax.

Demolition Protocol

The Institution of Civil Engineers (ICE) Demolition Protocol was launched in November 2003, having been developed by a team led by ICE, London Remade and Envirocentre. The Protocol is a resource efficiency model that shows how the production of demolition material can be linked to its subsequent specification and procurement as a high value material in new builds. In addition the Protocol shows how resource efficiency can be driven through the planning process, for example through Supplementary Planning Guidance conditions and agreements.
Take up of the Protocol has been extensive and continue to grow. In summary:

- The Protocol forms the backbone of WRAP’s Demolition Module, part of its programme to delivering best practice in materials resource efficiency. The protocol and guidance material targeted at policy makers, developers & designers, contractors and suppliers is available through the WRAP website (www.wrap.org.uk).
- The Protocol is referenced in supplementary planning documents for the London Borough Of Brent Council and Leicester City Council and in the London Borough Of Barking & Dagenham’s draft Planning Advice Note on Sustainable Design and Construction.
- It is being implemented on WRAP case studies with the above Councils, as well as through Glasgow City Council and the Nuclear Decommissioning Authority.
- ICE have been informed by the DCLG and Scottish Executive that the ICE Demolition Protocol will be referenced in MPS1 (Technical Annexes) and SPP4 - both are national planning documents for mineral resources.
- The Protocol is also referenced in the following:
  - the House of Commons
  - Town & Country Planning Association - Advice For Planning At Regional Level - Policy R12
  - Greater London Authority’s Draft Supplementary Planning Guidance on Sustainable Design & Construction - as one of the mayor’s preferred standards.
  - London Borough of Richmond Upon Thames Sustainable Design & Construction Checklist
  - London Borough of Croydon - a requirement through the Council’s Environmental Performance Statement for regeneration projects.
  - Mid Sussex County Council - Sustainable Construction Supplementary Planning Document
  - Association of London Government - draft London Best Practice Guide (The control of dust and emissions from construction and demolition).


Waste Strategy 2000 established the government’s vision of sustainable waste management in England until 2020. This set out the rationale for more sustainable management of the huge quantities of waste produced each year with the focus on:

- reducing the impact of waste on climate change;
- conserving limited natural resources;
- reducing the risks to health and the environment from potentially harmful substances within waste.

These key rationales for the government’s strategy remain unchanged, however, the past five years have seen a growing awareness of the economic and environmental benefits that can be delivered through this more sustainable approach to managing waste. A further substantial shift in direction is required, in particular with a stronger emphasis on:

- managing waste as part of a wider resource economy;
- reducing the growth in the amount of waste produced;
- the reduction, re-use and recycling of non-municipal waste (including from the construction sector); and
- stimulating investment in waste management infrastructure.

Against this backdrop, the government is currently reviewing Waste Strategy 2000. The new Strategy will set out the vision and strategic direction on waste for the next twenty years. The recent public consultation on the new proposals for sustainable waste management (which closed in May) provided stakeholders with the opportunity to comment on the direction and focus of the strategy, the key challenges ahead and potential policy instruments and delivery arrangements that would enable the achievement of the waste outcomes sought. The aim is to publish a final revised Strategy by the end of the year. More sustainable management of waste contributes to achieving key outcomes related to sustainable consumption and production and climate change and energy, two of the four priority areas for action under the UK Sustainable Development Strategy. Waste policy in the UK and England sits within the wider European policy and legislative framework and in reviewing England’s Waste Strategy the government is ensuring alignment with the European Thematic Strategy on the Preventing and Recycling of Waste.

Construction and demolition waste accounts for a large part of the total waste produced. The landfill tax, aggregates levy and minerals planning policy are driving recycling and re-use of much of this waste as alternative to newly quarried aggregates. As there is further growth in construction it will be important to de-couple increased resource consumption and growth. There is still considerable room for
Managing the Environment and Resources

Resource efficiency and the recovery of materials. The Site Waste Management Plans and the Code for Sustainable Homes (mentioned previously) are two new policy instruments that will help to drive the necessary change in this sector. The Government is currently considering what more could be done to encourage reduction, recycling and recovery of construction and demolition waste as part of continuing work on revision of Waste Strategy 2000. For further information see www.defra.gov.uk/environment.

The Welsh Assembly Government has produced a separate waste strategy for Wales Wise about Waste. It includes a commitment for a root-and-branch review in 2010, with smaller reviews in 2005 and 2015.

**Code of practice for good soil management on construction sites**

The consideration of sustainable soil management and use are embedded within the agricultural sector, i.e. Common Agricultural Policy cross-compliance. However, the significant impact on soils from other sectors has not previously been addressed. Within the urban environment the construction sector has the largest impact on the sustainable use of soils but soils are often only a last minute consideration in landscaping a development. However, evidence suggests there are significant opportunities for improvement if consideration is given earlier in the construction process.

Soil degradation occurs as a result of a range of construction practices and these have additional impacts on water quality, aquifer recharge and flood risk. Evidence has shown that soil erosion from construction sites is a major component of urban diffuse water pollution incidents handled by the Environment Agency and soil compaction from the use of heavy machinery reduces the infiltration capacity of the soil leading to excess run-off this may be beyond the capacity of existing storm drains and can lead to local flooding. Compacted soil may also compromise Sustainable Drainage Systems (SUDS) and provides a poor growing medium for plants leading to loss of landscaping schemes and higher maintenance costs.

The impacts of development are addressed in a large part through the planning system, however, soils have only recently been added to a range of Planning Policy Statements and these have yet to have any impact on the sustainable use of soils.

Government proposes to work with industry partners to develop a voluntary code of good soil management on constructions sites. This is intended to be a pragmatic code recognising the constraints that the industry faces and providing evidence of the benefits of good soil management to the industry and society. For more information see www.defra.gov.uk.

**Landfill Tax and the Aggregates Levy**

Economic instruments contributing to sustainability in the construction sector include the Landfill Tax and the Aggregates Levy.

Landfill Tax contributes to the development of an environmentally-sustainable economy by tackling the UK’s over-reliance on landfill across all sectors and encouraging more sustainable waste management options, including recycling and reuse. Landfill Tax applies to all waste disposed of by way of landfill by businesses and local authorities at licensed landfill sites on or after 1 October 1996, unless the waste is specifically exempt and is paid by the landfill site operator.

There are two rates of Landfill Tax – a standard rate for active wastes, £21 per tonne and a lower rate of £2 per tonne for inactive or inert waste such as rocks and soil. Budget 2003 announced that the standard rate of Landfill Tax would increase from 2005-06 by at least £3 per tonne each year, increasing to a medium-to long-term rate of £35 per tonne. Pre-Budget Report 2005 confirmed that the standard rate would increase by £3 per tonne to £21 per tonne in 2006-07.

Between 2000/01 and 2004/05, active waste disposed to landfill fell from 50.8 million tonnes to 46.1 million tonnes, while inactive waste fell from 15.8 million tonnes to 13 million tonnes. Part of the Landfill Tax regime is an exemption from the tax for certain wastes arising from the reclamation of contaminated land. Further information can be obtained from www.hmrc.gov.uk.

Revenues from the increasing standard rate of Landfill Tax are being recycled to business through the Business Resource Efficiency and Waste (BREW) programme in England to help businesses reduce the amount of waste they send to landfill.

In addition, the Aggregates Levy, introduced in 2002, encourages recycling and the efficient and sustainable extraction and use of an important natural resource by charging £1.60 per tonne for sand, gravel and rock subjected to commercial exploitation in the UK.

Sales of primary aggregate in Great Britain fell by 3% between 2002 and 2003 to their lowest level since 1982. Production of recycled aggregate in England increased by over 3 million tonnes between 2001 and 2003. The Levy is the most frequently given reason in surveys...
Safe and Fuel Efficient Driving (SAFED) programme

Under the heading of the second objective, DEFRA and Department for Transport (DfT) sponsor the Safe and Fuel Efficient Driving programme. This programme draws funds from ALSF and is designed to help drivers improve their safe and fuel-efficient driving techniques. Initially a one-year pilot, this was extended by DfT over a 3-year period which allowed 6000 drivers and 375 instructors to be trained.

The programme demonstrated the following benefits:

- Average fuel saving of 10.01%
- Average gear change reductions of 36.90%
- Reduced CO2 emissions
- Increased defensive driving skills

For more information, including details of a best practice guide see: www.safedaggregates.org.uk

WRAP (the Waste & Resources Action Programme)

WRAP is forecasting a 10 million tonne increase in the annual production of aggregates from Construction Demolition and Excavation Waste (CDEW) between 2004 and 2011. WRAP is backing this continuation of historic growth through increasing both market confidence and awareness, and spreading knowledge and good practice. For example, AggRegain, WRAP’s online guide to sustainable aggregates, receives over 9,000 visits a month – see www.aggregain.org.uk

Capital grants from WRAP targeted at increasing higher value quality recycled aggregates will have facilitated investment in an additional 3 million tonnes annual productive capacity by March 2006.

WRAP has also prevented significant loss of resources to inert landfill that would have resulted from the classification of all recycled aggregates as waste by changes in European Case Law. The production of the Quality Protocol for the Production of Aggregates from Inert Waste produced by WRAP in conjunction with industry, the Highways Agency and the Environment Agency, enables aggregates recyclers to demonstrate that their aggregates were no longer a waste, thereby removing the increased costs of waste management and increasing customer confidence. This action alone prevented a decline in the use of recycled aggregates.

WRAP is also pursuing materials resource efficiency in construction through recycling other construction waste materials, promoting good practice in site waste management and waste minimisation, and encouraging the procurement of recycled content in construction projects.

for growth by expanding recycled aggregates businesses since 2001.

Aggregates Levy Sustainability Fund

DEFRA announced the establishment of the Aggregates Levy Sustainability Fund (ALSF) in April 2002. The proposed objectives of the fund are to:

- minimise the demand for primary aggregates;
- promote environmentally friendly extraction and transport;
- reduce the local effects of aggregate extraction.

For the first objective, DEFRA proposed that WRAP (the Waste & Resources Action Programme) and the Department of Trade and Industry (DTI) establish a programme to deliver related projects. Two work streams have been pursued by:

- overcoming market barriers and promoting the increased use of alternative materials and recycled aggregates; and
- research into more sustainable construction and demolition practices.

For more information about the sustainable use of aggregates see WRAP’s AggRegain website www.aggregain.org.uk
WRAP recommends greater recognition of the linkage between the ‘materials’ and ‘waste’ themes – the efficient use of resources encompasses both, and is more consistent with both WRAP’s and the Institute of Civil Engineers views, as illustrated in the following diagram:

WRAP believes “zero net waste” is a practical benchmark of the efficient use of materials in construction. It involves balancing (a) the quantity/value of materials from finite natural resources being wasted with (b) an equal or greater quantity/value of re-used and recycled content plus materials from renewable resources.

In addition to WRAP’s position the Quarry Products Association (QPA) will imminently be publishing a position paper that puts forward that all quarry restorations using inert waste should be classified as waste recovery operations, not landfills, reflecting that inert waste is put to beneficial use and is not disposed of but recovered.

For the full range of WRAP’s activities in construction see www.wrap.org.uk

Environment Agency’s Spotlight on Business

Spotlight on Business is the annual report by the Environment Agency on the environmental performance of businesses. The 2005 report reveals many improvements, but also highlights the damage done by smaller companies and the continued failings of some bigger businesses.

The report finds improvements in many areas, particularly by larger companies. But it says the ‘bigger picture’ is that smaller businesses are responsible for much of the harm done to the environment, despite evidence that more than nine out 10 of them do not even recognise that they have an environmental impact.

The Environment Agency does not regulate the construction industry under Integrated Pollution Prevention and Control (IPPC), but it is looking for improvements in reducing the amount of waste the industry produces, and increasing waste reuse. Its remit does include abstraction licences and consents to discharge to water.

The construction sector produces around 91 million tonnes of waste: about twice as much as the waste produced by all other industries combined.

Of the total number of enterprises (201,122), nine businesses were fined over £10,000 compared to five in 2003.

For more information see: www.defra.gov.uk/environment/waste

For Pollution Prevention materials order form see: www.environment-agency.gov.uk/?lang= e

Strategic approach to research on construction waste

This BRE led programme’s objective is to improve alignment of BREW (Business Resource Efficiency and Waste programme as co-ordinated by Defra) with the business needs.

Taking action in each of these areas will enable construction projects to achieve “zero net waste”, i.e. the use of sufficient recycled and renewable materials to compensate for any wastage of non-renewable material after waste minimisation and good practice in waste management.

For more information see: www.defra.gov.uk/environment/waste

Managing the Environment and Resources

Efficient use of finite natural materials

Minimising environmental damage

Key sustainability goals

Materials and product selection

Materials use and waste management

Energy

Materials

Water

Utilising materials recovered onsite or locally e.g. construction and demolition waste, PFA

Waste avoidance and minimisation, e.g. through off-site manufacturing and stock control

Returning packaging and surplus materials (e.g. plasterboard off cuts) for reuse / recycling

Collection, segregation and recycling of wastes

Procurement of products containing higher than standard levels of recycled content

Use of renewable materials, e.g. certified timber

Specification of materials with low environmental impact (e.g. those that are ‘A’ rated in the Green Guide to Specification)
of the construction sector. It involves consultation with representatives of the construction industry, BREW delivery partners, government and regulators. The programme will consider the activities, drivers, trends and thinking of construction related business with key industry figures and policy/programme stakeholders. Gaps, confusion and inconsistencies will be identified, with a target of developing an effective road map for change over the next 5-10 years. This would result in a more concerted approach to construction and demolition waste across the BREW family of delivery partners with further alignment of policy and planning possible in future years.

In terms of reducing construction waste the way forward is to adopt a product life cycle based approach. The means of doing this are currently being explored by Be Aware.

BRE are leading this DTI funded project, BE AWARE – Built Environment Action on Waste Awareness and Resource Efficiency, that has an industrial consortium of 16 project partners driving the project. The project aims to reduce waste and resource use across the whole life cycle of any given construction product. The objectives include researching the viability of modifying product design, manufacture, packaging/distribution, application, maintenance and end of life management to maximise resource efficiency. This integrated approach to considering the whole life cycle of construction products will be enhanced by conducting pan-industrial waste exchange analysis, characterisation, testing and evaluation providing opportunities for knowledge transfer. The project will model scenarios for improving resource use throughout the whole life cycle by re-engineering processes.

National Construction Waste Benchmarking Programme
This DEFRA funded project will measure construction waste in a consistent and systematic way from a range of construction, refurbishment and demolition projects across the UK so that national benchmarks and standards can be formulated. The data collected will enable the industry to understand the causes of waste and to predict waste arising from new build, demolition and refurbishment sectors. Knowing the typical composition and quantity of waste being generated across these sectors will be a very powerful tool for setting targets for reduction and planning for reprocessing/recovery facilities.

For further information on waste management and environmental regulation issues, see the Environment Agency website: www.netregs.gov.uk

3.3 Water Issues
Proposals for joint Defra/DCLG consultation on mandating water efficiency
Following the consultation on the Code for Sustainable Homes, Ministers announced on 9 March 2006 that they were minded to make minimum standards for water efficiency in new homes mandatory. A joint Defra/DCLG project team is currently working up proposals for consultation this summer, with a view to laying regulations next year. There will be a three month consultation period.

The consultation will focus on ways of making water efficiency standards mandatory in new homes, existing homes when notifiable works are carried out, and the domestic uses of non-household buildings. The proposals are being further developed, but it is likely that the consultation will offer three options – a whole building performance standard, similar to that used for assessing energy efficiency, mandatory minimum specifications for key components such as toilets, baths etc, or a combination of the two. The proposals are being developed in consultation with a number of key stakeholders, including the Environment Agency, Water UK, Waterwise, the Consumer Council for Water, the NHBC, CEBC, and representative organisations for building specifiers.

Water management during construction phase
One issue on which there is still much to do is the need to reduce water pollution during the construction phase. Defra have worked with CIRIA to improve standards, but a lot of work is still required.

Water pollution from construction sites is still a regular occurrence. The Environment Agency recommends that a surface water management plan be developed as part of the construction programme for all developments in excess of 1 hectare in area. The plan should identify the risks of water pollution through the construction process and ensure that appropriate measures are in place to prevent and control these risks.

3.4 The Built Environment

Building Regulations
New Approved Documents for Part L and Part F came into force on 06 April 2006. It is anticipated that together with the regulation standards, these will deliver new dwellings which will conserve on average 20% more energy compared to existing regulations, while standards for other types of
Part P - New rules on electrical work in the home

New building regulations aimed at curbing the unacceptable number of deaths, injuries and house fires caused by faulty electrical installations came into force in January 2005. From that date all electrical work in dwellings will need to comply with Part P requirements and be carried out by persons who are competent to do the work. Small jobs such as replacing a socket-outlet or a light switch on an existing circuit will not need to be notified to a building control body, although there are some exceptions for high risk areas such as kitchens and bathrooms.

Part B - Fire safety

A revised draft of Approved Document B was published in July 2005 for a four-month consultation period, accompanied by a draft Regulatory Impact Assessment setting out the potential impacts of the proposed amendments. It is hoped that a final version will be published towards the end of 2006 and will come into force in April 2007. The consultation did not suggest any changes to the legislative requirements of Part B, but it did propose a new general regulation that would apply to non-domestic properties. This would require that sufficient information be provided for persons to operate, maintain and use the building in relative safety before a completion certificate can be issued.

The proposed changes to the guidance in Approved Document B fall into four main categories:

- responses to changes in construction practice or to fire experiences that indicate that present guidance may not give sufficient protection;
- updating to take account of changes to British Standards and other technical references;
- updating to take account of changes to associated legislation;
- deregulatory measures that clarify an area subject to misunderstanding, or to lessen a particular provision in the existing guidance considered to be onerous.

The Sustainable and Secure Buildings Act

The Sustainable and Secure Buildings Act (SSBA) received Royal Assent in September 2004. The SSBA will enable Building Regulations to embrace sustainability issues more fully by accommodating environmental issues and sustainable development, and furthering the prevention and detection of crime.

With particular relevance to sustainable design and construction, the Act gives new powers under the Building Act 1984 and Building Regulations to use the Regulations to ‘facilitate sustainable development’. The SSBA does not define sustainability or sustainable development. However, initial scoping exercises have identified potential areas that may include:

- energy conservation;
- use of new and renewable energy sources;
- sustainable use and management of water;
- waste management during construction and operation;
- material selection, durability and life cycle issues;
- reduction in pollution;
- promotion of health and wellbeing;
- security and crime prevention.

The Department of Communities and Local Government (DCLG) is undertaking research to look at how buildings are expected to be between 23.5% and 27% better. Pressure testing of air tightness will be required and when building work is carried out on buildings with a floor area greater than 1000 m², ‘consequential improvements’ are also required to be made to the whole building where practical and cost-effective.

The Part L provisions include implementation of the Energy Performance of Buildings Directive (EPBD) Articles 3 to 6 (national calculation methodology and setting and achieving building performance standards). The Government will be promoting the development of self-certification for Part L schemes to improve regulation and has already put in place a training and information programme. A further announcement will be made on the way forward for EPBD Articles 7 to 10 (building certification and regular inspections of boiler and air conditioning plant). Finally, the Government has indicated it is likely to pursue a course involving nationally recognised qualifications for EPBD energy surveyors.

http://www.communities.gov.uk

The Government also indicated in the autumn of 2005 that it will carry out a further review on improving the energy efficiency of existing buildings.
building sustainability might be improved using measures contained in this Act.

Complementing work on implementing the SSBA, it is hoped that the Code for Sustainable Homes will become the single national standard for sustainable buildings that all sectors of the building industry will subscribe to and consumers demand.

For more information see www.communities.gov.uk

Review of Building Regulations

DCLG are reviewing the process for updating the Building Regulations. Their position was stated within the Government’s response to Barker review in December 2005.

The Government has set out its case for the voluntary Code for Sustainable Homes, and will work with the industry to promote higher rates of take up. The Government challenges the industry to take this opportunity to raise the environmental performance of what is built.

However, the Government also needs to better align future reviews of statutory building regulations with this voluntary Code. It will therefore develop a revised process for updating Building Regulations, which will ensure that it can continue to make improvements to statutory standards in a simpler, more transparent and less piecemeal manner. This will make it easier for the industry to adapt to changes and should improve compliance.

Sustainable Communities Plan

In February 2003, the Office of the Deputy Prime Minister (ODPM) published the Sustainable Communities Plan. This action programme marked a step change in policies for delivering sustainable communities for all. It also recognises the need for buildings – both individually and collectively – which can meet different needs over time, and that minimise the use of resources. Sustainable construction must play its part in delivering these sustainable communities.

The main elements of the plan are:

• sustainability (£22 billion to improve housing and communities, including over £5 billion to regenerate deprived areas; a new regional approach to housing policy; and £350 million to speed up planning);

• housing supply step change (£5 billion for more affordable homes, including: at least £1 billion for key worker housing; support for people who wish to move into home ownership; action on empty proper ties; new focus on helping people into home ownership);

• new growth areas (£446 million for Thames Gateway with new development agencies; Cabinet Committee chaired by Prime Minister to plan for gateway development; £164 million for three other growth areas);

• decent homes (£2.8 billion to bring council homes up to a decent standard; £600 million to tackle low demand and abandonment; £260 million to combat homelessness; action to tackle bad landlords);

• Countryside and local environment (guarantee to protect green belt; £201 million to improve local environment – parks and public spaces; over 5,000 affordable homes in villages).

For more information see: www.communities.gov.uk

Planning policy

Planning Policy Statement (PPS) 1: Delivering Sustainable Development, sets out the Government’s overarching planning policies on the delivery of sustainable development through the planning system. This PPS replaces Planning Policy Guidance Note 1, General Policies and Principles, published in February 1997. It makes clear that the prudent use of resources means ensuring that we use them wisely and efficiently, in a way that respects the needs of future generations. This means enabling more sustainable consumption and production and using non-renewable resources in ways that do not endanger the resource or cause serious damage or pollution. The broad aim should be to ensure that outputs are maximised while resources used are minimised (for example, by building housing at higher densities on previously developed land, rather than at lower densities on greenfield sites).

It encourages local planning authorities to ensure that development plan policies seek to minimise the need to consume new resources over the lifetime of the development by making more efficient use or re-use of existing resources, rather than making new demands on the environment, and should seek to promote and encourage, rather than restrict, the use of renewable resources (for example, by the development of renewable energy). Regional planning authorities and local authorities should promote resource...
and energy efficient buildings; community heating schemes, the use of combined heat and power, small scale renewable and low carbon energy schemes in developments; the sustainable use of water resources; and the use of sustainable drainage systems in the management of run-off.

Planning Policy Statement (PPS) 3: Housing is a key component of the Government’s strategy to deliver more homes where they are needed. It provides a national policy framework for those at regional and local level responsible for developing planning policies, and advocates an evidence-based approach, and the use of sustainability appraisal, to ensure that the development plan provides a sound framework for deciding planning applications. This will ensure that homes are delivered to meet the needs and aspirations of all members of the community, while contributing to the delivery of sustainable development in sustainable communities.

PPS3 introduces important changes in the approach to planning for housing. Planning needs to be more responsive to the housing market, and to take account of the economic, as well as the social and environmental impacts of development. It needs to deliver the variety and choice of housing which will ensure that communities are sustainable, mixed and inclusive, in both urban and rural areas. It attaches high importance to the design and mix of housing in new developments to improve the quality of residential environments and contribute to the delivery of sustainable communities. It also proposes that local planning authorities should encourage applicants to apply the principles set out in the Code for Sustainable Homes, particularly for strategic sites that deliver a large number of new homes, to improve resource efficiency and give purchasers and tenants information on the running costs and sustainability of their new home.

Better Buildings Summit
The Better Buildings Summit was held in October 2003 and resulted from a commitment in the 2003 Energy White Paper. The Summit was a targeted, invitation-only event offering a very significant opportunity for high-level debate. 190 senior executives attended from across the construction and energy industries. The theme of the Summit was delivering better, greener, buildings, faster. It aimed to win the active support of industry and clients to create better, more sustainable buildings – both new and refurbished. One of the main outcomes of the Summit was the formation of the Sustainable Buildings Task Group, co-chaired by Victor Benjamin and Sir John Harman.

The Sustainable Buildings Task Group
The remit of the Group was to advise the Government on practical and cost-effective measures to improve the sustainability of buildings. Its final report was presented to Government in May 2004, and the Government’s response was published in July 2004. For details of the work of the Group, and copies of the Group’s report and Government’s response, see: www.dti.gov.uk/construction.

Code For Sustainable Homes
The Code for Sustainable Homes (CSH) is a new voluntary approach to improving the sustainability of new homes and building on the 70% improvements to the energy efficiency of new buildings made since 1990 (40% since 2002). New homes will be required to meet standards of energy and water efficiency, site and household waste, materials, and surface water management in order to meet the base level of the Code. Further tradable standards are included on lifetime homes, sound insulation, private external space, use of daylight and security.

The Code will, for the first time, provide buyers of new homes with information on the sustainability and running costs of their homes, which will gain one of five star ratings. Homes that meet the first level will use 20 per cent less energy and water compared to homes built in 2002. The highest level will require carbon-neutral development, using cutting-edge technology such as micro-generation.

The Code is not a substitute for Building Regulations. It is more comprehensive – addressing some things not in regulations – which means that the Code as a whole sets more demanding building standards even at the entry level. The Code points the way to the future of Building Regulations and represents a major opportunity to develop a voluntary, high compliance, approach.

The Code consultation document estimated that cost of complying with level one of the Code is estimated to be about £600, less than 1% of the build cost of an average dwelling. Buyers can expect to save around £100 a year in running costs. These figures will be updated as the Code is developed.

All homes receiving direct government funding will meet Level 3 of the Code, including those built through English Partnerships and Housing Corporation programmes. - higher than current building regulations. In giving house builders the opportunity to deliver, voluntarily, significant improvements to the sustainability of new homes, the Government will look for rapid take-up in the private sector and monitor
Perhaps the most evident change since 2000 is the growth of new construction methods involving the production of major assemblies panelised systems, volumetric units and whole building sections away from the construction workforce – generally referred to as Offsite Production (OSP). Although OSP still only represents approximately 2% of construction spend, in the last five years it has jumped from a niche market into the mainstream and is now poised to advance significantly. It could potentially reach as much of 5% or 10% of construction spend by 2012. There have also been some major developments in on-site construction methods with the use of ‘tunnel’-formed concretes and advancements in masonry technology.

This is particularly so in housing supply where a number of developers have forged medium to long term arrangements with the OSP supply chains. However, other big construction players and clients such as BAA, Amec, Bovis, B&Q and Somerfield, largely operating in the non-residential market, are now increasing their use of these solutions. A similar story is emerging in public sector procurement where, for example, increased use of modern construction methods is being incorporated into schools and healthcare building programmes.

The acceleration in the adoption of modern methods of construction has required support. It is not possible to list all the initiatives of the last five years, but it is worth mentioning a few which have made, or are poised in the near future to make, a major contribution in providing confidence to the market to adopt modern methods of construction. These include:

- the House Builders Federation (HBF)/National House Builders Council (NHBC) lead Barker Committee Recommendation 33 looking at providing solutions to the impediments of greater use of modern techniques;
- the Housing Forum’s Customer Driven Strategy to improve the quality of homes;
- NAO’s Report Using modern methods of construction to build homes more quickly and efficiently (2005); for information see www.nao.org.uk;
- DCLG/English Partnerships Design for Manufacture initiative to ‘showcase’ the best housing solutions;
- BRE’s LP2020 quality document which provides robust assurance of quality and durability to the market on new product ranges; and
- the establishment of Buildoffsite, an organisation to provide leadership to the offsite construction industry and a focal point for clients of modern methods. For more information see www.buildoffsite.co.uk

**Design for Manufacture (£60,000 Home) Competition**

In September 2004, the Deputy Prime Minister announced the launch of a competition to construct a £60,000 home. Nearly 300 expressions of interest were received, demonstrating the level of awareness of the challenge. In August 2005, nine successful consortia were invited to proceed to the next stage of the competition. These consortia were asked to...
submit real development proposals for the 10 sites put forward by English Partnerships for the competition.

The sites were divided into four tranches. The first included the sites at Allerton Bywater (Leeds), Upton (Northampton), Oxley Park (Milton Keynes) and Renny Lodge (Newport Pagnell). The second tranche included the sites at Horns Cross (Dartford), School Road (Hastings), Oxford Road (Aylesbury Vale), and Park Prewett (former hospital, Basingstoke). The third and fourth tranches will include the sites at Linton (former hospital, Maidstone) and Merton in London.

Preferred developers for the first four sites were announced in November 2005. They are:
- Barratt for Allerton Bywater and Upton;
- Wimpy for Oxley;
- Sixty K Consortium (including Kingspan and Crest Nicholson) for Renny Lodge.

Preferred developers for the second four sites were announced in December 2005. They are:
- William Verry Ltd for Aylesbury Vale and Hastings;
- The Countryside Consortium for Dartford;
- Westbury Homes Ltd for Basingstoke.

Bids have now been received for the former Linton Hospital site in Maidstone and are currently being assessed. Information about the competition and ideas put forward can be viewed online at www.designformanufacture.info Enquiries can also be sent to: designformanufacture@englishpartnerships.co.uk

Sustainable design

Construction projects need to embrace concepts of sustainability at the design stage. This involves not just considering what is being built, but how it is being built, with which products and methods; and which functions the project will perform or facilitate, once completed.

CABE (the Commission for Architecture and the Built Environment) is the government-funded agency promoting better designed buildings to improve long-term sustainability and to provide the UK with a better designed built environment. www.cabe.org.uk/

CABE indicates that architecture’s contribution to sustainability comes in three main areas:
- good architectural design leading to better buildings helps generate social, economic and environmental value over the long term, helping to sustain and improve communities by encouraging community spirit, healthier lifestyles and lower crime;
- good architectural design can reduce carbon dioxide emissions through specification of materials and manufacturing methods - both reducing waste; ‘the design of buildings to maximise the use of the sun or wind in lighting, heating, cooling and power generation, and the specification of high standards of thermal insulation. The imaginative conversion of existing buildings to other uses can also be seen as promoting sustainability through the use of existing structures leading to a reduction in consumption of building materials;
- strong architectural input to the planning of new local developments can promote higher-density mixed-use development (residential and business on one site or mixed-use buildings) while retaining green spaces, designing-in integrated public transport thereby discouraging car use and commuting. However, although architects have a major role to play in construction design, sustainability in design is the responsibility of all parties involved in design and development of projects.

Research for the Royal Academy of Engineering in 1999 demonstrated the typical relationship between the initial capital cost of an office building, its cost in use over 20 years, and the cost of staffing the business over 20 years. This ratio is portrayed as the 1:5:200 rule. Since then, there has been much debate about the precise numbers, but the principle is that the cost of good design – design that takes into account sustainability – is far outweighed by the benefits to the business over its business cycle.

Design Quality Indicators (DQIs) have been developed by the Construction Industry Council, industry professionals, and Imperial College University London to be used from the outset of a building project. The Indicators set aspirations to help define which aspects are fundamental and will add value in achieving excellence in the completed building, addressing the needs of all the stakeholders involved. In a DQI project, a DQI leader within the project team is appointed to champion the process. By the end of 2004, more than 500 projects used the DQI process and by end-2007, 80% of all publicly-funded/Private Finance Initiative projects worth more than £1 million are targeted to use DQIs, as well as 20% of all other projects worth more than £1 million.

BREEAM

BREEAM is an environmental assessment method for buildings – and rates their performance on a simple single scale of PASS, GOOD, VERY GOOD to EXCELLENT. BREEAM can be used to assess any
building type. This is achieved through standard schemes for offices, retail buildings, industrial buildings, schools, hospitals, prisons, courts and residential developments (EcoHomes), and the bespoke assessment criteria has been developed for buildings outside the standard schemes. Although a voluntary scheme, to date, over eight hundred commercial building projects have been assessed using BREEAM and a further 54,500 dwelling units assessed under EcoHomes.

To demonstrate the momentum of the scheme, during 2005 twice as many dwellings were assessed as the previous year. Currently there are over 5000 developments registered to undergo EcoHomes certification in the next three years. BREEAM is used as a requirement by Government through the Office of Government Commerce (OGC) Action Plan 2000 and Green Ministers, The Housing Corporation, English Partnerships, Government Office of the North East (GONE), The National Assembly for Wales and a number of RDAs. Many local authorities are using BREEAM standards as part of planning requirements. In addition, it is recommended by British Council for Offices, the National House Building Council (NHBC), WWF, Sustainable Homes and many others as well as being widely used by occupiers and procurers to specify high levels of performance.

BREEAM is managed and administered by BRE (Building Research Establishment), and delivered to the market through a network of over 430 licensed EcoHomes assessors working in 350 private companies and over 170 assessors covering the BREEAM Non Domestic schemes. BRE is a company owned by the BRE Trust, a research and education charity for the public benefit.
4 Government Procurement

The Government recognises it must lead by example – public procurement accounts for more than 20% of the output of the construction industry. Through Achieving Excellence in Construction, the Government has responded to the cross-industry drive for change and that initiative is acting as a catalyst for government client improvement. Achieving Excellence requires procurement on the basis of best whole-life value using integrated teams. Sustainability in construction procurement is key to achieving best whole-life value.

Achieving Excellence is supported by the Office of Government Commerce (OGC) by the new Procurement Guidance aimed at the government client. In 2003, OGC published the Achieving Excellence Procurement Guide 7. The guide outlines the principles of whole-life cost management and describes a process made up of:

- A framework for cost management
- Establishing baseline costs
- Estimating whole-life costs
- Cost management and reporting

In July 2000, based on the key themes identified by *Building a Better Quality of Life*, the Government Construction Clients Panel consisting of representatives with responsibility for procurement from most government bodies published *Achieving Sustainability in Construction Procurement: the Sustainability Action Plan*. This plan outlined continuously improving performance targets to deliver sustainable construction for three years. Sixteen government bodies/departments adopted the plan. Follow-up work on this Action Plan is being taken forward under the Estates and Property Management section of the Framework for Sustainable Development on the Government Estate.

For more information see www.ogc.gov.uk

There are many other specific examples of work for the public sector driving forward the sustainability agenda. For instance, the Sustainable Development Commission (SDC) is working with the Department of Health (DH) to promote good practice in the design and construction of health buildings, and to develop the evidence base for linking public health and the built environment. And in 2005, the SDC published a document on new-build and refurbishment for the National Health Service, *Healthy Futures #3: Buildings and Sustainable Development*. Another example can be seen in how the Environment Agency has driven forward the public sector sustainability agenda through its Sustainable Procurement Strategy, which includes good practice in procuring materials for building flood risk management structures and its own new office buildings.

4.1 Public Sector Construction Clients Forum (PSCCF)

The Public Sector Construction Clients Forum (PSCCF) held its inaugural meeting on 15th December 2005. Established by the Office of Government Commerce (OGC), with the aim of leading improvements in the whole life value for money procurement of sustainable built environment across the public sector, including PFI projects, by improving co-operation and communication with the construction industry, encouraging greater adoption of the principles of the Achieving Excellence in Construction initiative in the public sector and by championing design excellence and sustainability.
The PSCCF is chaired by Sir Christopher Kelly. Its membership is comprised of a cross section of high-level representatives from across the public sector, including Department of Health, DTI, MoD Defence Estates, Highways Agency, CABE, Nottinghamshire County Council and SWRDA. There are currently 5 working groups which support the work of the PSCCF:

- Demand/Capacity in the Construction Industry – covers matching of Public Sector construction demand and supplier capacity; first Kelly market actions; 2005 – 2015 construction capacity study; FKM demand database enhancement project.
- Whole- Life Value – covers working with the public sector to understand and apply Whole Life Value in a way that facilitates a common forum of measurement.
- Better embedding of best practice – covers identifying barriers to the promotion of best practice; collaborating with Project Banks to evaluate and to enhance the adopting of best practice; continuing to develop and to implement best practice principles.
- Fair payment - looks at issues surrounding Project Bank accounts and Fair Payment for the supply chain.
- Procurement Strategy.

4.2 Sustainable Procurement Task Force

The Government has a crucial role in furthering sustainable development through its procurement of goods, services and buildings. With a budget of some £150bn, the public sector can transform markets so that the private sector can join forces in pursuing sustainable purchasing policies. The Sustainable Procurement Task Force was established in May 2005, charged with drawing up an action plan to bring about a step-change in sustainable public procurement so that the UK is among the leaders in the EU by 2009. The Task Force was chaired of Sir Neville Simms, who is a leading private sector exponent of sustainable development. The Task Force working groups were:

- International Benchmarking
- Data-gathering and Prioritisation
- Working with Suppliers to achieve improvements
- Government Accounting and Budgeting
- Capacity Building/Training/Skills

The reports from these working groups can be downloaded from the link below. A substantial body of research was commissioned to supplement Task Force members’ own experience and provide a robust evidence base for the recommendations. The full Task Force met five times during the year to consider the output from the working groups and the research, and to help shape the National Action Plan. See www.sustainable-development.gov.uk/government/task-forces/procurement/index.htm

The action plan was launched on 12 June 2006. The National Action Plan summarises the views and position of the members of the Sustainable Procurement Task Force. It gives recommendations on how the UK Government can successfully meet its target of being recognised as amongst the leaders in sustainable procurement across EU Member States by 2009. The Government will review the National Action Plan and respond in full in Autumn 2006. Its future policy with respect to sustainable procurement will be informed by this response. This report does not represent the views of the Government.

The National Action Plan

The Task Force drew on the findings of reports by the National Audit Office, Environmental Audit Committee and others, as well as its own research to analyse the key barriers to sustainable procurement and presents a National Action Plan for overcoming them. The plan makes six key recommendations, underpinned by three building blocks for sustainable procurement and details the actions which must be taken with milestones for getting started and clear target dates for the future.

Recommendations:

- The first recommendation is for government to **Lead by example**. The lack of consistent leadership on sustainable procurement again emerged as a key barrier as it has from numerous earlier reports.
- The second recommendation is for government to **Set Clear Priorities**. Procurers complained of too much guidance, presented in an incoherent manner with no cross-government ownership – a “one size fits all” approach.
- The third recommendation is to **Raise the Bar**. The Task Force believes that existing minimum standards for central government should be properly enforced and extended to the rest of the public sector and that further standards (both minimum and forward-looking) should be developed in the priority areas of spend it has identified.
- Next the public sector must **Build Capacity** by developing its capabilities to deliver sustainable procurement. Procurers complained of lack of unambiguous information and training, confused messaging and lack of tools showing how to put sustainability into practice.
- The fifth recommendation is for government to **Remove Barriers** to sustainable procurement – whether actual or perceived –
and put in place the right budgetary mechanisms.

- Finally, the public sector needs to Capture Opportunities for innovation and social benefits and to manage risk better through smarter engagement with the market. Many suppliers felt that it was difficult to penetrate the public sector with innovative solutions and that there were missed opportunities for giving clear signals to the market.

The Building Blocks

The Task Force believes that these actions by public sector organisations need to be underpinned by three building blocks:

- The Flexible Framework – this guides public sector leaders in the actions required to make sustainable procurement happen. It allows organisations to assess the quality of its procurement activity and gives a clear route map to better performance.
- Prioritisation of spend – the Task Force has identified the need for a filter mechanism to determine policy priorities. It has developed a methodology for identifying in which areas of spend to focus attention. Its application at the national level has helped to identify ten priority areas of spend, highlighted in the report, for action nationally. Public sector organisations can also use the prioritisation tool to identify local priorities (additional to the national priorities).
- Toolkits – government needs to identify an owner for a ‘sustainable procurement delivery team’ which will develop specialist toolkits and provide expert advice and support to public sector procurers.

The Task Force believes that all public sector procurers (whatever their starting point) can use the building blocks to get started now and thus make rapid progress towards the 2009 target. In particular, the Task Force recommends a number of key milestones:

- 2007 all public sector organisations to reach Level 1 (or above) of the Flexible Framework by end April
- 2008 benchmarking of progress nationally and internationally
- 2009 all public sector organisations to reach Level 3 (or above) of the Flexible Framework with leadership (Level 5) in at least one area by December, but also recognises that progress should extend well beyond 2009.

4.3 Common Minimum Standards

In September 2005, OGC published on behalf of the Government, Common Minimum Standards for the procurement of built environments in the public sector. The standards bring together key existing minimum procurement standards, and mandate them across central government departments, executive agencies and non-departmental public bodies. The standards apply to any procurement of a built environment carried out in England for a public sector client, whether through a capital procurement, a private developer scheme or a Public Private Partnership/Private Finance Initiative (PFI). Departments are expected to take all reasonable measures to ensure that the standards are also adopted throughout the wider public sector where responsibility for the expenditure of public funds has been devolved.

The Standards require all construction projects to be carried out in accordance with the OGC’s Achieving Excellence initiative, including AE11: Achieving Excellence in Construction Procurement Guide 11: Sustainability, published in March 2005. AE11 sets out the processes by which public sector clients can procure and deliver construction projects that best promote sustainable development while achieving optimum whole-life value for money. Its aim is to encourage full consideration of economic, environmental and social factors in construction projects and to illustrate ways in which sustainable construction can be delivered.
4.4 The Government’s Response to the Biomass Task Force Report

The Government’s response to the Biomass Task Force Report was published on 27 April 2006 and this included a range of measures to encourage the use of renewable biomass power on the public estate. In particular, Defra is mapping its estate for its suitability for using biomass for heat and/or power. This activity will be followed by the mapping of the other main procuring Government Departments. The Department for Education and Skills (DIES) is also developing a requirement for its delivery partners to evaluate the feasibility of the use of biomass for all projects within its capital programme, including those in future Private Finance Initiative Contracts. The Climate Change Programme Review, the Micro-generation Strategy and the Low Carbon Buildings Programme which are discussed in Section 3.1 also provide incentives, including capital grants, to help promote the use of biomass and other renewable power in both public and private sector buildings. See: http://www.defra.gov.uk/farm/crops/industrialenergy/biomass-taskforce/pdf/btfreport.govresponse.pdf

4.5 Sustainable Construction on the Defence Estate

Defence property and construction offers significant scope for sustainable outcomes related to a more efficient business operation. The Ministry of Defence (MOD), in partnership with OGC and other stakeholders, is applying its considerable expertise as a construction client to maintain an estate of the right size and quality, managed in a sustainable manner, to achieve its defence objectives. New project and programme procurement strategies have been implemented to take full account of the Government’s commitment to sustainable development. Defence Estates (DE) is currently represented on the Public Sector Client Construction Forum (PSCCF) and associated Working Groups. The Sustainable Development agenda is a key part of this activity. As evidence of MOD’s commitment to sustainable delivery, MOD’s design and construction strategy, Better Defence Buildings, was reissued in 2006 and the related Design Excellence Evaluation Process (DEEP) tool is helping deliver sustainable design solutions across the Defence Estate. As a Design Quality Indicator (DQI), DEEP is applied collaboratively utilising the three core principles of Function, Impact, and Build, to deliver fit for purpose, efficient and sustainable buildings. A best practice case study highlighting the built sustainability aspects of the Allenby/Connaught PFI was published by OGC. Project Allenby/Connaught is the Ministry of Defence’s (MOD’s) redevelopment project for the army barracks in Aldershot and around Salisbury Plain. The project delivers the accommodation necessary to enable organisational changes in the army and addresses problems created by an outdated army estate. It will provide a modern living and working environment, with associated support services for some 18,000 personnel. The 35-year PFI contract has a capital value of more than £1 billion and a through life value of more than £7 billion. For more information see www.dgc.gov.uk

A major achievement in 2005 is MOD’s Defence Estates launch of the Defence Related Environmental Assessment Methodology (DREAM4Construction) for defence construction projects - the first in-house environmental methodology developed by a government construction client. DREAM will assist MoD’s delivery of the construction-related Framework for Sustainable Development on the Government Estate targets. It has been specifically designed to measure the environmental performance of defence construction projects against internally defined standards. The new DREAM tool is now being trialled in defence construction projects.: www.dream.bdp.co.uk/default.asp

The defence sector is particularly suited to innovative methods of construction, and consequently prefabrication is now being extensively used for major projects. Another best practice case study is being developed in 2006 with DTI to disseminate the lessons learned and best practice on modular construction. The best practice guide for the MoD Single Living Accommodation Modernisation (SLAM) project is being developed. SLAM has adopted both traditional and modular construction techniques.

Finally, another initiative - lead by WRAP - is the development in 2006 of a new tool to quantify the amount of recycled material by value in construction projects with the aim of setting a performance target. SLAM
exceeds WRAP targets (for use of recycled waste), as 20% of construction content is of recycled origin.

4.6 Sustainable Design and Construction of Schools

Investment in the school estate within the various DfES programmes will reach record levels of £8 billion per year by 2011. The government aims to rebuild/refurbish all secondary schools and significantly improve 50% of primary schools over the next 15 years. This major capital investment presents an opportunity to create a generation of primary and secondary schools that are procured, designed, built and operated sustainably. The actions by DfES to promote sustainable schools include:

- Publication of its Sustainable Development Action Plan (SDAP)
- Creation of a Sustainable Schools Web-site - www.teachernet.gov.uk/sustainableschools/
- Case studies of sustainable schools to be published in summer 2006
- Guidance on sustainability – ‘a design primer’ to be published in autumn 2006
- Monitoring and reporting the performance of new sustainable school buildings
- Funding demonstration schemes for sustainability within the ‘One-School-Offer programme’
- Developing and piloting s3: a sustainable schools self-evaluation tool for head teachers
- Producing benchmarks for energy and water use
- Developing a whole-life cost tool to allow the benefits of a range of sustainable options to be compared
- Developing guidance on energy procurement and energy efficiency
- Developing guidance on renewable energy, to be published in August 2007
- Identifying funding options for schools within the Low Carbon Building Programme and third party finance
- Ensuring that BSF schools comply with environmental targets
- Encouraging the consultation process through the use of Design Quality Indicators (DQIs)
- Producing guidance on design and construction for school buildings

In 2003 DfES commissioned a school specific BREEAM Schools www.breeam.org/schools.html. It is now a DfES requirement that new school buildings and refurbishment projects above a threshold of £500,000 for primary schools and £2 million for secondary schools and involving rebuilding or complete refurbishment of more than 10% of the floor area of a school to achieve at least a ‘very good’ BREEAM rating. DfES have also completed a cost study into the cost of achieving good, very good and excellent ratings on a variety of new build and refurbishment projects in different types of location and after further work expect to publish cost information on the cost of achieving BREEAM very good and excellent ratings.
The UK was one of the first countries to establish a set of indicators for sustainable development in 1996. Since then deteriorating global climate and environmental conditions have led to an increasing worldwide awareness of the importance of design and construction not only to the built environment, but also to the impact on the global environment.

It is estimated that as much as one tenth of the global economy is dedicated to the design, construction, equipping and operation of the built environment and that the sector consumes around a quarter of the world’s supply of timber, minerals, water and energy. The concept of ‘green buildings’ that not only reduce the demands for non-renewable materials during construction and fit-out, but also lower the demand for energy conservation throughout the building’s life cycle and consider reuse of materials at the end of the building’s life, are therefore gaining importance for domestic, commercial and industrial developments globally.

The increasing recognition worldwide of the needs to protect the environment for future generations has led to more and more overseas governments taking action in this area. For instance, creating better public infrastructure, improving building designs and revitalising old urban areas to create a cultural atmosphere are high on the Hong Kong Special Administrative Region Government’s agenda. The Government has been promoting sustainable urban planning and design practices as well as sustainable building design. In China, recent regulations passed by the Ministry of Construction mean that new buildings have to adhere to energy saving policies. And in November 2005, the UK and China signed an agreement to establish a coherent framework for engagement on the complex and cross cutting issue of sustainable development between the two governments. These issues range from protecting natural resources and urbanisation to sustainable production and economic globalisation.

Even in the US – which chose not to sign the Kyoto Agreement – some states and more than 160 cities are taking their own steps to combat global warming along the lines of the Agreement.
Since formulation of the 2000 Strategy for Sustainable Construction there have been various developments relevant to the issue of sustainable construction. These have been aimed at improving the quality of services the industry provides to the public and hence improving the quality of our lives. Some of these are described below.

6.1 TrustMark

TrustMark has been developed to replace the Quality Mark scheme that closed in December 2004 because of insufficient take-up by builders. The initiative is designed to raise standards and empower consumers by providing them with a mechanism to identify reputable builders and specialist trades people. It fulfils a 2001 manifesto commitment to tackle cowboy builders who cause significant levels of consumer detriment in the repair, maintenance and improvement sector.

DTI has developed the TrustMark in partnership with the construction industry and consumer bodies to licence trade associations and other organisations that meet a set of competency and customer-care standards. Schemes delivering these standards will be approved to use the TrustMark brand by a board of industry and consumer representatives. TrustMark is a non-profit company limited by guarantee, operating under licence from DTI. DTI will be represented at board meetings with observer status.

TrustMark was introduced to the trade by Alun Michael, Construction Minister, in June 2005. The first wave of scheme operators have already been approved and the initiative was launched to the public in January 2006, enabling consumers to use TrustMark to help them engage reputable firms to work on their homes.

For further information on TrustMark see: www.trustmark.org.uk

6.2 Research Programmes

Using Sound Science Responsibly is one of the five guiding principles of the UK’s Sustainable Development Strategy. Ensuring policy is developed and implemented on the basis of strong scientific evidence, whilst taking into account scientific uncertainty, through the precautionary principle, as well as taking account of public attitudes and values.

The 2003 Innovation Report recommended that DTI funds were focused on supporting technological development in market-specific areas delivering broad public (sustainable) benefits. Subsequently, Partners in Innovation (PII), the DTI’s construction research programme, was rationalised into the Technology Programme that funds projects relating to underpinning technology themes such as Materials, Information and Communications Technologies (ICT), Manufacturing and Energy. Projects approved to the end of 2005 cover areas such as energy efficient cladding, renewable eco-composites, environmental control systems, recycling and waste, design simulation and manufacturing. DTI has also been funding feasibility studies for the Zero Emissions enterprise covering deconstruction, recycling of thermal insulation panels and refurbishment. Competitions in 2006 include material modeling, contaminated land and low carbon energy technologies.

The DTI recognises energy efficiency in buildings as an important element in delivering the aims of the 2003
Energy White Paper and key research areas include energy-efficient technologies such as novel insulation materials, ventilation, solar shading and low energy lighting. These DTI initiatives complement sustainable construction research and best practice guidance developed through Engineering and Physical Sciences Research Council (EPSRC), Economic and Social Research Council (ESRC), The Environment Agency and government-funded initiatives such as the Carbon Trust and WRAP.

The EPSRC has established Sustainable Urban Environment (SUE) consortia to provide a source of expertise and to develop the research base for sustainable communities. Defra and DTI are promoting the use of sustainable renewable construction materials through their Strategy for non-food crops and uses- creating value from renewable materials*. Research and Development is a key part of the Strategy and a number of recent construction related projects have been looking at performance issues relating to flax and hemp insulation, the development of life cycle assessments (LCAs) for various renewable building products and development of a technical manual on the use of hemp and lime in construction.


The Carbon Trust is an independent not-for-profit company set up by the Government with support from business. It is designed to take the lead on low carbon technology and innovation in the UK, and to place the UK at the forefront of international action. The Carbon Trust encourages and promotes the development of low carbon technologies as part of the UK’s Climate Change Programme. It also promotes both energy-efficient technologies and low carbon energy supplies. By doing so, it aims to support the transition to low carbon technology within the UK. To meet these objectives, a key part of the Carbon Trust’s work is to support UK businesses in reducing carbon emissions through funding. In addition, the Carbon Trust assists businesses to reduce carbon dioxide emissions by supporting technological innovation and the adoption of more efficient working practices through a number of distinct programmes.

Since 2001, the Carbon Trust has committed over £9.8 million to support research, development and demonstration (RD&D) projects in UK business and academia, leveraging over £21 million of other investment into innovative RD&D. The Trust targets and supports ground breaking projects that demonstrate a potential to reduce greenhouse gas emissions. It offers a grant of up to £250,000 towards the cost of the project providing it also demonstrates:

- genuine innovation;
- clear need or demand for the outputs of the project;
- benefits to the UK.

For further information see: www.thecarbontrust.co.uk

The 2006 DTI competition for a Knowledge Transfer Network (KTN) for the Modern Built Environment aims to draw together industry and the research supply base, building on existing initiatives including the SUE consortia, INREB (Integrating New and Renewable Energy in Buildings) and other existing networks.

Key challenges remain for the sector. Industry and Government need to join up these various strands of research and development activities, to identify and articulate gaps in sustainable construction research activities, and, critically, to accelerate the uptake of research and development outcomes – technological, social and procedural. For more information see www.dti.gov.uk/construction/research

A project database and archive can be found at www.dti.gov.uk/construction/research.info

6.3 Sustainable Construction within the Regions

The sustainable construction agenda has been enthusiastically embraced by England’s regions and is vigorously promoted by the Regional Development Agencies (RDAs). The introduction of the Single Programme in 2002 and the guidance developed for that funding was the catalyst for a uniform approach to project appraisal that incorporate an assessment of the impact of physical regeneration. RDAs have refined these assessments and established sustainability policies to help guide funding for physical regeneration to minimise the environmental impact. The issue of the Common Minimum Standards for the procurement for built environments in the public sector has reinforced the policies already in place in a drive towards achieving excellence in construction.

The Appraisal Steering Group brings together the RDAs, London Development Agency (LDA), English Partnerships (EP), Welsh Development Agency (WDA), DTI, DCLG, Department for Culture Media and Sport (DCMS), DEFRA, Department for Education and Skills (DfES) and Government Offices. The Group was restructured in April 2004 with the aim of ensuring the development and dissemination of best practice in the appraisal, delivery
and evaluation of projects in the RDA Single Programme and EP’s equivalent activities, and to establish an effective sustainability culture within the Agencies.

Some RDAs have taken forward the sustainable construction agenda by establishing centres of excellence for constructing the built environment to act as a focal point for performance improvement activity. These centres act as a direct link to facilitate a step-change in the performance improvement of their regions’ construction industry sector, in terms of productivity and quality. They achieve this by engaging with construction employers and all organisations involved with the development of the built environment to work towards the national objectives of Constructing Excellence.

RDAs have established design panels to help drive forward the quality of design in the built environment and actively support the demonstration and showcasing of exemplar buildings, whether through direct development of pilot demonstration projects or in partnership through conditions set down in funding agreements.

A great deal has been achieved in embedding sustainable construction within the agendas of the regions, particularly by RDAs, by disseminating national initiatives and influencing partners to carry this forward:

**Inspire East – East of England Regional Development Agency (EEDA)**

- Inspire East is working with Constructing Excellence in the East of England to develop an Action Excellence manual and programme to promote more sustainable working practices in the Construction Industry.
- Inspire East is establishing a Design Review Panel - these get a mention in the report.
- Inspire East are establishing an Excellence Framework - which will set standards and measures for sustainable communities based on the DCLG definition and provide a benchmark for Inspire East’s work in promoting best practice. It will allow for an assessment of excellence to be made on sustainable communities projects. This is intended to be embedded into EEDAs processes to be used as a project appraisal tool and also as a post completion evaluation tool. It is being developed by BRE and will have links to the Sustainability Checklist in the East of England.
- Inspire East has set up a Design Champions Network in the Region - primarily for local authority champions but extending to PCT’s to embrace health buildings and considerations and to housing associations - this is to ensure local authorities champion high quality design and demands higher standards from developers and the construction industry.
- East of England has a Sustainable Construction Task Group and a Sustainable Construction strategy
- Regional Cities East network to demonstrate the role the medium sized cities apply in the economic growth of the Region - these cities share a desire to grow sustainable and will be adopting targets and practices to support this e.g. development of carbon neutral housing.

**East Midlands Development Agency (EMDA)**

- EMCBE – East Midlands Centre for constructing the Built Environment has been established to manage all sustainable built environment projects in the region. Currently the Centre is working on a range of activities:
  - EMPIRE – regional project looking to address the impact of sustainability.
  - Envirowise Resource Club – a regional project looking at reducing waste in the construction process.
  - Design Competition – to encourage better sustainable design
- Local Government Construction Clients Steering Group – provide clear client leadership in public sector construction procurement and delivery
- Working Well Together – secretariat for the industry programme of improving the health & safety of the industry.
- Sustainable Construction Conference – October 2005 to promote the agenda
- ISO14001 – Supporting the accreditation of East Midlands construction businesses to achieve the environmental standard.
- Fast Track – Business advise for business in the East Midlands wanting to improve their resource efficiency.
- Skills Group – a regional skills group has been establish to coordinate the regional skills agenda for the construction industry.

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Initiatives

North West Development Agency (NWDA)
- **Sustainability policy** - Full multi levelled Sustainability policy, exec summary, advisory paper and implementation toolkit and guidelines for the Built Environment.
- **Training program** – NWDA developed a training programme in partnership with CCI. The programme captures all aspects of sustainable development.
- **Best Practice and good practice** examples being implemented on site. (e.g. ELIVATE)
- **Report and case study** setting out the Project applications of Rethinking Construction principles onto a major strategic development site in Liverpool.
- **Quality/cost selection**
- **Performance and programme management through KPIs**
- **Internal training and system adjustment**
- **Internal capacity building**
- **Framework and Supply Chain Measurement and Management programmes under way already.**
- **Creation of the Regional Sector Skills and Productivity Alliance and the sub action plans for skills and Productivity led by CITB and CCI respectively.**
- **Salford Hope Hospital**

South East Development Agency (SEEDA)
- **SE Centre for the Built Environment** – a business led consortium, supported by SEEDA to inform policy, drive business-to-business learning and networking, and develop action plans to improve business performance throughout the supply chain.
- **Training charters** – through local authority procurement
- **CPD** – promoting inter-professional CPD events through CPD website
- **Cross Agency working** – an internal SEEDA network to bring together all interest in the built environment, encouraging collaborative action.
- **SE Construction Skills Forum**
- **Checklist for Sustainable Developments in the SE** - has already been shared with RDAS, but is being updated to be web-enabled
- **SE Excellence** – Regional Centre of Excellence to support the renaissance of SE towns and cities by encouraging individuals and organisations to learn new skills.
- **SEEDA also support a Regional Design Panel, and a Design Champions Club for local authority members and officers**

South West Regional Development Agency (SWRDA)
- SWRDA have worked alongside other partners to establish the ‘Constructive series’ This is effectively a local labour initiative on a sub regional basis. It pools skills and resources within public sector bodies to offer a joined up approach to skills training. The initiative has been set up across all seven sub regions in the SW and a SSA has been signed by the CITB-CS, LSC, CICSW and SWRDA.
- **SWRDA helped form Future Foundations – the sustainable construction charter for the region. The aim of this initiative is to make sustainable construction in the region the norm. For further information see:**
  - [www.futurefoundations.co.uk](http://www.futurefoundations.co.uk)
- REM – Regeneration East Midlands
  - Design Review Panel
  - Training Programme
- East Midlands Regional Assembly Sustainable Development Guide
- East Midlands Regional Centre of Excellence - sponsors a Local Authority efficiency programme through EMCBE which brings together, promoting other regional construction initiatives, adding value to the local authority network and improving their understanding of the agenda.
  - The programme majors on:
    - Performance measurement
    - Frameworks to drive efficiency
    - Supply Chain development
    - Improving the skills agenda through Local Authority Procurement
- EMDA IT Development tool
Hosting the Olympic and Paralympic Games in 2012 will offer a unique opportunity to showcase the very best of Britain and deliver a truly sustainable Games ... integrate sustainable development from the earliest preparations through to delivery and to a lasting post-Games legacy.

6.4 The Olympics 2012
Hosting the Olympic and Paralympic Games in 2012 will offer a unique opportunity to showcase the very best of Britain and deliver a truly sustainable Games that delivers long-term benefits for the local community as well as the nation as a whole. Sustainability lies at the heart of the delivery of the Games: we want to deliver not only the best Games ever, but the most sustainable too. London’s bid included a commitment to integrate sustainable development from the earliest preparations through to delivery and to a lasting post-Games legacy.

The Olympic Delivery Authority (ODA), responsible for the delivery of the infrastructure, and the London Organising Committee for the Olympic Games (LOCOG), responsible for staging the Games themselves, will develop appropriate sustainability and procurement strategies to ensure a sustainable approach which provides lasting economic, environmental and social benefits.


6.5 Sustainable Development Plans for Government Departments
In the foreword to the UK Sustainable Development Strategy Securing the Future (March 2005), the Prime Minister promised that each Government Department and its Executive Agencies would produce its own Action Plan to ensure delivery.

For example the DTI’s Action Plan sets out the Department’s approach to sustainable development, its commitments and priorities and its plans for taking them forward. It covers DTI itself and DTI Agencies. DTI shares with all other departments a commitment to:
• a new sustainable development purpose and a new set of principles to guide policy-making;
• strengthening leadership capacity within the Department and its agencies, for example, by providing civil servants with better training in sustainable development;
• setting stretching targets for meeting objectives through a National Action Plan for Sustainable Procurement;
• ensuring that an understanding of how to apply sustainable development principles is a key part of policy skills for the future and that all policies are properly appraised against them;
• integrating sustainable development commitments into the 2006 Spending Review and beyond, setting the Public Service Agreement targets and allocating resources accordingly;
• implementing proposals for achieving significant change in the sustainable development performance of the Government Estate made in 2005; and
• a new set of indicators to measure progress on sustainable development.

Further details of the Action Plan can be found at: www.dti.gov.uk

NHS Estates – a Case example
In 2000 Department of Health (DH) was involved with the Government Construction Client Group to determine the Sustainable Construction Action Plan. The intention was that Government Departments would lead...
by example and use the BREEAM tool. Following assessment, BREEAM was not considered to be suitable for the NHS. In view of this, DH and DTI joint funded the NHS Environmental Assessment Tool (NEAT) that was produced by BRE and based on BREEAM. NEAT was issued in 2002 as part of an environmental package to the NHS consisting of a Strategy, guidance and the NEAT tool to assist in delivery across the NHS estate in a consistent manner. NEAT is in two parts –

- for new builds/refurbishments;
- existing estate.

The requirement across the NHS is to achieve a score of Excellent for new builds or Very Good for refurbishments. Further, as a consequence of the Government’s Climate Change Programme requirements, the NHS in England was set energy/carbon efficiency targets. In order to achieve these, NHS Estates have introduced two sets of mandatory targets for NHS bodies in England to:

- Reduce the level of primary energy consumption by 15% or 0.15 MtC (million tonnes carbon) from March 2000 to March 2010.
- Achieve a target of 35-65 GJ/100 cu.m. energy efficiency performance for the healthcare estate. NHS Estates developing an Estate Strategy for all new capital developments and major redevelopments or refurbishments; and

- All existing facilities should achieve a target of 55-65 GJ/100 cu.m.

The DH has worked for many years with the NHS providing advice and guidance in many ways and working with partners such as the Carbon Trust in developing guidance such as ‘Encode’ which covers energy/carbon management guidance across both new capital development schemes and the existing operational estate.

There are plans for NEAT to be further developed in the future at which time it is the intention to firm up requirements in line with new and forthcoming legislation and regulation; changing practices and improving standards. The DH has also commissioned the Sustainable Development Commission to produce a ‘Good Corporate Citizenship’ method, under the Corporate Social Responsibility agenda.

6.6 Sector Sustainability Challenge

The Government is building on the work done by the Pioneers Group and wants to strengthen its work with business to improve understanding of delivering long-term decoupling of environmental degradation from economic growth in key sectors while putting in place measures to support that transition. The Sector Sustainability Challenge has therefore been developed to support selected projects focused on taking forward sectoral or supply chain initiatives to put sustainable consumption and production into action. On 30 March 2006, the DTI announced that six organisations, including the Quarry Productions Association, have been awarded contracts under the Sector Sustainability Challenge following a successful tender process. The Challenge is funded jointly by DTI and DEFRA. The six successful organisations will promote, develop and implement sectoral sustainable development in ways that stimulate practical actions that lead to improved performances. This is seen as reinforcing the Government’s continuing commitment to sector sustainability, a commitment made in Securing the Future: The UK Government Sustainable Development Strategy.

For more information see: http://www.dti.gov.uk/sustainability

6.7 Key Performance Indicators (KPIs)

The UK was one of the first countries in the world to produce a set of highly regarded sustainable development indicators. At the UK level progress has been reviewed through the 15 headline indicators in the government annual reports. Of these 15 indicators for sustainability, two directly relate to construction: H14 – new homes built on previously developed land, and H15 – waste arisings and management. The targets are available from www.sustainable-development.gov.uk along with more information.

Key Performance Indicators, Environmental Performance Indicators (EPIs), and the adoption of benchmarking are becoming increasingly commonplace in the construction industry. A suite of six EPIs developed by the Movement for Innovation (see Constructing Excellence) sets benchmarks for meeting environmental targets and provides a measurement tool.

Industry-specific indicators of progress are also published annually in the Construction Industry Headline KPI Pack (see Constructing Excellence).

For more information see: www.constructingexcellence.org.uk www.dti.gov.uk/constructionKpi
6.8 Constructing Excellence

Constructing Excellence has gradually developed through bringing together a number of different organisations over a period of time: Rethinking Construction was the umbrella body which was formed in 1998 to implement the recommendations of Sir John Egan’s report of the same name, co-ordinating the different strands of activity of the Movement for Innovation, the Housing Forum, the Local Government Task Force and the Respect for People programme. The Construction Best Practice Programme and Rethinking Construction merged to become Constructing Excellence (CE) in 2003. Since then, Be the Building and Estates forum and the Construction Clients Group have also joined the ‘family’.

Constructing Excellence aims to achieve a step-change in the performance of the construction industry by tackling market failures in the sector and selling the business case for continuous improvement through focused programmes in Innovation, Best Practice Knowledge, Productivity and Engagement.

Constructing Excellence’s four programmes work together to facilitate the identification, assessment and ‘capture’ of new and existing knowledge to establish and develop products and services to support and drive a culture of continuous improvement. The organisation works with individuals and organisations across the whole spectrum of construction activity to achieve this.

The demonstration project programme has to date been one of the key means of proving the business benefits of change. Almost 500 demonstration projects, representing a total construction value of around £9 billion, have been part of this programme that showcases an extremely wide range of innovations. One of the key tenets of performance improvement is the need to monitor performance and benchmark against other comparable organisations. A range of indicators of progress has been developed to help different sectors within construction to do this: Key Performance Indicators, Environmental Performance Indicators and Respect for People Indicators are published annually. Of major importance is the regional network of Constructing Excellence centres (real or virtual) and Clubs that provide opportunities across the country for the construction industry to engage locally with the improvement agenda. These are independent organisations that work with, and are supported by, the national centre.

Sustainability has been part of this improvement agenda from the very beginnings of the organisation. The Sustainability Zone within the CE website provides substantial information on sustainable construction, and a very wide range of reports and tools has been produced. These include:

- Environmental Performance Indicators developed by a Movement for Innovation working group;
- the Demonstrations of Sustainability report (May 2003) which showcases some of the demonstration projects examining their sustainability performance;
- a project-level Sustainability Checklist;
- a number of fact sheets on sustainability topics.

For more information see: www.constructingexcellence.org.uk

6.9 Sustainability Checklists

The South East England Development Agency’s (SEEDA) Sustainability Checklist was developed as a tool to enable assessment of the sustainability aspects of a development. It may also be used by developers to demonstrate the sustainability credentials of their development. The Checklist aims to form a common framework for the South East.

The Checklist is divided into 10 sections (as seen below), each section containing information and a set of structured questions addressing each particular sustainability issue. Guidance on answering the questions allows the user to determine what level of sustainability the development is achieving.

The Checklist provides suggested ranges of performance or standards, which are derived (wherever possible)
Initiatives

• ensure that regulation to encourage sustainability does not impose unnecessary burdens on small business.
Through the businesslink.gov website the Small Business Service also:
• supports the communication of best practice on sustainability; and
• helps construction industry businesses understand what regulations they need to comply with.

SiteWise II
With the majority of construction firms being SMEs, specific measures are needed to facilitate change in this group. An example of this is the Environment Agency’s support of a specific initiative to focus on the sector; SiteWise II. A three-year pilot campaign in the Anglian Region, aims to improve environmental awareness and performance of construction related SMEs. By 2021 there will be in excess of 500,000 new homes in the East of England and Northamptonshire. Given the level of growth in that Region, influencing the construction sector is incredibly important. SiteWise II aims to improve the environmental performance and awareness of the construction and building industry particularly SMEs in the East of England, Northamptonshire and Milton Keynes. EA are working with a number of external organisations, including Envirowise, Kier Eastern, CITB and White Young Green Consultants to deliver SiteWise II.
The campaign follows a phased approach - phase 1 targeting builders and contractors, Phase 2 designers/architects and developers, phase 3 micro builders, and phase 4 end users/clients. Experience suggests SiteWise II, or a similar approach, should be implemented nationally.

For more information on SiteWise II or the workshops please e-mail sitewise@environment-agency.gov.uk.

6.10 Small and Medium sized Enterprises (SMEs)

Small Business Service
The Small Business Service exists to make the UK the best place in the world to start and grow a business by acting as an advocate for small business with policy-makers and those who provide services for business. On sustainability issues the Small Business Service can:
• help policy officials to understand the likely impact of their policies and actions on small businesses; and thus

See www.sustainability-checklist.co.uk/TheChecklist/ImpactofBuildings/

Funding has been provided by DCLG and WWF to support the development of the Checklist to meet the requirements of other regions of England; should they wish to adopt it, so that a common approach can be taken across the country.

from current planning guidance notes, good practice guidance or based on scientific research. Where good practice guidance or research information is not yet available, the standards were agreed by consensus of the committee overseeing the Checklist’s development and based on the experience gathered from the testing of the Checklist.

The Checklist/ImpactofBuildings/
Sustainable construction is not just for Government. It is an issue being embraced and taken forward by both Government and businesses alike. This is in line with Promoting Good Governance – one of the five guiding principles of the UK’s Sustainable Development Strategy. It is aimed at actively promoting effective, participative systems of governance in all levels of society – engaging people's creativity, energy and diversity.

A great deal of guidance has been produced by various bodies to help the construction industry with various aspects of sustainability. These include, for example, documents by the Sustainability Forum and its predecessor:

- Reputation, Risk and Reward (2002) which examines the business case for sustainability in the UK property sector;
- Demonstrations of Sustainability (May 2003);
- Progress towards more Sustainable Construction (Nov 2003);
- Making the Most of our Built Environment (Mar 2004)

Another example of guidance is the Constructing for Sustainability 2003 publication by the Construction Industry Council’s Sustainable Development Committee.

Copies of these documents can be found at: www.dti.gov.uk/construction/sustain

Reputation, Risk and Reward (www.projects.bre.co.uk/rrr) highlights the circle of blame concept:

- constructors - ‘we can build environmentally efficient buildings, but the developers don’t ask for them’;
- developers - ‘we would ask for environmentally efficient buildings, but the investors won’t pay for them’;
- investors - ‘we would fund environmentally efficient buildings but there is no demand for them’;
- client/occupiers - ‘we would like to have more sustainable buildings to fulfil our corporate policy commitments but there is little choice of properties’.

It also highlights the revenue-generating benefits of sustainability:

- enabling a company to become more attractive to clients who have corporate responsibility policies, or who offer preferential bid status to companies with good environmental management policies and practices;
- increasing market share and earnings;
- producing more attractive, flexible properties, with quicker or higher value rent-up of space, higher occupancy rates and/or lower operation and maintenance costs;
- creating opportunities for new business, e.g. environmental consulting;
- making more ‘future proof’ investments in property, leading to increased revenues over time.

Figure 2 The Carillion Sun Dial

1. Living within Environmental Limits
2. Achieving a Strong, Healthy & Just Society
3. Achieving a Sustainable Economy
4. Promoting Good Governance
5. Using Sound Science Responsibly
6. Natural Resource Protection and Environmental Enhancement
7. Sustainable Communities
8. Social Inclusion
9. Making Batter a Better Life
Many companies have developed their own sustainability plans and strategies. For example, Carillion has produced a sustainability strategy which can be summarised in the "Sun Dial" diagram on the previous page.

A recent study by Cranfield University identified that over 50 different organisations and industry groups have an interest in sustainable construction issues. The lack of cohesion within the industry is a significant problem. If real transformation is to be achieved on the scale required, a national coalition is essential to promote and champion the design and construction of sustainable buildings that are also profitable and healthy places to live and work. The USA has developed a group called the Green Building Council that has sought to resolve this. Such a corresponding group in the UK would be an option for consideration. However, the Sustainability Forum, a pan industry already exists and which could be strengthened to fulfil this role. See www.usgbc.org for more information about the impact and effect of the US Green Building Council.

The following are some examples of the work on the sustainability agenda being undertaken by businesses and organisations in the construction sector.

7.1 Work of the Sustainability Forum

The Sustainability Forum is a pan-industry body that has been formed to advise the Strategic Forum for Construction, and DTI, on sustainable construction issues. The Forum is chaired by Ian Coull, CEO, Slough Estates plc, and has four well-established sub-groups that have engaged with industry through studies, workshops and seminars to develop new best practice for construction and provided a variety of new guidance documents.

Carbon Sub-Group

The Carbon Sub-Group has been active in trying to raise awareness at Chief Executive level of the major opportunities (and equally major threats) presented by the Low Carbon Economy. A ‘CO2 for CEOs’ project was carried forward in partnership with 18 sponsoring and supporting organisations (for full list see www.shake-up.org), and are included in the production of a Black Box ‘Shaker’ gift for Chief Executives. The headline message of the Black Box is that “all organisations need to make low carbon an explicit strategic objective for all their activities”. Chief Executives attending seminars have made commitments to do just this – evidence of the effectiveness of the novel approach.

The Carbon Sub-Group has also proposed the introduction of a Voluntary Energy and Carbon Declaration (VECD) – a ‘Carbon Index’. The VECD would allow building owners or occupiers to display the low energy and carbon credentials of their building in a consistent and meaningful way.

Materials and Waste Sub-Group

The Materials and Waste Sub-Group produced the Site Waste Management Plans – Guidance for Construction Contractors and Clients, a voluntary code of practice, in July 2004. This guidance has been extensively trialled by industry through workshops arranged by Constructing Excellence and Environwise during 2005. The Sub-Group is also working on the development of a guide aimed at architects called Designing for Waste Minimisation, which was published in early 2006. A potential further area for consideration by the Group is efficient procurement of materials.

Framework Sub-Group

The Framework Sub-Group has recently been instrumental in the development of new targets and visions for the construction industry. Together with support from Constructing Excellence, BRE and the Construction Industry Environmental Forum (CIEF), the Sub-Group has held a series of ‘Visions Workshops’ with varied audiences of industry professionals, central and local government, to provide a matrix of ‘base information’. These data have been used to develop industry targets on topics such as energy efficiency/resource use, quality, build cost and carbon reduction. (For further information see Section 8).

Skills and Training Sub-Group

The Skills Working Group was tasked by ConstructionSkills to fill an acknowledged gap and to develop a high-level framework for sustainability skills in the construction sector – this was later widened to include the broader built environment sectors. As a result a Skills Matrix was developed and tested with experts from across the built environment and provides a high level guide on sustainability for:

- skills research across several sectors within the built environment;
- the development of new standards, qualifications and training;
- the assessment of current training/qualifications as ‘fit for purpose’ from a sustainability outcomes perspective;
- the development of tools and support;
- the assessment of industry skills needs, development and progression.

As a common framework for the many organisations supporting the construction and wider built environment industries on sustainability, as well as construction companies themselves, the Skills Matrix enables greater coherence of...
effort and measurement of outcome. Many organisations have expressed interest in using it and it is hoped this will lead to faster and more ‘joined-up’ progress in delivering a sustainable built environment.

7.2 Facilities Management

Facilities Management is the integration of multi-disciplinary activities within the built environment and the management of their impact upon people and the workplace. Effective Facilities Management, combining resources and activities, is important to the success of any organisation. At a corporate level, it contributes to the delivery of strategic and operational objectives. And on a day-to-day level, it provides a safe and efficient working environment.

The growth of Facilities Management (FM) as an industry and profession has been slow since its inception in the late 1980s. It has only recently been recognised at an entity in its own right and still suffers from being the poor relation to the construction industry. However, the FM activities provide the greatest environmental and social influence within the built environment.

The FM sector is now large and complex, comprising a mix of in-house departments, specialist contractors, large multi-service companies, and consortia delivering the full range of design, build, finance and management. Estimates vary, but market research suggests that, in the UK alone, the sector is worth around £36 billion per annum.

Sustainability is a critical area affecting the Facilities Management community, and one which will continue to grow as the need to deliver against global treaties, European Union and government targets on energy, water, child poverty etc. draw closer. There is a recognition that unless businesses significantly influence their existing portfolio these targets will not be achieved – and with less than 2% churn per annum, today’s portfolio will account for more than a third of the portfolio standing in 2050.

In February 2006, the British Institute of Facilities Management (BIFM) Sustainability Group launched the results of a research project investigating facilities managers’ knowledge gaps on sustainability.

In conjunction with Reading University, the BIFM is developing a suite of practical tools for facilities managers to operate their buildings sustainably, including a website. The project will develop and update information on sustainable facilities management to be applicable by those who influence the management and performance of the existing building stock.

There are a number of strategic areas to meet the challenges faced by Facilities Management.

Knowledge Management

There is a known gap between the design intent of a facility and its actual operation throughout its lifecycle. Part of this is due to changes made during the construction process, part is down to poor management of the facility, and part is due to the lack of knowledge transferred to the FM team on how to effectively manage the facility under varying conditions. There is a need to manage better the knowledge and change management process from design through to operation to enable properties to deliver their real value. The return cycle will enable FM practitioners to use their knowledge of the performance of buildings to deliver improved facilities from the design and construction phase, helping to improve the overall asset value and performance of the building stock.

Performance Indicators

The definitions of sustainability affecting Facilities Management are varied and complex depending upon the activity performed. This may in part explain the poor take-up of sustainability by organisations. Further development of performance measures will help to support the education process, provide a level of consistency in the marketplace and enable organisations to measure anticipated and actual results.

Whole-Life Value

There is a barrier between the capital and revenue budgets which undervalues the delivery of exceptional buildings from a sustainability perspective. By its very nature, whole-life value will aim to define and measure tangible and intangible costs for a project, within reasonable boundaries, to enable option appraisal and comparisons to be made. There is a need for greater consistency in how value is measured and formal guidance on the structure and process used.

Skills and Competency

It is recognised that there is a lack of skills within the FM industry to manage actively facilities from a sustainability perspective. This is partly due to the wide range of backgrounds facilities management professionals come from, and partly due to the wide range of skills necessary. FM professionals need to be more involved in the design and construction activities and able to communicate ideas effectively and to understand the process in which the designers and constructors are operating.

Community Involvement

Much of the workforce for FM is based within the local community where the vast majority of staff live, and where the future workforce will reside. There is a need for greater collaboration and increased co-operation within the community to ensure the availability of
suitable employees as well as the economic success of the area. Many of the lowest paid staff will work within the FM team, often outside usual business operating hours, and they are likely to be particularly dependent on the local employer.

7.3 Development of Sector Sustainability Strategies

A number of construction sub-sector sustainability strategies have been published over the past few years. They aim to develop a common understanding of the issues and to present effective and targeted approaches for each sector to contribute to achieving a more sustainable construction industry. Sectors being addressed include building services and construction products. Those published include: Society, Sustainability and Civil Engineering (April 2002), Brick: made for generations (Nov 2002), Building a Better Future (steel sector, December 2002), Cement and Concrete Sector Interim Strategy (April 2003) and Naturally Wood (February 2004). Others have adopted existing strategies; for example the Built Heritage Sector has used DCMS’ Sector Sustainability Strategy as a basis for its own work.

A Strategy and Action Plan was developed by the Institution of Civil Engineers (ICE)

The terms “sustainable construction” and “sustainable building” have in the past led to a lack of focus on civil engineering and infrastructure projects. To address this issue, Society, Sustainability and Civil Engineering – A Strategy and Action Plan was developed by the Institution of Civil Engineers (ICE), Association of Consulting Engineers, Civil Engineering Contractors Association, CIRIA and the Construction Products Association.

Key initiatives flowing from the strategy have included:

- The development of a Civil Engineering Environmental Quality Assessment and Award Scheme (CEEQUAL) from the feasibility to operational stage. In broad terms, CEEQUAL is a civil engineering equivalent of the BREEAM scheme for buildings. The value of projects assessed or in the process of assessment under CEEQUAL is approaching £1B.

- The development by a cross industry team and publication by BRE of Achieving Whole Life Value in Infrastructure and Buildings, providing practical guidance to the application of whole life techniques across the two sectors. Both of the above projects were supported by DTI.

The education and professional development needs of civil engineers are also being addressed. The Joint Board of Moderators, who accredit undergraduate degrees on behalf of the ICE, Institution of Structural Engineers, Institution of Highways and Transportation and the Institute of Highways Incorporated Engineers have adopted sustainability guidelines against which syllabuses are now assessed. Post formal education, ICE’s routes to full professional membership now also require the development of sustainability competence.

Many major Civil Engineering businesses and clients have recognised that economic, social and environmental issues need to be addressed in a holistic fashion. Major infrastructure projects such as Heathrow Terminal 5 have included extensive sustainability plans. ICE do expect more companies to accept that there is a sound business case for embracing sustainable development. However the take up of sustainability is by no means universal and in a sector characterised by a high proportion of SMEs supply chain engagement will continue to be crucial.

7.4 Benchmarking house-builders on sustainability

In 2005, around £300 billion of equities was managed on a socially responsible basis in the UK.

Many investment managers deliver their commitments to being a responsible investor through, among other things, proactive engagement with companies. The rationale is that regular, constructive engagement can deliver substantial change in the way companies manage their key social and environmental impacts and risks, so protecting and enhancing shareholder value.

One example is the work in the housing sector undertaken by Insight – the asset manager of HBOS plc.

In January 2004, in partnership with WWF, Insight published a benchmarking study (carried out during 2003) which evaluated how well the UK’s leading listed house-builders were managing and reporting on sustainability issues. Each company was evaluated against a set of 18 criteria reflecting best practice in each of three key areas: governance and risk management, environmental impacts and societal impacts.

The study revealed that while the house-builders had begun to recognise the growing importance of sustainability issues to their
businesses, few had well-developed strategies, policies and practices to address them effectively. The two companies that came closest to meeting best practice were Countryside Properties and The Berkeley Group. However, most lagged far behind best practice. The analysis also revealed that public disclosure of information on sustainability issues was quite poor and inconsistent. In addition, the research yielded a wealth of detailed information about the nature and quality of each company’s management of individual sustainability issues, from climate change to waste management and health and safety.

In order to assess whether companies had made any progress on managing and reporting on sustainability issues, Insight and WWF repeated the analysis in 2005 and published the results of the follow-up benchmark in September 2005.

The results show substantial improvement in the reporting and performance of all of the companies involved. All had substantially improved their management of sustainability issues, as shown in Figure 3. Crest Nicholson, The Berkeley Group and George Wimpey emerged as the leaders; others – McCarthy & Stone, Bellway, Barratt, and Wilson Bowden – demonstrated substantial improvement. In most cases, the companies have implemented many of the specific recommendations made to them.

In addition, the analysis demonstrated that all of the companies had improved their reporting on sustainability, although their disclosure is still not comprehensive and so does not paint a complete picture of the work they are doing on sustainability.

Clearly, Insight’s engagement is not the only factor at work here. Government, market and other trends and pressures are also driving change. The fact that Insight worked with WWF, a highly credible environmental organisation with specialist knowledge in this area, undoubtedly contributed to the success of this project. Nevertheless, most companies have greatly improved their management and reporting of many of the issues addressed in the benchmark in line with the suggestions made to them.

In discussion, several noted that their performance on sustainability is helping to deliver business benefits – from winning planning permission and contracts with government agencies to cost savings through waste management programmes and tighter risk management. Some are also beginning to realise that fully integrating sustainability into their businesses can deliver differentiation and other reputational benefits.
The first of the guiding principles of the UK Sustainable Development Strategy is focused upon respecting the limits of the planet’s environment, resources and biodiversity – seeking to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations.

This Review has enabled us to develop a vision for the future. It is based on initial work by the Sustainability Forum and was shaped by responses to our consultation and by the Stakeholder workshop held as part of this Review process. Industry’s initial thoughts on the targets, as collated during the public consultation phase of the review can be found on the DTI website: www.dti.gov.uk/sectors/construction/sustainability/strategy/page13543.htm

The vision is aimed at securing an efficient and effective industry which will, in itself, remain sustainable through the development of a skilled and committed workforce and the efficient management of all available resources utilised by the construction industry. This is a vital goal to attain in what will be seen as an increasingly competitive global market over the coming decades. It will see new opportunities growing for those companies that are quick to develop and take up new ideas.

This vision highlights key issues across the spectrum of sustainability, and challenges industry with specific objectives. These are listed overleaf, together with relevant existing government targets.
# The Future

## Table: Targets and Visions for Sustainable Construction to 2015 and Beyond

<table>
<thead>
<tr>
<th>Issue</th>
<th>Government targets</th>
<th>Metric</th>
<th>Industry's vision</th>
<th>Industry's vision of interim projects date</th>
<th>Final achievement date</th>
<th>Primary responsibility</th>
<th>Mechanism</th>
<th>Secondary Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Climate change/energy</strong></td>
<td>Publicly funded houses to be CSH level 3</td>
<td>CO2 emissions (m2/yr), predicted and measured</td>
<td>Zero CO2 building emissions (m2/yr) (EA support)</td>
<td>20% of new build by 2010; existing by 2015</td>
<td>By 2020</td>
<td>100% of new build by 2020; existing by 2030</td>
<td>DCLG (publicly-funded housing) (DfE) (overall climate change) planners; developers</td>
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<td>Building regulations; planning; taxation; incentives; enforcement; CSR awareness</td>
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<td></td>
<td>Developers; designers; contractors</td>
<td></td>
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<tr>
<td><strong>Waste</strong></td>
<td>Publicly funded houses to be CSH level 3</td>
<td>Tonnages to landfill (KSD framework indicator (all industries) 1990-2000)</td>
<td>Zero waste (EA support)</td>
<td>2006; annual review</td>
<td>By 2020</td>
<td>Government; developers; Designers; clients; manufacturers; WRAP (Waste Resource Action Programme)</td>
<td>Local authorities; contractors</td>
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<td>Legislation; regulations; enforcement; demolition protocol; taxes; incentives; CSR; awareness</td>
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<tr>
<td><strong>Materials</strong></td>
<td>Publicly funded house to be CSH level 3</td>
<td>‘A’ rated materials used 90% reduction/LCA declaration for products.</td>
<td>Use of sustainable materials/ reduced primary materials consumption. Increased use of recovered materials.</td>
<td>50% reduction by 2015; annual review</td>
<td>By 2025</td>
<td>90% by 2025</td>
<td>DCLG; manufacturers; designers; contractors</td>
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<td>Regulation; codes; green guide; supply chain monitoring</td>
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<tr>
<td><strong>Costs</strong></td>
<td>Treasury already defines value for money as the optimum combination of whole-life cost and quality to meet the user requirement</td>
<td>% deployment (new build selected on basis of WLCI, Construction Inflation Index)</td>
<td>Change to whole life costing of (public) assets</td>
<td>2010</td>
<td>2020</td>
<td>OGC; city institutions and funders; clients</td>
<td>Changed policy – new public finance paradigm (voluntary market mechanisms)</td>
<td>PFI bidders; designers; suppliers</td>
</tr>
</tbody>
</table>

## Issue: Water

<table>
<thead>
<tr>
<th>Government targets</th>
<th>Metric</th>
<th>Industry's vision</th>
<th>Industry's vision of interim projects date</th>
<th>Final achievement date</th>
<th>Primary responsibility</th>
<th>Mechanism</th>
<th>Secondary Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publicly funded houses to be CSH level 3</td>
<td>Litres/person/day</td>
<td>Reduced consumption (specific potable)</td>
<td>+25% reduction by 2015; existing by 2020</td>
<td>50% reduction by 2015</td>
<td>DCLG; OPWAT; local authorities; planners</td>
<td>Building regulations; planning; enforcement; billing for metering; water trading; awareness</td>
<td>Developers; Companies Public demand</td>
</tr>
</tbody>
</table>

## Flood Risk

<table>
<thead>
<tr>
<th>Government targets</th>
<th>Metric</th>
<th>Industry's vision</th>
<th>Industry's vision of interim projects date</th>
<th>Final achievement date</th>
<th>Primary responsibility</th>
<th>Mechanism</th>
<th>Secondary Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publicly funded houses to be CSH level 3</td>
<td>Runoff as a percentage of pre-development site runoff</td>
<td>Phase out of high flow fittings</td>
<td>Runoff reduced to green field runoff rate or better; Rainwater harvesting implemented</td>
<td>Runoff maintained as existing by 2015</td>
<td>All sites run off at greenfield or better by 2015</td>
<td>Building regulations; planning; enforcement; billing for drainage; water testing; awareness</td>
<td>Developers; Companies Public demand</td>
</tr>
</tbody>
</table>

## Water Quality

<table>
<thead>
<tr>
<th>Government targets</th>
<th>Metric</th>
<th>Industry's vision</th>
<th>Industry's vision of interim projects date</th>
<th>Final achievement date</th>
<th>Primary responsibility</th>
<th>Mechanism</th>
<th>Secondary Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publicly funded houses to be CSH level 3</td>
<td>Surface water is managed on site using SUDS approach to drainage</td>
<td>Surface water discharges from development do not adversely impact on water quality</td>
<td>Appropriate Water Framework Directive quality objectives met</td>
<td>2010</td>
<td>All sites drained using SUDS approach by 2015</td>
<td>Building regulations; planning; enforcement; billing for drainage</td>
<td>Developers; Companies Public demand</td>
</tr>
</tbody>
</table>

## Quality aesthetics

<table>
<thead>
<tr>
<th>Government targets</th>
<th>Metric</th>
<th>Industry's vision</th>
<th>Industry's vision of interim projects date</th>
<th>Final achievement date</th>
<th>Primary responsibility</th>
<th>Mechanism</th>
<th>Secondary Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publicly funded houses to be CSH level 3</td>
<td>Cabe provided exemplar buildings/DQI</td>
<td>Post occupying evaluation of all public buildings every 5 yrs (to be considered)</td>
<td>Quality and aesthetics standards c.f. Sweden/publicly accessible buildings</td>
<td>Strategic Forum for Construction target; by end of 2007, 60% of all publicly funded PFI projects (£1m+) to use DQIs and 20% of those projects &gt;£1m in value</td>
<td>DCLG; CABE; professional institutions; BRE regional Design Champion’s Clubs</td>
<td>Measurement against exemplars; increased legislation</td>
<td>Finance institutions; Developers; Construction industry</td>
</tr>
</tbody>
</table>
Most notably, after the successful bid, the 2012 Olympics will put London and the UK at the very front of the world stage. Constructing the Olympic infrastructure and facilities, and securing its long term legacy, offers a unique opportunity to raise the profile and strengthen the case for sustainable development in the construction industry in the UK and worldwide. As well as the lasting environmental, physical and economic legacy of a sustainable, regenerated Lower Lee Valley, the Games will also provide exciting opportunities to enhance the lives of people throughout the UK. The industry should embrace the opportunities offered by the high profile Olympic development programme to showcase excellence in construction and ensure that sustainable development best practice is better understood and widely adopted throughout all the UK’s nations and regions.

Achieving a Sustainable Economy is one of the five guiding principles of the UK’s Sustainable Development Strategy. When considering the future of the construction sector the following issues form important elements and, wherever possible, they should be incorporated into future work.
A way to consider how the government supports change in the industry is by using the behaviour change model that was introduced in the UK sustainable development strategy (see Figure 4 above).

This model suggests that the Government has four ways in which it can support change in the industry to deliver sustainable construction and contribute to sustainable development. These are:

- to enable change, by removing barriers, providing information, capacity building;
- to encourage change, by establishing the legislative and fiscal framework to support sustainable behaviour, and where necessary penalise unsustainable practices;
- to engage with industry, by using stakeholder fora, existing industry communication networks and industry media to communicate the message; and
- to exemplify good practice, by raising awareness through awards and recognition, government and public sector leading by example in setting high standards in its own procurement. The government’s role as the biggest construction client in the ongoing programme of capital investment offers direct leverage to deliver market transformation. This will result in a thriving environment for innovations in supply chains, products and services that will themselves be key enablers for more sustainable development in all sectors of construction.

Skills

More sustainable construction cannot be delivered unless there are the necessary skills. The Sustainability Forum’s Skills Matrix is an excellent start in identifying skills requirements, and it complements the Egan Report on Sustainable Communities. For more information see: http://www.communities.gov.uk.

But analysing the skills gaps is insufficient. It is important to examine how training and development is delivered. Better access to training and embedding relevant sustainable development issues in core training are challenges to be addressed in order to build the capacity of the construction industry to deliver more sustainable construction.

Knowledge development and transfer

This issue is closely linked to the issue of skills. Access to information on sustainable construction is crucial, in a form that is readily accessible. Knowledge and experience gained from projects and research work is not disseminated widely enough at present. There may be a need for research to be undertaken to assess why this is the case and to examine how it can be addressed. For example, there is rarely a mechanism to translate knowledge from the design and construction phases into Facilities Management – there is an ongoing role for the Project Team that is not always recognised.

Encouragement and incentives

There are many ways in which the construction sector in its broadest sense could be encouraged to provide more sustainable buildings and structures and rewarded for doing so. Sponsorship of nationally recognised design awards would be one way of raising awareness and understanding of sustainable construction. The social aspect of sustainability is perhaps the area that the construction industry is least comfortable with, and an award that encourages designers to explore the future requirements for domestic dwellings – having regard to known and predicted changes in both technology and lifestyles – could prove useful in research terms as well as profile-raising.

Figure 4: The behaviour change model

Approach evolves as attitudes and behaviours change over time

Enable

- Remove barriers
- Give information
- Provides facilities
- Provides viable alternatives
- Educate/train/provide skills
- Provide capacity

Encourage

- Tax system – grants
- Expenditure – grants
- Reward schemes
- Recognition/social pressure – League tables
- Penalties, fines & enforcement action

Catalyse

Is the package enough to break a habit and kick start change?

Engage

- Community action
- Co-production
- Deliberative fora
- Personal contacts/enthusiasts
- Media campaigns/opinion formers
- Use Networks

Exemplify

- Leading by example
- Achieving consistency in policies
Whole Life Value including Whole-Life Costing and Life Cycle Analysis

One of the greatest barriers to more sustainable construction is the frequent conflict between capital and revenue spend in delivering projects – for example, where a project’s capital cost might be higher but substantial revenue savings would be achieved as a result. Projects assessed on the basis of whole-life value balance these impacts and benefits, and it becomes possible to assess more accurately the true costs of a design and any changes made to it.

Lifecycle performance indicators for design intent and operation would provide valuable information to procurers, occupiers and managers of buildings and structures.

Climate Change

The climate is already changing and will continue to change before the problems of global warming are resolved – this exacerbates the over-design of services to address cooling requirements at low capital cost but high-energy use. Consideration needs to be given now as to how the built environment will adapt to these changes. This may require modification to planning procedures and building regulations. Challenges include design for flexible occupancy and use to minimise retrofitting of cooling.

Issues that need to be addressed in terms of designing for a changing climate include: hotter drier summers; role of thermal mass; modern methods of construction and the ‘right’ level of thermal mass; shading; controlled ventilation; low energy cooling; warmer wetter winters; more common extreme events; and resource efficiency.

Materials

As one of the major users of resources, the industry needs to consider minimisation in design, design for re-use and use of recycled, renewable, reclaimed and secondary materials whenever possible. Key areas for consideration are waste minimisation, recycling and re-use during construction. Further issues include the environmental impact of materials and their production.

Water

Water supply and management issues will become increasingly important, particularly with increased development in areas such as the South East that are already importing water from other regions of the country. The impact of the Water Framework Directive has perhaps yet to be felt in this respect. Building Regulations will again have significant impacts here – the use of low-flow taps, low-consumption sanitary equipment and rainwater management can reduce domestic consumption significantly.

There is a need to encourage an integrated approach to water management, in particular using rainwater harvesting and grey water reuse to reduce potable water demand and to reduce flows in foul, combined and surface water sewers. This is especially important in London and other major cities where existing infrastructure is already under pressure.

Energy Efficiency

There is an opportunity to make the most of data generated as a result of the Energy Performance of Buildings Directive and to feed this back into the design and construction processes. For example, it will be possible to compare aspirations with performance in practice, and to encourage understanding of the differences (whether caused through user choices or by changes to the design during construction).

Regeneration

There is considerable scope for integrating sustainable construction with sustainable development at the regional level. Linking the construction sector to other regional sectors can improve local business, environment (e.g. the re-use of brownfield and uplift of local land is commercially advantageous to local business through increased rental values) and social opportunities (e.g. cross-linking employment opportunities in the reprocessing sector). This also provides a closed loop for recycling into new construction products that could further boost regional economies.

Post-Occupancy Evaluation

There is little obvious incentive at present (particularly for one-off clients) to undertake post-occupancy evaluation, yet this process can be invaluable. Not only is it essential for the efficient operation of buildings; it should lead to the improved design of new buildings by Architects and Systems Designers. This cyclical data feed must become a standard practice within the industry if it is to move forward with greater efficiency.

ICE’s vision on Trends and Challenges for the future

In general terms the Institution of Civil Engineers (ICE) would expect government to provide more economic incentives to promote sustainable procurement and development, building on measures such as the Landfill Tax and Aggregates Levy. They would also hope to see new legislated standards e.g. for increased energy efficiency. This has the potential to improve the sustainability performance of future contracts, particularly those let under PFI as it facilitates the implementation of contracts addressing the long-term impact of energy as well as cost.

The expectation is for sustainable procurement to move higher up the government and industry’s agenda following the publication of the report of the Sustainable Procurement Taskforce, chaired by Sir Neville Simms, a Fellow of ICE.

ICE believe government has the
opportunity to become an exemplar client driving change across the industry but this they feel will require:

- Understanding and leadership. In particular government and industry must work to develop an understanding of life cycle impact of infrastructure and buildings, without which long-term procurement will not improve.
- Contract arrangements must then reflect life cycle costs. The financial cost of projects will need to be balanced with sustainability implications

More specifically, ICE has conducted an assessment of infrastructure research priorities on behalf of the New Construction Industry Research and Innovation Panel (nCRISP). This study has identified a number of key sustainability challenges for the sector.

Under the general heading of sustainability of the built environment, issues to be tackled include quantification and measurement of sustainability; design for maintenance and replacement to optimise whole life performance; sustainable urban drainage (SUDS); the impacts of refurbishment and re-use; and the use of hydrogen fuel cells. While all of these issues are important for infrastructure it is clear that they have much wider implications across the whole of the built environment.

Aspects of sustainability relating specifically to transport infrastructure include the need to optimise the use of existing roads through a better understanding of the current demands of users and modern vehicles and the measurement of impacts through post implementation studies. Complementing optimisation, the development of combined transport corridors needs to be explored as this may deliver reductions in land usage and environmental impacts.

Longer term, climate change raises specific issues for civil engineering. The risk of flooding is now a major issue and is likely to become increasingly serious. Progress is needed on both technical aspects of flood control and the management of existing systems and future development. In addition the potential impact of extreme weather events on infrastructure will need to be addressed including the consequences for transport and energy infrastructure, reservoirs, dams and shorelines, and estuaries.

Security of the UK energy supply is also a long-term concern together with the impact of new forms of energy, including renewables and micro-generation on the requirements for new infrastructure and maintenance of the existing network. The UK is also facing the prospect of a multi billion pound investment in new waste management infrastructure to meet the demands of the landfill directive. This opens up an opportunity to develop a network of “resource management” facilities, to recover value from material, including construction and demolition waste. Care must however be taken to ensure that this network is not unnecessarily energy intensive, leading to increased greenhouse gas emissions.

The demand for development, including that identified in the Sustainable Communities Plan is strongest in the South and East of England. This will be met by the new resource schemes currently being considered in the South East, combined with improved demand management.

Conclusion
A comprehensive list of the Initiatives found within this document can also be found at the website: www.dti.gov.uk/sectors/construction/sustainability/strategy/page13543.html

Much remains to be done through the Sustainability Forum and its working groups, in conjunction with the Sustainable Development Commission, Government and industry to develop practical actions which ensure sustainability is properly mainstreamed into all of the construction industry.

The visionary targets are seen as a first step, resulting from the Review’s consultation, in the setting of challenging and realistic targets which industry can endorse. Further work, including identifying processes for monitoring and evaluating progress, will be taken forward in a series of post review workshops. Details of these workshops will be posted on the above website.

The targets, once refined, can be used to encourage industry to respond positively to some of the big issues it faces. They will also help Government identify how it can better support change in the industry to deliver sustainable construction. In doing this, Government will continue to work with industry to obviate the need for further regulation by application, where appropriate, of voluntary mechanisms.

This Review is the first stage in forming an effective framework – one that will guide the sector toward an improved use of Sustainable Construction. We expect to publish a further document after completing this process in 2007.
promoting the use of small-scale renewable energy sources, such as solar and wind.

Business in the Environment
www.business-in-environment.org.uk
Business in the Environment inspires businesses to work towards environmentally sustainable development as a strategic, mainstream business issue.

The Carbon Trust
www.thecarbontrust.co.uk
The Carbon Trust encourages and promotes the development of low carbon technologies as part of the UK’s Climate Change Programme. It promotes both energy efficient technologies and low carbon energy supplies.

Energy Savings Trust
www.est.org.uk/
The Energy Savings Trust is a non-profit organisation, funded by Government and the private sector. The Trust works with households, business and the public sector:
• encouraging a more efficient use of energy;
• stimulating the demand and supply of cleaner fuelled vehicles;

in establishing the London Plan which will influence the plans of all the London boroughs, and also having the power to direct the boroughs to refuse planning permission to certain types of planning application.
## ANNEX B

### Building Regulations

<table>
<thead>
<tr>
<th>Approved Document (AD)</th>
<th>Subject Area</th>
<th>Summary of input to the sustainability agenda</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Structure</td>
<td>Durability of structure and materials through suitable use, detailing and construction methods ensuring that the building is safe structurally.</td>
</tr>
<tr>
<td>B</td>
<td>Fire Safety</td>
<td>DCLG is reviewing Part B and the supporting guidance in the approved documents which draws upon recent experience of actual fires and takes into account relevant research. The review has considered fire safety in all types of premises including dwellings, care homes and warehouses. It has also considered the important role that sprinklers and other types of fire protection measures may have.</td>
</tr>
<tr>
<td>C</td>
<td>Site Preparation</td>
<td>Part C was recently revised. The review and Resistance dealt with moisture and weather to Moisture resistance and expanded guidance relating to development on land affected by contamination. Part C also deals with other substances likely to be a health hazard such as radon. Work is in progress on improving the flood resilience of buildings. This is likely to bring a new requirement in the Building Regulations to deal with flood performance.</td>
</tr>
<tr>
<td>D</td>
<td>Toxic Substances</td>
<td>Part D addresses the toxicity of a wide range of substances and materials used in construction such as control of toxic fumes from foams used for cavity wall insulation which applies to existing and new buildings.</td>
</tr>
<tr>
<td>E</td>
<td>Resistance to Passage of Sound</td>
<td>The introduction of regulation on noise pollution has an overall objective of securing reasonable standards of health, safety and welfare for persons in or about buildings in respect of resistance to the passage of sound, without imposing disproportionate bureaucracy and costs on builders, materials producers, building owners or building control bodies. The key objectives are to improve standards of sound insulation and to significantly improve compliance with the Regulations so that reasonable sound insulation is achieved before the home is occupied.</td>
</tr>
<tr>
<td>F</td>
<td>Ventilation</td>
<td>The revision of Part F now means that the way ventilation openings are described has been changed to more accurately reflect their performance, guidance on ventilation of domestic basements has been included and the recommended air supply rate to offices has been increased from 8l/s/person to 10l/s/person.</td>
</tr>
<tr>
<td>G</td>
<td>Hygiene</td>
<td>DCLG is reviewing Part G. The range of issues includes hot water safety, better scales of provision of toilets and a new topic of water conservation.</td>
</tr>
<tr>
<td>H</td>
<td>Drainage and Waste Disposal</td>
<td>Part H was comprehensively revised in 2001. It deals with all aspects of building drainage including non-mains drainage such as septic tanks. There may be some limited interim changes to deal with work on private (shared) sewers and better waste storage to improve recycling.</td>
</tr>
<tr>
<td>Approved Document (AD)</td>
<td>Subject Area</td>
<td>Summary of input to the sustainability agenda</td>
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<tr>
<td>J</td>
<td>Heat Producing Appliances</td>
<td>Part J addresses safe building provisions for air supplies to combustion appliances, the discharge of combustion gases to atmosphere and protection of building fabric from the risk of ignition (requirements J1, J2 and J3). The three existing requirements have been retained and the Approved Document supporting technical guidance has been improved. Two new requirements were added in 2002, with supporting technical guidance, which address the protection of external above-ground oil and LPG storage systems from fire and the prevention of oil pollution of ground water (new requirements J4 and J5).</td>
</tr>
<tr>
<td>K</td>
<td>Protection from Falling, Collision and Impact</td>
<td>Part K addresses the issue of protection from falling, collision and impact in and around buildings such as from stairs, ladders, trap doors etc. Standards are set which ensure the design, construction or installation of the features are safe for people.</td>
</tr>
<tr>
<td>L</td>
<td>Conservation of Fuel and Power</td>
<td>The commitment in the Government’s February 2003 Energy White Paper was for a further substantive uplift in energy efficiency. The 2006 revisions include the technical provisions in Energy Performance of Buildings Directive (EPBD – Articles 3 - 6) and mean significant changes, so that, for instance, for new dwellings average energy performance is expected to be around 20% better than before. The cumulative effect of the 2002, 2005 Condensing Boilers and the 2006 changes is substantial at around a 40% improvement in the energy efficiency of new dwellings.</td>
</tr>
<tr>
<td>M</td>
<td>Access to and use of Buildings</td>
<td>Part M deals with accommodating the changing lifestyles and circumstances in housing through design and increasing social equity by enabling access.</td>
</tr>
<tr>
<td>N</td>
<td>Glazing</td>
<td>Part N concentrates on the health and safety of people in and around buildings with regard to windows. It sets measures which reduce the risk of sustaining cuts and piercing injuries, and enhance transparency and safe operation of windows skylights and ventilators.</td>
</tr>
<tr>
<td>P</td>
<td>Electrical Safety</td>
<td>New building regulations aimed at curbing the unacceptable number of deaths, injuries and house fires caused by faulty electrical installations.</td>
</tr>
<tr>
<td>R7</td>
<td>Materials and Workmanship</td>
<td>Any building work which is subject to the requirements imposed by Schedule 1 of the Building Regulations (i.e. Parts A - N) should, in accordance with Regulation 7, be carried out with proper materials and in a workmanlike manner. This aspect of the Building Regulations promotes use of recycled materials, use of low impact materials and responsible sourcing of materials.</td>
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</tbody>
</table>
### ANNEX C

**Main Contributors to the preparation of the consultation document for this Review**

<table>
<thead>
<tr>
<th>Berkeley Group</th>
<th>Glass &amp; Glazing Federation</th>
<th>Sustainability Forum</th>
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</thead>
<tbody>
<tr>
<td>British Cement Association (BCA)</td>
<td>Health and Safety Executive (HSE)</td>
<td>Sustainability South West</td>
</tr>
<tr>
<td>British Electro-technical and Allied Manufacturers Association (BEAMA)</td>
<td>Highways Agency (Department of Transport)</td>
<td>Treasury (HMT)</td>
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<tr>
<td>British Institute of Facilities Management (BIFM)</td>
<td>Horticultural Trade Association (HTA)</td>
<td>Thames Water</td>
</tr>
<tr>
<td>British Plastics Federation (BPF)</td>
<td>Institution of Civil Engineers (ICE)</td>
<td>Skanska</td>
</tr>
<tr>
<td>British Pre-cast Concrete Confederation</td>
<td>Institute of Structural Engineers (ISE)</td>
<td>UK Accreditation Service (UKAS)</td>
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<tr>
<td>British Nuclear Group (BNG)</td>
<td>Kingspan Insulation</td>
<td>UK Trade and Investment (UKTI)</td>
</tr>
<tr>
<td>Building Research Establishment (BRE)</td>
<td>Landscape Institute</td>
<td>WRAP (the Waste &amp; Resources Action Programme)</td>
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<tr>
<td>Cabinet Office (CO)</td>
<td>National Audit Office (NAO)</td>
<td>Welsh Assembly</td>
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<tr>
<td>CELUFORM</td>
<td>NHS Estates</td>
<td>World Wide Fund (WWF)</td>
</tr>
<tr>
<td>Chartered Institute of Building (CIOB)</td>
<td>Office of Government Commerce (OGC)</td>
<td></td>
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<tr>
<td>Commission for Architecture and the Built Environment (CABE)</td>
<td>Quarry Products Association (QPA)</td>
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<tr>
<td>Construction Confederation (CC)</td>
<td>RENEW</td>
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<tr>
<td>Construction Industry Council (CIC)</td>
<td>Royal Institute of Chartered Surveyors (RICS)</td>
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<tr>
<td>Construction Industry Research &amp; Information Association (CIRIA)</td>
<td>Rural Development Service</td>
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<tr>
<td>Construction Industry Training Board (CITB)</td>
<td>Sheffield City Council</td>
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<tr>
<td>East Midlands Development Agency (EMDA)</td>
<td>Sustainable Development Commission (SDC)</td>
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<td>English Partnerships (EP)</td>
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<td>English Nature</td>
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<td>Environment Agency (EA)</td>
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<td>Federation of Environmental Trade Associations (FETA)</td>
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<tr>
<td>Fulcrum Consulting</td>
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<tr>
<td>Future Foundations</td>
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</table>
DTI would like to thank the following organisations for use of their photographs in this document:
Nigel Young/Foster and Partners.
Mandy Reynolds/Feilden Clegg Bradley Architects.
CABE (Commission for Architecture and the Built Environment).