

# Performance

a corporate responsibility report from the UK cement industry

**BCA**  
British Cement Association



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**Front cover** The Darwin Centre, Natural History Museum, London  
**Inside front cover** Royal Alexandra hospital London

# This review



The year under review in this edition of *Performance*, 2007, was a very positive one for the UK cement industry.

The industry has made significant improvements to the sustainability of its operations during 2007 and in particular has made important progress towards and in some cases already exceeded its 2010 targets in the Environment Agency's sector plan. The industry will continue to build on this success and has now worked with the regulator to agree new goals for 2015 as detailed on page 16.

The use of waste-derived fuels has played a significant part in achieving this success. The growth in their application is an excellent example of how the UK cement industry is making productive use of materials that otherwise would have gone to landfill or have been incinerated without energy recovery. As a result of new legislation, the Environment Agency removed its Substitute Fuels Protocol guidance in December 2007. Some issues were not covered by these new provisions, and consequently the BCA developed a new '*Code of practice for the use of waste-derived fuels in cement kilns*' covering the consultation process, community relations, and the reporting of results.

BCA member companies operate in England, Wales, Scotland and Northern Ireland and *Performance* covers all these operations. At the beginning of 2007, UK cement makers – Castle Cement, CEMEX UK, Lafarge Cement UK and Tarmac Buxton Lime and Cement – increased their overall production output by 3.6 per cent following operational problems the previous year and reflected growing UK demand – up by 4.8 per cent over 2006.

The industry committed itself to a zero target for lost time incidents in 2006 and I am pleased to report a reduction of 36 per cent in the numbers recorded during 2007. Nevertheless, we still have much to do in the area of health and safety, especially in terms of contractors working on our sites.

The end of 2007 brought an end to the first phase of the EU Emissions Trading Scheme. While the industry has fully met its obligations to date, it now has great concerns about how the scheme will be designed in the post-Kyoto period. We believe that current proposals threaten the future of what is a healthy domestic industry, supplying an essential material for economic and social development. Moreover, uncertainty about future plans for the scheme is hindering major investment decisions in UK and Europe.

The UK cement industry is committed to reducing its carbon footprint as is borne out by its operating results, recorded in the five annual editions of *Performance* now published. The industry is playing its part in the fight to tackle climate change. Since 1990, emissions have been cut by over 27 per cent and in 2007, emissions were more than 3.7 million tonnes less than in 1990. Today the climate change challenge is joined by another: that of rapidly increasing energy prices.

Mitigation and adaptation to climate change is a priority for us all. Concrete has natural properties that make it flood and fire resistant as well as offering innovative solutions to reduce the energy needed to keep our homes warm in winter and cool in summer by absorbing and releasing heat. Cement is an essential ingredient to create flexible, adaptable and attractive concrete structures that form the social and economic fabric of the nation. We will continue to strive to meet the needs of both the environment and the society we serve in an efficient, cost effective and sustainable manner and to come up with answers to tomorrow's challenges.



Pal Chana  
BCA CHIEF EXECUTIVE

November 2008



Courtesy The Concrete Centre

£60 million Brewery Wharf apartment development, built on a brownfield site in Leeds city centre

### Performance photography

Photographs in *Performance* have been selected to demonstrate the wide end-uses of concrete, showing the great versatility of this sustainable building material

The UK cement industry supplies a wide range of products to suit the needs of end-users as diverse as civil engineers, designers of precast concrete products and the do-it-yourself enthusiast building a garden path. Each product has intrinsic properties in terms of strength, setting and general performance capabilities.

With an annual turnover of £775 million and employing over 3,000 people directly and around 15,000 indirectly, the UK cement industry plays a fundamental role within the £5 billion concrete industry. Demand for cement in the UK reached 14.5 million tonnes in 2007, approximately 90 per cent of which was manufactured locally.

The industry continues to be an important employer and source of local income, generally in rural locations close to sources of raw materials such as limestone and chalk.

Although major investment totalling over £240 million has been completed in recent years, the industry continues to invest in new plant, technology and distribution facilities to make its operations more efficient, increase environmental performance and assist working towards sustainability.



Stanton twin block concrete sleepers



Block paving at housing development, Oxford

During 2007, Lafarge Cement UK put in hand final design and costing feasibility studies for its proposed new cement works at Holborough in Kent. The company already has planning permission to build the works and the studies will enable Lafarge to make a final decision on allocating the necessary investment, although the future format of the EU Emissions Trading Scheme will also have a bearing on what the company decides to do. Also in 2007, Lafarge completed a £15 million rail improvement scheme at its Hope works in Derbyshire. This included building a new branch line, constructing a loading facility and the purchase of rail wagons. The investment reduces the road transport needed to bring materials into the works and to distribute cement.

CEMEX UK was granted planning permission in 2007 to build a £27 million facility for the blending of cements at the Port of Tilbury, Essex. Blended cements give improved workability in unhardened concrete and increases the long-term durability of concrete subjected to aggressive environments. Because of the reduced clinker content, CEMEX UK has estimated that emissions of carbon dioxide are reduced by 50 per cent for each tonne of blended cement produced at the new facility, which is due to become operational by the end of 2008.

Building on its £110 million investment in a new plant which came on line in 2004, Tarmac Buxton Lime and Cement has continued to invest in facilities to reduce its use of fossil fuels.



Courtesy Tarmac



Courtesy The Concrete Centre



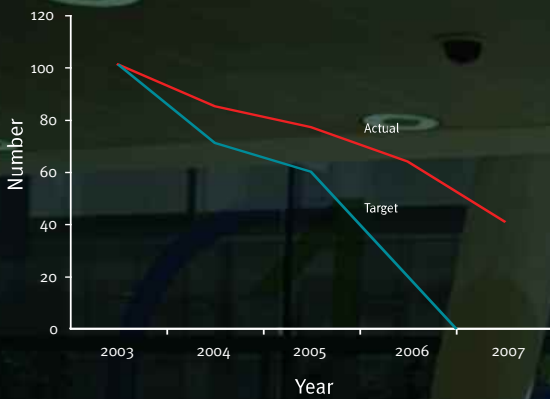
Courtesy Newscast



**Main** Concrete provides strength and design possibilities in bridge construction  
**Top** Falmouth College of Arts  
**Above** UK's longest road tunnel to alleviate the bottleneck at Hindhead and the Devil's Punchbowl in Surrey

HEALTH AND SAFETY DATA

lost time incidents



**Footnote** A lost time incident (LTI) is defined as causing an injury that prevents an employee or contractor returning to work the next day

UK cement industry incident statistics – 2003 to 2007

	2003	2004	2005	2006	2007
target	101	71	60	54	0
<b>actual</b>	<b>101</b>	<b>85</b>	<b>77</b>	<b>64</b>	<b>41</b>
of which, direct employees	47	40	46	42	24
of which, contractors	54	45	31	22	17

The industry introduced a zero tolerance policy towards lost time incidents and stepped up its contact with all levels of stakeholders

## Health and safety

The industry's health and safety zero lost time incidents policy completed its first full year in 2007 and resulted in a reduction in the number of lost time incidents from 64 in 2006 to 41 in 2007.

However, the industry accepts much is still to be done and has begun work in specific areas – kiln maintenance and contractor safety on site – to improve further its health and safety performance.

Each of the BCA members has its own health and safety training programme incorporating support from the trade unions and the most senior of management to augment efforts being made centrally via the trade association.

On a broader health and safety front, the Committee on the Medical Effects of Air Pollution (COMEAP) issued its latest report on the health effects associated with the burning of waste-derived fuels in cement kilns. The earlier report in 2005 had looked at waste tyres and substitute liquid fuels while the latest assesses meat and bone meal, processed sewage pellets and refuse derived fuel. The committee used emissions data from trial burns of these materials to assess possible effects. In its subsequent report, published in early 2008, COMEAP stated that the results were reassuring and that these fuels would result in 'no changes in emissions... that would be of significance for human health.'



## Public consultation

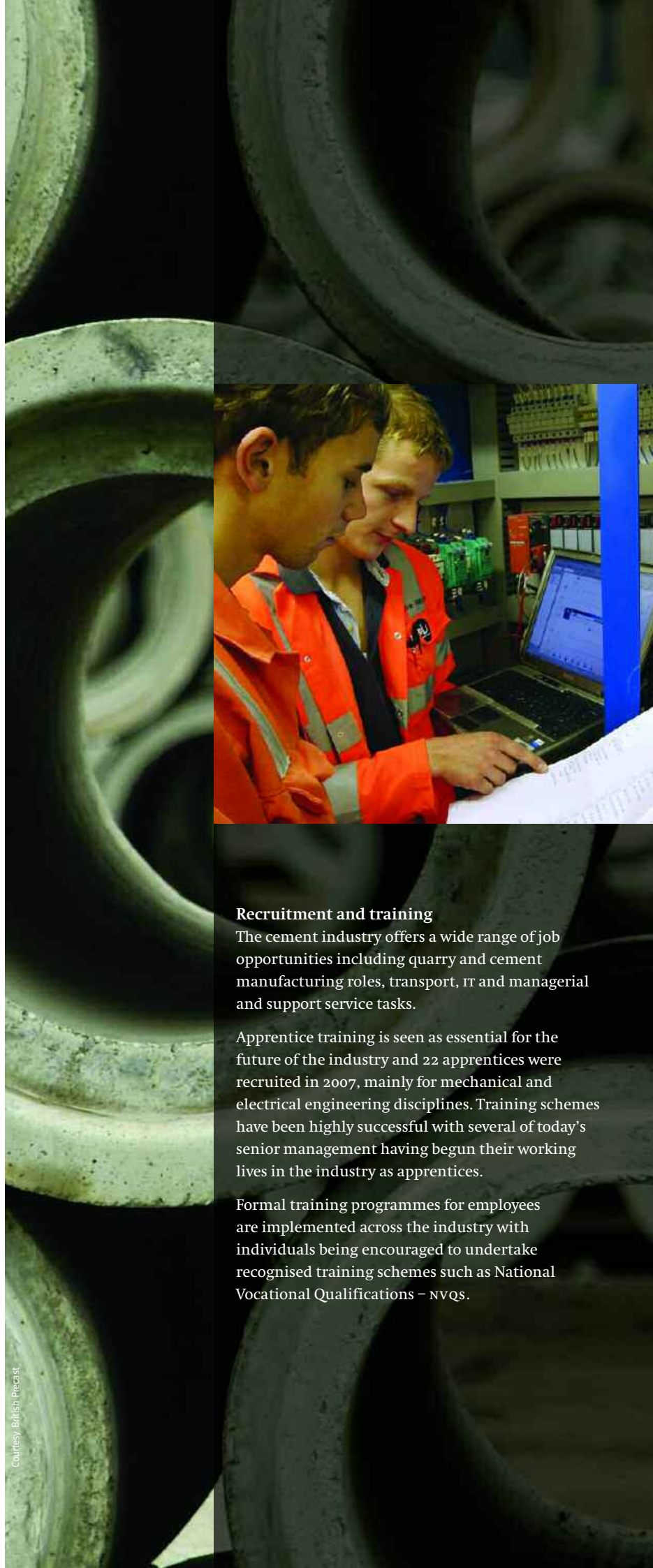
The cement industry continues to work in partnership with Forum for the Future on a programme of activity to provide stakeholders with a clear opportunity to engage with the industry on sustainability. Central to this have been annual meetings at which industry representatives and stakeholder groups discuss targeted issues on sustainable development.

An important outcome of the July 2007 stakeholder meeting was an overall positive acceptance of the industry's performance and strategy for sustainable manufacture. The industry committed itself to continue dialogue with stakeholders and improve communication by simplifying performance reporting. It also undertook to address key common priorities on sustainable development for the cement and concrete industry and its stakeholders.

The industry recognises the importance of its local communities and continues to foster good relationships and understanding with those living close to its operations. It is actively seeking better ways to engage and communicate including newsletters, liaison meetings, open days and site visits. The newsletters are often used to provide information for public consultation on developments at the works in addition to covering human interest stories about the company, and its interactions with the local community.



Courtesy/ Newcastle



Courtesy/ British Precast



### Recruitment and training

The cement industry offers a wide range of job opportunities including quarry and cement manufacturing roles, transport, IT and managerial and support service tasks.

Apprentice training is seen as essential for the future of the industry and 22 apprentices were recruited in 2007, mainly for mechanical and electrical engineering disciplines. Training schemes have been highly successful with several of today's senior management having begun their working lives in the industry as apprentices.

Formal training programmes for employees are implemented across the industry with individuals being encouraged to undertake recognised training schemes such as National Vocational Qualifications – NVQs.



### Advocacy

The cement industry is highly regulated so it is vital that it is fully aware of forthcoming legislation and its possible implications. The BCA and its members take a structured approach to contact with government and ministers, political parties, trade unions and European institutions. By so doing, the industry plays a full and supportive role in the development of effective legislation as appropriate on proposed legislative changes.

BCA membership of House of Commons all-party groups and the principal organisations with which it engages includes:

#### All party groups

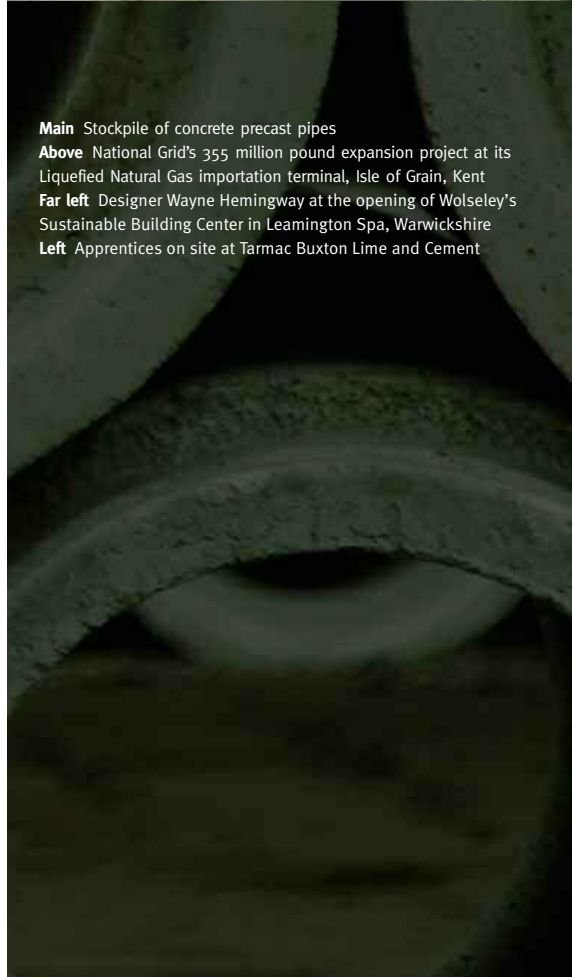
Climate Change  
Energy  
Environment  
Minerals  
Renewable and Sustainable Energy  
Sustainable Waste

#### Representation on EU/UK government groups

European Commission Lifecycle Assessment Platform  
Hazardous Waste Forum  
Strategic Forum for Construction; Sustainable Construction Task Group  
Sustainable Construction Strategy Project Board

#### Other groups

British Precast  
British Standards Institution  
Building Research Establishment  
Carbon Capture and Storage Association  
Confederation of British Industry  
CEMBUREAU  
Chartered Institute of Waste Management  
Construction Products Association  
Energy Intensive Users Group  
Environmental Industries Commission  
European Concrete Forum  
European Concrete Platform  
Forum for the Future  
Environmental Protection UK  
The Concrete Centre  
The Concrete Society  
UK Emissions Trading Group  
World Business Council for Sustainable Development  
Cement Sustainability Initiative



**Main** Stockpile of concrete precast pipes  
**Above** National Grid's 355 million pound expansion project at its Liquefied Natural Gas importation terminal, Isle of Grain, Kent  
**Far left** Designer Wayne Hemingway at the opening of Wolseley's Sustainable Building Center in Leamington Spa, Warwickshire  
**Left** Apprentices on site at Tarmac Buxton Lime and Cement

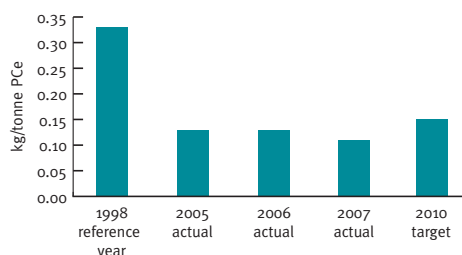
The UK cement industry has reported annually on its environmental performance since 2003. The following data show the significant progress made over this period

The Environment Agency in November 2005 published, *Improving environmental performance, a sector plan for the cement industry in England and Wales*. It provided a framework of agreed environmental objectives and priorities for the sector up to 2010.

In the following pages, the BCA reports progress against those objectives during 2007, using data that covers operations throughout England, Wales, Scotland and Northern Ireland. Data provided by the environment Agency covers only its area of responsibility – England and Wales.

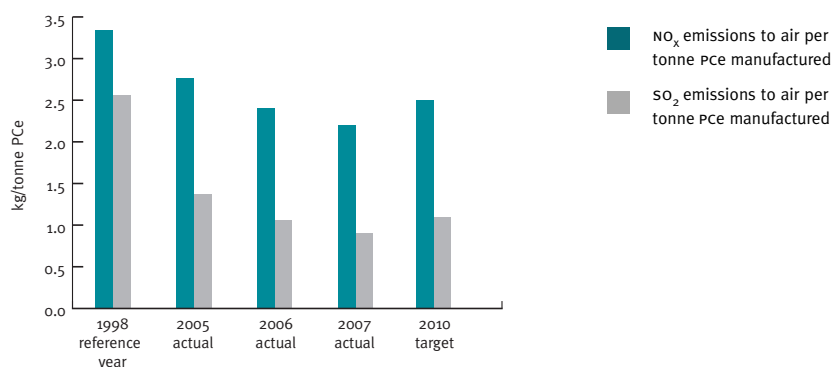
In 2008, the Environment Agency and the BCA membership agreed new objectives for 2015, with a vision for 2020. These new objectives can be found on page 16, entitled *Proposed sector plan objectives*.

Dust emissions to air per tonne pce manufactured



pce is Portland cement equivalent

NO<sub>x</sub> and SO<sub>2</sub> emissions per tonne pce manufactured



Recovered concrete to replace natural raw materials

## OBJECTIVE 1

### *Reduce consumption of natural resources per tonne of cement manufactured*

The industry continues to source waste materials that it can use safely in place of natural raw materials and fossil fuels. In 2007 it productively used over 1.3 million tonnes of waste-derived materials in this way, thus playing a major role in UK waste management.

Pulverised fuel ash from power generation continues to be the main substitute raw material although recycled construction materials, including crushed concrete and plasterboard are also employed, as are moulds from the ceramic industry.

BCA member companies now use a wide range of waste-derived fuels and in 2007, the level of replacement of fossil fuels reached 19.4 per cent of which 4 per cent was classified as biomass.

Substitute liquid fuels, produced from the by-products of solvent recycling, have now been used for 15 years in the UK and additionally in that period, the industry has introduced tyres – used both chipped and whole – meat and bone meal, sewage sludge pellets and paper and plastics. Criteria remain the same: fuels must be compatible with cement manufacture and their use must be safe and have no negative impact on the environment.

## PERFORMANCE INDICATORS

- 1.1 use of natural raw materials per tonne pce manufactured<sup>1</sup>
- 1.2 use of fossil fuels for primary energy per tonne pce manufactured

	BASE	ACTUAL	TARGETS
units	1998	2007	2010
1.1 kg/te pce	1498	1416	1413
1.2 kwh/te pce	1103	834	764

1.1 Investigations have revealed improvements in measurements of natural raw material efficiency, which have shown that the 1998 baseline is lower than it should be and targets will need to be revised accordingly.

## OBJECTIVE 2

### *Reduce the amount of cement process waste residues disposed of per tonne of cement produced*

BCA member companies reported in *Objective 1* their beneficial use of 1.3 million tonnes of waste as raw material or fuel in 2007. Against that figure it disposed of less than 83,000 tonnes of process residues, making it a net consumer of waste.

The greatest amount of process waste was cement kiln dust (CKD). In previous years the industry has been able to report its success in using the material for agricultural purposes where, mixed with sewage sludge, it has helped create fertile soil for land reclamation.

This is no longer possible following changes in legislation, hence the zero figure recorded in the 2007 performance indicator 2.1 in the accompanying table. The industry will work with the agency to investigate technical and regulatory solutions for CKD recovery.

The industry continues to recycle a percentage of process waste – CKD and bypass dust – by returning it to the production process and, where necessary, seeks to minimise the impact of any disposal by constructing specially designed landfill sites within its own boundaries.

#### PERFORMANCE INDICATORS

- 2.1 CKD (i) recovered off-site; (ii) disposed of per tonne PCE manufactured
- 2.2 other waste (i) recovered off-site; (ii) disposed of per tonne PCE manufactured

	BASE	ACTUAL	TARGETS
units	1998	2007	2010
2.1(i) kg/te PCE	0	0	1.07
2.1(ii) kg/te PCE	22.9	7.05	7.5
2.2(i) kg/te PCE	0.79	0.94	1.50
2.2(ii) kg/te PCE	4.17	1.41	3.00

- 2.1(ii) Recovery is reduced due to amendments made to waste management licensing exemptions and the closure of wet kilns
- 2.2(ii) 'Other waste' is not directly cement production process related, as such year-on-year variance is expected, eg, the 2006 data includes a significant amount of demolition waste.



SO<sub>2</sub> emissions can be reduced by the use of modern gas scrubbers

## OBJECTIVE 3

### *Reduce emissions from cement manufacturing*

Principal emissions from cement manufacturing are carbon dioxide (CO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>), sulphur dioxide (SO<sub>2</sub>) and particulate matter (dust). Between 1998 and 2007, the UK cement industry achieved 65 per cent reduction in SO<sub>2</sub>, 34 per cent in NO<sub>x</sub> and 65 per cent in dust. In recent years, heavy investment in new technology, including abatement equipment and use of waste-derived fuels, has reduced emission levels below the targets set by the Environment Agency.

Investment in abatement technology continued. Lafarge Cement UK completed the installation of a £20 million sulphur dioxide scrubber at Dunbar, Scotland. This has significantly reduced emissions both of SO<sub>2</sub> and dust.

CEMEX UK completed the installation of a bag filter system to reduce dust emissions at its Rugby works by 80 per cent. This represents a £6.5 million investment and works by extracting dust from kiln gases as they pass through the plant's exhaust duct.

Process improvements have also helped. At Castle Cement's Ketton works modifications to the calciner have reduced NO<sub>x</sub> emissions.

Tarmac Buxton Lime and Cement further reduced its NO<sub>x</sub> emissions by introducing tyre chips as a fuel into its calciner.

#### PERFORMANCE INDICATORS

- 3.1 number of sites requiring action to reduce local environmental impacts<sup>2</sup>
- 3.2 dust emissions to air per tonne PCE manufactured<sup>3</sup>
- 3.3 NO<sub>x</sub> emissions to air per tonne PCE manufactured
- 3.4 SO<sub>2</sub> emissions to air per tonne PCE manufactured
- 3.5 total environmental burden to air<sup>4</sup>

	BASE	ACTUAL	TARGETS
units	1998	2007	2010
3.1 number	2	1	0
3.2 kg/te PCE	0.33	0.11	0.15
3.3 kg/te PCE	3.34	2.20	2.50
3.4 kg/te PCE	2.56	0.91	1.10
3.5 burden value	1807	894	1054

#### OBJECTIVE 4

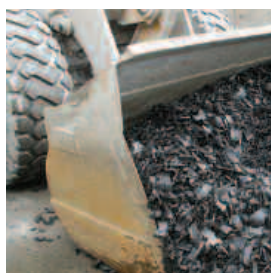
##### *Reduce emissions of greenhouse gases per tonne of cement manufactured*

In 2007, CO<sub>2</sub> emissions were over 3.7 million tonnes lower than in 1990. Early action by investment in new plant and the use of waste-derived fuels ensured achievement of these reductions, often going beyond existing national and EU commitments. A future step change in emissions will be difficult to achieve through technological change, an important reason why the industry supports market mechanisms to drive down carbon use.

Calcination of raw materials and burning of fuels are the main producers of CO<sub>2</sub> in cement manufacturing, but much smaller amounts are generated through materials transport and the use of electricity.

In 2007, the amount of direct CO<sub>2</sub> generated per tonne of cement produced, reported in objective 4.1, remained at about the same level as in the previous year. BCA member companies emitted an average of 819 kg of CO<sub>2</sub> per tonne of Portland cement equivalent, although the total amount of CO<sub>2</sub> produced increased in line with the industry's higher production output. The industry continued to use ground limestone, fly ash and ground granulated blastfurnace slag to produce factory-made composite cements, further reducing its CO<sub>2</sub> content by allowing customers who are unable to blend themselves the opportunity to use lower CO<sub>2</sub> cement.

Although the industry has made substantial reductions in its CO<sub>2</sub>, it has serious reservations concerning Phase III of the EU Emissions Trading Scheme which will be effective from 2013 to 2020.



Chipped tyres

#### OBJECTIVE 5

##### *Optimise the sustainable use of wastes from other industries or sources*

The cement industry continues to play a major role within UK waste management, now using over 300,000 tonnes of processed waste materials as fuel and over one million tonnes as raw materials. The approximately 20 percent replacement of fossil fuels with waste-derived materials equates to a saving of over 330,000 tonnes of coal.

During 2007, the industry continued to expand its use of waste-derived fuels. Tarmac Buxton Lime and Cement successfully carried out trials at its Derbyshire works using chipped tyres and began trials using meat and bone meal (MBM). Castle Cement trialled MBM at its Ketton, Rutland works and applied to the Environment Agency to trial MBM and paper and plastics at Padeswood in north Wales. CEMEX UK set up trials of its waste-derived fuel, Climafuel – made principally from paper and plastics – at two of its plants, Barrington in Cambridgeshire and South Ferriby in Lincolnshire. CEMEX UK was also granted permission to trial Climafuel and tyres at its Rugby works in Warwickshire. At the end of the year, Lafarge Cement UK began public consultation prior to an application for

Under current EU proposals, industry must buy at auction the CO<sub>2</sub> allowances it needs to continue production, whereas non-carbon constrained countries will not suffer this substantial cost penalty. This will result in a shift of production to these countries, the so-called 'carbon leakage'. A recent report by the Boston Consulting group indicates that at 25 Euros per tonne (approximately £21), all UK combined clinker and cement manufacturing will disappear off-shore.

The EU proposals contain some provisions to assist 'competitively impacted industries' such as cement, but much greater certainty is required to determine the extent to which it will be impacted.

Carbon capture and storage, (CCS), provides a potential medium-term solution to the reduction of CO<sub>2</sub> emissions, and BCA has been working with the International Energy Agency, (IEA), to identify the potential of this technology.

#### PERFORMANCE INDICATORS

- 4.1 emissions of CO<sub>2</sub> directly from cement plants per tonne pce
- 4.2 emissions of CO<sub>2</sub> from combustion of fossil fuel at cement plants per tonne pce
- 4.3 emissions of CO<sub>2</sub> from calcination of raw materials per tonne pce

	BASE	ACTUAL	TARGETS
units	1998	2007	2010
4.1 kg/te pce	924	819	833
4.2 kg/te pce	387	278	273
4.3 kg/te pce	520	499	512

permission to use solid recovered fuel – derived from paper, plastics and biodegradable waste from homes and businesses – at its Caudon works in Staffordshire.

#### PERFORMANCE INDICATORS

- 5.1 mass of waste recovered as fuel per tonne pce manufactured
- 5.2 mass of waste recovered as raw materials per tonne pce manufactured
- 5.3 proportion of fuel comprising waste material
- 5.4 proportion of raw materials comprising waste material
- 5.5 proportion of Environment Agency permit decisions to allow use of substitute fuels that are determined within target time<sup>5</sup>

	BASE	ACTUAL	TARGETS
units	1998	2007	2010
5.1 kg/te pce	9.64	26.78	21.00
5.2 kg/te pce	63.14	89.14	100
5.3 thermal %	5.7	19.47	15.00
5.4 mass %	4.04	5.99	8.00
5.5 %/number	–	50% <sup>a</sup>	75% <sup>b</sup>

<sup>a</sup> within six months <sup>b</sup> within four months



Restored area at former cement quarry in Buckinghamshire

## OBJECTIVE 6

### *Develop site restoration plans and biodiversity action plans*

Under existing planning permissions and Pollution Prevention Control permits, formal restoration plans are in place for all cement works and their quarries. Ultimate restoration will be dependent, however, on future land use as cement operations are highly capital intensive and hence have very long working lives. Additionally, all BCA member companies' cement plant and quarries have, or are linked to, biodiversity action plans.

Following the completion of its policy to centre its production on dry-process kilns, Castle Cement began work in 2007 on the demolition of redundant wet-process kilns and associated landscaping at its Padeswood, north Wales works and at Clitheroe, Lancashire.

CEMEX UK supported *Butterfly Conservation*, Europe's largest insect conservation charity. At South Ferriby works, a butterfly habitat was created, while at Barrington, work was undertaken to preserve and create habitat for the increasingly rare small blue butterfly. In Southam near Rugby, CEMEX employees worked with the charity to preserve and create habitat for species, including the *dingy* and *grizzled skippers*. CEMEX UK also signed a memorandum of understanding and published the

conservation book *Birds and people* with Birdlife International. The company's aim is to raise public awareness of the importance of bird conservation and the fact that declining bird populations are primarily due to habitat loss, something the company seeks to redress in the UK as part of its restoration programmes

At Tarmac Buxton Lime and Cement the biodiversity action plan for Tunstead, which is located in the Peak District of Derbyshire, is being implemented through a variety of specific projects. These include the creation of new grassland, woodland, wetland and rock outcrop wildlife habitats through the progressive restoration of formerly operational areas of the quarry.

#### PERFORMANCE INDICATORS

- 6.1 proportion (and number) of existing operating quarries that have restoration plans
- 6.2 proportion (and number) of appropriate sites that have, or are linked to, biodiversity plans

		BASE	ACTUAL	TARGETS
	units	1998	2007	2010
6.1	% (number)	94 (35)	100 (24)	100
6.2	% (number)	0 (0)	100 (14)	100 (15)

## OBJECTIVE 7

### *Improve transparency, understanding and engagement between the Environment Agency, industry and other stakeholders*

Consultation is very much part of the day-to-day working philosophy of the cement industry and this has led to better understanding of its role in the UK today. Each of the BCA member companies communicates effectively with its neighbours, using tools ranging from newsletters and local liaison committees to open days or special exhibitions to explain specific proposals.

#### PERFORMANCE INDICATORS

- 7.1 proportion (and number) of plants using community communication tools
- 7.2 proportion (and number) of substitute fuel proposals during the year that were pro-actively communicated by companies to local communities
- 7.3 proportion (and number) of local liaison meetings attended by Environment Agency officers<sup>6</sup>
- 7.4 proportion (and number) of substitute fuel decisions during the year for which an Environment Agency Decision Document was issued

		BASE	ACTUAL	TARGETS
	units	1998	2007	2010
7.1	% (number)	68 (15)	100 (14)	100
7.2	% (number)	100 (2)	100 (7)	100
7.3	% (number)	N/A	92 (34/39)	100
7.4	% (number)	N/A	100 (4)	100



Industry environmental management systems include regular monitoring

## OBJECTIVE 8

### Work to risk-based regulatory and environmental management systems

The Environment Agency in England and Wales, the Scottish Environment Protection Agency and the Industrial Pollution and Radiochemical Inspectorate in Northern Ireland control the industry's manufacturing operations under the Pollution Prevention and Control regulations.

Each of the BCA member operations is accredited to ISO 14001 and/or EMAS and works to maintain and improve their accreditation.

No prosecutions were taken out against BCA members during 2007.

Three enforcement notices were issued by the agency during the year. Castle Cement received one at Padeswood for failure to progress agreed programmes on time and incomplete process risk assessments for a tyre feed system. A further one was issued at Castle's Ketton works for failings in operational control leading to unauthorised dust releases. The third was issued to CEMEX UK for dust emissions at Rugby, arising from a pressure valve release.

Castle Cement also received notice of 12 category 2 breaches of permit, although the Environment Agency has acknowledged that there were some inconsistencies in the way it recorded some incidents.

Throughout, industry members have reviewed their procedures and systems, modified equipment where necessary and undertaken to work to prevent future problems.

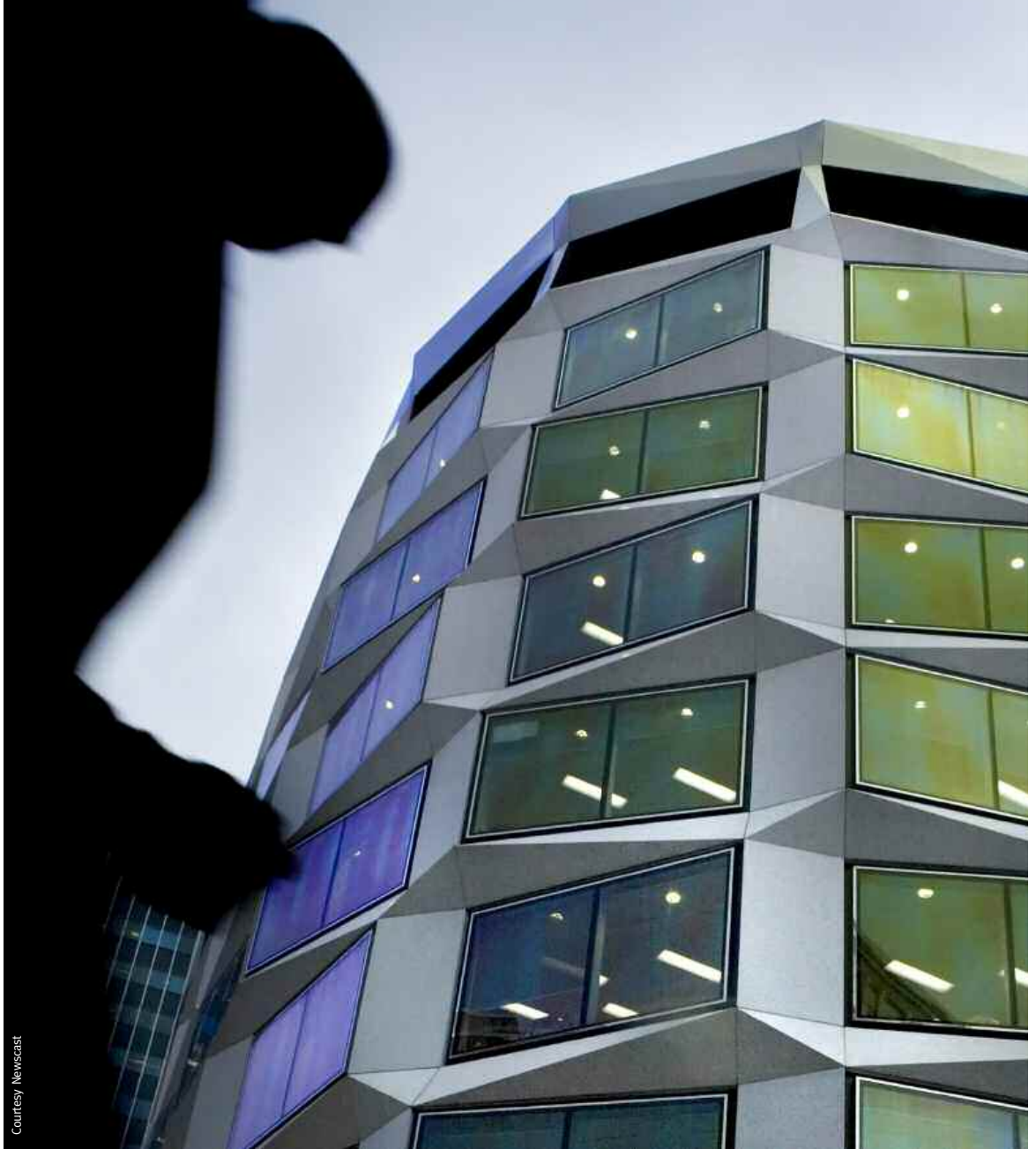
## PERFORMANCE INDICATORS

- 8.1 proportion (and number) of sites with ISO 14001 and/or EMAS certification or equivalent
- 8.2 EP OPRA – Overall management rating
- 8.3 EP OPRA – Regulatory compliance rating<sup>7</sup>
- 8.4 pollution incidents: Annual number of Category 1 and 2 incidents<sup>8</sup>
- 8.5 breaches of permits: Annual number of Category 1 and 2 breaches of permits<sup>9</sup>
- 8.6 number of sites with enforcement actions and prosecutions<sup>10</sup>
- 8.7 OMA scores<sup>11</sup>
- 8.8 proportion (and number) of PPC permit applications and variations determined within target time<sup>12</sup>
- 8.9 proportion (and number) of sites receiving check monitoring reports from the Environment Agency within target time<sup>13</sup>

		BASE	ACTUAL	TARGETS
	units	1998	2007	2010
8.1	% (number)	91 (20)	100	100 (15)
8.2	% band A	N/A	92 (11)	100
8.3	% by score	N/A	(see note i)	–
8.4	number	N/A	0	A
8.5	number	N/A	12	A
8.6	number	N/A	4 (ii)	A
8.7	score	N/A	40% minimum 84% average 94% highest	A
8.8	% (number)	N/A	33(1)	B
8.9	% in target time	N/A	33(2)	C

A to be determined  
B 75% within 4 months  
C 100% within 6 weeks

(i): 8.3, Actual recorded scores were B(5), C(4), D(1) and E(2)  
(ii): 8.6, 4 = 1 prosecution and 3 enforcement notices



Courtesy Newscast

Austral House, Legal and General London headquarters, 1 Coleman Street Moorgate, London

## OBJECTIVE 9

### *Promote product stewardship and wider supply chain benefits*

The BCA's move to align itself with other trade bodies serving the concrete industries is a further indication of its wish to demonstrate to its stakeholders how concrete is an integral part of sustainable construction.

The *Sustainable Concrete Declaration* made by eight major companies in the industry and their trade associations – and described more fully in the following pages – is an acceptance of a common vision for the concrete industry and the setting of strategic objectives and commitments that will monitor industry performance and demonstrate continuous improvement for the future in delivering sustainable construction.

The BCA membership has continued to work within its Cement Makers' Code and met all the necessary operational requirements for 2007. The code demonstrates the members' commitment to being responsible manufacturers.

In 2007, the BCA continued its work with CEMBUREAU and its member trade associations to improve the environmental information available for cement. This has resulted in the development of a European standard format for cement *Environmental product declarations*.

### PERFORMANCE INDICATORS

No product specific indicators or targets were set in the initial Environment Agency sector plan. However, the regulator proposed the following indicators for further investigation:

- 9.1 to develop guidelines demonstrating how the product can be used sustainably throughout its lifecycle
- 9.2 to integrate sustainable development into all cement industry strategies, activities and communications.

# Proposed sector plan objectives

OBJECTIVE	UNITS <sup>A</sup>	2007 ACTUAL	2010 TARGET	2015 TARGET
<b>1 To increase the use of waste used as raw materials or fuel in cement works (resource efficiency)</b>				
1.1 Use of natural raw materials per tonne manufactured	kg/t	1415.95	1420.0	1400.0
1.2 Use of fossil fuels (coal, petcoke, oil, gas) for primary energy per tonne manufactured	% thermal	80.53	75.0	70.0
1.3 Mass of waste recovered as fuel per tonne manufactured	kg/t	26.78	45.0	60.0
1.4 Mass of waste recovered as raw materials per tonne manufactured	kg/t	89.14	115.0	135.0
1.5 Proportion of fuel comprising waste material	% thermal	19.47	25.0	30.0
1.6 Proportion of raw materials comprising waste material	% mass	5.99	7.0	11.0
<b>2 To reduce waste disposal from cement manufacturing</b>				
2.1 CKD disposed of per tonne manufactured	kg/t	7.05	7.5	7.0
<b>3 To reduce air pollution from cement manufacturing</b>				
3.1 Dust emissions to air per tonne manufactured	kg/t	0.11	0.13	0.10
3.2 NO <sub>x</sub> emissions to air per tonne manufactured	kg/t	2.20	2.20	2.00
3.3 SO <sub>2</sub> emissions to air per tonne manufactured	kg/t	0.91	1.10	1.1 <sup>B</sup>
<b>4 To reduce emissions of greenhouse gases per tonne of cement</b>				
4.1 Emissions of CO <sub>2</sub> directly from cement plants per tonne manufactured	kg/t	819.1	800.0	775.0
4.2 Emissions of CO <sub>2</sub> from combustion of fossil fuel (coal petcoke, oil, gas) at cement plants manufactured	kg/t	278.0	244.0	225.0
4.3 Emissions of CO <sub>2</sub> from calcination of raw materials per tonne manufactured	kg/t	499.3	500.0	490.0
<b>5 To improve regulatory compliance and stakeholder perception of sites</b>				
5.1 Proportion of substitute fuels proposals communicated, to local communities, in accordance with the BCA Code of Practice (%/number)	%/number		100.0	100.0
5.2 Number of justified complaint free days <sup>C</sup>	average per works	to be reported new indicator	to be reported	to be reported
5.3 Number (and proportion) of sites with ISO 14001 and/or EMAS certification or equivalent	%/number	100.0	100.0	100.0
5.4 Number of enforcement notices, formal cautions and successful prosecutions <sup>D</sup>	number in each category	3 enforcements rugby 2006	0	0
5.5 Number of category 3 incidents and breaches <sup>E</sup>	number in each category		to be reported	to be reported
5.6 Number (and proportion) of PPC permit or variation applications where public participation is required, or deemed appropriate, determined within target time of 4 months	%/number		100% within target time	100% within target time
5.7 Number (and proportion) of other variations and applications determined	%/number <sup>F</sup>		100% within three months	100% within <sup>G</sup> three months



2020 VISION

The industry will continue to replace natural raw materials with waste-derived alternatives subject to technical, quality, commercial availability, environmental and regulatory considerations. No 2020 target has been set due to uncertainty outside the control of the cement industry, such as the commercial waste management infrastructure	<p><b>Notes</b></p> <p><b>A</b> All objectives are per tonne of cement manufactured (calculated as Portland Cement Equivalent) unless otherwise stated. Portland Cement Equivalent (pce) is a normalising factor related to cement output often used by the cement industry, enabling a comparison of impacts such as environmental between sites whilst taking into consideration differing production methods, cement types and movement of intermediate products.</p> <p><b>B</b> The 2015 targets for SO<sub>2</sub> will be reviewed annually</p> <p><b>C</b> Complaint free day = 24hr period starting at midnight that the IPPC installation (including associated quarries but excluding landfills) carried out its operations without receiving a justified complaint. 'Justified means where a complaint is related to an occurrence that can be directly attributable to site activities'. Base year: 2000</p> <p><b>D</b> Refer to the Environment Agency Enforcement and Prosecution Policy. This indicator excludes prosecutions under appeal.</p> <p><b>E</b> Refer to the Environment Agency Common Incident Classifications Scheme, cics categories 1, 2 and 3 are major, significant and minor incidents respectively.</p> <p><b>F</b> The determination periods quoted can lengthen where: (i) decisions are required as to whether information is sensitive due to commercial or industrial confidentiality and/or national security; and/or (ii) further information is required to determine the application. The 'clock stops' on the determination period where the regulator has served a notice requiring further information (Schedule 5 paragraph 16(3)(a) of the EP regulations). The clock starts again once the regulator has received all notice information required.</p> <p><b>G</b> The target for the number and proportion of variation applications determined within target time will be reviewed annually</p>
The industry will aim for 50% replacement by 2020 subject to technical, quality, commercial availability, environmental and regulatory considerations	
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The industry will continue to replace natural raw materials with waste-derived alternatives subject to technical, quality, commercial availability, environmental and regulatory considerations. No 2020 target has been set due to uncertainty outside the control of the cement industry, such as the commercial waste management infrastructure	
The industry will work with the Environment Agency to investigate technical and regulatory solutions for CKD recovery	<p><b>D</b> Refer to the Environment Agency Enforcement and Prosecution Policy. This indicator excludes prosecutions under appeal.</p> <p><b>E</b> Refer to the Environment Agency Common Incident Classifications Scheme, cics categories 1, 2 and 3 are major, significant and minor incidents respectively.</p> <p><b>F</b> The determination periods quoted can lengthen where: (i) decisions are required as to whether information is sensitive due to commercial or industrial confidentiality and/or national security; and/or (ii) further information is required to determine the application. The 'clock stops' on the determination period where the regulator has served a notice requiring further information (Schedule 5 paragraph 16(3)(a) of the EP regulations). The clock starts again once the regulator has received all notice information required.</p> <p><b>G</b> The target for the number and proportion of variation applications determined within target time will be reviewed annually</p>
The industry will maintain its good performance on dust emission reduction and will review techniques and technology to reduce dust emissions further beyond 2015. No 2020 target has been set due to the uncertainty of predicting future dust abatement equipment performance	
The industry will maintain its good performance on NO <sub>x</sub> emission reduction and will review techniques and technology to reduce emissions further, aiming for 1.8kg/t	
The industry will maintain its good performance on SO <sub>x</sub> control and will review techniques and technology to reduce emissions further whilst recognising the influence of raw material variability. No 2020 target has been set due to the uncertainty surrounding the geological characteristics of natural raw material reserves	<p><b>D</b> Refer to the Environment Agency Enforcement and Prosecution Policy. This indicator excludes prosecutions under appeal.</p> <p><b>E</b> Refer to the Environment Agency Common Incident Classifications Scheme, cics categories 1, 2 and 3 are major, significant and minor incidents respectively.</p> <p><b>F</b> The determination periods quoted can lengthen where: (i) decisions are required as to whether information is sensitive due to commercial or industrial confidentiality and/or national security; and/or (ii) further information is required to determine the application. The 'clock stops' on the determination period where the regulator has served a notice requiring further information (Schedule 5 paragraph 16(3)(a) of the EP regulations). The clock starts again once the regulator has received all notice information required.</p> <p><b>G</b> The target for the number and proportion of variation applications determined within target time will be reviewed annually</p>
The industry aims to further minimise direct emissions of CO <sub>2</sub> by investigating new technologies and implementing these where they are technically, environmentally and financially justified	
The industry aims to replace as much fossil fuel with waste-derived alternatives to the greatest extent subject to technical, quality, commercial availability, environmental and regulatory considerations	
The industry aims to further minimise direct emissions of CO <sub>2</sub> by investigating new technologies and implementing these where they are technically, environmentally and financially justified	<p><b>F</b> The determination periods quoted can lengthen where: (i) decisions are required as to whether information is sensitive due to commercial or industrial confidentiality and/or national security; and/or (ii) further information is required to determine the application. The 'clock stops' on the determination period where the regulator has served a notice requiring further information (Schedule 5 paragraph 16(3)(a) of the EP regulations). The clock starts again once the regulator has received all notice information required.</p> <p><b>G</b> The target for the number and proportion of variation applications determined within target time will be reviewed annually</p>
The industry is committed to involving stakeholders in its communications according to its Code of Practice	
The industry aim is 365 complaint free days per year (366 days in 2020)	
The industry aim is to maintain and continuously improve its environmental management systems	
The industry aim is zero Category 1 and Category 2 incidents which may lead to enforcement action. The Environment Agency will work to ensure that categorisation of incidents and breaches is undertaken in a consistent manner across the sector sites	
The industry aim is zero Category 3 incidents and breaches. The Environment Agency will work to ensure that categorisation of incidents and breaches is undertaken in a consistent manner across the sector sites	
The Environment Agency will work with industry to ensure that determinations do not delay environmental improvements or commercial progress, where this does not have a negative impact on the environment	<p><b>G</b> The target for the number and proportion of variation applications determined within target time will be reviewed annually</p>
The Environment Agency will work with industry to ensure that determinations do not delay environmental improvements or commercial progress, where this does not have a negative impact on the environment	

# Working towards sustainability

The cement sector has been a pioneer in the incorporation of sustainable development principals within its activities. Following in-depth work by BCA Sustainable Development Task Force it published a report in November 2005 and updated progress in July 2007, which set a strategic vision for the UK cement industry and a series of objectives.

This initiated further programmes of work, of which the Environment Agency Sector Plans, Revitalising Health and Safety and climate change commitments provided quantitative targets against which to measure performance.

The industry has now broadened its horizons further by working more closely with its partners on other parts of what effectively makes up the UK concrete industry. This initiative ensures the cement and concrete industry is not only working towards sustainability in terms of its manufacturing, product development and usage but also is ideally placed to operate alongside government in its *Sustainable Construction Strategy*.

Indeed, this strategic move provides great opportunities for the concrete industry as a whole to work together on sustainability and it has already committed itself to a *Sustainable Concrete Declaration*. This has led to a 2012 vision statement, four strategic objectives and eight concrete commitments for the new body.

*The 2012 vision is:*

'By 2012, the UK concrete industry will be recognised as a leader in sustainable construction, by taking a dynamic role in delivering a sustainable built environment in a manner that is profitable, socially responsible and functions within environmental limits'

*The four objectives are:*

- 1 agree and adopt a common framework
- 2 improve environmental profiles
- 3 enable clients to achieve sustainable construction
- 4 communicate progress and solutions.



*Against these objectives, the main players in the UK concrete industry have made eight firm commitments:*

- to launch an annual sustainability performance report for the UK concrete industry, starting in March 2009
- to set targets for performance indicators by the end of 2009
- to establish a joint research and development programme to reduce carbon dioxide and other impacts
- to establish a joint skills transformation programme aimed at positioning the industry to play a leading role in the challenge of sustainable construction
- to provide clients with industry data for life cycle analysis models
- to develop sustainable construction solutions
- to provide clients with the knowledge and tools to adopt new solutions
- to demonstrate the benefits of concrete in the built environment.

In signing this *Sustainable Concrete Declaration*, the companies involved undertook to implement these commitments fully and the trade bodies to encourage their members to do so. Both groups said they would communicate the strategy internally and externally to try and ensure commitments become reality.

The declaration is also an undertaking to align with the government's *Sustainable Construction Strategy* announced in June 2008. Concrete plays a vital role in society today and has a major part to play in working towards the goal of sustainable construction.

### Industry alignment

Cement manufacturers have also made great strides forward in working more closely with their partners in other parts of what effectively makes up the UK concrete industry. In January 2008, a small project team was set up to work with the BCA, Quarry Products Association and The Concrete Centre to develop proposals for a single organisation. BCA chief executive officer (CEO), Mike Gilbert, was seconded to lead the team with Dr Pal Chana taking on the role of acting CEO of BCA. Agreement has been reached that, from 1 January 2009, a single industry body will represent the interest of the members of the three companies.

This new body – yet to be named – will form strategic alliances with British Precast and the Concrete Society. The re-alignment of industry effort will bring great benefits in terms of reducing duplication of effort, improving impact of advocacy with government and rationalising the use of available resources.

In practical terms this means an integrated new organisation with 70 staff based in two locations – London and Camberley in Surrey.

**Main** Concrete features in the design of this residential development

**Above** Concrete plays its part in tunnel construction

**Left** Precast concrete sea defences

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- |                     |                                 |
|---------------------|---------------------------------|
| * Lafarge Cement UK | * CEMEX UK                      |
| 1 Dunbar            | 8 South Ferriby                 |
| 2 Hope              | 9 Rugby                         |
| 3 Cauldon           | 10 Barrington                   |
| 4 Aberthaw          | * Castle Cement                 |
| 5 Westbury          | 11 Ketton                       |
| 6 Northfleet        | 12 Padeswood                    |
| 7 Cookstown         | 13 Ribblesdale                  |
|                     | * Tarmac Buxton Lime and Cement |
|                     | 14 Tunstead                     |

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## NOTES TO THE PERFORMANCE INDICATORS

1 Pce = Portland Cement equivalent. Where practicable, a normalising factor of tonnes of Pce is to be used in establishing the sector plan's performance indicators. The unit of tonnes of Portland cement is already widely used by the cement industry to express production output. The use of a normalising factor enables environmental impacts to be directly related to cement production output, for example tonnes of sulphur per tonne Pce. This also allows direct comparisons to be made with pollution data between kilns and companies.

Hence: kg/te Pce is kilogrammes per tonne of Portland cement equivalent.

- 2 Number and proportion of sites where pollution reduction is required via a PPC improvement programme to satisfy an existing statutory local environment action plan. This assessment includes the impact of fugitive dust emissions.
- 3 Measured as total particulate. This comprises all particle fractions including PM10.
- 4 Mass divided by environmental assessment level for oxides of nitrogen, sulphur dioxide and particulate.
- 5 Statutory determination period is three months. The targets are set by taking into account elapsed time for information notices and extended consultation.
- 6 Liaison meetings arranged by companies to which the Environment Agency has been invited.
- 7 EP OPRA (Environmental protection operator and pollution risk appraisal).
- 8 Refer to the Environment Agency Common Incident Classifications Scheme ('CICS'). CICS categories 1, 2 and 3 are major, significant and minor incidents respectively.
- 9 Refer to the Environment Agency Compliance Classification Scheme ('CCS'). A breach is classed as CCS category 1, 2 or 3 in accordance with the CICS classification for the incident associated with that breach.
- 10 Refer to the Environment Agency Enforcement and Prosecution Policy. This indicator excludes prosecutions under appeal.
- 11 OMA (Operator Monitoring Assessment) currently covers emissions to air.
- 12 Target is based on elapsed time and allows for applications that may need extended consultation.
- 13 Target is from date of testing by monitoring contractors and excludes those subject to quality assurance or non-compliance investigation.

For further information on Environment Agency matters, please refer to: [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)