

**The UK Construction Industry:  
progress towards more sustainable  
construction 2000 - 2003**

The Sustainable Construction Task Group

October 2003



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This report has been prepared by the Sustainable Construction Task Group, Chairman Sir Martin Laing. SCTG members are the British Property Federation, CABE, Construction Confederation, Construction Industry Council, Construction Products Association, Electrical Contractors' Association, Forum for the Future, Housing Corporation, Insight Investment, Office for Government Commerce, Sponge, and WRAP. The secretariat for the group is provided by BRE.

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## Introduction

Three years ago 'Towards Sustainability – A Strategy for the Construction Industry' identified a ladder, with each rung representing a key area in which progress had to be made to achieve sustainable construction. This report aims to

- Account for progress up the ladder;
- Review the ladder;
- Highlight innovations that are ready for widespread uptake;
- Suggest priorities for next steps.

The Sustainable Construction Task Group looks forward to this review being advanced by young property and construction professionals, in the shape of a critical appraisal of progress and challenges for the industry, due to be published in Spring 2004.

### Legislation

A common call is that legislation is the only driver for change to the industry and the built environment. Landfill Tax, Quarry Tax and the Climate Change Levy have all had an impact. Revisions to Building Regulations, such as Part L, have also challenged the industry, with the forthcoming European Energy Performance of Buildings Directive bringing more change. The recent Communities Plan from the Office of the Deputy Prime Minister (ODPM) presents a framework for sustainable communities. The industry has yet to realise its practical response. More changes will be brought through the Energy White Paper, Water Bill and Planning and Compulsory Purchase Order Bill.

The OECD's report 'Environmentally Sustainable Buildings' reviews legislation and policy across developed countries and suggests a level of best practice. Comparison of UK policies with other OECD countries shows that overall the UK is neither leading, nor lagging behind. Industry requested a report on how EU legislation impacts on sustainable construction, and this is now available on the DTI website. Legislation is important, and arguably it should become a new first rung of the ladder.

### Group work

Nevertheless, much of the action to date has been voluntary, as the professions act according to personal commitments and government guidance. There has been marked growth of joint initiatives, listed below, which act across many rungs of the ladder. The value of these opportunities for networking and joint action cannot be underestimated.

- British Institute of Facilities Management, International Facility Management Association and Royal Institute of Chartered Surveyors (RICS) joint initiative on Sustainable Facilities Management;
- FIT Buildings Network;
- Royal Institute of British Architects (RIBA) Sustainable Futures Group;
- Chartered Institution of Building Services Engineers (CIBSE) Carbon Task Group;
- Civil Engineering Sustainability Sector Strategy (Institution of Civil Engineers, Association of Consulting Engineers, Civil Engineering Contractors Association, Construction Products Association and CIRIA);
- Construction Industry Council (CIC) Sustainable Development Committee;
- SALLI, the Sustainability Alliance of Professions;
- RICS Foundation
- Global Alliance for Building Sustainability (GABS);
- Sponge;
- Property Environment Group (PEG) by Upstream;
- Regional work, for example in the East of England and Wales on strategies for the construction industry;
- Strategic Forum overseeing Constructing Excellence, made up of Rethinking Construction and Construction Best Practice.

The following pages present progress up each rung of the ladder. To avoid repetition, each piece of evidence has been inserted against the one rung it applies to most closely, though much of the evidence applies to more than one rung.

- Promoting awareness and educating people
- Collecting information on sustainability initiatives and practical examples of sustainability in action
- Monitoring and observing performance
- Demonstrating a clear business case for more sustainable construction
- Stakeholder dialogue
- Spreading best practice
- Setting and promoting targets
- Establishing a Voluntary Code of Reporting
- Reviewing Performance
- Learning from failures



## Promoting awareness and educating people

### What's happened?

There have been a great many events, seminars and conferences on or around the subject of sustainable construction since 2000, many of them organised by the joint initiatives mentioned above.

Professional bodies and trade organisations have been busy helping their members keep up to date. Publications have also encouraged an understanding of the issues underpinning sustainable construction. Action has shifted focus from general awareness raising to targeted guidance and strategies covered by the next rungs of the ladder. However, it is worthwhile highlighting some specific steps forward:

- The CIC Happold Lecture series, particularly Tessa Tennant's lecture
- The 'Inspiring Construction' course at Schumacher College.
- The continued work of Action Energy (formerly the Energy Efficiency Best Practice Programme), The Energy Saving Trust, The Carbon Trust and INREB, in particular the Design Advice programme and its three review books.
- The Environment Agency has produced training materials on construction and demolition waste, and sent it to all training establishments. Their initiative NetRegs promotes awareness of environmental legislation and how to comply, particularly with a section for construction.
- 'Easy Access to Environmental Management' simplifies the process for small companies.
- 'Constructing for Sustainability' raises the awareness of clients.
- SD4BP is a website highlighting training opportunities for building professionals.
- WWF's 1 Million Sustainable Homes Initiative has raised public awareness.

- Forum for the Future has been involved with many awareness raising projects, such as 'Engineers for the 21st Century', the London Sustainability Exchange (LSx) and The Natural Step.
- Sustainable Construction in Practice (SCiP) regional education roadshows.

Many Professional Bodies including ICE, RIBA and RTPI have integrated sustainability issues into the accreditation guidelines for undergraduate degrees leading to chartered status and into the requirements for full professional membership.

### Is it enough, and what next?

- Awareness within the construction professions and trades is increasing, but not enough
- The overload of initiatives for the construction sector can be confusing.
- There are continuing problems reaching small and medium sized enterprises, and the entirety of supply chains.
- Education of the general public, and homeowners in particular, is a key area, which could also reach the elusive small and occasional clients.
- CABE Education aims to 'inspire young people to connect with, understand and get more from their built environment'. The newly formed Advisory Committee of Built Environment Education has been asked to make recommendations for improvements in the sector to two government departments.
- The Sustainable Development Commission has an educational role and could also become involved.
- The Egan Skills Review currently being carried out will produce relevant guidance for further action.

## Collecting information on sustainability initiatives and practical examples of sustainability in action

### What's happened?

- 'Demonstrations of Sustainability'
- 'Accounting for Sustainability'
- 'Sustainable housing schemes in the UK: a guide with details of access'
- Ecoconcrete and Total Climate Control
- Action Energy Good Practice Guides

The documents above are examples of a plethora of publications that have gathered examples of more sustainable projects. The UK boasts many recently completed exemplar sustainable construction projects. This report is illustrated by some examples, and the table below lists yet more. Housing examples are collated by organisations such as 'Sustainable Homes'. Constructing Excellence also collects information through the demonstrations program:

### HOUSING

- Gallions' Thamesmead Ecopark
- Rocket Pool Drive, Wolverhampton
- Central Oakridge Regeneration, Basingstoke
- Bryce Road, Dudley
- Greenwich Millennium Village
- Raines Dairy, Stoke Newington
- Fairfax House, Lambeth
- Nightingale Estate
- BedZED, Sutton
- Netherne-on-the-Hill, Coulsden
- Gusto Millennium Green, Collingham
- Mason Moor Housing, Southampton
- Various Integer projects, such as Sandwell

### CIVIL ENGINEERING

- Reading Sewage Treatment Plant,
- Newburn Riverside land reclamation, Newcastle
- Greyabbey & Kircubbin Wastewater Treatment Works,
- Newtownstewart Bypass,
- Osberton Top Bridge Refurbishment, Chesterfield Canal,
- Littlestone Sea Defences,
- Wakefield Flood Defence Works
- Mayfield Farm Constructed wetlands, Heathrow
- Tayside gully waste treatment centre

### OFFICES

- Arup campus
- Wessex Water Headquarters, Bath
- Greater London Authority headquarters
- Richard Doll Building, Oxford
- Portcullis House, Westminster
- Norton Park, Edinburgh
- BRE Environmental Building, Watford

### OTHERS

- University of East London Docklands Campus
- Great Western Hospital, Swindon
- Great Notley Country Park Discovery Centre
- Dunston Innovation Centre
- Cabot Community Sports Centre, Bristol
- University of East Anglia, ZICER building
- De Montford University Millennium Campus
- University of Nottingham Jubilee campus
- Pride Park land reclamation plus stadium and business park construction, Derby

### Is it enough and what next?

- More exemplar development is needed, but exemplars must be publicised so they become normal practice
- The right information must be collected and presented in the right way to the right audiences.
- The current balance of information is heavily weighted towards new build projects, which usually have a strong steer from a client with a professional interest in sustainability. Speculative developments and refurbishments are rarely a feature.

## Monitoring and observing performance

### What's happened?

At an industry level, all major awards now have sustainability categories, and sustainability criteria are being used to judge overall winners. Examples include The Civic Trust, RIBA, RICS, ICE, Better Public Building, Design Council, Housing, Building, Quarry Products Association and CABE.

On a project basis, various independent and self-assessment schemes monitor and reward the achievement of environmental and social criteria. BRE's Environmental Assessment Method (BREEAM) has versions for offices, homes (called EcoHomes) retail and industrial units, with more in development. CEEQUAL is an environmental and social assessment method for civil engineering. NEAT is a self-assessment scheme developed for NHS Estates. SPeAR is a sustainability appraisal system that can be applied to companies, processes or projects.

When considering investment the FTSE4GOOD Index rates companies on their environmental and social performance. Other examples are Morley Fund Management's Sustainability Matrix and the Business in the Environment/Community annual surveys. The Mass Balance report examined total industry resource use and impact.

At a sectoral level, associations are examining and reporting on performance:

- Society, sustainability and civil engineering.
- A sustainability strategy for the brick industry.
- Sustainable Steel Construction – Building a better future.
- Sustainable development and the cement and concrete sector.

At a company and project level, a wide range of indicators are available for monitoring purposes. They have supported companies in making benchmarking standard practice:

- 'Sustainable construction: company indicators'.
- DTI Construction KPIs, including this year Environmental KPIs, based upon the M4I EPIs.
- Design Quality Indicator.
- Construction Product Association KPIs, covering environmental and social issues.
- Respect for People indicators and toolkits.
- Whole Life Cost Forum comparator tool.
- Carillion's 'Strategy for sustainability'.

The Clients Charter brings issues from the indicators listed above together, to help clients specify sustainable performance and monitor achievement.

### Is it enough and what next?

- A regular comment is that there are too many indicators!
- Companies must regulate the number of indicators they use, and ensure they are extracting useful data.
- Constructing Excellence demonstrations and case studies prove the benefits of understanding performance.
- Absolute and normalised indicators must be developed, with robust measures and both short term and aspirational SMART targets.

## Demonstrating a clear business case for more sustainable construction

### What's happened?

This is where the collections of sustainability initiatives and examples often fall down – explaining why a company would want to do it in the first place. Most exemplars feature extraordinarily committed clients or planners or design teams or contractors, or all four. However, some publications have collected compelling evidence of the business benefits of more environmentally and socially aware construction activity:

- 'Reputation, Risk and Reward'
- 'Sustainable buildings: benefits for occupiers, designers, investors and developers and constructors'
- Carillion case study of Great Western Hospital
- SIGMA project
- 'The Value of Good Design'
- 'Sustainability Pays'
- 'Sustainable Buildings are better business'

### Is it enough and what next?

- There remains a lack of clear evidence to convince those that continue to be sceptical.
- Companies are becoming more used to reporting internally and sharing data externally, which must become the norm.
- More authoritative reports can be made by involving unbiased organisations. Following Carillion's leadership of putting their case study in the public domain will benefit the entire industry.

## Case Study

### ZICER Building, University of East Anglia

The University of East Anglia has already proved itself a forward thinking client, with the construction of the Elizabeth Fry Building, claimed by the Building Services Journal to be 'the best building in the UK'. Now UEA have improved on it with the ZICER Building. A purpose built centre for five high profile environmental departments, it had to be attractive to look at and work in, and highly energy efficient.



- The constructors Willmott Dixon, is very pro-active toward the environment and sustainability and very proud to be associated with the design and construction of ZICER. Willmott Dixon even ensured that the ground works vehicles ran on recycled fuel.
- Whitbybird engineers were involved with integrating photovoltaic panels into the top floor of the building and modelling the performance. The 33kW array displaces 18 tonnes of carbon dioxide production per year. Additionally, the building is connected to the UEA's CHP network.
- Construction materials, fitting and furniture were chosen with whole life cycle impacts in mind. For example, recycled concrete aggregates were used in the foundation. Timber was sourced from sustainably managed forests.
- Features such as triple glazed windows with integral adjustable blinds ensure it is one of the most airtight buildings of its size and nature in the UK. The carbon index is greater than 10, leading to carbon emissions 70% lower than mid-1990s best practice.

## Stakeholder dialogue

### What's happened?

A wide range of projects have endeavoured to improve dialogue with users, local communities and other stakeholders, including:

- Respect for People Initiative
- School Works
- Enquire by Design, Planning for Real and Place Check
- AccountAbility 1000 Series
- Just Values – beyond the business case for sustainable development
- How to be a socially responsible client initiative
- Quarry Products Association Good Neighbour scheme
- PVC Stakeholder Council developed following The Natural Step 20:20 Vision Report on PVC

The Considerate Constructors Scheme was set up five years ago by the industry to improve construction's image. Raising the standards of management beyond statutory requirements can minimise the disturbance or negative impact to the neighbour, the general public and the environment. The Scheme has now registered over 6,300 sites since inception and in the last year registered some £8bn of contract value. This is equivalent to over 15% of total construction value. Given the present rate of expansion the Scheme expects to register 25% of all construction value in two years time.

Building Sights is a scheme to encourage the use of viewing platforms, site visits and imaginative hoardings to raise awareness of projects under construction. The award, a CABI and Arts Council England joint initiative, is open to projects that have been under construction during 2002/3. Such awareness is often a vital precursor to closer involvement.

Some companies are providing information on stakeholder dialogue in their annual or special reports, which is explained under the 'reviewing performance' rung.

### Is it enough and what next?

- This is a key area in which the construction industry can continue to improve performance.
- Best practice is mostly undertaken by larger product suppliers, developers and contractors. Cascading this behaviour down the supply chain to more types of organisation and smaller companies is a next step.

## Case Study

### BedZED

Beddington Zero Energy Development (BedZED) is a mixed housing and commercial development of 82, 1-4 bedroom flats and houses, with 1600m<sup>2</sup> of commercial space and workspace. BedZED is a Peabody development in partnership with BioRegional Development Group, designed by Bill Dunster Architects. Features include:



- On brownfield wasteland, reconciling high density living with residential and workspace amenity
- Each dwelling has access to private green space
- All black and grey water treated on site, and rainwater collected
- Super-insulation, wind driven ventilation with heat recovery, and passive solar gain
- Wood fuelled combined heat and power plant
- kW peak photovoltaic installation provides enough solar electricity to power 40 electric cars
- Good transport links, served by train, tram and bus routes
- Secure drop-off points for deliveries,
- Generous bike storage,
- Links into Sutton's existing cycle network,
- A 'pedestrian first' policy, with good lighting, drop kerbs for prams and wheelchairs and a road layout that keeps vehicles to walking speed.
- Construction used local and reclaimed materials

For more information, see [www.zedfactory.com](http://www.zedfactory.com) and [www.bioregional.com](http://www.bioregional.com)

## Spreading best practice

### What's happened?

Action on this rung is often subsequent to general awareness raising. There are many specialist private companies and NGOs disseminating information about specific areas, but below are some of the more general broadcasting routes:

- Construction Industry Environmental Forum (CIEF)
- Environmental Performance Improvement Clubs (EPICs)
- Many CIC Guidance documents, for example on energy, water, brownfield land, transport, adding value etc
- Sponge – for young property and construction professionals interested in sustainability
- 'Liveable City Handbook' by Corporation of London
- Various European projects such as SUREURO, BEQUEST, PRESCO, SUNH and SHINE
- WellBuilt! for local authorities interested in sustainable construction
- Construction Best Practice and Rethinking Construction demonstrations, case histories, regional group events and training programmes.
- The Natural Step Pathfinder Network.

### Is it enough and what next?

- There will always be a role for the dissemination of best practice in the industry.
- Dissemination will be more effective as it becomes more targeted to particular audiences and interest groups.

## Case Study

### Norton Park Edinburgh

Norton Park is a red sandstone Grade II listed former Board School in an inner city location of Edinburgh. Renovation and conversion of the building was managed by the Albion Trust, who wanted to provide office space for a number of voluntary organisations and embody high environmental standards. The brief specified improved performance in certain areas and the designers came up with the following solutions:



- Reduced energy use, considering lighting, ventilation and cooling, through additional insulation and secondary double glazing, a new heating system utilising condensing gas boilers and a heat recovery system incorporating solar technology.
- The use of environmentally preferable construction materials
- Measures to minimise water consumption.

For more information see [www.actionenergy.org.uk](http://www.actionenergy.org.uk)

## Setting and promoting targets

### What's happened?

All the indicators discussed under the 'monitoring and observing' rung have been used to set targets. Some overarching reports have publicised new targets:

- The Engineer of the 21st Century Inquiry and the follow up on Change Challenges for Sustainability
- Urban Task Force report
- Accelerating Change, which includes sustainability as a cross-cutting issue

Improvements in the sustainability of social and private housing have been encouraged by targets such as:

- English Partnerships state all developments they fund must meet BREEAM 'Very Good'. Millennium Communities must meet 'Excellent'.
- The Housing Corporation has set from 1 April 2003 all new ADP funded schemes to receive an EcoHomes accreditation or will not be funded. For 2003/4 the minimum requirement in SDS will be for an EcoHomes 'Pass' rating. Achieving a 'Good' rating will remain a recommended item in the SDS and will attract the Sustainability multiplier in the TCI framework. For 2005/6 the Housing Corporation intends to make the achievement of a 'Good' rating a minimum requirement in the SDS with 'Very Good' becoming a recommended item.

- The Government Construction Clients Panel committed 16 government bodies/departments to achieving BREEAM 'Excellent' on all new build and 'Very Good' on all refurbishment by April 2003.
- WWF's campaign for 'One Million Sustainable Homes' calls for all new build and refurbished homes in the four growth areas (outlined in Sustainable Communities) to be Ecohomes 'Very Good' with a high proportion of 'Excellent'.

This has encouraged company policy on sustainable construction. For example in Countryside Property's 2002 report the company stated "We are committed to achieving an EcoHomes 'Good', with increasing numbers of developments achieving 'Very Good' and 'Excellent' over the next ten years."

### Is it enough and what next?

- There will always be a role for setting and updating targets, within organisations and across the industry. See the next rung on 'reviewing performance'.

## Establishing a Voluntary Code of Reporting and Reviewing Performance

### What's happened?

The combined pressures of corporate governance reform, the threat of legislation in Europe and the UK, and the activity of the socially responsible investment community, are driving ever more companies to report on social and environmental as well as economic performance. Some high level initiatives that have helped progress are:

- Global Reporting Initiative
- CIRIA's Industry Sustainability Indicators and Targets and the Pioneers Club.
- MaSC
- SEEDA's Sustainability Checklist for Developments
- London Sustainable Construction Initiative

The nCRISP review 'Sustaining Sustainability' and OECD's 'Environmentally Sustainable Buildings' and 'Directions#3' by salterbaxter and Context are examples of overarching reviews.

Company reports have become more sophisticated. Of the 21 construction and building material companies in the FTSE250, two thirds cover environment and social performance in some form. Five of the companies are in the FTSE4GOOD Index and three are in the Dow Jones Sustainability Index. Twelve real estate companies are in the FTSE250 and all except three are also in FTSE4GOOD. An example from outside the FTSE250 is Carillion and their report 'On being a good neighbour – moving towards sustainable construction' which they published in association with The Natural Step.

### Is it enough and what next?

- Although progress has been made, appropriate company reporting is far from 100%. Reporting may also be suitable at a development or site level.
- To encourage small and medium sized companies, further Government support and legislation will be necessary.

## Case Study

### Great Western Hospital Swindon

Through their company sustainability policy and working with The Natural Step, Carillion improved their working in a range of ways on the Great Western Hospital (previously called the Princess Margaret). A number of case studies and reports have been issued about the project. Over £1.5 million was recorded in direct and indirect cost savings through a sustainability accounting process – the savings are probably greater but the review was not comprehensive. A brief summary of the innovations of the project are:



- Carillion partnered with the wall panel supplier to create a bespoke product, saving approximately £285,000 in time and waste of plaster and paint. The panel supplier reclaimed and recycled off-cuts.
- A standard ceiling tile size was specified for the whole hospital, similarly saving waste of materials.
- Modern construction methods resulted in no scaffolding being required on site and also saved waste. The lack of scaffolding played a major role in the excellent accident record on site.
- A job centre was located on site throughout most of the construction phase to facilitate the use of local labour. A community liaison officer was also employed.
- A balancing pond was constructed to capture run-off from the site, reduce water pollution, control flood water and eventually provide an area for wild birds.
- Features such as super insulation, natural ventilation and solar shading together act to reduce the hospital's energy use by 30%. The extra insulation meant fewer radiators were installed, saving capital cost.
- The floor covering was chosen according to whole life cost and environmental impact data.

For more information see [www.ciria.org.uk](http://www.ciria.org.uk) and Engineering Sustainability March 2003 "A strategy for sustainability."

## Learning from failures

### What's happened?

Admitting failure is not possible for most if not all construction projects. Learning cannot begin until there is more open admission of all aspects of the project. Failure is difficult to define. Project over-run in time and cost is a type of failure, but so are client dissatisfaction, defects, poor design quality, poor functionality and environmental inefficiency. One aspect of a project may fail, when the rest of the project is highly successful. These and other reasons mean there has been little to no learning from failures.

### Is it enough and what next?

Learning from mistakes is important and must be encouraged. Nobody wants to be part of a failure, but they do want to be part of an experience. Learning from experience captures that parts of projects can be successful and must be repeated, while other parts fail, need to be investigated and other solutions tested. Everyone knows how much more profitable and satisfying repeat business can be, because the team has learnt from its mistakes. This rung of the ladder will be re-labelled, to encourage sharing of knowledge within project teams, within companies and between companies. It will hopefully remove some of the pressure for more sustainable projects to be perfect before their lessons can be disseminated.

## At the top of the ladder?

### Evidence of real change:

#### Pollution incidents

The number of pollution incidents on construction sites has been falling since 2000, with 30 in 2002, 41% less than in 2001. The Environment Agency is seeking to achieve a further decrease in numbers of incidents of 10% by 2005.

#### Pioneers Club

The Pioneers Club was part of CIRIA's on-going response to the industry's need for guidance on sustainable construction practices. It began meeting in June 2001 and was the result of a DTI Partners in Innovation contract entitled, "Sustainable construction: targets & indicators".

The project steering group comprised 10 leading construction contracting and consultancy companies (listed below), DTI, Forum for the Future and the Royal Bank of Scotland. All members contributed to funding the project. The project was managed by CIRIA and ran for 2 years.

#### Contractors

- Taylor Woodrow Construction
- Balfour Beatty Civil Engineering Limited
- Laing Plc
- Carillion
- Skanska

#### Consultants

- Atkins
- WSP
- Arup
- Buro Happold
- MWH

The project directly followed on from CIRIA's research project, "Sustainable construction: company indicators". This provided, through industry consultation, a series of indicators against which companies would be able to measure the sustainability of their construction business and the activities they performed.

Addressing environmental, social and economic aspects, each indicator would provide a snapshot of progress towards sustainable construction. Overall progress could then be assessed by setting performance targets against the indicators and considering the suite of indicators as a whole.

The Pioneers Club supported its member companies in addressing the CIRIA social and environmental indicators. The economic indicators were not directly addressed by the project. Companies could amend the CIRIA indicators or introduce other indicators to complement the overall suite of indicators they were adopting.

A detailed project report (available shortly) summarises the experiences from the companies as they went through various stages of indicator implementation. This is an examination of the practical lessons learned about the measurement of sustainability performance against given indicators.

Another outcome is the production of ten case studies (currently being published). Each of these deals with a theme from which specific lessons can be learned about sustainable construction practices and the use of indicators. Collectively the case studies cover many of the major issues which arose from the experiences of the Pioneers and as such they represent a useful overview of how to implement sustainability.

#### Design estimates for energy and water use

The Movement for Innovation published six Environmental Performance Indicators in 2000. DTI adopted most of these in their Environmental Key Performance Indicators in 2003. It is possible to compare the figures on design estimates for operational energy and water from the different years.

The type of sample and sample size was very different between the two years. Therefore it is unsurprising to hear the year 2000 data lies completely within the range of the year 2003 data. In 2003, some projects were worse than in 2000, and some were better. For both energy and water, more projects were better than worse, but it is too soon to tell whether these differences are significant.

The most important progress is that from now on, this comparison will be possible. It is very important to have such data available publicly, for clients, design teams and contractors. The original 2000 data was broken down into different types of project (residential, commercial, educational etc) and it is a shame this differentiation has been lost. Hopefully it will be restored over the next years of data collection, to provide more useful benchmarks for members of the construction team.

#### Waste management

National levels of construction and demolition waste are estimated to be 70-90 million tonnes – three times domestic waste. 13 million tonnes are calculated to be unused materials. Much work has

focused on reducing waste, for example through organisations such as WRAP (funded by the Aggregates Levy Sustainability Fund), Waste Watch and ReMade. For example London ReMade and ICE have produced a Demolition Protocol. Action has also been undertaken by private companies, seeking to reduce their liability to the Landfill and Aggregates Levies.

Symonds have carried out two surveys of construction and demolition waste, in 1999 and 2001. Although no statistically significant change has been reported in total amount of waste, the estimate for production of recycled aggregate and soil has risen steeply, from 25.13 million tonnes in 1999 to 45.07 million tonnes in 2001. So hardcore recycling is progressing well, with almost no hardcore being unnecessarily landfilled. Progress is being made on other waste streams arising from construction, such as plasterboard. Several Rethinking Construction demonstrations have focussed on the benefits to be gained from segregating, reusing and recycling waste. Most of the major contractors have waste management policies and practices in place. New pressure is being applied through the Packaging Regulations, the Landfill Directive, and also changing attitudes to plasterboard. It has not been classified as hazardous, but waste management companies are increasingly requiring it to be segregated. Tools such as SMARTStart help companies understand the waste streams arising.

**Social and economic success**

The industry KPI data from 2001 to 2003 shows improvement in measures for client satisfaction with product and service, defects and cost predictability. There has been no change or a deterioration in time predictability, productivity, profitability and health and safety measurements. Possibly the best overall indicator of social and economic success is the rate of uptake of the best graduates by the industry. The skills shortfall of 380,000 people within four years predicted by the Construction Industry Training Board, is a great area of concern. Considering that 78% of people would rather work for an ethically reputable company than take a pay rise (Cherenson Group poll), this only strengthens the need for the property and construction industry to take sustainability seriously.

**Conclusion**

In terms of demand, from investors, construction clients and individual home owners, economic instruments should be applied to further correct market failures. Owner and tenant relationship problems are particularly important to resolve.

In meeting demand, or simply acting professionally, some companies have made significant progress. Most have made no or limited

numbers of steps towards more sustainable solutions. More and more information is available, though more needs to be provided on the business benefits of actions towards sustainability. The wealth of information and initiatives can be confusing, and this is partly due to lack of co-ordination at Government level, where construction is spread across many departments. A co-ordinated national programme would reduce the current duplication of effort, but would be difficult to achieve considering the number of interest groups, professions and roles to be catered for.

The Sustainable Construction Task Group hopes that such dilemmas can be addressed by Sponge, the network for young property and construction professionals. Their work underway on a critique of progress and challenges to the industry will bring a valuable insight into the future of the industry.

The Sustainable Construction Task Group suggest the following ladder, to help measure continuing progress over the following years. If you have feedback or would like to become involved in the further work of the Task Group or Sponge, please get in touch.



## References

### Regional links

#### Northern Ireland

Northern Ireland Office ([www.nio.gov.uk](http://www.nio.gov.uk))

Northern Ireland Executive ([www.northernireland.gov.uk](http://www.northernireland.gov.uk))

#### Scotland

Scottish Executive ([www.scotland.gov.uk](http://www.scotland.gov.uk))

Scottish Enterprise ([www.scottish-enterprise.com](http://www.scottish-enterprise.com))

Modernising construction in Scotland ([www.pullingtogether.co.uk](http://www.pullingtogether.co.uk))

Scotland's Centre for Architecture, Design and the city ([www.thelighthouse.co.uk](http://www.thelighthouse.co.uk))

Scottish Environment Protection Agency (SEPA) ([www.sepa.org.uk](http://www.sepa.org.uk))

#### Wales

The National Assembly for Wales ([www.wales.gov.uk](http://www.wales.gov.uk))

Welsh Development Agency ([www.wda.co.uk](http://www.wda.co.uk))

#### South West England

South West Development Agency ([www.southwestrda.org.uk](http://www.southwestrda.org.uk))

Government Office for the South West ([www.gosw.gov.uk](http://www.gosw.gov.uk))

Sustainability South West is the round table body ([www.oursouthwest.com/ssw](http://www.oursouthwest.com/ssw))

SSW have produced Future Foundations, a charter for building better ([www.futurefoundations.co.uk](http://www.futurefoundations.co.uk))

Somerset Trust for Sustainable Development: aims to make sustainable design and building practices the norm rather than the exception throughout Somerset, ([www.sustainablehousing.org.uk](http://www.sustainablehousing.org.uk))

The Architecture Centre, Bristol ([www.arch-centre.demon.co.uk](http://www.arch-centre.demon.co.uk))

#### South East England

South East England Development Agency have a Construction and Property Sector Group ([www.seeda.co.uk](http://www.seeda.co.uk))

The group is run by the Thames Valley Centre for the Built Environment ([www.tvcbe.org.uk](http://www.tvcbe.org.uk))

The Architecture Centre, Kent ([www.architecturecentre.org](http://www.architecturecentre.org))

#### East of England

East of England Development Agency ([www.eeda.org.uk](http://www.eeda.org.uk))

East of England Regional Assembly ([www.eelgc.gov.uk](http://www.eelgc.gov.uk))

GO-East have also been active ([www.go-east.gov.uk/](http://www.go-east.gov.uk/))

East of England Sustainable Development Round Table ([www.sustainability-east.com](http://www.sustainability-east.com))

#### London

London Development Agency ([www.lda.gov.uk](http://www.lda.gov.uk))

Greater London Authority (the Mayor and the Assembly for London) ([www.london.gov.uk](http://www.london.gov.uk))

Government Office for London ([www.go-london.gov.uk](http://www.go-london.gov.uk))

Hackney Building Exploratory ([www.buildingexploratory.org.uk](http://www.buildingexploratory.org.uk))

London Open House ([www.londonopenhouse.org](http://www.londonopenhouse.org))

#### West Midlands

Government Office for the West Midlands ([www.go-wm.gov.uk](http://www.go-wm.gov.uk))

Advantage West Midlands is the RDA ([www.advantage-westmidlands.co.uk](http://www.advantage-westmidlands.co.uk))

Sustainability West Midlands is the round table body.

Midlands Architecture and the Designed Environment (MADE) ([www.made.uk.net](http://www.made.uk.net))

#### East Midlands

East Midlands Development Agency ([www.emda.org.uk](http://www.emda.org.uk))

Government Office for the East Midlands ([www.go-em.gov.uk](http://www.go-em.gov.uk))

East Midlands Regional Assembly support the Sustainable Development Round Table ([www.eastmidlandsassembly.org.uk](http://www.eastmidlandsassembly.org.uk))

#### North West of England

North West Development Agency ([www.nwda.co.uk](http://www.nwda.co.uk)) They have developed a Sustainability Appraisal System.

Centre for Construction Innovation, Manchester ([www.cube.org.uk](http://www.cube.org.uk) and [www.ccinw.com](http://www.ccinw.com))

Liverpool Architecture and Design Trust ([www.ladt.org.uk](http://www.ladt.org.uk))

#### North East of England

One NorthEast is the RDA ([www.onenortheast.co.uk](http://www.onenortheast.co.uk))

Northern Architecture ([www.north.org.uk](http://www.north.org.uk))

Durham County Council prepared 'Building in Sustainability' for the region ([www.buildingsustainability.co.uk](http://www.buildingsustainability.co.uk))

#### Yorkshire and Humberside

Yorkshire Forward are currently undertaking work on the construction industry. They have used a novel approach in their regeneration plans for six market towns, using an 'Urban Renaissance Panel' of international consultants and designers ([www.yorkshire-forward.com](http://www.yorkshire-forward.com))

## Government links

Audit Commission ([www.audit-commission.gov.uk](http://www.audit-commission.gov.uk))

Department of Environment Food and Rural Affairs (DEFRA): environment, sustainable development and rural development issues covered ([www.defra.gov.uk](http://www.defra.gov.uk))

Department of Trade and Industry (DTI) covers the construction industry ([www.dti.gov.uk/construction/sustain](http://www.dti.gov.uk/construction/sustain))

Department for Transport (DfT): activities include measures for integrated transport, mobility and inclusion ([www.dft.gov.uk](http://www.dft.gov.uk))

Office of the Deputy Prime Minister: construction legislation, local government, the regions, neighbourhood renewal, planning, regeneration, supporting people and urban issues covered ([www.odpm.gov.uk](http://www.odpm.gov.uk))

The Environment Agency is interested in waste and pollution on construction sites, SUDS and operational water use and has produced NetRegs ([www.environment-agency.gov.uk](http://www.environment-agency.gov.uk))

Housing Corporation ([www.housingcorp.gov.uk](http://www.housingcorp.gov.uk))

Local Government Association (LGA) ([www.lga.gov.uk](http://www.lga.gov.uk))

Information for local government from central government ([www.info4local.gov.uk](http://www.info4local.gov.uk))

Improvement and Development Agency (IDeA) ([www.idea.gov.uk](http://www.idea.gov.uk))

NHS Estates has developed a self-assessment scheme called NEAT – NHS Environmental Assessment Tool ([www.nhsestates.gov.uk](http://www.nhsestates.gov.uk))

Office of Government Commerce (OGC) – they have developed the Gateway Process for project management, and other guidance, for example of Health & Safety excellence ([www.ogc.gov.uk](http://www.ogc.gov.uk))

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

## Constructing Excellence links

Construction Best Practice (CBP) run regional clubs to disseminate best practice, holds information on sustainable construction and also provides a link to KPIZone ([www.cbpp.org.uk](http://www.cbpp.org.uk))

Rethinking Construction has developed from The Egan Report and is a stand-alone publication. It is now an umbrella organisation for M4i, The Housing Forum, LGTF, and work with central government ([www.rethinkingconstruction.org](http://www.rethinkingconstruction.org)). The Movement for Innovation (M4i) run demonstrations for non-housing developments, and have regional clusters for information dissemination ([www.m4i.org.uk](http://www.m4i.org.uk)). The Housing Forum run demonstration projects for housing developments ([www.housingforum.org.uk](http://www.housingforum.org.uk)). The Local Government Task Force promotes Rethinking Construction to local authorities ([www.lgtf.org.uk](http://www.lgtf.org.uk))

## General organisations and tools

ActionEnergy provides a range of energy efficiency best practice resources ([www.actionenergy.co.uk](http://www.actionenergy.co.uk))

AccountAbility is a not-for-profit professional institute which promotes social and ethical accountability ([www.accountability.org.uk](http://www.accountability.org.uk))

Association of Environment Conscious Builders (AECB) ([www.aecb.net](http://www.aecb.net))

BRE – Building Research Establishment. See here for more information about BREEAM, EcoHomes, invest, Environmental Profiles, Green Guide, MaSC, post-occupancy evaluation, SMARTStart, SMARTWaste, whole life costing and much more ([www.bre.co.uk](http://www.bre.co.uk))

British Council for Offices (BCO), has produced advice on green roofs and fuel cells, and general guidance on 'Sustainability Starts in the Boardroom' and 'Sustainable Buildings are Better Business' ([www.bco.org.uk](http://www.bco.org.uk))

British Property Federation (BPF) who have produced an Energy Guide for members ([www.bpf.org.uk](http://www.bpf.org.uk))

British Standards Institution (BSI) ([www.bsi-global.com](http://www.bsi-global.com))

BSRIA - Building Services Research and Information Association ([www.bsria.co.uk](http://www.bsria.co.uk))

Business in the Community helps members improve their impact on communities and the environment ([www.bitc.org.uk](http://www.bitc.org.uk))

The Carbon Trust ([www.thecarbontrust.co.uk](http://www.thecarbontrust.co.uk))

CIOB - Chartered Institute of Building ([www.ciob.org.uk](http://www.ciob.org.uk))

CIRIA - Construction Industry Research and Information Association. Also has details of Construction Industry Environmental Forum (CIEF) and Construction Productivity Network (CPN) ([www.ciria.org.uk](http://www.ciria.org.uk))

Chartered Institute of Environmental Health (CIEH) ([www.cieh.org.uk](http://www.cieh.org.uk))

Chartered Institute of Public Finance and Accountancy (CIPFA) ([www.cipfa.org.uk](http://www.cipfa.org.uk))

The Clients Charter is available from [www.clientsuccess.org.uk](http://www.clientsuccess.org.uk)

Commission for Architecture and the Built Environment (CABE) ([www.cabe.org.uk](http://www.cabe.org.uk))

The Confederation of Construction Clients (CCC) – an organisation that represents construction clients and has developed the Clients' Charter and Toolkit. ([www.clientsuccess.org](http://www.clientsuccess.org))

Considerate Constructors Scheme is a code of practice for improved construction sites ([www.ccscheme.org.uk](http://www.ccscheme.org.uk))

Construction Industry Council (CIC) is the representative forum for the industry's professional bodies, research organisations and specialist trade associations. The Happold Lecture Series available here, plus more details about the sustainable development group ([www.cic.org.uk](http://www.cic.org.uk))

Construction Industry Training Board (CITB) ([www.citb.org.uk](http://www.citb.org.uk))

Construction Products Association (CPA) has launched KPIs ([www.constprod.org.uk](http://www.constprod.org.uk))

Construction Resources ([www.constructionresources.com](http://www.constructionresources.com))

Corporate Register is the world's largest on-line collection of non-financial company reports ([www.corporateregister.com](http://www.corporateregister.com))

Crisp – see new Crisp below

Design Quality Indicator ([www.dqi.org.uk](http://www.dqi.org.uk))

English Partnerships ([www.englishpartnerships.co.uk](http://www.englishpartnerships.co.uk))

The Energy Saving Trust provides guidance ([www.practicalhelp.org.uk](http://www.practicalhelp.org.uk))

Forest Stewardship Council ([www.fsc-uk.info](http://www.fsc-uk.info))

FTSE4GOOD develops and maintains a series of global sustainable investment indices ([www.ftse4good.com](http://www.ftse4good.com))

Green Register of Construction Professionals ([www.greenregister.org](http://www.greenregister.org))

Global Reporting Initiative is compiling sustainable reporting guidelines ([www.globalreporting.org](http://www.globalreporting.org))

INREB (Integration of New and Renewable Energy in Buildings) is a Faraday Partnership between BRE and four Universities ([www.inreb.org](http://www.inreb.org))

Institution of Civil Engineers (ICE) ([www.ice.org.uk](http://www.ice.org.uk))

Institute of Environmental Management and Assessment (IEMA) ([www.iema.net](http://www.iema.net))

Institute of Public Finance ([www.ipf.co.uk](http://www.ipf.co.uk))

Joseph Rowntree Foundation ([www.jrf.org.uk](http://www.jrf.org.uk))

National House-Building Council (NHBC) ([www.nhbc.co.uk](http://www.nhbc.co.uk))

The Natural Step ([www.naturalstep.org.uk](http://www.naturalstep.org.uk))

NetRegs is a web resource to help small companies understand environmental legislation ([www.environment-agency.gov.uk/netregs](http://www.environment-agency.gov.uk/netregs))

New CRISP (nCrisp) (Construction Research and Innovation Strategy Panel) develops the research agenda for construction ([www.crisp-uk.org.uk](http://www.crisp-uk.org.uk))

PlaceCheck a method for assessing the qualities of a place ([www.udal.org.uk/placecheck.htm](http://www.udal.org.uk/placecheck.htm))

Planning for Real is a community consultation method which is managed by the Neighbourhood Initiatives Foundation ([www.nifonline.org.uk](http://www.nifonline.org.uk))

Prince's Foundation are involved in a number of projects, and espouse 'Enquiry by Design' ([www.princes-foundation.org](http://www.princes-foundation.org))

Royal Institute of British Architects (RIBA) ([www.architecture.com](http://www.architecture.com))

Royal Institute of Chartered Surveyors (RICS) ([www.rics.org](http://www.rics.org))

School Works is a body working towards better school refurbishment and management ([www.school-works.org](http://www.school-works.org))

Sponge - network for young professionals in sustainable construction ([www.spongenet.org](http://www.spongenet.org))

Strategic Forum – chaired by Peter Rogers. Web pages currently hosted by Construction Best Practice ([www.cbpp.org.uk/acceleratingchange](http://www.cbpp.org.uk/acceleratingchange))

SPeAR – Sustainable Project Appraisal Routine can be applied to projects, products, processes and more ([www.arup.com](http://www.arup.com))

Sustainability Alliance ([www.sustainabilityalliance.org.uk](http://www.sustainabilityalliance.org.uk))

Sustainability Works: a reference tool for sustainable housing ([www.sustainabilityworks.org.uk](http://www.sustainabilityworks.org.uk))

Transport 2000 ([www.transport2000.org.uk](http://www.transport2000.org.uk))

WellBuilt! a network for local authority professionals interested in more sustainable construction ([www.wellbuilt.org.uk](http://www.wellbuilt.org.uk))

WRAP is the Waste and Resources Action Programme and has a range of activity on construction waste ([www.wrap.org.uk](http://www.wrap.org.uk))

WWF has launched an initiative for One Million Sustainable Homes ([www.wwf.org.uk/sustainablehomes](http://www.wwf.org.uk/sustainablehomes))

## Publications

Accelerating Change. Strategic Forum (2002)

Archilab's Earth Buildings. Thames & Hudson (2003)

Bio-Architecture. Architectural Press (2003)

Brownfields – building on previously developed land. CIC (2003)

Constructing for Sustainability: a guide for clients and their professional advisors. CIC (2003)

Delivering New Homes: processes, planners and providers. Routledge (2003)

Demonstrations of Sustainability. Constructing Excellence (2003)

Ecohouse 2: a design guide. Architectural Press (2003)

Energy Efficient Building. Taunton (2000)

Engineers of the 21st Century. Forum for the Future (2002)

Environmental Design. Second edition. Randell Thomas (Ed) (2002)

Environmentally Sustainable Buildings. OECD (2002)

Green Building Handbook. Spon. Vol I 2001. Vol II 2002.

Green Buildings Pay. Spon (1998) 2nd ed. (2003)

Green Guide to Specification. Third edition (2002)

Green Guide to the Architects Job Book. RIBA (2000)

Green Shift. Architectural Press (1999)

Just Values – beyond the business case for sustainable development. BT in association with Forum for the Future (2003)

Liveable City Handbook. Corporation of London (2000)

Mass Balance of the UK Construction Industry. Viridis (2001)

On being a good neighbour – moving towards sustainable construction. Carillion in association with The Natural Step (2003)

Planning and Environmental Impact Assessment in practice. Longman (2000)

Renewable Energy in the Built Environment. Building Centre Trust (2001)

Reputation, Risk and Reward. Construction Confederation (2001)

Rough Guide to Sustainability. RIBA (2001)

Society, Sustainability and Civil Engineering. ICE, ACE, CECA, CPA & CIRIA (2001)

Sustainable buildings: benefits for occupiers, designers, investors and developers and constructors. BRE IP 13/03 parts 1-4 (2003)

Sustainable development and the cement and concrete construction sector. BCA and The Concrete Centre (2003)

Sustainable housing schemes in the UK: a guide with details of access. Hockerton Housing (2002)

Sustainability Accounting in the Construction Industry. Carillion, Casella Stanger, Forum for the Future and CIRIA (2002)

Sustainability Pays. CIS in association with Forum for the Future (2002)

Sustainable Practices in the Built Environment. Butterworth Heinemann (2001)

Sustainable Urban Design. Spon (2002)

Sustaining Sustainability. NCrisp (2003)

The eco-design handbook. Thames & Hudson (2002)

To-morrow (re-edition) Routledge (2003)

Towards the sustainable use of material resources. The Natural Step (2002)

Urban Design Compendium. Llewellyn Davies (2000)

User Responsive Design. Norton (2002)

Value of Good Design. CABE (2002)

## Initiatives

ACCA's work on Corporate Social Responsibility and sustainability reporting ([www.acca.org.uk](http://www.acca.org.uk))

BIFM IFMA and RICS joint initiative on Sustainable Facilities Management

CIBSE Carbon Task Group

CIC Sustainable Development Committee ([www.cic.org.uk](http://www.cic.org.uk))

Global Alliance for Building Sustainability ([www.earth-summit.net](http://www.earth-summit.net))

How to be a socially responsible client. Forum for the Future, CIRIA, Buro Happold and the Sustainable Development Corporation.

FIT Buildings Network ([www.theFBnet.com](http://www.theFBnet.com))

Property Environment Group ([www.pgonline.net](http://www.pgonline.net))

RIBA Sustainable Futures Group ([www.riba.org](http://www.riba.org))

RICS Foundation ([www.rics-foundation.org](http://www.rics-foundation.org))

SALLI, the Sustainability Alliance of Professions

SIGMA ([www.projectsigma.com](http://www.projectsigma.com))

## International links

BEQUEST - providing a permanent resource of information for people who need guidance on methods to improve the environmental sustainability of Urban Development (<http://www.surveying.salford.ac.uk/bqextra/>)

Building for Environmental and Economic Sustainability software (BEES) ([www.bfrel.nist.gov/oe/software/bees.html](http://www.bfrel.nist.gov/oe/software/bees.html))

EuroAlliance of Companies for Energy Efficiency in Buildings (EUROACE)

EGBF – European Green Building Forum ([www.egbf.org](http://www.egbf.org))

European Construction Industry Federation (FIEC)

International Council for Research and Innovation in Building and Construction, which has a specialist page on sustainable construction [www.cibworld.nl/pages/begin/Pro2.html](http://www.cibworld.nl/pages/begin/Pro2.html)

PRESCO – creating a European Code of Practice for Sustainable Building (<http://go.to/presco.net>)

The US Green Building Council is a coalition of business leaders ([www.usgbc.org](http://www.usgbc.org))

## Research

The table below shows some of the titles of relevant Partners in Innovation projects let in 2003 (classification by SCTG):

### New and improved technology

- Design for improved solar shading control
- Ground storage of building energy
- Increasing the uptake and installation of photovoltaic systems
- Structural Insulated Panels (SIPs) – the future generation of housing?

### Reducing resource use

- Alternative aggregates in concrete and asphalt
- Business data for recycling
- Demonstration project to minimise resource usage in a defined geographical area
- Environmentally friendly cements to support sustainable construction
- Exploiting the Value of Construction Waste
- Guide to using reclaimed equipment, components and materials in buildings
- Low cost earth brick construction: monitoring & evaluation
- National Green Specification (NGS): waste management and recycling
- Pilot study for the development of concrete materials
- Potential use of re-used and recycled construction waste as aggregate for coastal & fluvial engineering
- Removing barriers to use of non-primary and marginal aggregates
- Timber KPIs - creating a sustainable programme
- Using secondary and recycled aggregates in construction: a SCiP workshop
- Waste management - demonstrating the business case and enabling SMEs to take the first step to implementing sustainable waste management practices

### Contaminated land

- Contaminated land website for the construction industry
- Cost effective investigation of contaminated land
- Making poorly compacted brownfield land available for immediate redevelopment by grouting using recycled materials

### Sustainable drainage

- Designing for exceedance in urban drainage systems - good practice
- Sustainable drainage systems - updated guidance on technical design and construction

### **Social and economic performance**

- Adapting non-domestic buildings to meet investor requirements when reporting non-financial performance
- Best - Building Excellence Skills Today
- Better designed buildings: improving the valuation of intangibles
- Designing for whole life value (BRE)
- Enabling social inclusion through training
- Guidance to help the occasional client build Corporate Social Responsibility (BRE)
- Investing in tomorrow's company: how to meet investor requirements when reporting non-financial performance (CIRIA)
- Making sense of sustainable property - seminars for property people (Uni of Kingston)
- Mentoring within an integrated supply chain
- Unlocking whole life value for infrastructure and buildings
- Workforce mobility and skills in the construction sector

### **General**

- A design guide for the environmental refurbishment of residential towers
- Building in urban environments - investigation of reducing noise, waste and local impacts
- Essential environmental one-pagers for small construction companies
- Occupying buildings sustainably (Faber Maunsell)
- Practical implementation of sustainable construction at project level
- Practical sustainable development - guidance for planners and developers (Faber Maunsell)
- Tower crane stability - best practice guidance



