Sustainable Construction: An Introduction

Who should read this fact sheet?

There is a growing call from society and government for UK businesses to operate more sustainably; and there are benefits for companies in the construction industry which do so. This fact sheet provides an introduction to sustainable construction for companies across the industry, whether or not they have made progress on sustainability to date. Additional fact sheets are available that provide more specific guidance for the following sectors:

- clients
- designers
- contractors
- suppliers.

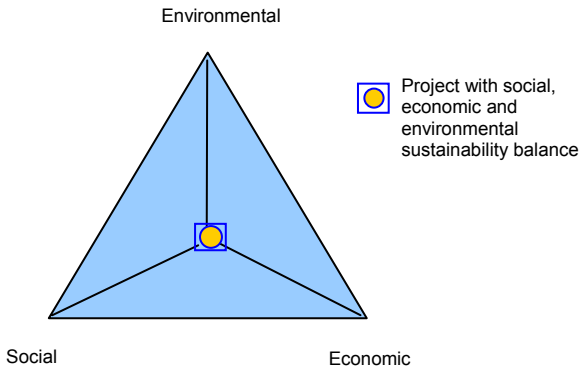
What is sustainable construction?

A sustainable approach takes account of the need for your company to prosper in business, without seeking profitability at the expense of the environment or society. It recognises that decisions made now will have long term as well as short term impacts. Sustainability is sometimes termed the 'triple bottom line', because it involves a commitment to economic, environmental and social objectives:

- **economic sustainability:** increasing profitability by making more efficient use of resources including labour, materials, energy and water
- **environmental sustainability:** protecting the environment from the impact of emissions, effluent and waste and where possible, enhancing it and using natural resources, carefully
- **social sustainability:** recognising the needs of everyone impacted by construction, from inception of a project to demolition The list will include construction site workers, local communities, the supply chain and people that will use the finished product.

Sustainable construction takes account of these objectives in a balanced way at all stages of a construction project. Sustainability should be considered when first deciding whether a new building or piece of infrastructure is needed, throughout the specification and design, on the construction site, in operation (including maintenance and refurbishment), and ultimately in deconstruction or demolition.

The triple bottom line of sustainability



Why construct sustainably?

A variety of direct financial rewards and indirect benefits flow from sustainable construction, which senior industry figures recognise and promote:

'Sustainability underpins future profits'
(Sir Neville Simms, Chairman, Carillion)

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The following are some of the business benefits that can be achieved by a more sustainable approach:

- **Win business by responding to increasing client demand for sustainability**

  Government is the single largest UK construction client, responsible for 40% of UK construction. Sustainability targets have been set for all public sector construction. Suppliers and contractors must meet these sustainability requirements in order to win work. The Government has also set out a Sustainable Communities plan which it expects sustainable construction to play a major part in delivering.

  An increasing number of private sector clients, both large and small are also demanding more sustainable construction. In order to be well placed to win business in the future, companies in the construction industry need to address sustainability.

- **Manage your reputation**

  Avoid reputation damage. A sustainable approach can reduce some of the key risks associated with construction. This can help avoid adverse publicity over environmental and social performance, and associated costs, and encourage investment.

  Improve relationships with clients, suppliers and contractors. Fostering good relations will help win repeat business and reduce time spent preparing bids. It can also help ensure that projects run more smoothly.

  Improve relationship with local communities. By being considerate to local communities, for example through the Considerate Constructors Scheme, time spent dealing with complaints will be minimised. The client/building occupants are also likely to be more readily accepted into the community.

  Avoid fines. Individual construction companies were fined between £13,000 and £40,000 for pollution offences in 2002[1]. Managing environmental and social risks can help avoid fines.

- **Attract and retain the best employees**

  78% of employees would rather work for an ethical and reputable company than receive a higher salary. [2]

- **Achieve cost savings through greater material efficiency**

  In 2001 construction site and demolition waste in Britain was 94 million tonnes (24% of all waste generated)[3]. Each year there are around 13 million tonnes of materials that are delivered to site but never used.

  The production, use and disposal of materials accounts for a significant proportion of UK energy and resources. In addition, landfill tax is increasing each year, and the aggregates levy increases the costs associated with using virgin materials.

  Sourcing materials with minimum environmental impact (such as those that are recycled or reused) and minimising waste can have cost benefits as well as providing positive publicity.

At Langley Park, Laing Homes saved £½ million by reusing and reclaiming demolition materials already on site, which led to £600 per housing unit being saved on waste disposal.

1 Environment Agency
2 Cherenson Group, 2001
3 Digest of Environmental Statistics, 2003

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- **Reduce operational costs and resource consumption**

  Energy: Most businesses and public sector organisations could easily cut their heating, lighting and power bills by up to 20% without any capital investment[4].

  The Government has set a target to reduce total UK CO_2 emissions by 60% by 2050.

  To meet this target, energy consumption in buildings must be cut. The climate change levy is charged on all non-renewable energy supplied to industrial and commercial users. By reducing energy use - for example, by building better insulated and naturally ventilated buildings, and switching to renewable sources of energy - costs of energy bills and climate change levy charges can be cut.

  Water: Water consumption in the UK has risen substantially over the last few decades. The treatment of water for human consumption is expensive and resource-intensive, and there are some places in UK, particularly the South East, where water is scarce. Water efficient fittings can cut water consumption in a building significantly and are one way of reducing demand.

- **Reduce transport costs**

  Minimising the number of journeys needed to sites, and sourcing materials and labour locally, will bring cost and time savings.

  Transport accounts for 25% of UK CO_2 emissions, and commuting to and from work accounts for 80% of this[5]. Locating developments so as to reduce the need to travel by car will reduce this impact.

  Produce more attractive, flexible properties

  'Beautiful buildings are more difficult to discard, and can give purpose, momentum and added value when the building is re-used'
  (Durham County Council).

  It is easier to refit buildings that are flexible and to install new technology and adapt them to new user needs. This extends the life of buildings and makes property investments more 'future-proof'.

Case study examples

Millennium Green, Collingham

Gusto Construction's development in Nottinghamshire comprises 25 quality, environmentally sustainable homes. Both design and construction incorporate environmental good practice and sustainable development objectives combined with traditional ideals and common sense.

Benefits

- The properties use up to 60% less energy than a standard new house, through the use of high levels of insulation (almost three times the insulation level of a 2001 building regulations house, with roof insulation being made from recycled newspaper), low energy lights and appliances and solar panels (which generate around sixty per cent of the energy required for hot water).
- The development won the 2003 Environment Agency national water efficiency awards: rainwater is recycled from the roofs for toilet flushing, washing machines and watering gardens, reducing the level of treated water use. This has attracted positive publicity for the development.
- Various other features enable occupants to enjoy a better quality of life, and are additional selling points for the houses. These include light pipes, which allow more sunlight into the building, pollen filter and heat recovery ventilation system, which create a healthy and fresh indoor environment, and ISDN compatible telephone and Internet connections.

For more information contact Ros Curtis, Gusto Construction
T: 01636 894900
E: ros@gusto-uk.com

[4] Action Energy
[5] Transport and Buildings: the Environmental Impact, BRE, 1999

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Great Western Hospital, Swindon

For the first time in public buildings, Private Finance Initiative (PFI) has forced capital and operational expenditure to be jointly assessed. This has given constructors an incentive to think long-term.

Carillion, who designed and constructed the hospital and is also part of the partnership that will run it for 27 years, saw considering the whole life of the Great Western Hospital as an opportunity to include sustainability.

Carillion worked with the supply chain on sustainability principles from the outset of the project. In order to ensure that sustainability was an integrated part of the project, Carillion also worked with The Natural Step to adapt its procurement cycle to ensure that sustainability considerations would be taken at key stages.

Benefits

- Reduced landfill: 50% reduction in waste leaving the site compared to a similar scheme in Dartford, by designing-out waste, recycling, prefabrication and composting biodegradables.
- It is expected that the hospital will consume 30% less energy and emit 35% less CO_2 compared to a typical existing hospital.
- Carillion has scooped five awards for its pioneering work at The Great Western Hospital in environmental, safety and project-related areas, alongside the associated public relations activity.
- A cornerstone of Carillion's strategy was engaging with suppliers. In this two-way process, suppliers learned that Carillion had a genuine policy of seeking more sustainable solutions and Carillion benefited from supplier's innovations.
- Balancing initial extra costs and consequent savings showed that sustainable construction need not cost more and can result in savings.

For more information see CBP Case Study 191 (www.cbp.org.uk), or contact Carillion Building.

T: 01793 716100. W: www.carillionplc.com

Sources of further information

Key information sources on sustainable construction are listed below. For more specific information relating to your sector, see the sector-specific fact sheets for clients, designers contractors and suppliers.

Building a Better Quality of Life: A strategy for more sustainable construction (2000).

In May 1999, the Government published '*A better quality of life - a strategy for sustainable development for the United Kingdom*'. In response to this, *Building a Better Quality of Life* lays out the Government's strategy for a more sustainable construction industry.

Available at www.dti.gov.uk/construction/sustain

Construction Industry Key Performance Indicators (KPIs)

Published annually, these are a series of handbooks and wallcharts to measure and benchmark the following areas of industry performance:

- all construction KPIs
- environment KPIs
- consultants KPIs
- M & E contractors KPIs
- construction products industry KPIs
- respect for people KPIs.

Graphs are provided that enable performance to be benchmarked against the rest of the industry in the key areas relevant to sustainable construction.

Downloadable benchmark graphs and more information is available at www.kpizone.com, under 'indicators'

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BREEAM (BRE Environmental Assessment Method), EcoHomes, Sustainability Checklist for Developments and CEEQUAL (Civil Engineering Environmental Quality Assessment and Award Scheme)

BREEAM is a system for assessing and certifying the environmental performance of buildings that can be applied to new and existing buildings. EcoHomes is a version of BREEAM designed specifically for dwellings. They are voluntary schemes carried out by independent assessors. Clients can use BREEAM and EcoHomes to specify the environmental sustainability performance of their buildings. Designers can use BREEAM and EcoHomes as tools to improve the performance of their buildings and their own experience and knowledge of environmental sustainability. CEEQUAL is a similar scheme for assessing civil engineering projects. The Sustainability Checklist for Developments, is a tool based on BREEAM that can be used to assess the sustainability performance of whole developments.

More information is available at www.breeam.org, www.ceequal.com and www.bre.co.uk/sustainable.

Considerate Constructors scheme

A voluntary code of practice administered by the Construction Confederation. It seeks to minimise the noise, dirt and inconvenience that construction sometimes causes the neighbourhood and eradicate offensive behaviour and language from construction sites. It recognises and rewards contractors who look beyond their statutory duties in site management, safety and environmental awareness.

More information is available at www.ccscheme.org.uk

Reputation, Risk and Reward: the business case for sustainability in the UK property sector

This is a report by the Sustainable Construction Task Group that outlines the business benefits of sustainable construction and sustainable property development. It includes useful background information to the issues surrounding these areas.

Available to download free of charge at http://projects.bre.co.uk/rrr/.

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