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SUSTAINABLE  
CONSTRUCTION STRATEGY  
REPORT 2006

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## 1 INTRODUCTION

### Consultation for a Strategy for 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 8% of GDP and employing 1.5 million people, construction can lead the way in considering sustainable development in all of its activities.

In 2000, the Government published its first Strategy for Sustainable Construction Building A Better Quality of Life which presented a way forward for Government and industry. This current document considers what has been achieved over the past five years and summarises progress made on specific initiatives identified in the original Strategy. It aims to provide an effective framework to guide future government policies where they are relevant to construction and outlines where the Government wishes to see the industry going in its future development. It also indicates where businesses believe their efforts should be concentrated and aims to encourage industry to respond positively to some of the big questions it faces.

This document will form the basis of a revised Strategy for Sustainable Construction and is intended as part of the consultation process. We welcome input from all stakeholders, and will consider all feedback in finalising the Strategy.

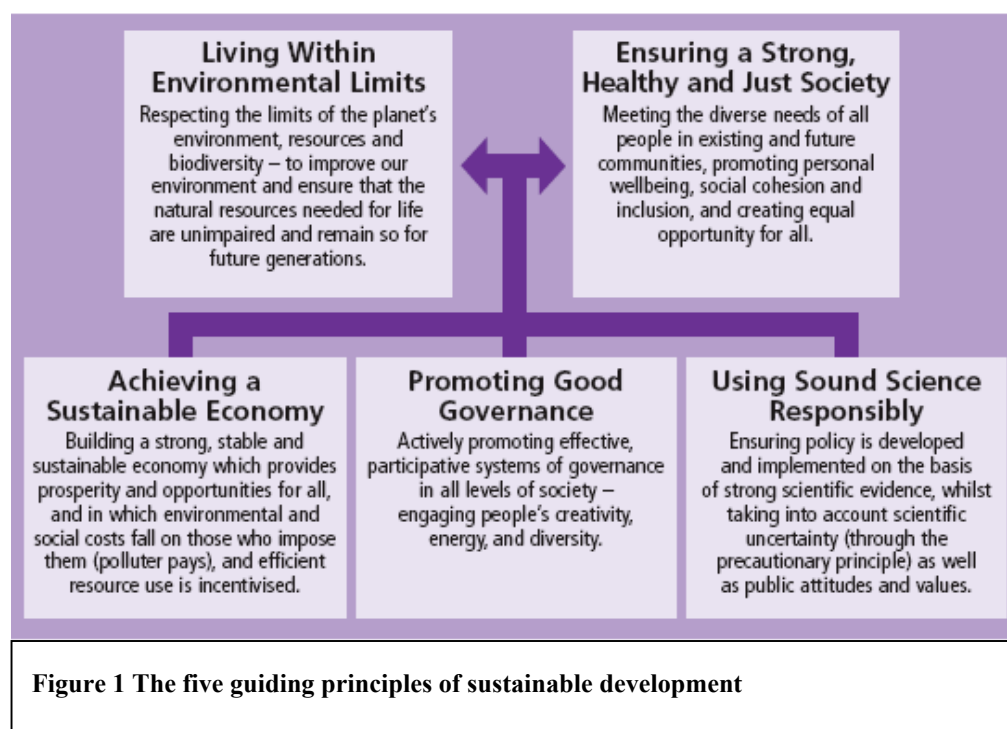
These proposals for the Strategy are based upon the principles of sustainable development which the Government as a whole is committed to support. These are outlined in the UK Strategy for Sustainable Development published in March 2005, ([www.sustainable-development.gov.uk/publications/uk-strategy/uk-strategy-2005.htm](http://www.sustainable-development.gov.uk/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

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.

### 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 1.5 million people and accounts for at least 8% 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 and demolition materials (and soil) equals 91 million tonnes in England and Wales annually (2003). 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.

Energy produced from non-renewable sources and consumed in building services accounts for approximately 50% of UK CO<sub>2</sub> emissions, contributing to climate change, consuming non-renewable resources and adding to pollution. This needs to change if the Government's target of a 60% reduction in the 1990 level of emissions by 2050 is to be achieved.

More than 20% 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 very poor record in relation to people, especially for health and safety. This results 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.

## 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. [www.nao.org.uk/publications/nao\\_reports/04-05/0405364.pdf](http://www.nao.org.uk/publications/nao_reports/04-05/0405364.pdf)

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 value for money, in practice designing and procuring on the basis of whole-life value 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 in 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.

## 2 THE PEOPLE AGENDA

One of the five guiding principles of the UK's Sustainable Development Strategy is Ensuring a Strong, Healthy and Just Society. Construction is hugely dependent on the commitment, skills and adaptability of its workforce. It is still a 'people' industry – in comparison with many newer, high-technology based sectors, construction depends on relatively large numbers of people to deliver its products and services. The industry relies on a continuing supply of skilled people, at all levels, to enable it to provide the buildings and structures clients want, when they need them. Many factors determine how successful individual firms will be in staying in business, not least how capable they are at engaging the skilled people they need. There are also issues that affect the industry as a whole.

### 2.1 The image of skills in construction

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 over 50,000 students to building-related courses each year across the UK, although only 30,000 attain qualifications.

Data from ConstructionSkills and the Learning and Skills Council shows that 30% of all new entrants at NVQ Level 1-3 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 decline in the number of students on built environment courses from 10,630 in 1998/99 to 9,720 in 2002/03, although this was a 3% increase on the year before (source, Higher Education Statistics Agency, HESA). Building has shown the steepest declines in student numbers, while over the same period architecture has experienced consistent increases. Data on 2005 applications to universities and colleges suggests that the number of undergraduates beginning courses in architecture continues to increase.

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 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=355](http://www.bre.co.uk/service.jsp?id=355)) 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.

One part of the delivery of the proposed new Strategy for 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 2005, 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 [www.dti.gov.uk/construction/respect/rfp.pdf](http://www.dti.gov.uk/construction/respect/rfp.pdf)

## 2.6 Equal opportunities and diversity

Construction remains an overwhelmingly white, male-dominated industry. By the end of 2004, some 9% 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. 30% were engaged in non-manual

employment, with 12% in professional occupations – architecture, surveying and management (National Statistics, Labour Force Survey, Spring 2004).

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 21<sup>st</sup> 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 Health and safety and welfare

The Government/Health and Safety Commission's Revitalising Health and Safety (RHS) strategy (2000) set out common targets for improvement in health and safety in all industries.

The targets were to:

- reduce the incidence rate of fatal and major injury accidents by 10% by 2010 (5% by 2004), i.e. 1% year-on-year for 10 years;
- reduce the incidence of cases of work-related ill health by 20% by 2010 (10% by 2004);
- reduce the number of working days lost per 100,000 workers from work-related injury and ill health by 30% by 2010 (15% by 2004).

At the Construction Health and Safety Summit, called by the Deputy Prime Minister in 2001, the construction industry set itself even tougher goals, some 10 times the RHS targets. These were to:

- reduce the incidence rate of fatal and major injury accidents by 66% by 2010 (40% by 2004) i.e. 10% year-on-year;
- reduce the incidence rate of cases of work-related ill health by 50% by 2010 (20% by 2004);
- reduce the number of working days lost per 100,000 workers from work-related injury and ill health by 50% by 2010 (20% by 2004).

At the 2001 Summit, the industry adopted the approach of the Construction Skills Certification Scheme (CSCS) card to raise the health and safety profile. This is a means of registering continuing competence for an individual construction worker. Since then, the industry has voluntarily adopted the CSCS Card, and by 2005 over 750,000 cards had been issued since the start of the scheme in 1995. This is roughly half the workforce and well on the way towards the target of a fully competent workforce across the industry by 2009/10.

In February 2005, a follow-up to the 2001 Summit was held to review progress, maintain momentum, and re-invigorate commitment to health and safety over the next five years and beyond. The occasion also marked the launch of the Respect for People Code of Good Health and Safety Practice (see below). All those involved in the construction process – whether clients, designers, contractors, or government policy-makers – have been encouraged to register commitment to good health and safety practice on a special website, and record their action plans to improve performance in this area.

Up to the end of financial year 2003/4, the fatal injury rate had fallen 25% since the RHS baseline of 1999/2000, and 40% since the 2001 Construction Health and Safety Summit. Employee major injury had fallen 15% since the RHS baseline of 1999/2000 and 12% since the 2001 Summit, while the employee over-three-day accident rate has fallen 25% since the RHS baseline of 1999/2000 and 18% since the Summit.

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.

### 3 MANAGING THE ENVIRONMENT AND RESOURCES

Another of the five guiding principles of the UK Strategy for Sustainable Development is living within environmental limits. Three aspects of this are energy, waste and the built environment.

#### 3.1 Energy

##### Climate change programme

The UK Climate Change Programme (CCP) was published in 2000 and set out policies to deliver both the UK's commitment to reduce emissions of greenhouse gases by 12.5% on base year levels by 2008-12 under the Kyoto Protocol, and also the UK's more ambitious domestic goal to reduce emissions of carbon dioxide by 20% on 1990 levels by 2010. Emissions from buildings contribute around 50% of UK carbon emissions, and a number of policies to tackle these emissions were included in the original CCP or have been developed since. Revisions to Part L of the Building Regulations, coming into force in 2006, require substantial improvements in the energy efficiency and 'carbon footprint' of new buildings. The CCP, and the UK's progress towards both its Kyoto commitments and domestic target for emissions, are currently under review. It is expected that a new programme setting out a number of new policies to move us towards our climate change goals will be published in early 2006.

##### 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

[customs.hmrc.gov.uk/channelsPortalWebApp/channelsPortalWebApp.portal?nfpb=true&pageLabel=pageExcise\\_ShowContent&id=HMCE\\_PROD\\_009791&propertyType=document](http://customs.hmrc.gov.uk/channelsPortalWebApp/channelsPortalWebApp.portal?nfpb=true&pageLabel=pageExcise_ShowContent&id=HMCE_PROD_009791&propertyType=document)

##### 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 and through the ongoing Climate Change Programme review is now looking in detail at possible new and strengthened cost-effective energy efficiency policies and measures.

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

In the Pre-Budget Report of December 2005 the Chancellor announced a summary of the principal conclusions of the joint DEFRA and HM Treasury Energy Efficiency Innovation Review. It can be found on the Treasury, DEFRA, Energy Saving Trust and Carbon Trust websites [www.hm-treasury.gov.uk/pre\\_budget\\_report/prebud\\_pbr05/other\\_docs/prebud\\_pbr05\\_odenergy.cfm](http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr05/other_docs/prebud_pbr05_odenergy.cfm) [www.defra.gov.uk/environment/energy/review](http://www.defra.gov.uk/environment/energy/review) [www.est.org.uk/aboutest/publications/eeirsummary](http://www.est.org.uk/aboutest/publications/eeirsummary) [www.thecarbontrust.co.uk](http://www.thecarbontrust.co.uk)

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 is being considered as part of the ongoing Climate Change Programme Review.

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 Review. This work is feeding into wider consideration of how best to focus government research funds, under the management of the Carbon Trust.

## The DTI's Microgeneration Strategy and Low Carbon Buildings Programme

The aim of the Government's Microgeneration Strategy is to remove barriers preventing the uptake of microgeneration technologies and stimulate demand to create a marketplace where they become popular commodities rather than expensive niche products. The Strategy must be published by April 2006 under the requirements of Section 82 of the Energy Act 2004.

In October 2005, DTI announced the start of the Low Carbon Buildings Programme in April 2006 (provided the necessary state aids clearance is received) with £30 million to spend over three years. £1.5 million would be pulled forward to ease the transition between the existing capital grant programmes (Clear Skies and Major Photovoltaic Demonstration Programmes), which finish in March 2006, and the new programme.

Sustainable construction has a key role to play in helping to create a stable market for microgeneration technologies. Several questions in the Microgeneration Strategy consultation (which closed in September 2005) focused on this issue. The Microgeneration Strategy will be looking at ways to promote sustainable construction incorporating microgeneration technologies.

## 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 will allow 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 investments by business to help EU Member States achieve the reductions necessary to meet their Kyoto Protocol targets for 2008-2012.

The pilot stage of the Scheme, Phase I, started on 1 January 2005 and will run for three years (2005 to 2007). The approved UK National Allocation Plan (NAP) for the first phase was published in May 2005, and the first trade took place the same day. Following phases will each last for five years for which the NAPs must be submitted to the European Commission 18 months before the beginning of the relevant period.

The second phase coincides with the first Kyoto commitment period (2008 to 2012). The Phase II NAP is to be submitted to the European Commission by the end of June 2006, and the UK Government is intending to produce a draft NAP for formal consultation later in the year of the year. The UK Government has been gathering and analysing evidence to inform decision-making on the Phase II NAP and the shape and scope of the Scheme. Responses received from the 2005

consultation and partial Regulatory Impact Assessment, together with a significant amount of further research, and views and signals from other Member States and stakeholders, will all feed into the development of the draft NAP and Phase II policy.

### 3.2 Waste

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 Office of the Deputy Prime Minister's (ODPM) website: [www.odpm.gov.uk](http://www.odpm.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.

The Government through the Environment Agency wants to manage waste in a sustainable way, optimising recycling and re-use as well as limiting its production, and within the current legal arrangements. 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, for example – and working out new approaches to low risk waste regulation. See: [www.environment-agency.gov.uk/subjects/waste/1030716/1098094/?lang=e](http://www.environment-agency.gov.uk/subjects/waste/1030716/1098094/?lang=e)

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. The Department for Environment, Food and Rural Affairs (DEFRA), which leads on waste management topics, is now looking at establishing the Site Waste Management Plans as a regulatory requirement for industry, and the scale and scope of these is being considered through a formal consultation process with industry in 2006.

Fly-tipping is one of a number of problems highlighted by the Anti-Social Behaviour Act (Nov 2003). Meanwhile, the Clean Neighbourhoods and Environment Act 2005 contains provisions on waste management,

including on fly-tipping, and may require construction firms to have Site Waste Management Plans.

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.

For further information on waste management and regulation issues, see the Environment Agency website: [www.netregs.gov.uk](http://www.netregs.gov.uk)

#### Review of Waste Strategy 2000 (September 2005)

Waste Strategy 2000 set the government strategy for waste management in England and Wales up to 2020. A review of the Strategy was instigated in September 2005 and provides an opportunity to reflect on existing policies and delivery mechanisms, to evaluate progress to date, and to set out the Government's long-term strategy on waste.

The Government intends to publish an authoritative revised waste strategy for England in summer 2006, setting its vision and strategic direction on waste for the next 15 years, as well as the policies and actions to deliver the strategy.

Key themes will include:

- a clearer long-term vision for waste and resource management as part of the Government's drive for sustainable development and in particular sustainable consumption and production;
- the optimum framework of targets for recycling and composting;
- making a modernised land use planning regime deliver for waste;
- the use of economic and other incentives to drive businesses and consumers to manage their waste and resources more sustainably.

The review will take into consideration European developments, in particular the European Commission's Thematic Strategies on Waste Prevention and Recycling and Sustainable Resource Use to ensure that waste policy sits within the Thematic Strategies framework and the broader context of action at EU level on sustainable development.

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.

For further information see [www.defra.gov.uk/environment](http://www.defra.gov.uk/environment) /+issue covered.

#### 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 re-use. 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, £32 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](http://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 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 the existing Waste and Resources Action Programme (WRAP) and the Department of Trade and

Industry (DTI) establish a programme to deliver related projects. Two work streams were identified:

- 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 aggregates see [www.wrap.org.uk](http://www.wrap.org.uk)

### Waste and Resources Action Programme (WRAP)

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](http://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 increase in the loss of resources to inert landfill which 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 the Waste and Resources Action Programme see <http://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 2004 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 of 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](http://www.defra.gov.uk/environment/waste)

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

### 3.3 The Built Environment

#### Building Regulations

Part L Conservation of Fuel and Power - including Energy Performance in Buildings Directive (EPBD) and Part F - amendments

New Approved Documents for Part L and Part F are coming into force on 06 April 2006. It is expected that together with the regulation standards, this will deliver new dwellings which will conserve on average 20% more energy compared to existing regulations, while standards for other types of 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 m<sup>2</sup>, '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.

[www.odpm.gov.uk/index.asp?id=1130479](http://www.odpm.gov.uk/index.asp?id=1130479)

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.

#### 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 which 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 Office of the Deputy Prime Minister (ODPM) is undertaking research to look at how 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.odpm.gov.uk](http://www.odpm.gov.uk)

[www.dti.gov.uk/energy](http://www.dti.gov.uk/energy)

## Sustainable Communities Plan

In February 2003, the 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; £500 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.odpm.gov.uk/communities](http://www.odpm.gov.uk/communities)

### 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.

Draft Planning Policy Statement (PPS) 3: Housing was published for consultation in December 2005 by ODPM, and 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.

Draft 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 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](http://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 (such as A rated appliances or dual flush toilets), site and household waste, materials, and surface water

management in order to meet the base level of the Code. Further optional 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 microgeneration.

The Code does not substitute for Building Regulations. It is very comprehensive – addressing some things not in regulation – 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 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.

All homes receiving direct government funding will meet the Code and those built through English Partnerships and Housing Corporation programmes will meet level three, which is significantly 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 this on an annual basis. It is the Government's ambition for the Code to become the norm for new-build homes.

The Code is voluntary and compliance will not be a condition of planning approval. Local authorities are also being encouraged in Planning Policy Statement (PPS) 3 to identify strategic sites, where homes may meet the Code, in their local development plans.

### Modern methods of construction

The term 'modern methods of construction' is difficult to define in precise and unequivocal terms and it is even more difficult to provide data to demonstrate the benefit brought to either part or the whole of the construction or operation of a building or structure by adopting a certain approach or methodology. Looking back over the last five years, it is clear that a more mature view is now emerging from construction stakeholders that to be 'modern' is not synonymous solely with the adoption of a new 'technology', and that it represents an amalgam of good design principles, and improved procurement practice and construction process which is responsive to clients, improves the built environment, and is sustainable. These factors have been covered elsewhere in the Strategy.

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 terms 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); see [www.nao.org.uk](http://www.nao.org.uk)
- for information;
- ODPM/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](http://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. An announcement on the outcome is likely in February 2006.

Information about the competition and ideas put forward can be viewed online at [www.designformanufacture.info](http://www.designformanufacture.info)

Enquiries can also be sent to:  
[designformanufacture@englishpartnerships.co.uk](mailto: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](http://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, 60% 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.

#### 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 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](http://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.

### 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 over £125 billion, the public sector can transform markets so that the private sector can join forces with it in pursuing sustainable purchasing policies. Established in May 2005, the Sustainable Procurement Task Force is charged with drawing up an Action Plan for Government by April 2006 to bring about a step-change in sustainable public procurement so that the UK is among the leaders in the European Union by 2009. The Task Force is under the chairmanship of Sir Neville Simms. See [www.sustainable-development.gov.uk/delivery/global-local/ProcurementTaskForce.htm](http://www.sustainable-development.gov.uk/delivery/global-local/ProcurementTaskForce.htm)

The Task Force working groups are:

1. International Benchmarking
2. Data-gathering and Prioritisation
3. Working with Suppliers to achieve improvements
4. Government Accounting and Budgeting
5. Capacity Building/Training/Skills

Task Force sub-groups are:

1. Testing the Flexible Framework sub-group
2. Data sub-group
3. Macro Issues sub-group

The Action Plan should set out how to:

- avoid adverse environmental impacts arising on the government estate and in the supply-chain;
- make more efficient use of public resources;
- stimulate the market to innovate and to produce more cost-effective and sustainable options for all purchasers;
- set an example for business and the public and demonstrate that Government and the wider public sector are serious about sustainable development.

### 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.

### 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.

As evidence of MOD's commitment to sustainable delivery, MOD's design and construction strategy, Better Defence Buildings, was reissued in 2005 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 will be published by OGC shortly.

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 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.

Finally, another initiative – lead by Waste Resources Action Programme (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.

## 5 OVERSEAS DIMENSION

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 re-use 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.

## 6 INITIATIVES

Since formulation of the 2000 Strategy for Sustainable Construction there have been various developments relevant to the issue of sustainable construction. Some of these are described below.

### 6.1 TrustMark

TrustMark has been developed to replace the Quality Mark scheme which 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 tradespeople. 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](http://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.

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 which 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 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.

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.

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](http://www.dti.gov.uk/construction/research)  
A project database and archive can be found at [www.constructionresearch.info](http://www.constructionresearch.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 which incorporated 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 recent issue of the Common Minimum Standards for the procurement for built environments in the public sector will reinforce 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, ODPM, 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. An example is the South West RDA which, along with other regional partners, has promoted Future Foundations supporting the development of a Sustainable Construction Charter for the region. This provides a definition of sustainable construction, checklist and engagement tool. The Future Foundations project forms one of the five strands of Constructing Excellence in the region and provides a catalyst for ensuring policy and practice to support the delivery of sustainable construction. To date, around 140 organisations have pledged support for the initiative, gaining a wider understanding of the benefits of adopting this approach and delivering a more sustainable future for the region as a result. See: [www.futurefoundations.co.uk](http://www.futurefoundations.co.uk)

#### 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.

See DCMS:

[www.culture.gov.uk/global/press\\_notices/archive\\_2005/dcms162\\_05.htm](http://www.culture.gov.uk/global/press_notices/archive_2005/dcms162_05.htm)

## 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](http://www.dti.gov.uk)

## 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.

Full details can be found at: <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. They are available from [www.sustainable-development.gov.uk](http://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.sustainable-development.gov.uk](http://www.sustainable-development.gov.uk)

[www.constructingexcellence.org.uk](http://www.constructingexcellence.org.uk)

[www.dti.gov.uk/construction/kpi](http://www.dti.gov.uk/construction/kpi)

[www.constructionresearch.info](http://www.constructionresearch.info)

[www.ciria.org.uk](http://www.ciria.org.uk)

## 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 which 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 which provide opportunities across the country for the construction industry to engage locally with the improvement agenda. These are independent organisations which 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 SustainabilityZone 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](http://www.constructingexcellence.org.uk)

## 6.9 Sustainability Checklists

The South East England Development Agency's (SEEDA's) 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.

Sustainability Checklist sections:

- Outward focus - impact on the wider community
- Land use, urban form and design
- Transport
- Energy
- Impact of buildings
- Impact of infrastructure
- Natural resources
- Ecology
- Community
- Business

The Checklist provides suggested ranges of performance or standards, which are derived (wherever possible) 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. See [www.sustainability-checklist.co.uk/TheChecklist/ImpactofBuildings/](http://www.sustainability-checklist.co.uk/TheChecklist/ImpactofBuildings/)

Funding has been provided by ODPM 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.

#### 6.10 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
- ensure that regulation to encourage sustainability does not impose unnecessary burdens on small business.

Through the [businesslink.gov](http://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.

## 7 INDUSTRY INVOLVEMENT

Sustainable construction is not just for Government. It is an issue being embraced and taken forward by both Government and businesses.

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](http://www.dti.gov.uk/construction/sustain)

Reputation, Risk and Reward ([www.projects.bre.co.uk/rrr](http://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.

Many companies have developed their own sustainability plans and strategies. This is in line with Promoting Good Governance – one of the five guiding principles of the UK's Sustainable Development Strategy. Additionally though, 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 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 which 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 16 sponsoring and supporting organisations (for full list see [www.shake-up.org](http://www.shake-up.org)), and 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 Envirowise during 2005. The Sub-Group is also working on the development of a guide aimed at architects called Designing for Waste Minimisation, which will be 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 brainstorming '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 as 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 £96 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 better manage 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 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 actively manage 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).

## 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.

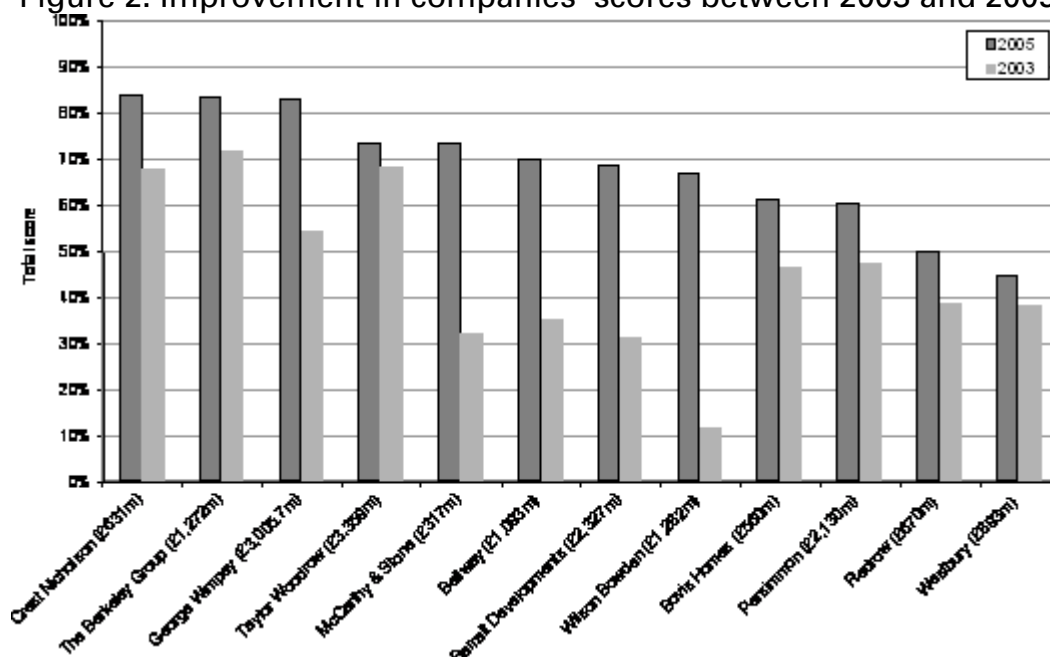
In January 2004, in partnership with WWF, Insight published a benchmarking study (carried out during 2003) which evaluated how well the UK's leading listed house-builders were managing and reporting on sustainability issues. Each company was evaluated against a set of 18 criteria reflecting best practice 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 2. 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.

Figure 2: Improvement in companies' scores between 2003 and 2005



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. 8

## THE FUTURE

The Sustainability Forum has developed a vision for the future. This vision highlights key issues across the spectrum of sustainability, and challenges Government and industry with specific objectives. These are listed below, together with relevant government targets. Government continues to work with industry to avoid the need for further regulation by application, where appropriate, of voluntary mechanisms.

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

Issue	Industry's vision	Metric	Government targets	Industry's vision of interim progress date	Final achievement date	Primary responsibility	Mechanism	Second-ary responsibility
Climate change/energy	Zero CO <sub>2</sub> emissions (in m <sup>2</sup> /yr)	CO <sub>2</sub> emissions /m <sup>2</sup> /yr, predicted and measured	Publicly funded houses to be CSH level 3 as of April 06  CO <sub>2</sub> emissions 20% below 1990 levels by 2010. 1990 level was 165mt so target is 132mt.	20% of new build by 2010; existing by 2015	100% of new build by 2020: existing by 2030	ODPM (publicly-funded housing); DEFRA (overall climate change); planners; designers	Building regulations; planning; taxation; incentives; enforcement; CSR; awareness	Developers; clients; designers; contractors
Waste	Zero waste	Tonnes to landfill. UKSD framework indicator (all industries) 1998/99 100,170mt to landfill. 2002/03 96,302mt to landfill.	Publicly funded houses to be CSH level 3 as of April 06. Total waste arisings for 2001 were 93.91mt of which 40mt is currently recycled; the target being greater recycling up to 100% in a viable economic climate.	2006; annual review	2020	Government; developers; clients; manufacturers	Legislation; regulations; enforcement; demolition protocol; taxes; incentives; CSR; awareness	Local authorities; designers; contractors
Materials	Use of sustainable materials/reduced materials consumption. Use of recovered materials.	'A' rated materials used/% reduction/LCA declaration for products.	Publicly funded houses to be CSH level 3 as of April 06	50% reduction by 2015; annual review  Currently 13mt of construction materials annually delivered to site remain unused	90% by 2025	ODPM; manufacturers; developers; contractors	Regulation; codes; green guide; supply chain monitoring	Local authorities; planners; companies; specifiers

Costs	Change to whole-life costing of (public) assets	% deployment (new build selected on basis of WLC); Construction Inflation Index	Treasury already defines value for money as the optimum combination of whole-life cost and quality to meet the user requirement	2010	2020	OGC; city institutions and funders; clients	Changed policy – new public finance paradigm/voluntary (market mechanisms)	PFI bidders; designers
Water	Reduced consumption (especially potable)	Litres/person/day 1992 – 140 l p/d 2003 – 154 l p/d	Publicly funded houses to be CSH level 3 as of April 06	30% reduction by 2010	50% by 2015	ODPM; OFWAT; local authorities; planners	Building regulations; planning; enforcement; billing and metering; water trading; awareness	Developers; companies; public demand
Quality; aesthetics	Quality and aesthetics standards c.f. Sweden/ publicly accessible buildings	CABE-provided exemplar buildings/ DQI	To be confirmed. DCMS is in the process of reinvigorating the ministerial Design Champion role which promotes quality design throughout Government.  All publicly funded houses to be CSH level 3 as of April 06	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 >£1m in value	2008/2010	ODPM; CABE; professional institutions; BRE	Measurement against exemplars; increased legislation	Finance institutions; developers; construction industry
Skills	Zero skill shortage (trades and professions; existing workforce and trainees)	Capacity building; number of skilled shortfall; % trained annually; quality of life measurement  Number of skill-shortage vacancies in construction 2004 = 13,650. % of which are skill-shortage related in 2004 = 43%. (Source Respect for People KPIs 2005)	Developing Sector Skills Councils that are valued, appropriately focused, and have viable strategies that are implemented effectively, and which contribute to improved business performance in the industry	25% of existing workforce trained; and 100% of new trainees	Annual review	Government; CITB-Construction Skills; professional organisations	Conscription; mandatory courses; CSR; awareness	Training organisations; clients; designers; contractors; CPD
Safety	Zero RIDOR (reported accidents)	Accident frequency rate	The Revitalising Health and Safety	2006; annual review	2020	Clients; HSE	Process actions; training	Designers; contractors

			<p>strategy statement, (June 2000), set national targets for improving health and safety performance by 2010:</p> <ul style="list-style-type: none"> <li>• to reduce the incidence rate of fatalities and major injuries by 10%;</li> <li>• to reduce the incidence rate of cases of work-related ill health by 20%;</li> <li>• to reduce the number of working days lost per worker from work-related injury and ill health by 30%; and to achieve half the improvement under each target by 2004.</li> </ul>				<p>Formal mechanisms: Codes and standards</p> <p>Informal mechanisms: Best practice guides</p>	
Equity/ Respect for People	Fair trade & Respect 4 People commitment	<p>Number of commitments ; DQI assessment</p> <p>Currently 15% of direct construction industry employees covered by liP recognition (source: Respect for People KPIs 2005).</p>	Respect for People adopted by the industry as a core business value	--	2010	Government lead; CABE; H&S	Participatory processes: DQI	ODPM; planners; peer pressure

Of particular note, after the successful bid, is the 2012 Olympics which 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 sustainably 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 are important and, where possible, they should be incorporated into future work.

### 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.odpm.gov.uk/index.asp?id=1127955>

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 which 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.

## 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, 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 which 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.

## 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 which 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 and to feed the results into future projects, yet this process can be invaluable.

Listing of other organisations relevant to sustainable construction

The Sustainable Development Commission (SDC) [www.sd-commission.gov.uk](http://www.sd-commission.gov.uk)

The SDC's main role is to advocate sustainable development across all sectors in the UK, review progress towards it, and build consensus on the actions needed if further progress is to be achieved.

The Strategic Forum for Construction  
[www.strategicforum.org.uk](http://www.strategicforum.org.uk)

[www.sustainable-development.gov.uk](http://www.sustainable-development.gov.uk)

The website outlines the Government's approach to sustainable development. It consists of policy and strategy documents, information, links, and consultations.

WWF [www.wwf-uk.org](http://www.wwf-uk.org)

The mission of WWF – the global environment network – is to stop the degradation of the planet's natural environment, and to build a future in which humans live in harmony with nature. WWF-UK is currently running the Sustainable Homes campaign, pressing for higher environmental standards for buildings in the UK.

The Mayor of London's guide to sustainable design and construction  
[http://www.london.gov.uk/mayor/planning/docs/Sustainable Design and Construction.pdf](http://www.london.gov.uk/mayor/planning/docs/Sustainable_Design_and_Construction.pdf)

Business in the Environment [www.business-in-environment.org.uk](http://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](http://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/](http://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;
- promoting the use of small-scale renewable energy sources, such as solar and wind.

Building Regulations – Measures to reduce carbon emissions in building construction and make the process more efficient

Approved Document (AD)	Subject Area	Summary of input to make reduction in areas such as carbon dioxide emissions/energy consumption/health, safety and welfare and noise pollution
A	Structure	Durability of structure and materials through suitable use, detailing and construction methods ensuring that the building is safe structurally.
B	Fire Safety	ODPM is currently (2005) 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.
C	Site Preparation and Resistance to Moisture	Part C was recently revised. The review dealt with moisture and weather 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.
D	Toxic Substances	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.
E	Resistance to Passage of Sound	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.

F	Ventilation	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.
G	Hygiene	ODPM is currently (2005) reviewing Part G. The range of issues includes hot water safety, better scales of provision of toilets and a new topic of water conservation
H	Drainage and Waste Disposal	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.
J	Heat Producing Appliances	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).
K	Protection from Falling, Collision and Impact	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.
L	Conservation of Fuel and Power	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.
M	Access to and use of Buildings	Part M deals with accommodating the changing lifestyles and circumstances in housing through design and increasing social equity by enabling access.
N	Glazing	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.
P	Electrical Safety	New building regulations aimed at curbing the unacceptable number of deaths, injuries and house fires caused by faulty electrical installations.
R7	Materials and Workmanship	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.

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East Midlands Development Agency (EMDA)

English Partnerships (EP)

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Office of Government Commerce (OGC)

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Sustainable Development Commission (SDC)

Treasury (HMT)

UK Trade and Investment (UKTI)

Waste Resources Action Programme (WRAP)

Welsh Assembly