



*the Sign of Quality*



UNITED KINGDOM  
QUALITY ASH  
ASSOCIATION



# Concrete Industry Sustainability Performance Report

6th report: 2012 performance data

# Chairman's Statement



As we reach the first formal milestone of our strategy – 2012 targets - it is appropriate to reflect on the sustainability journey of the built environment since the UK concrete industry committed to our Sustainable Construction Strategy back in 2008.

It is now commonplace in construction for projects to require environmental assessments; site waste management plans are now the norm and product manufacturers are frequently asked to provide details of their sustainability performance. Terms such as carbon footprint, carbon budgets and responsible sourcing are now an accepted part of our language.

Since 2008 there has also been a change of Government and the sustainability aspiration for UK, based on a holistic definition, has regressed to an emphasis on carbon reduction. In 2013, the publication of the Low Carbon Routemap by the Green Construction Board provided a long awaited, detailed plan for achieving the built environment contribution to the UK Government commitment of 80% reduction in carbon emissions by 2050 based on 1990 levels.

Now reporting on our 2012 targets, we are delighted to report that six of our eleven targets have been met. Balancing environmental, social and economic concerns over the past four years, against difficult economic conditions, has been especially challenging and the concrete and supply chain companies that comprise the industry have maintained their commitment to a sustainable built environment and our 2020 targets further reflect these ambitions.

Progress on our 2020 strategy is already being made, for example, as part of our commitment to resource efficiency, the precast, brick and ready-mixed concrete sectors have worked in partnership with WRAP to launch Resource Efficiency Action Plans (REAPs); providing a focus on practical actions to improve long term performance.

We feel proud of our progress to date but are certainly not complacent about the challenges ahead, particularly in relation to CO<sub>2</sub> reduction. Our 2020 commitments reflect our aspiration for continuous improvement both in our industry performance and the quality and extent of our reporting.

**Andy Spencer**  
Chairman, Sustainable Concrete Forum

# Our Sixth Report

In 2008 the UK concrete industry launched the Concrete Industry Sustainable Construction Strategy. Manufacturers and sector associations from the aggregate, cement, GGBS, fly ash, admixtures, ready-mixed and precast concrete sectors committed to the strategy's vision, strategic objectives and defined commitments. Links to sector information are included on page 13.

To ensure successful implementation of the strategy the Sustainable Concrete Forum was established to oversee delivery of the objectives and commitments.

This sixth report presents the industry's performance from 2008 to 2012, a milestone year for the strategy as many of the targets for performance improvement were set to be achieved in 2012. The next stage of the strategy is also featured - our commitments to 2020.

The report presents data gathered by Forum members from concrete production in 2012, representing an estimated 81% of total concrete production. 2012 data shows that the industry has met its performance targets in relation to environmental management, quality management, CO<sub>2</sub> emissions, emissions to air and water, waste and waste materials as an alternative source of energy. Progress on health and safety is on track for our 2014 target.

Targets have not been reached in all areas, and although many show an improvement from our 2008 baseline, we are disappointed not to have achieved all our ambitions within the desired timescale. In these areas, such as additional cementitious materials, employment and skills, biodiversity plans and local community engagement we continue to work towards our targets, now set for 2020 and beyond.

In 2013 the Green Construction Board (GCB), tasked with pushing forward the UK Government's sustainable construction strategy, published simple, focused recommendations through the "Greening the Industry" campaign and the comprehensive "Low Carbon Routemap for the Built Environment". In this our sixth annual report, the concrete industry responds to these GCB "Act on" recommendations and demonstrates our ongoing progress and actions.

The bulk of the KPI data contained in this report relates to work to improve performance within the industry and its products. A key part of the strategy however, also involves interaction with our stakeholders, designers, specifiers, contractors and end users to ensure that the significant sustainability benefits of concrete construction can be cost-effectively optimised throughout the life of a building or structure. Highlights of this activity are contained in this report with more information available at [www.sustainableconcrete.org.uk](http://www.sustainableconcrete.org.uk)

# ACTION towards a Sustainable Built Environment



Precast concrete colonnades at St Paul's School, London. *Image courtesy of Nicholas Hare Architects © Alan Williams Photography*

## The Concrete Industry Sustainable Construction Strategy has been a catalyst for:

- Agreeing an industry-wide framework of performance indicators and data collection.
- Reporting on production performance annually.
- Promoting sector initiatives that reward and encourage best practice and innovation.
- Increasing dialogue with stakeholders including regulators and clients.
- Developing strategic partnerships to encourage communication and efficiency, for example with the UK Contractors Group.

## From 2008 – 2012 the concrete industry has demonstrated leadership in:

- **Responsible sourcing** - within a year of the launch of BES 6001 81% of concrete produced was accredited to the new standard.
- **Health and Safety** - metrics and initiatives have been established to support our target of Zero Harm.
- **Carbon reduction** - reducing the embodied carbon dioxide of concrete through investment in innovation and efficient production technologies. Our standardised or baseline mix shows a 23% reduction in CO<sub>2</sub> from 1990.

- **Performance measurement** - with six annual reports published, the industry is committed to annual reporting of progress and has launched 2020 performance targets.
- **Water management** - the industry is committed to the collection of data to inform best practice, enabling targets to be set for the optimum usage of water.
- **Waste consumption** - significantly increasing our consumption of materials diverted from the waste stream. In 2012 the concrete industry consumed 62 times more recovered and waste material than the waste it sent to landfill.
- Launching the '**This is Concrete**' campaign to showcase exemplars of sustainable concrete design and construction. [www.thisisconcrete.co.uk](http://www.thisisconcrete.co.uk)
- Publishing **best practice guidance** on *Specifying Sustainable Concrete*, *Thermal Performance* and *Material Efficiency* through support of The Concrete Centre.
- Providing **events and training** for industry and end-users to encourage best practice, including conferences, CPD seminars and breakfast briefings through sector trade associations and The Concrete Centre.

# Action on Materials

*“Materials and products have impacts through the whole life cycle of building and infrastructure – Act now to minimise impacts and maximise benefits”*

Green Construction Board

## Our Strategy 2020 Commitments

- **Target continuous improvement of sustainable production performance and report annually.**

The concrete industry sustainable construction strategy and the supporting performance indicators provide a framework for a common, transparent approach for the industry to measure, manage and reduce the impacts of manufacturing.

The industry is committed to publishing an annual performance report and providing stakeholders with information on progress towards a stretching set of improvement targets.

The use of the internationally recognised management systems ISO 9001 and ISO 14001 is widespread and the strategy urges companies to have their systems independently certified as reported by key indicators.

- **Provide Life Cycle Assessment data compliant with codes and standards.**

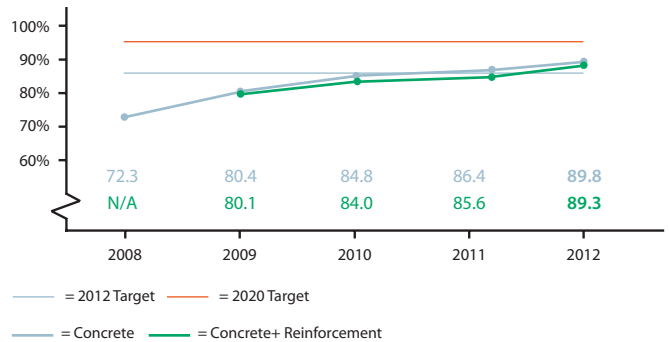
For many years data generated by industry has been fed into the BRE environmental profiles that are the basis of the *Green Guide to Construction*. The industry has published data sheets relating to the embodied carbon dioxide of concrete and constituent raw materials available at [www.concretecentre.com](http://www.concretecentre.com).

Currently, the industry is assessing how best to present clear Life Cycle Analysis (LCA) data, potentially in the form of verified Environmental Product Declarations (EPDs) which comply with new European Standards that will ultimately feed into Building Information Modelling (BIM) systems. This will allow designers to achieve measurably low impact buildings and infrastructure based on reliable whole life data.

Through The Concrete Centre and company and association members of the Sustainable Concrete Forum, the industry provides a wide range of information and training on how concrete construction can provide low embodied and operational energy solutions.

## Environmental Management

Percentage of production sites covered by a certified ISO 14001 EMS



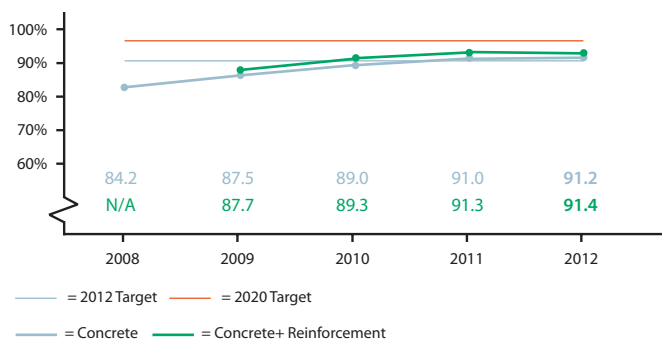
Controlling and managing the environmental impacts of procuring materials and manufacturing products is an essential requirement for sustainable development.

Environmental Management Systems, particularly when meeting the requirements of ISO 14001, are a best practice approach to identifying impacts, assessing their importance and providing a structured approach to controlling, reporting and managing performance improvement.

Our indicator reports on the percentage of the sites that are independently certified to ISO 14001. During 2012 the total number of sites certified increased above our 2012 target of 85%, with a rise to 89.8% of concrete and 89.3% of concrete + reinforcement sites being certified.

## Quality and Performance

Percentage of production sites covered by a certified ISO 9001 QMS



Product consistency, performance and being fit for purpose are crucial to sustainability and ensuring that materials are not rejected or potentially wasted, which is costly economically and environmentally.

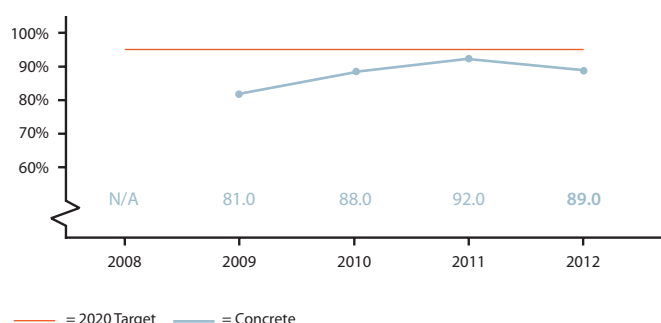
# Sustainable consumption and production

Quality management systems have a vital role and our indicator reports on the percentage of the sites that are independently certified to ISO 9001:2008.

Since 2008 the proportion of sites certified has steadily risen to 91.2% in 2012, achieving the 90% 2012 target.

## Responsible Sourcing

Percentage of production certified to BES 6001 responsible sourcing standard



The demand for evidence of the responsible sourcing of building products and materials is ever increasing, particularly in the wake of the UK Contractors Group (UKCG) announcement in 2012 of their commitment to give preference to procuring products that are able to demonstrate compliance with a recognised responsible sourcing scheme, certified by a third party.

As reported in previous reports, since the introduction of the first scheme available to all construction materials, BES 6001:2008, the concrete industry has adopted certification to this standard within its strategy. BES 6001 covers not only supply chain traceability but requires producers and in turn their supply chains to demonstrate improving performance with regard to managing wider social and environmental aspects that relate to sustainability.

Our indicator reports the proportion of concrete production that is currently certified to BES 6001. 89% of all concrete in 2012 was certified to BES 6001 and of the production tonnage certified, 99% has achieved 'Very Good' or 'Excellent' performance rating.

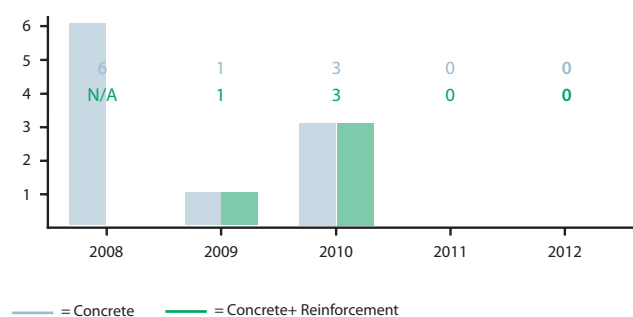
The 89% achieved is a reduction from the 92% achieved in 2011 and this is due to some rationalisation of production. The industry is also encouraging more companies to join the strategy, to achieve long-term improvement in the industry, the short-term impact is that many of these smaller companies are yet to complete the certification process.

No target was set in 2008 as BES 6001 had not been published when the strategy was launched; our 2020 target is for 95% certification.

The constituent materials of concrete and reinforcement have adopted BES 6001 and more information is available at [www.sustainableconcrete.org.uk](http://www.sustainableconcrete.org.uk)

## Emissions (Excluding CO<sub>2</sub>)

Number of convictions per annum for air and water emissions



Our indicator relating to emissions excluding CO<sub>2</sub> reports the number of convictions for emissions to air and water within the industry per annum.

During 2012 the industry has again achieved its target of zero convictions. For an industry which in 2012 produced more than 40 million tonnes of materials from operations that involve extraction, handling and storage of natural materials we feel this is an important achievement.

Our 2020 target is also zero convictions and we will also review other potential indicators to ensure that we continue to focus on further improvement.

## Stakeholder Engagement

The development of our strategy has been shaped by both formal and informal stakeholder engagement. Stakeholder interviews were carried out in 2007 and 2011 with representatives from the construction marketplace, relevant UK government departments as well as the concrete industry and supply chain.

The Sustainable Concrete Forum, the group responsible for the development and implementation of the strategy, bring the findings of their own stakeholder engagement to the strategy and groups such as CONSTRUCT and UK Contractors Group now participate in the Forum.

The concrete industry is also committed to communicating with end-users and designers. The industry supports The Concrete Centre in developing and sharing sustainability best practice. For more information on the resources and events available visit [www.concretecentre.com](http://www.concretecentre.com)

If you would like to provide any feedback and comments on the performance report and strategy you can provide this online at [www.sustainableconcrete.org.uk](http://www.sustainableconcrete.org.uk)

# Action on Carbon

*“Built environment accounts for about half of the UK’s carbon emissions – Act now to reduce carbon emissions”*

Green Construction Board

## Our Strategy 2020 Commitments

- **Contribute to the delivery of a low carbon built environment**

The performance indicators and targets within the concrete industry strategy are aimed primarily at reducing the capital carbon (or embodied carbon dioxide) in concrete. However, concrete has a key role to play in reducing operational carbon dioxide from buildings in use; concrete’s thermal mass properties as part of a design strategy can reduce the energy use in buildings.

Within its low carbon routemap the GCB includes a target for a reduction of 31% in capital carbon for the cement and concrete sector by 2050 based on 2010 levels. If assumed to be a linear reduction, this target represents approximately 8% reduction in total emissions from 2010 to 2020.

The concrete industry 2020 target is to reduce kg CO<sub>2</sub>/tonne of concrete by 30% from a 1990 baseline. However, if we use the standardised (baseline) concrete mix in 2010 (the GCB baseline) achievement of our 2020 target would represent approximately 16% reduction in total emissions from 2010 to 2020.

The concrete industry target represents a milestone significantly ahead of the GCB routemap.

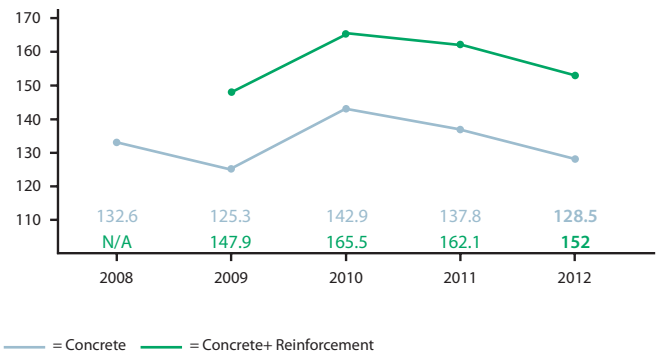
- **Develop a Low Carbon Freight Initiative to support improvement in transport performance through the concrete supply chain to construction sites**

Concrete is a UK manufactured product that is locally sourced, reducing the transport CO<sub>2</sub> of a construction project. The concrete industry has committed to a Low Carbon Freight initiative to measure and manage transport CO<sub>2</sub>.

The concrete industry supports the GCB recommendation to ‘Cut Carbon Everywhere’ and this is just one of the benefits of choosing materials that are sourced and manufactured in the UK.

## Energy Efficiency

Energy used in production as a proportion of production output (kWh/tonne)

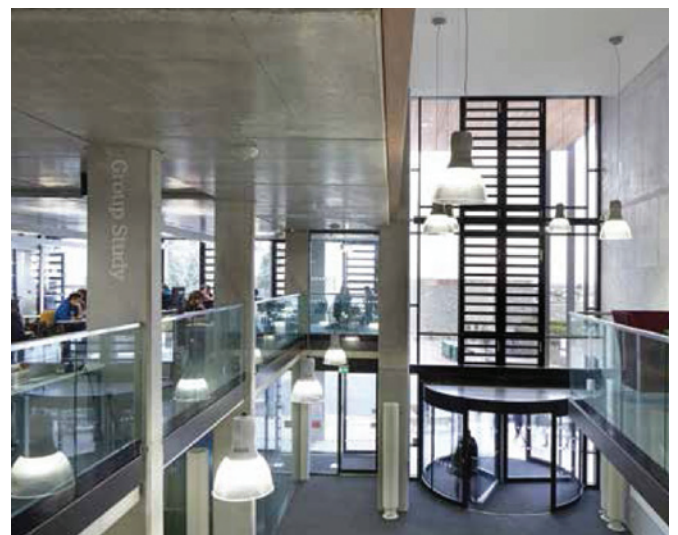


— = Concrete — = Concrete+Reinforcement

Reducing the carbon dioxide emissions associated with the production of concrete and its constituent materials can be achieved by improving energy efficiency or reducing energy consumption. The indicator (kWh/tonne) also referred to as ‘energy intensity’ reports energy consumption during the manufacture of concrete products added to proportional contributions from each of the constituent materials. This is effectively a measure of the average embodied energy of all concrete produced by the Forum members.

Based on 2012 data, the values are 129 and 152 kWh/tonne for concrete and concrete + reinforcement respectively. This represents a 7% reduction from 2011, reflecting efforts throughout the concrete production and supply chain to reduce energy use.

Our overall energy efficiency target is to deliver an industry CO<sub>2</sub> reduction and achieve sector climate change agreement targets. From 2008 to 2012, the energy intensity value for concrete has reduced by 3%.

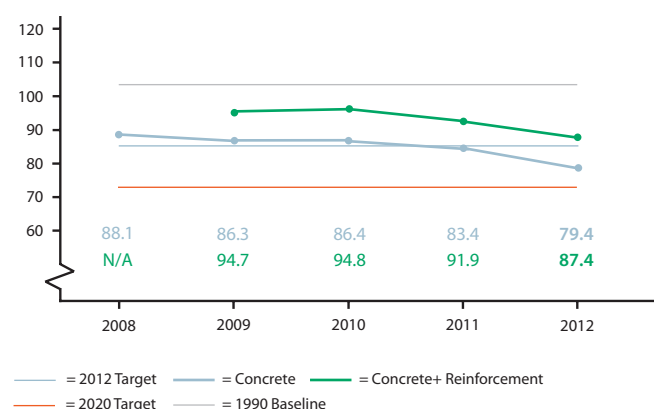


Exposed concrete provides thermal mass at Burwell Deakins’ designed Exchange building, Falmouth.

## CO<sub>2</sub> Emissions – Production

The indicator for emissions of CO<sub>2</sub> from production or carbon intensity is measured as kg CO<sub>2</sub>/tonne of concrete produced. Data from the energy use of concrete production and a proportional contribution from constituent materials are converted to CO<sub>2</sub> emissions using recognised methodology. The indicator is influenced by both production CO<sub>2</sub> emissions and the average mix proportions of concrete. These proportions are directly affected by the relative market demand for different types of concrete. In order to differentiate between these two influences, we report CO<sub>2</sub> emissions based on a 'Standardised or Baseline mix' and a 'Rolling mix'.

CO<sub>2</sub> emissions – Production (Standardised mix) (kg CO<sub>2</sub>/tonne)



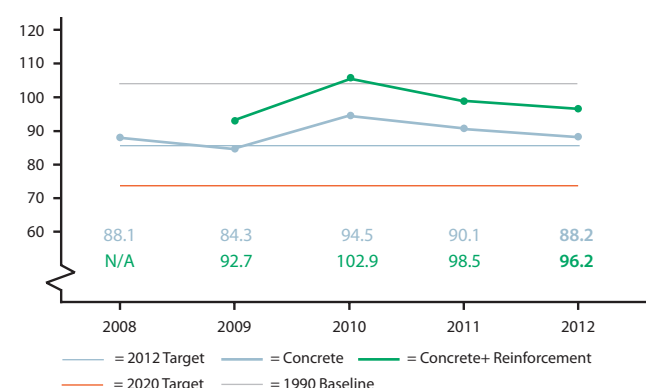
The **Standardised** or **Baseline mix** is based on the average proportions of materials in concrete when the strategy was launched in 2008. By using these mix proportions we report the overall carbon intensity and show the performance directly under the industry's control.

On this basis, the CO<sub>2</sub> intensity of concrete has consistently reduced since 2008, such that the target of 17% reduction from the 1990 level has been met and exceeded with an actual reduction of 23%.

In 2012, based on a baseline mix, 79.4kg of CO<sub>2</sub> was produced per tonne of concrete. The target for 2020 is to reduce this further to 72.2kg per tonne, this equates to a 30% reduction from a 1990 baseline.

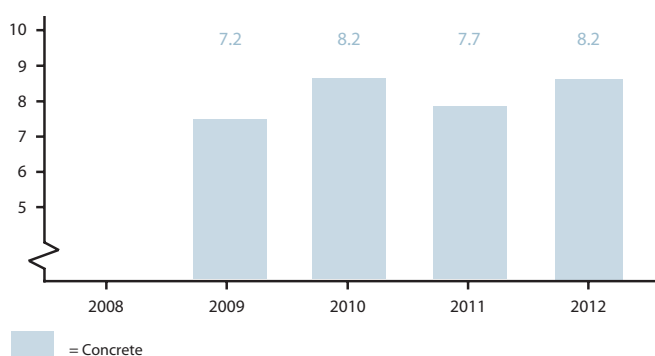
The **Rolling mix** value shows that although there is a 15% reduction from the 1990 baseline, the industry efforts to reduce CO<sub>2</sub> emissions from its own operations have to some degree been counteracted by changes in the type of concrete being supplied. This could be attributable to factors such as the reduced proportion of housing and higher proportion of major projects that have formed construction output since 2008, leading to an average specification for concrete at a higher strength level.

CO<sub>2</sub> emissions – Production (Rolling mix) (kg CO<sub>2</sub>/tonne)



## CO<sub>2</sub> Emissions – Transport

CO<sub>2</sub> emissions of total delivery transport through the industry supply chain (kg CO<sub>2</sub>/tonne)



Within the concrete supply chain, some elements of transport are relatively simple to measure; others are more complex potentially involving multiple modes of delivery with sub-contracted vehicles scheduling return loads in order to make efficient use of vehicles. Work is ongoing to ensure that a reliable baseline of data can be achieved.

The relative consistency of the indicator of kg CO<sub>2</sub>/tonne calculated from the conversion of data from the deliveries of concrete and proportioned materials is encouraging. The value is around 8kg CO<sub>2</sub>/tonne and in 2012 it is 8.2kg CO<sub>2</sub>/tonne. The rationalisation of production plants and materials supply, dictated to an extent by the economic conditions, will increase the value of this indicator as transport distances tend to increase.

The delivery mode for concrete products remains dominated by road transport. In 2012 the average delivery distance for ready-mixed concrete was 12km, the corresponding figure for precast being 106km.

While the average road delivery distance for all raw materials for concrete in 2012 was 43km, there is also greater opportunity for rail and water transport of bulk materials. In 2012 over 15 million tonnes of aggregates and cement were delivered by rail.

# Action on Waste

“The construction and demolition sector is the largest generator of waste in the UK – Act now to reduce waste”

Green Construction Board

## Our Strategy 2020 Commitments

- **Develop a Material and Resource Efficiency Programme to inform best practice across the life cycle of concrete in the built environment**

A success story that has been consistent during the 2008-2012 period of data collection is the net waste ratio of the industry. In 2012, the concrete industry used 62 times more recovered and waste material than the waste it sent to landfill, making the industry a net consumer of waste.

It should be noted that the category of ‘waste’ is used here to reflect the theme of the Green Construction Board. Indicators relating to material efficiency are included in this section. The concrete industry, as well as recycling its own process waste, is very active in the use of by-products, secondary materials and material diverted from the waste stream to reduce its demands on primary raw materials.

In 2020, our target is to reduce waste to landfill to less than 0.5kg per tonne of concrete produced. This represents a 90% reduction from the 2008 baseline.

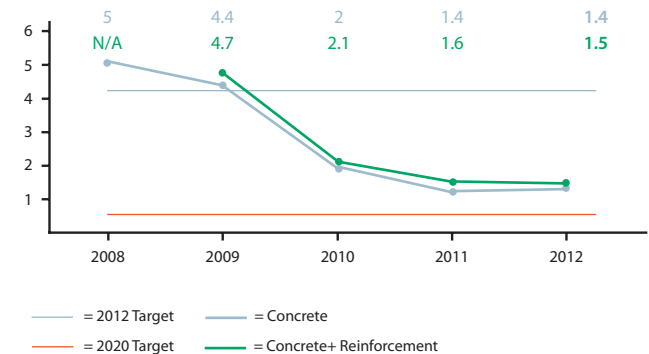
The industry has also launched a new commitment to develop a Material and Resource Efficiency Programme and this process is already underway, as the concrete industry is working in partnership with WRAP to develop REAPs (Resource Efficiency Action Plans).

The concrete industry also provides best practice guidance on designing material efficient structures and designing to minimise waste on site. More information can be found in *Material Efficiency* available to download from [www.concretecentre.com/publications](http://www.concretecentre.com/publications)



## Waste Minimisation

Waste to landfill as a proportion of production output (kg/tonne)

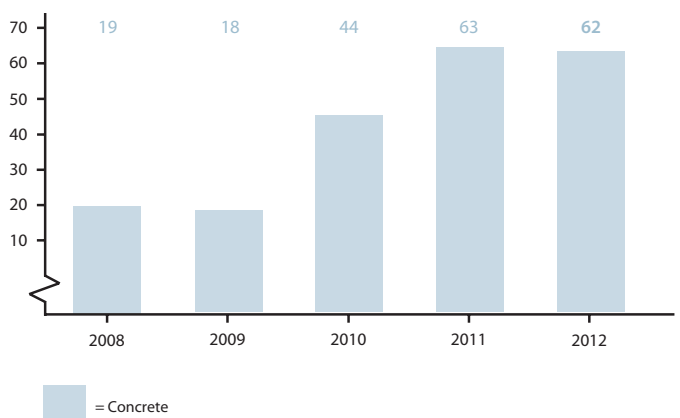


The indicator for waste minimisation relates to waste disposed to landfill per tonne of concrete produced and includes a proportional waste contribution from constituent materials.

During 2012 the industry maintained its performance improvement and reduced its waste to landfill still further, achieving a value of 1.4 kg/tonne; 72% lower than the 2008 baseline value. This has far exceeded our target for a 15% reduction and sets the industry well on the way towards the 2020 target of 90% reduction from 2008.

The inclusion of a waste contribution from the reinforcement industry adds only 0.1 kg/tonne with a concrete + reinforcement value of 1.5kg/tonne.

Net waste consumption ratio



The graph shows the ratio of waste and by-products used in concrete manufacture divided by waste to landfill generated by concrete production and its constituent materials - the net waste ratio.



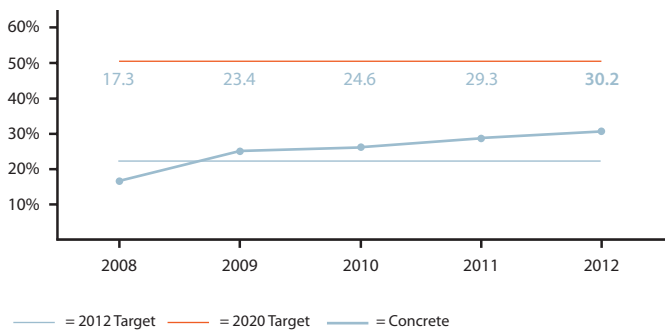
# Natural Resource Protection and enhancing the environment

## Materials Efficiency

The concrete industry, as well as recycling its own process waste, is very active in the use of by-products, secondary materials and material diverted from the waste stream to reduce its demands on primary raw materials.

### Replacement of fossil fuels

Material diverted from the waste stream for use as a fuel source, as a percentage of total energy use



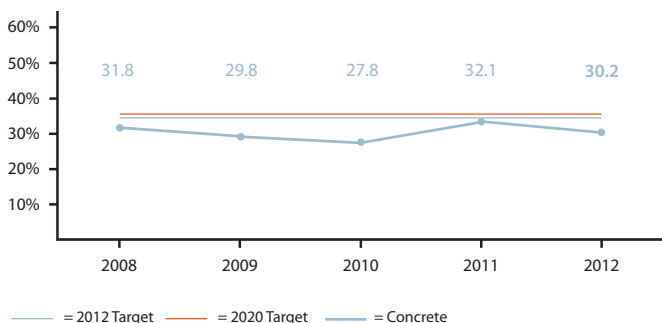
The industry requires high temperatures for production, primarily in cement manufacture, and this is an opportunity to safely burn alternative combustible materials instead of non-renewable fossil fuels. Where fuels used are recognised as carbon neutral under EU Emissions Trading Scheme (EU ETS), this has the additional benefit of reducing the embodied carbon dioxide of cement.

The concrete industry indicator shows the proportion of energy derived from materials diverted from the waste stream as a percentage of total energy use.

The value of 30.2% for 2012 has exceeded the target of 21%. The 2020 target has been set at 50% requiring a significant improvement from the 2008 baseline value of 17.3%.

### Additional cementitious materials

The amount of additional cementitious materials as a proportion of total cementitious materials



Concrete manufacture uses by-products from other industries, such as fly ash from power stations and ground granulated blastfurnace slag (GGBS) from the steel industry. These materials have a lower embodied CO<sub>2</sub> than the cement they replace and can have a positive effect on the appearance and performance of concrete.

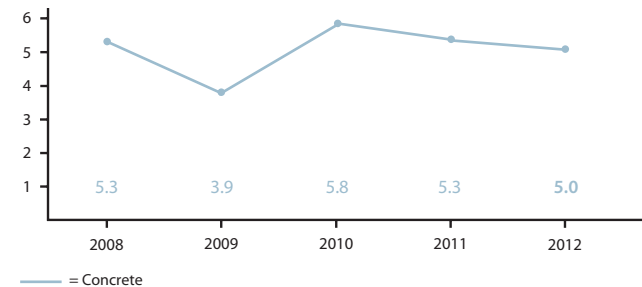
To support designers in achieving the benefits of additional cementitious materials guidance is available in *Specifying Sustainable Concrete* published by The Concrete Centre.

The indicator reports the percentage of additional cementitious material as a percentage of the total cementitious materials.

The values for this indicator are consistently around 30% but the 2012 target of 33% was not reached. As the level of additional cementitious is related to the mix of concrete being produced this indicator is affected by the types of project in the marketplace. The target has been extended to 35% for 2020.

### Recycled/secondary aggregates

The use of recycled/secondary aggregates as a proportion of total aggregates used in concrete production



Depending on the application and the type of concrete there is often an opportunity to incorporate recycled aggregates previously used in other projects and secondary aggregates that may be by-products from other processes e.g. 'stent' from china clay production and granulated slag from steel making.

Environmentally it is preferable to use these materials as close as possible to their origin, although their embodied CO<sub>2</sub> value can exceed virgin materials. This decision should be made on a project basis to ascertain benefit. For this reason the concrete strategy does not include a numerical target for the proportion of recycled/secondary aggregates of the total aggregates used but reports on the trend. This has been consistent at around 5% by mass in concrete production, although some products can have significantly higher levels.

### Recycled steel reinforcement

Steel reinforcement manufacturing BAR members used around 94% of recycled ferrous metal waste as a proportion of the raw materials consumed in their electric arc furnaces (EAF). While reinforcement fabricators used 100% EAF material in producing and supplying rebar for use in concrete.

# Action on Biodiversity and Water

*“Nearly 500 species of animals and plants have become extinct in England and 30% of priority species are declining – Act now to protect and enhance biodiversity”*

Green Construction Board

## Our Strategy 2020 Commitments

- **Support the Mineral Products Association (MPA) Biodiversity Strategy “Building on our legacy... realising our potential”**

Aligned with the Government’s Biodiversity 2020 strategy, the Mineral Products Association (MPA) is setting the agenda for the industry actions on biodiversity.

More information on the strategy is included in the panel on page 11.

- **Develop a water strategy to support the measurement and reporting of sustainability performance and target setting**

The concrete industry has set a commitment to developing a water strategy. The aim is to develop more comprehensive measurement to provide a more rigorous understanding of the water footprint of concrete production and how this can be managed.

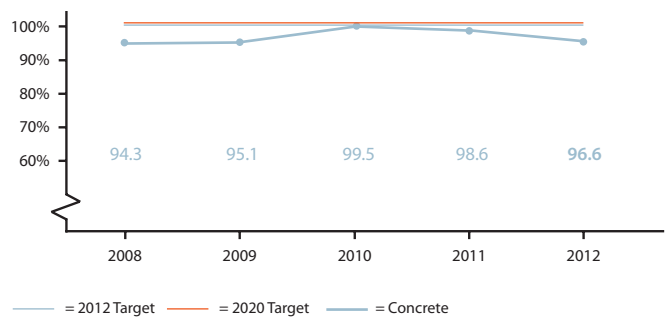
The target is to have reliable baseline data and improvement targets for water consumption by 2015.

Concrete products also have a key role in providing durable infrastructure for sustainable urban drainage systems, flood management and water storage and the industry will communicate with clients to provide knowledge of these solutions to enable the design of a sustainable built environment.



## Biodiversity

Percentage of relevant production sites that have site specific action plans



The concrete industry makes a significant contribution to biodiversity and nature conservation through the management and restoration of sites of mineral extraction.

The strategy prioritises its actions within quarries and the indicator reports on the proportion of relevant production sites that have an action plan relating to site restoration, biodiversity or geodiversity.

The value reported for 2012 is 96.6% of sites, which is lower than our aspiration of 100%. Within this metric there is always potential for a few sites where, for example, restoration plans have yet to be finalised. The 100% target is retained for 2020.

The industry is reviewing the development of additional indicators to measure biodiversity performance, for example, priority habitat creation.

The industry is working with Government to help ensure the national 2020 Biodiversity Strategy introduced in 2012 is delivered and is a member of Government’s Terrestrial Biodiversity Group and also works closely with many conservation organisations locally and nationally.

The MPA organises a biennial Restoration and Biodiversity awards scheme to highlight, reward and promote best practice in these areas. MPA has also commissioned research to improve understanding of the relationship between the industry’s activities and ecosystems services.

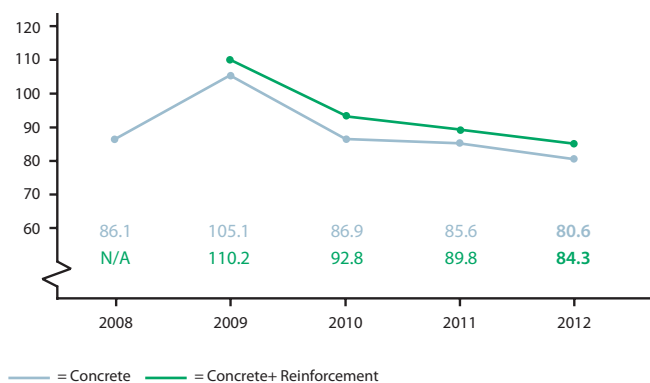
# Natural Resource Protection and enhancing the environment

*"Our water resources are under stress. If we do not act now the security of our water supplies could be compromised – Act now to save water"*

Green Construction Board

## Water

Mains water consumption as a proportion of production output (litres/tonne)



Water is an essential ingredient for the hydration of cement and is an important resource for concrete and its materials supply chain.

The industry indicator reports mains water in litres per tonne of concrete used directly in concrete production added to a proportioned contribution from raw materials production.

The annual indicator is showing a gradually reducing trend although water usage can vary seasonally and year on year as the amount of water retained in natural materials varies depending on weather conditions.

Water consumption is a more complex issue for mineral extraction as processing often involves water, and a high degree of recycling; such that measurement of water 'consumed' is relatively difficult to establish accurately.

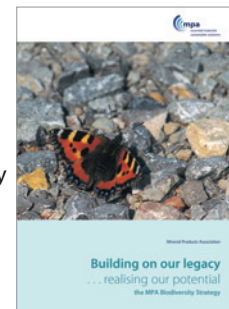
Because of these complexities data being collected on the use of controlled water, such as boreholes and rivers, is currently regarded as being insufficiently reliable to be reported with confidence or to provide a baseline for target setting.

Another factor to consider is the impact of water extraction across geographical areas of the UK, as different regions exhibit varying periods of water stress (where the accepted level of demand for fresh water is greater than availability).

The industry is developing a more comprehensive water strategy with the aim of improving understanding of overall water consumption, how it can be measured and managed and how performance improvements be achieved.

## Biodiversity strategy

MPA members manage an area of land equivalent to a small National Park and RSPB research indicates that mineral sites could meet 100% of the targets for nine out of 11 priority habitats in the UK Biodiversity Action Plan (BAP). The concrete industry is uniquely placed to contribute to UK BAP targets and MPA members want to build on their biodiversity legacy and realise this potential.



### Our Biodiversity Commitments

- **Extend** our knowledge of the wildlife interest and potential on and adjacent to active sites and how best to manage this, and maximise benefits through restoration and after-use.
- **Share** best practice between our members and partners around the country through regular briefings and a specific working group.
- **Develop** our partnerships with conservation organisations, decision makers and individuals to ensure that we are delivering both what people want and wildlife needs. To support this work we will organise biodiversity exchanges of all organisations with an interest in improving biodiversity.
- **Celebrate** our successes through a members' award for Biodiversity Achievement sponsored by Natural England. The reinforcement sector has a partnership with the Wildlife Trust.
- **Understand** our contribution to delivery of local, national and international biodiversity priorities including monitoring our success against a range of indicators.
- **Increase** our influence through contact with policy makers at all levels, including engagement with European initiatives in association with European Trade bodies.
- **Promote** biodiversity education using industry assets such as restored sites and field study and education centres to encourage out of classroom learning and to make the most of first-hand experiences of the natural environment.

# Action on Wellbeing

## Our Strategy 2020

The concrete industry strategy is developed to reflect the three pillars of sustainability: environmental, economic and social. In this section of the report we focus on people and their wellbeing. This is not an area explicit within the current initiatives of the Green Construction Board.

- **The Mineral Products Association (MPA) is setting the agenda for the industry actions on Health and Safety and the target is to reduce lost time incidents from 2009-2014 by 50% with the aim of zero harm.**

Health and Safety is the highest priority throughout the construction industry and is established as part of the culture of the concrete industry.

The frameworks for reporting in this area are already established at a national and sector level and the concrete industry sustainable construction strategy is committed to supporting and exceeding the objectives of national and sector schemes.

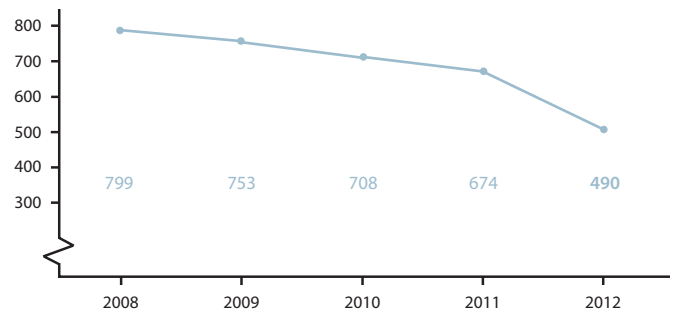
The concrete industry also supports MPA 'Stay Safe' and 'Cycle Safe' campaigns that aim to protect people from danger in quarries and from danger on our roads.

For more information visit [www.mineralproducts.org](http://www.mineralproducts.org)



## Health & Safety

Reportable injuries per 100,000 direct employees per annum



Health and safety of its employees is a key focus of the concrete industry strategy.

Two indicators are used to report performance:

- The number of Reportable Injuries\* per 100,000 direct employees per annum
- Lost Time Injuries\*\* for direct employee per 1 million hours worked

The indicator for reportable injuries has shown a consistent improvement since 2008, the 2012 value representing a 39% reduction from the 2008 level.

**Lost Time Injuries (LTI) for direct employees per 1 million hours worked**

	2009	2010	2011	2012
<b>Concrete</b>	3.2	6.5	6.3	4.6
<b>Concrete + reinforcement</b>	3.8	6.5	7.0	4.5
<b>Concrete as 2009 Baseline</b>	3.2	2.4	1.6	1.6

The indicator for lost time injuries continues to show improvement in the overall concrete and concrete + reinforcement values with 2012 showing a reduction of around 30% since 2010.

In 2010 the data capture was extended considerably and the 2009 and 2010 data sets are not directly comparable, consequently values are also shown based on the 2009 baseline. The values for 'concrete as 2009 baseline' are also showing good progress with 50% reduction having been achieved by 2012.

*\*A Reportable Injury is defined as any injury that is reportable under the Reporting of Injuries, Disease and Dangerous Occurrences Regulations 1995 (RIDDOR).*

*In 2012 the HSE definition of reportable changed to from 3 days to 7 days. The concrete industry indicator will remain at 3 days.*

*\*\*A Lost Time Injury is defined as an occupational injury resulting in the absence of the injured party for one or more working shifts.*

## Employment and Skills

Percentage of employees covered by certified training and evaluation processes



Having a skilled, competent and informed workforce is essential for the industry to remain competitive, safe and capable of meeting the objectives of the concrete industry strategy.

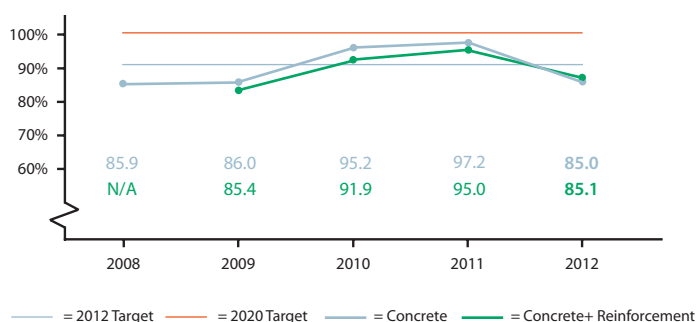
Measurement of competency can be challenging and the current indicator essentially measures the management of training by reporting on the proportion of employees whose training is monitored and managed within ISO 9001, ISO 14001, BS OHSAS 18001 certified management systems.

The industry target for 2012 and 2020 is to aspire to 100%. 2012 performance is 90% for concrete and 91% for concrete + reinforcement.

The industry is reviewing potential indicators that can provide a more comprehensive measure of competency reflecting the work that the MPA is doing in this area.

## Local Community

Percentage of relevant sites that have community liaison activities



It is often the case that concrete supply chain production sites have close links with the local communities through the employment of local people and the use of local materials.

However, because of the scale and nature of operations and potential associated impacts some sites may be regarded as relevant for having more formal local community liaison activities.

'Relevant' sites are defined by the industry as mineral extraction sites in the cement and aggregates sectors and also other specific operations that members consider to have a potential significant impact on the local community. This may apply to production sites within close proximity to sensitive receptors.

The indicator shows the proportion of relevant sites that undertake regular community liaison activities such as liaison groups or council meetings open days, public meetings, community newsletters, social, recreational and educational activities involving the local community.

The trend prior to 2012 showed a gradual increase in performance with the target being met in 2010 and 2011. However in 2012 the target of 90% has not been met.

Based on feedback from member companies, the concrete industry will review the definitions associated with this indicator, to ensure the data collection is consistent. Improvements to the indicator definitions will be considered.

Concrete is a UK manufactured product with production sites situated throughout the UK often in rural areas, providing local employment to the communities which we are part of. The industry is committed to working together with the community to mitigate any potentially adverse impacts of this manufacturing activity. The 2020 target is for 100% of relevant sites to have Community Liaison Programmes.

### Sector information and reports

- Admixtures [www.admixtures.org.uk](http://www.admixtures.org.uk)
- Aggregates [www.mineralproducts.org/sustainability/](http://www.mineralproducts.org/sustainability/)
- Cement <http://cement.mineralproducts.org/>
- Fly Ash [www.ukqaa.org.uk](http://www.ukqaa.org.uk)
- GGBS [www.ukcsma.co.uk/sustainability.html](http://www.ukcsma.co.uk/sustainability.html)
- Precast concrete [www.britishprecast.org/](http://www.britishprecast.org/)
- Ready-mixed concrete [www.brmca.org.uk](http://www.brmca.org.uk)
- Steel reinforcement [www.uk-bar.org/](http://www.uk-bar.org/)

# Concrete Industry Sustainable Construction Targets

## Sustainable Consumption and Production **Action on Materials**

Sustainability Principle	Performance Indicator	Baseline	Performance								Targets		
		1990	Concrete				Concrete + reinforcement				2012	2020	
			2008	2009	2010	2011	2012	2009	2010	2011			2012
Environmental Management	% of production sites covered by an Environmental Management System (EMS)		72.3%	80.4%	84.8%	86.4%	89.8%	80.1%	84.0%	85.60%	89.30%	85%	95%
Emissions (excluding CO <sub>2</sub> )	Number of convictions for air and water emissions per annum		6	1	3	0	0	1	3	0	0	Zero per annum	Zero per annum
Stakeholder Engagement	The industry sectors have successful and wide ranging schemes in place. The justification for an industry wide measure continues to be evaluated for future reporting.												
Quality and Performance	% of production sites covered by a certified ISO 9001 quality management system		84.2%	87.5%	89.0%	91.0%	91.2%	87.7%	89.3%	91.3%	91.4%	90%	95%
Responsible Sourcing	% of production certified to BES 6001		N/A	81%	88%	92%	89%	N/A	N/A	N/A			95%

## Climate Change and Energy **Action on Carbon**

Sustainability Principle	Performance Indicator	Baseline	Performance								Targets		
		1990	Concrete				Concrete + reinforcement				2012	2020	
			2008	2009	2010	2011	2012	2009	2010	2011			2012
Energy Efficiency	Kilowatt hours of energy used in production as a proportion of production output (kWh/tonne)		132.6	125.3	142.9	137.8	128.5	147.9	165.5	162.1	152	Deliver the industry CO <sub>2</sub> target and achieve sector climate change agreement targets	
CO <sub>2</sub> Emissions - Production	CO <sub>2</sub> emissions as a proportion of production output. Rolling Mix (kg CO <sub>2</sub> /tonne)	103.2	88.1	84.3	94.5	90.1	88.2	92.7	102.9	98.5	96.2	Reduce by 17% from 1990 baseline (85.4)	Reduce by 30% from 1990 baseline (72.2)
	CO <sub>2</sub> emissions as a proportion of production output. Standardised Mix (kg CO <sub>2</sub> /tonne)	103.2	88.1	86.3	86.4	83.4	79.4	94.7	94.8	91.9	87.4		
CO <sub>2</sub> Emissions - Transport	CO <sub>2</sub> emissions from delivery transport through the industry supply chain as a proportion of production output. (kg CO <sub>2</sub> /tonne)			7.2	8.2	7.7	8.2					Additional indicators and targets to be developed by 2015	

## Natural Resource Protection and Enhancing the Environment **Action on Waste/Biodiversity**

Sustainability Principle	Performance Indicator	Baseline	Performance								Targets		
		1990	Concrete					Concrete + reinforcement				2012	2020
			2008	2009	2010	2011	2012	2009	2010	2011	2012		
Waste Minimisation	Waste to landfill as a proportion of production output (kg/tonne)		5	4.4	2	1.4	1.4	4.7	2.1	1.6	1.5	15% (4.3)	90% (0.5)
	Waste diverted from potential landfill divided by waste generated and sent to landfill (Ratio)		19	18	44	63	62	N/A	N/A	N/A			
Materials Efficiency	Materials diverted from the waste stream for use as a fuel source, as a % of total energy use.		17.3%	23.4%	24.6%	29.3%	30.2%	N/A	N/A	N/A		21%	50%
	% of additional cementitious materials (GGBS, fly ash, etc.) as a proportion of total cementitious materials used.		31.8%	29.8%	27.8%	32.1%	30.2%	N/A	N/A	N/A		33%	35%
	Recycled/secondary aggregates as a proportion of total concrete aggregates		5.3%	3.9%	5.8%	5.3%	5.0%	N/A	N/A	N/A		No targets have been set as increasing recycled content is not always indicative of sustainable performance.	
	% of recycled scrap as a proportion of total constituent raw materials used.		N/A	N/A	N/A	N/A		97.0%	97.2%	94.0%	94.0%		
Water	Mains water consumption as a proportion of production output. (litres/tonne)		86.1	105.1	86.9	85.6	80.6	110.2	92.8	89.8	84.3	The current Water strategy programme will result in targets being in place by 2015.	
Site Stewardship & Biodiversity	% of relevant production sites that have specific action plans.		94.3%	95.1%	99.5%	98.6%	96.6%					100%	100%

## Creating Sustainable Communities **Action on Wellbeing**

Sustainability Principle	Performance Indicator	Baseline	Performance								Targets		
		1990	Concrete					Concrete + reinforcement				2012	2020
			2008	2009	2010	2011	2012	2009	2010	2011	2012		
Health & Safety	Reportable injuries per 100,000 direct employees per annum.		799	753	708	674	490						
	Lost Time Injuries (LTI) for direct employee per 1,000,000 hours worked.			3.2	6.5	6.3	4.6	3.8	6.5	7.0	4.5	From 2009-2014, reduce lost time incidents by 50% with an aim of zero harm	
Employment & Skills	% of employees covered by certified training and evaluation process.		84.4%	86.5%	90.4%	91.5%	90.3%	87.3%	90.9%	92.2%	91.3%	100%	100%
Local Community	% of relevant sites that have community liaison activities.		85.9%	86.0%	95.2%	97.2%	85.0%	85.4%	91.9%	95.0%	85.1%	90%	100%

*To ensure the successful implementation of the Concrete Industry Sustainable Construction Strategy the industry established the Sustainable Concrete Forum and associated Task Groups*

The Sustainable Concrete Forum and its member Associations maintain records of which member companies have supplied data. In order that the process is transparent, records are kept of which members companies have supplied data for each performance indicator.

**[www.sustainableconcrete.org.uk](http://www.sustainableconcrete.org.uk)**

**Founder members of the Forum:**

- Aggregate Industries [www.aggregate.com](http://www.aggregate.com)
- Brett Group [www.brett.co.uk](http://www.brett.co.uk)
- British Precast [www.britishprecast.org](http://www.britishprecast.org)
- British Ready-Mixed Concrete Association [www.brmca.org.uk](http://www.brmca.org.uk)
- Cement Admixtures Association [www.admixtures.org.uk](http://www.admixtures.org.uk)
- Cementitious Slag Makers Association [www.ukcsma.co.uk](http://www.ukcsma.co.uk)
- CEMEX [www.cemex.co.uk](http://www.cemex.co.uk)
- Hanson UK [www.heidelbergcement.com](http://www.heidelbergcement.com)
- Lafarge Tarmac [www.lafargetarmac.com](http://www.lafargetarmac.com)
- Marshalls plc [www.marshalls.co.uk](http://www.marshalls.co.uk)
- Mineral Products Association [www.mineralproducts.org](http://www.mineralproducts.org)
- MPA - Cement <http://cement.mineralproducts.org>
- UK Quality Ash Association [www.ukqaa.org.uk](http://www.ukqaa.org.uk)

**Associations that have joined the Forum:**

- British Association of Reinforcement (BAR) [www.uk-bar.org](http://www.uk-bar.org)

Published by MPA The Concrete Centre, on behalf of the Sustainable Concrete Forum

Gillingham House, 38-44 Gillingham Street, London SW1V 1HU

Tel: 0207 963 8000

**[www.concretecentre.com](http://www.concretecentre.com)**

© MPA The Concrete Centre, 2013

All advice or information from MPA The Concrete Centre is intended only for use in the UK by those who will evaluate the significance and limitations of its contents and take responsibility for its use and application. No liability (including that for negligence) for any loss resulting from such advice or information is accepted by Mineral Products Association or its subcontractors, suppliers or advisors. Readers should note that the publications from MPA The Concrete Centre are subject to revision from time to time and should therefore ensure that they are in possession of the latest version.



Printed on 9Lives silk comprising 55% recycled fibre with 45% ECF virgin fibre. Certified by the Forest Stewardship Council.

Front Cover Image:

**The Sainsbury Laboratory, Cambridge:** this concrete building is the winner of the 2012 Stirling Prize. A video of the project can be viewed at [www.thisisconcrete.co.uk](http://www.thisisconcrete.co.uk)