

Performance

a corporate responsibility report from the UK cement industry

reduction in CO₂ emissions

fossil fuel consumption cut by

23%

27.5%

improvement in specific energy consumption

BCA
British Cement Association

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Front cover Concrete was used extensively in the construction of a new international headquarters building at 101 Queen Victoria Street, London
Inside front cover Concrete – hence cement – played a major role in the development of the Heathrow Express and Piccadilly line extensions for Heathrow Airport's Terminal 5

This review



During 2006, the UK cement industry made excellent progress against sector plan targets agreed with the Environment Agency in 2005.

In particular, UK cement makers – Castle Cement, CEMEX UK, Lafarge Cement UK and Tarmac Buxton Lime and Cement – have reduced significantly carbon dioxide (CO₂) emissions and increased the use of wastes for raw materials and fuels. Direct CO₂ emissions have been reduced by over 29% between 1990 and 2006 giving a saving of over 3.9 million tonnes. Since 1998, use of waste-derived alternatives has meant that the cement industry has reduced its fossil fuel consumption per tonne of cement by over 23%. In 2006, over one million tonnes of waste was used productively, replacing 15% of kiln fuels and 6% of virgin raw materials.

BCA member companies operate in England, Wales, Scotland and Northern Ireland and *Performance* covers all these operations.

In the year, each member company reached set targets under the UK government Climate Change Agreement. Since the start of the agreement in 2002, the sector has achieved an improvement in specific energy consumption of 27.5%, relative to the 1990 base year position. Indeed, this means the industry has surpassed its overall sector plan target of a 26.6% improvement by 2010 – a great achievement.

The cement industry also met its obligations under the European Union's Emissions Trading Scheme (EU ETS). Nevertheless, the industry believes there is a need for rationalisation in climate change policies as the overlap between the UK and European schemes creates significant increased bureaucracy and impacts competitiveness.

The UK cement makers have just completed a major phase of investment in new plant and equipment that has contributed greatly to improvements in energy efficiency and hence reduction in carbon emissions. Future improvements will be more difficult to achieve no matter how well the industry continues to utilise waste-derived materials to fuel its kilns rather than using virgin fossil fuels.

The industry continues to invest. During the year Castle Cement's new £64 million kiln at its Padeswood works in Flintshire came fully on stream, and was officially opened by the first minister of the National Assembly for Wales, Rhodri Morgan. Lafarge Cement UK continued with its £20 million upgrade of its Dunbar works in Scotland while CEMEX UK has announced its plans to build a £27 million cement blending facility at Thurrock, Essex. Following its £110 million investment in a new cement plant and rail infrastructure to mitigate road transport movements, Tarmac Buxton Lime and Cement has made a significant investment to conserve fossil fuels by using tyres chips. In addition, £3.3 million has been invested in initiatives to improve the environment and support communities around its operations.

Additionally, cement manufacturers invested over £12 million to comply with the requirements of the EU Waste Incineration Directive, which applies to all plants that recover energy from waste. This use of waste also contributes to industry-wide reductions in emissions of oxides of nitrogen.

The industry continues to improve its health and safety performance. It has introduced a zero tolerance policy towards incidents, while reporting a 32% improvement in lost-time incidents between 2003 and the end of 2006.

In June 2006, BCA members signed up to a Cement Makers' Code that sets out the values, ethics and standards they should follow. I am pleased to report that all have met the necessary criteria in this, its first year of operation.

The BCA also works with bodies representing the users of cement. It has helped establish the UK Concrete Platform, a body to co-ordinate our work in areas of common interest. It is yet another step towards the overall goal of sustainable construction.

A handwritten signature in black ink, appearing to read 'Mike Gilbert', written in a cursive style.

Mike Gilbert
BCA CHIEF EXECUTIVE

July 2007

KEY POINTS

Provides essential, virtually irreplaceable, building material
Investment continues in new plant and equipment
Important employer in rural areas



Cement from CEMEX UK's Rugby plant is being used in pumped concrete, which is pumped into old mine workings beneath the village of Combe Down near Bath to stabilise conditions



Controlling quarry operations at a Lafarge Cement UK works

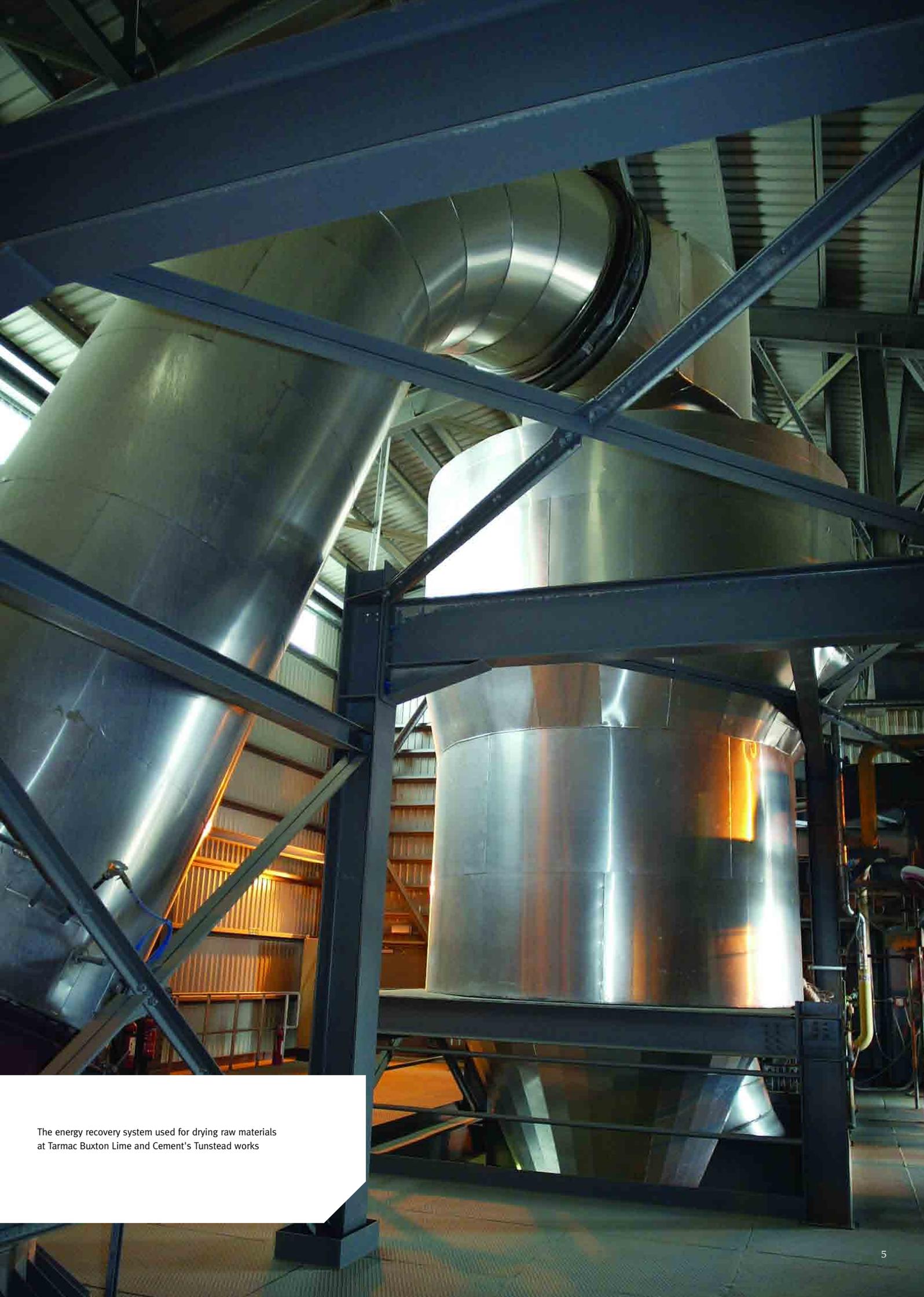
Provision of cement underpins the activities of the £83 billion annual turnover UK construction industry, where concrete is an essential, sustainable building material. The UK cement industry has a combined turnover of £775 million a year and employs 3,500 people. In 2006, the UK consumed over 13 million tonnes of cement, of which approximately 90% was manufactured locally.

A very wide range of cements is available to suit varying needs. Each product has specific properties in terms of strength, setting and general performance capabilities. The embodied CO_2 of a tonne of concrete varies with the mix design but is in the range of 75 to 176 kg CO_2 /tonne.

Much attention is being placed on the further development of cementitious products with less dependence on totally clinker-based production. By using percentages of fly ash from coal burning power stations, ground granulated blastfurnace slag (ggbs) or ground limestone with Portland cement (CEM I) the total carbon dioxide produced per tonne of cement can be significantly reduced.

The cement industry is an important employer in the generally rural locations in which it operates, close to sources of raw materials. Necessary products and services are normally resourced locally, adding to the contribution made to the local economy over and above salaries.

The industry continues to invest. CEMEX UK announced its intention to construct a £27 million grinding facility at Tilbury in Essex to manufacture blended cements. With a 1.2 million tonne capacity, the new factory will primarily produce CEM III, a blend of ordinary Portland cement and ggbs, suitable for all types of concrete applications. Castle Cement is to increase its clinker grinding capacity at Padeswood in north Wales with a £10 million investment. As part of the development, the company is making good use of a mill that used to be part of its now closed depot in Glasgow. Each member company continues to invest in plant to handle waste-derived raw materials and fuels.



The energy recovery system used for drying raw materials at Tarmac Buxton Lime and Cement's Tunstead works



Employee health and safety is a priority for the industry. Here nurse and occupational health advisor, Stewart Sanderson, advises a member of staff at Castle Cement's Ribblesdale works

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

UK cement industry incident statistics – 2003 to 2006

	2003 ACTUAL		2004 ACTUAL (TARGET)		2005 ACTUAL (TARGET)		2006 ACTUAL (TARGET)	
	Employees	Contractors	Employees	Contractors	Employees	Contractor	Employees	Contractor
Number of lost time incidents	47	54	40 (33)	45 (38)	46 (28)	31 (32)	42 (32)	27 (22)
Number of fatal incidents	0	0	0	1	1	0	0	2

Health and safety

During 2006, the industry introduced a zero tolerance policy towards incidents (an injury that prevents an employee or contractor returning to work the next day).

This is a new focus for the industry's *Revitalising health and safety* commitment begun in 2004, which has played a positive part in reducing lost-time incidents by 32% up to the end of 2006.

The industry is also looking at what other communications means it may use to improve further its health and safety performance. Included within its plans are workshops on kiln relining safety. The general health and well-being of the industry's workforce and its neighbours is a principle that is incorporated in the code of practice of the cement industry, the *Cement Makers' Code*.

CEMBUREAU, the European cement association, is funding a comprehensive health study through which health, exposure and toxicological studies are being undertaken to answer the questions raised by the UK Health and Safety Executive's Hazard Assessment of Portland cement. In particular the studies focus on cement worker health and the exposure levels of construction workers.

Another facet of health and safety is being provided by the cement industry through the development of concrete barriers for motorway central reservations. The Highways Agency now specifies this type of barrier for all motorways in England.

Public consultation

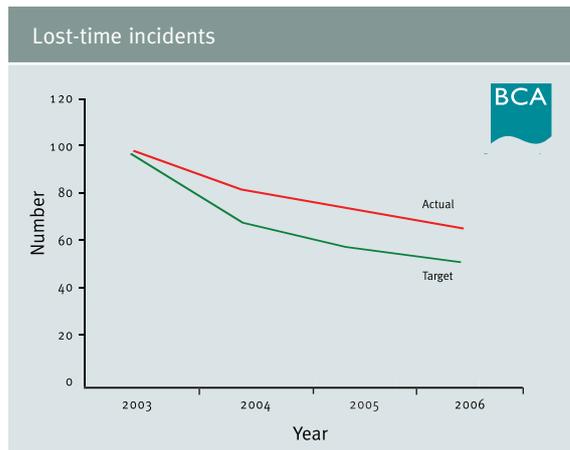
In July 2005, the cement industry initiated, in partnership with Forum for the Future, a national initiative to provide stakeholders with a clear opportunity to engage with the industry and arranged a national Stakeholder Forum. The Forum has since become an annual event, with further events held in June 2006 and July 2007 to discuss with the industry stakeholders targeted issues on sustainable development.

An outcome of the 2006 forum was an undertaking by the BCA to increase engagement on health issues associated with emissions of co-incineration from cement manufacture. To take matters forward, the BCA has established an industry stakeholders steering group on health issues, which is considering the development of a proposal to submit to government during 2007.

Additionally, much is done at works level. Regular liaison committee meetings are held between local management and representatives of the community where company plans and aspirations can be explained and discussed. The industry also arranges open days where local people can visit a works, see its operations and talk to employees about what goes into making cement.

BCA member companies also produce newsletters to explain their activities and exhibitions are often held when a major planning application is being developed.

Transparency is the overall aim so that any interested individual has the opportunity to gain information about industry activities and to have the opportunity to express his or her views accordingly.





KEY POINTS

- Lost-time incidents reduced by 32% since 2003
- Regular local, national and international engagement
- Range of educational materials produced



A student study tour at CEMEX UK's Barrington works

The BCA has made available a range of educational material suitable for seven to 11 year-olds through the industry's website, www.cementindustry.co.uk. It includes information on science, nature, the environment and the industry and shows the interdependence of these elements and society itself in our lives today.

Recruitment and training

Each BCA member company has training and development plans for its employees. The workforce is encouraged to undertake recognised training schemes such as National Vocational Qualifications – NVQs – for particular employment disciplines.

Today, a very wide range of jobs is available from operational roles, through transport, IT and managerial and support service tasks.

Advocacy

Staying abreast of and recognising the implications of forthcoming legislation is of vital importance to the highly regulated cement industry. Through the BCA, the industry takes a structured approach to contact with officials, regulators and national and European politicians, to ensure early action can be taken over any proposed legislative changes and the industry's voice heard and acted upon.

BCA membership of House of Commons all-party groups and the principal organisations on which it is represented, are given below:

All party groups

- Climate Change
- Energy
- Environment
- Minerals
- Renewable and Sustainable Energy
- Sustainable Waste

Representation on EU/government groups

- European Commission Lifecycle Assessment Platform
- Hazardous Waste Forum
- Sustainability Forum
- Sustainable Construction Strategy

Other groups

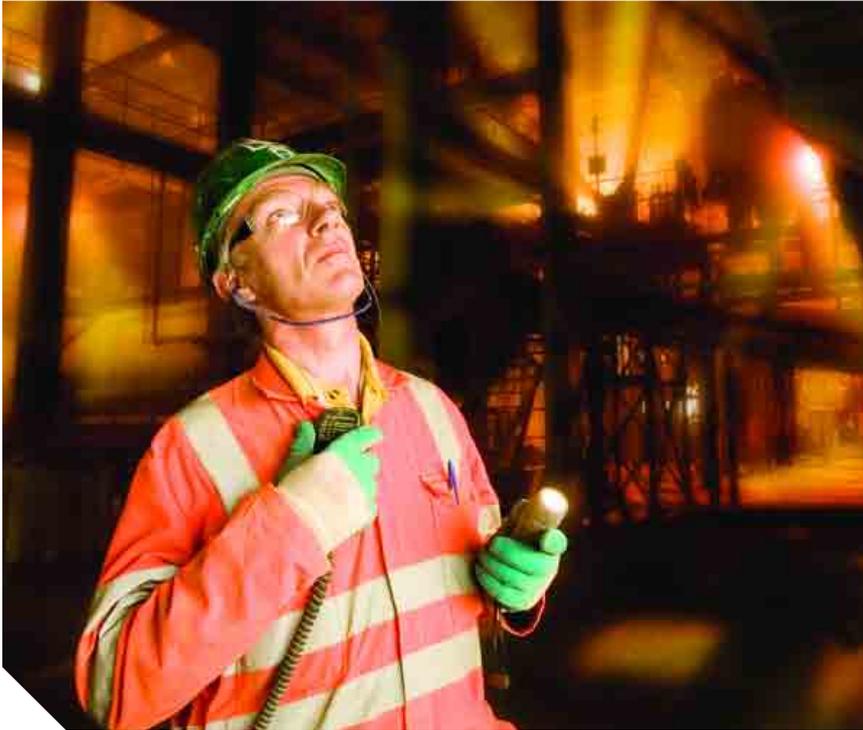
- BSI
- CBI
- CEMBUREAU
- Chartered Institute of Waste Management
- Construction Products Association
- Energy Intensive Users Group
- Environmental Industries Commission
- Forum for the Future
- Forum in the European Parliament for Construction
- National Society for Clean Air
- The Concrete Centre
- The Concrete Society
- UK Emissions Trading Group



The industry encourages youngsters to join its apprenticeship schemes. At Lafarge Cement UK's Caudon works, Hannah Smith (front) is welcomed by works manager Nicolas Maes (back left) and fellow apprentices: (l-r) Ben Cross, James Moore, Dan Nicholls and Neil Butterworth

Environment

The UK cement industry has reported annually on its environmental performance since 2003. The following data reports progress against the industry's sector plan



Night shift checks at Lafarge Cement UK's Northfleet works in Kent

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

In the following pages, the BCA reports the industry's progress against objectives set by the Environment Agency, using data that covers operations throughout England, Wales, Scotland and Northern Ireland. The data provided by the Environment Agency covers only its area of responsibility - England and Wales. Throughout, 1998 is the agreed baseline year.

Notes to the performance indicator tables can be found on the inside back cover flap.



CEMEX UK representative examines Climafuel, an alternative kiln fuel made from household waste

OBJECTIVE 1

Reduce consumption of natural resources per tonne of cement manufactured

Use of waste-derived raw materials and fuels in cement manufacture continues to increase, with over 1.4 million tonnes of materials now being used.

In 2006, the cement industry replaced approximately 1.16 million tonnes of virgin raw materials with waste-derived products. Principal replacement was pulverised fuel ash, a by-product from power generation but use was also made of construction materials such as crushed concrete and plasterboard or moulds from the ceramics industry.

Tarmac Buxton Lime and Cement has invested £650,000 in systems at its Tunstead operations to allow the recovery of process wastes from its lime kilns and lime hydration plants to provide raw materials for its cement making process on site. In 2006, 8,300 tonnes of waste was recovered in this way, saving an equivalent amount of primary raw material.

The industry increased its use of alternative fuels by 15 per cent over the previous year, leading to a present level of replacement of fossil fuels to almost 15%.

PERFORMANCE INDICATORS

- 1.1 use of natural raw materials per tonne pce manufactured¹
- 1.2 use of fossil fuels for primary energy per tonne pce manufactured

		BASE	ACTUAL	TARGETS	
	units	1998	2006	2006	2010
1.1	kg/te pce	1468	1497	1428	1413
1.2	kwh/te pce	1103	846	973	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.



KEY POINTS

- Almost 15% of kiln fuel derived from waste
- Industry is net consumer of waste
- Principle emissions to air reduced

OBJECTIVE 2

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

The UK cement industry is a net consumer of waste but continues to seek to reduce further any process waste arising. While it generates 111,000 tonnes of waste from its 14 manufacturing plants, it uses productively as raw material or fuel, 1.4 million tonnes of waste-derived materials.

Cement kiln dust (CKD) remains the largest amount of process waste. A percentage of this is returned to the production process but the volumes of CKD going to landfill have been reduced by some 75 per cent since 1998, falling from 289,207 tonnes to 70,281 tonnes in 2006.

Companies minimise the impact of disposal of CKD by seeking to build specially designed landfill sites within a works' boundary. At Padeswood in north Wales, Castle Cement gained permission to build a fully clay-lined site within its works rather than have to transport the dust to another location some eight miles away, with resultant savings in lorry movements on local roads.

In the north of England, CEMEX UK is providing CKD to a land reclamation company that uses it to stabilise and create fertile soil on colliery spoil heaps. The cement kiln dust is alkaline and the coal spoil acidic, so CKD is mixed with a suitable bio-solid such as sewage sludge to neutralise the acidity and add nutrients.

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	2006	2006	2010
2.1(i) kg/te PCE	0	0.52	1.29	1.07
2.1(ii) kg/te PCE	22.9	6.08	10	7.5
2.2(i) kg/te PCE	0.79	0.42	1.50	1.50
2.2(ii) kg/te PCE	4.17	3.53	3.50	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.



A section of the new kiln plant at Castle Cement's Padeswood works

OBJECTIVE 3

Reduce emissions from cement manufacturing

Principal emissions from cement manufacturing are carbon dioxide (CO₂), oxides of nitrogen (NO_x), sulphur dioxide (SO₂) and dust. Planned investment in abatement technology and more modern plant mean the emission levels continue to be below target levels.

The industry's 2006 reported emissions demonstrate the benefits achieved through the bringing on stream of Castle Cement's new kiln at Padeswood in north Wales, which led to the closing down of five kilns – three at Padeswood and two in Clitheroe. The overall effect achieved by the company was a 15% drop in CO₂ emissions, 43% in oxides of nitrogen, 98% in sulphur dioxide and 46% of dust.

The first phase of construction of Lafarge Cement's £20 million investment at Dunbar, Scotland, in a new sulphur dioxide scrubber took place in 2006. A pre-cyclone was installed as part of the works' raw milling operations to collect 90 per cent of ground materials. The new cyclone helped cut dust emissions by reducing the burden on dust abatement equipment. Installation of the actual scrubber continued during the year.

Process control can also play its part. CEMEX UK introduced new kiln firing systems at Barrington works in Cambridgeshire and South Ferriby works in North Lincolnshire. These have led to a significant reduction in NO_x as fuel consumption has been lowered.

Each member company of the BCA is also benefiting from reduced overall emissions from use of waste-derived fuels as can be seen from the results reported under Objective 4.

PERFORMANCE INDICATORS

- 3.1 number of sites requiring action to reduce local environmental impacts²
- 3.2 dust emissions to air per tonne PCE manufactured³
- 3.3 NO_x emissions to air per tonne PCE manufactured
- 3.4 SO₂ emissions to air per tonne PCE manufactured
- 3.5 total environmental burden to air⁴

	BASE	ACTUAL	TARGETS	
units	1998	2006	2006	2010
3.1 number	2	1	2	0
3.2 kg/te PCE	0.33	0.13	0.20	0.15
3.3 kg/te PCE	3.34	2.41	2.80	2.50
3.4 kg/te PCE	2.56	1.06	1.50	1.10
3.5 burden value	1807	979	1237	1054

OBJECTIVE 4

Reduce emissions of greenhouse gases per tonne of cement manufactured

Carbon dioxide from cement manufacture is primarily produced by the calcination of limestone or chalk and the burning of fossil fuels. These direct emissions are included under Objective 4.1. Smaller amounts are generated through raw materials transport and use of electricity.

The industry continues to reduce its CO₂ emissions through investment in energy-saving technology and use of waste-derived fuels. It also achieves a decrease through the factory production of composite cements that make use of constituents other than clinker. Materials such as ground limestone, fly ash from coal burning power stations and ggbs are used to produce a range of factory made composite cements such as CEM II and CEM III.

The industry has met its 2010 UK Climate Change Agreement goal having achieved by 2006 – a designated target year for the scheme – a 27.5 per cent improvement in specific energy consumption. The industry has saved over 3.9 million tonnes of CO₂ since 1990 by reducing its absolute emissions by 29 per cent.

In 2006, direct CO₂ emissions per tonne of Portland cement equivalent were 812 kg CO₂/t PCE, a decrease of 12.1% per cent compared to the industry baseline year, 1998.



The tyre chips storage bay at Tarmac Buxton Lime and Cement's Tunstead works

OBJECTIVE 5

Optimise the sustainable use of wastes from other industries or sources

The industry's role within the UK waste management infrastructure is accepted by the Environment Agency. The industry is making productive use of a wide range of wastes for use both as raw materials – described under Objective 1 – and fuels. Alternative fuels presently used are processed from the residues following recycling of used solvents; scrap vehicle tyres; paper, plastic and other fibrous material waste that cannot be viably recycled; sewage sludge; and meat and bone meal (MBM).

Not only does use of these materials reduce the amount of virgin fossil fuels that are used to provide energy for the industry's kilns. It also provides other environmental benefits through the reduction of emissions, particularly of oxides of nitrogen.

During 2006, the industry sought to expand its use of alternative fuels. CEMEX UK successfully trialed the use of chipped tyres at its Rugby works where it also applied to trial an alternative kiln fuel made from household waste referred to as Climafuel. The company also started Climafuel trials at South Ferriby and Barrington works. Tarmac Buxton Lime and Cement successfully undertook

BCA member companies continue to support the principle of an emissions trading scheme rather than a tax to achieve reductions in the production of CO₂ and each operates under the EU scheme. Along with other energy-intensive industries, BCA sees no benefit from the UK Climate Change Agreement running alongside its EU counterpart. A high level of bureaucracy is involved in running two schemes ostensibly aimed at achieving the same result.

PERFORMANCE INDICATORS

- 4.1 emissions of CO₂ directly from cement plants per tonne PCE
- 4.2 emissions of CO₂ from combustion of fossil fuel at cement plants per tonne PCE
- 4.3 emissions of CO₂ from calcination of raw materials per tonne PCE

		BASE	ACTUAL	TARGETS	
	units	1998	2006	2006	2010
4.1	kg/te PCE	924	812	847	833
4.2	kg/te PCE	387	287	324	273
4.3	kg/te PCE	520	494	512	512

trials with chipped tyres at Tunstead works, while Lafarge Cement was given permission to trial meat and bone meal at its Aberthaw and Hope operations. Castle Cement began using MBM permanently at its Ribblesdale works and was given permission to trial the material at Ketton in Rutland.

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 time⁵

		BASE	ACTUAL	TARGETS	
	units	1998	2006	2006	2010
5.1	kg/te PCE	9.64	25.29	14.00	21.00
5.2	kg/te PCE	25.70	100.25	50.00	100
5.3	thermal %	5.7	14.93	10.00	15.00
5.4	mass %	1.7	6.23	4.00	8.00
5.5	%/number	–	67 (2)	75% ^A	75% ^B

^A within six months ^B within four months



KEY POINTS

- 27.5% improvement in specific energy consumption
- Over 3.9 million tonnes of CO₂ saved
- Industry's role in waste management recognised



Quarry face restoration at Tarmac Buxton Lime and Cement's Tunstead works

OBJECTIVE 6

Develop site restoration plans and biodiversity action plans

Because of the capital-intensive nature of cement works and their quarries, the operations have very long lives so final restoration is dependent on future land needs. However, under existing planning permissions and Pollution Prevention Control permits, formal restoration plans are in place.

A recent example of restoration and safeguarding biodiversity followed the closure of Tarmac Buxton Lime and Cement's old cement plant at Tunstead. The company demolished the wet process plant and, in 2006, undertook and completed the restoration of this part of its site. The old plant occupied some 10 acres and the restoration involved the planting of over 6,500 trees and construction of traditional dry stone walling.

Meanwhile, CEMEX UK is creating special habitats for butterflies at its Barrington and South Ferriby operations.

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	2006	2006	2010
6.1	% (number)	94 (35)	100 (23)	100	100
6.2	% (number)	0 (0)	100 (15)	80 (12)	100 (15)

OBJECTIVE 7

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

Perception of the value of the UK cement industry has improved over the past four years, according to the second awareness survey carried out on behalf of the British Cement Association.

Key stakeholders identified for closer engagement following the first survey in 2003 were politicians, journalists, civil servants, pressure groups and manufacturers. Each group was asked to identify both their positive and negative perceptions of the industry, in order to find out how its reputation had changed since the first survey. Findings show that overall knowledge of the industry has improved. In particular, politicians have a better understanding of the value the industry adds to UK plc, the importance of a UK manufacturing base and the value of growth in UK production.

The main negative perceptions identified were based around emissions and transport noise and congestion.

The industry continues to seek dialogue with stakeholders at national and local levels and increase knowledge of its activities. With this in mind, it has redesigned its website and has developed an educational package.

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 officers⁶
- 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	2006	2006	2010
7.1	% (number)	68 (15)	100 (14)	100	100 (15)
7.2	% (number)	100 (2)	100 (7)	100	100
7.3	% (number)	N/A	95 (39)	100	100
7.4	% (number)	N/A	100 (2)	100	100



KEY POINTS

- All BCA members accredited to ISO 14001 and/or EMAS
- Second industry perception study completed
- Compliance with Cement Makers' Code demonstrated



Visual scrutiny of a secondary liquid fuel sample at CEMEX UK

OBJECTIVE 8

Work to risk-based regulatory and environmental management systems

Each cement manufacturing plant is covered by the Pollution Prevention and Control regulations, under the control of the Environment Agency in England and Wales, the Scottish Environment Protection Agency and the Industrial Pollution and Radiochemical Inspectorate in Northern Ireland.

All BCA members' operations are accredited to ISO 14001 and/or EMAS.

In 2006, the Environment Agency took out one prosecution and served four enforcement notices on BCA members. At Padeswood works in north Wales, Castle Cement was prosecuted for dioxin emissions and also received two enforcement notices regarding dust and reporting procedures. Lafarge Cement received two enforcement notices both relating to compliance with the Waste Incineration Directive, one at Hope works the second at Westbury. In all cases the industry has reviewed its procedures and systems, in some instances modifying technology used and accepts it must strive to improve its overall standards.

PERFORMANCE INDICATORS

- proportion (and number) of sites with ISO 14001 and/or EMAS certification or equivalent
- EP OPRA – Overall management rating
- EP OPRA – Regulatory compliance rating⁷
- pollution incidents: Annual number of Category 1 and 2 incidents⁸
- breaches of permits: Annual number of Category 1 and 2 breaches of permits⁹
- number of sites with enforcement actions and prosecutions¹⁰
- OMA scores¹¹
- proportion (and number) of PPC permit applications and variations determined within target time¹²
- proportion (and number) of sites receiving check monitoring reports from the Environment Agency within target time¹³

	units	BASE ACTUAL TARGETS			
		1998	2006	2006	2010
8.1	% (number)	91 (20)	100 (14)	100(15)	100 (15)
8.2	% band A	N/A	92 (11)	80	100
8.3	% by score	N/A	(see note i)	A	–
8.4	number	N/A	0	B	F
8.5	number	N/A	1	B	F
8.6	number	N/A	5 (ii)	B	F
8.7	score	N/A	78 ^{ave}	C	F
			93 ^{highest}		
8.8	% (number)	N/A	67 (2)	D	G
8.9	% in target time	N/A	0	E	H

- A reported scores
- B number recorded
- C recorded score
- D 75% within 6 months
- E 75% within 6 weeks
- F to be determined
- G 75% within 4 months
- H 100% within 6 weeks

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



Front cover of *Working towards sustainability 2*, the industry's report on its work on sustainable development

OBJECTIVE 9

Promote product stewardship and wider supply chain benefits

Work continues to help define and inform users on the benefits of cement-based construction. The BCA collaborates with The Concrete Centre, the Concrete Society, the British Precast Concrete Federation and the British Ready Mixed Concrete Association in this work, as well as liaising with research and educational bodies.

BCA members are monitoring the BRE project which is aimed to develop criteria for responsible sourcing of construction materials, by giving an ethos on life cycle management, taking into consideration sustainable development principles and bringing together supply chain management with material stewardship.

Each BCA member is integrating sustainable development into its activities and has signed up to the Cement Makers' Code. The code sets out the values, ethics and standards that should be followed by all BCA members in pursuit of all activities. All members have demonstrated their compliance with the code for 2006.

The industry approach to sustainability is summarised on pages four and five of this document and a second full report, *Working towards sustainability 2*, can be downloaded from the BCA website, www.cementindustry.co.uk.

Looking to the future, the BCA is working with CEMBUREAU on a template format for a European cement environmental product declaration (EPD). This will record the material's environmental impact on a cradle to works' gate basis, enabling the industry's customers to evaluate the impact of their own products.

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.



Construction of a new bag filter system at CEMEX UK's plant in Rugby

Working towards sustainability



Concrete paving provides an attractive surface at Gateshead

In November 2005, a BCA Sustainable Development Task Force published a report, *Working towards sustainability*, which set a strategic vision for the UK cement industry and a series of objectives.

The industry has made progress against those objectives with all UK cement manufacturers working hard to improve their sustainability. In May of this year, the BCA published a second report, entitled *Working towards sustainability 2*, a copy of which can be downloaded from the BCA website, www.cementindustry.co.uk.

Key achievements reported were that direct emissions of carbon dioxide (CO₂) from UK manufacturers have been reduced. Additionally, use of fossil fuels and virgin raw materials is being significantly cut back by the use of waste-derived products. The report also highlighted the industry's position on health and safety and pointed up the fact a national stakeholders' engagement event had been established on an annual basis. *Working towards sustainability 2* was based on 2005 data so the actual statistical position at the end of 2006 was even better.

The industry now has in place a framework in which it can work towards sustainable development, with both a strategy and an agenda for future activities and a strategy in place.

Its strategic vision for sustainability is:

'Through performance to reputation. The UK cement industry's performance on sustainable development is continually improved until it is recognised as leading the way by 2010.'

KEY POINTS

Publication of second report on sustainable development

Second national stakeholder forum held

Framework in place for working towards sustainable development



Tarmac Buxton Lime and Cement helped the local community with the construction of traditional dry stone walling close to its works in Derbyshire

The industry's sustainability objectives:

- to create a framework that will allow the industry to maximise its contribution to the well being of its employees, to its neighbours and to wider society, making the UK cement industry an employer of choice
- to maximise the contribution of cement to the delivery of a more sustainable built environment
- to improve continually the sustainability performance of the cement industry by setting and reviewing targets on environmental, economic and social performance
- to extend our constructive, proactive and sustainable relations with stakeholders
- to optimise the role that the cement industry can play in assisting the UK with delivery of best practicable environmental options for waste recovery
- to integrate sustainable development into all UK cement industry strategies, activities and communications.

Work with Forum for the Future and other partners on sustainability has enabled the industry to identify the key sustainability areas on which to focus its strategy on sustainable development. These include the continuing implementation of the carbon strategy to tackle climate change and reduce CO₂ emissions; the well being and health and safety of employees and neighbouring communities; the reduction of the environmental costs and improvement of the economic and social benefits – not only from cement manufacturing but over the whole life of buildings; building on the positive perception from industry stakeholders on the benefits of using cement in sustainable construction; and, continual interaction and communication with stakeholders through *Performance*, the corporate responsibility report of the cement industry.

Continuing engagement with stakeholders is of major importance for the industry to improve its performance and communication with key interested parties. Since 2005, the industry holds a national stakeholder forum on an annual basis and this includes workshops on targeted sustainable development issues.

Cement and our future

Cement's fundamental role in concrete is helping society towards its goal of sustainable construction

Performance of concrete structures

The BCA and The Concrete Centre are supporting research programmes with the Building Research Establishment, University of Manchester and Edinburgh University to address key technical issues. The two bodies also continue to support the Concrete Fire Forum (www.concretefireforum.org.uk). This aims to provide a platform for the exchange of information on issues relating to the behaviour of concrete structures in fire. It also works to establish end user and industry needs in relation to fire performance of such structures.

The benefits of concrete construction to resist fires are well known. Concrete is non-combustible and emits no toxic fumes when subjected to fire. The material is a good insulator and its temperature will usually be much lower than that of the flames. Concrete, as its temperature rises and it loses moisture, does gradually lose strength but, in most fires, it will retain its structural integrity and the structure can be successfully repaired.

The BCA continues to work with The Concrete Centre and the design and construction industries on the thermal performance of concrete structures to promote low-carbon, long-life homes and buildings that can adapt to a changing climate.

During 2006, the BCA collaborated with The Concrete Centre on the publication of two guidelines – Utilisation of thermal mass in non-residential buildings and thermal mass for housing.

In buildings, 90% of the environmental impact of CO₂ arises during their operational lifetime from heating, cooling and lighting. Concrete buildings, due to their thermal mass properties, are able to absorb and release heat, meaning less energy is needed for heating and cooling, thus providing energy savings over their lifetime.

In terms of domestic properties, research carried out by Arup Research and Development indicated that the difference in embodied CO₂ between a typical concrete/masonry house and a timber framed one is very small at about 4%. This difference can be offset in as little as 11 years through the effective use of the thermal mass in the concrete-based construction. Most of the CO₂ savings are derived from the use of thermal mass to capture

solar gains during the heating season, reducing the amount of fuel required. With temperatures forecast to rise over coming years, the research also found increasing CO₂ savings in the concrete/masonry house, through the use of thermal mass to reduce or avoid the need for air-conditioning.

The building material of choice

Collaboration at European level has led to the publication of further technical evidence showing why concrete is the building material of choice.

The European Concrete Platform (ECP) is a recently formed alliance of the European associations representing the cement and concrete industry. It aims to promote concrete as the material of choice providing building solutions for sustainable development and sustainable construction and was formed by four associations:

BIBM International Bureau of Precast Concrete
CEMBUREAU the European Cement Association
EFCA European Federation of Concrete Admixtures Associations
ERMCO European Ready Mixed Concrete Organisation

The ECP has produced two wide-ranging publications to help specifiers, regulators, building owners and users understand the benefits of using concrete as a building material.

Comprehensive fire protection and safety with concrete demonstrates how concrete can be used to provide complete fire protection including preservation of life and protection of property and the environment. Through a series of well-illustrated case studies and figures, this brochure underlines the outstanding fire resistant properties of concrete.

Concrete for energy-efficient buildings explains how concrete can be used both to reduce the speed of climate change and to minimise the effects it will have on the built environment. Supported by the results of new research and evidence from work on real buildings, this brochure clearly presents the energy efficiency benefits of concrete.

Copies of the brochures can be freely downloaded from the publications section of the cement industry website www.cementindustry.co.uk.



UK Concrete Platform

Five leading organisations in the cement and concrete sector agreed in 2006 to form the UK Concrete Platform (UKCP). Joining the BCA in the organisation are The Concrete Centre, British Precast Concrete Federation, Quarry Products Association and the Concrete Society. The UKCP is not an organisation or a legal entity but a forum where issues and opportunities can be discussed and solutions identified.

The five chief executives comprise the UKCP Industry Management Group which meets quarterly. Practical work is carried out by five task groups, each of which has agreed terms of reference and deliverables.

Sustainable construction task group

BCA representative – Stefania Rosso, sustainable development manager

A new sector website has been launched, www.sustainableconcrete.org.uk. This brings together in one place a wealth of information on raw materials and concrete products with illustrative case studies. The task force is developing a responsible sourcing scheme for cement and concrete. In addition, it is drawing up responses to a range of consultations faced by the industry. The task group is chaired by John Hannah of the British Ready Mix Concrete Association.

Education and training task group

BCA representative – Dr Chris Clear, senior research manager, concrete performance

The main work of the group is to map the training qualifications and gaps across the sector and to increase awareness of all relevant courses and providers. In addition, the group will develop new resources about concrete. The group is chaired by Martin Powell, chief executive of the Concrete Society.

Technical publications task group

BCA representative – Dr Pal Chana, director standards and technical

This task group, previously known as the Cement and Concrete Industry Publications Group (CCIP), is chaired by Dr Andrew Minson of The Concrete Centre. The group is charged with overseeing the programme of technical publications as they progress through the process of drafting, editing and production into the market. It is also responsible for identifying gaps in the publications available and devising ways in which both industry and commercial publishers can fill them.

Research and innovation group

BCA representative – Dr Pal Chana, director standards and technical

Since May 2007, the group has been chaired by Norman Brown of the BPCF. To date, the group has produced an updated database of all cement and concrete research projects in the UK and is currently working on an accessible and managed web version of the database. The group has undertaken a research review of current projects within each member organisation as well as a review of opportunities within the European 7th Framework programme. The group is the UKCP's link with the new Department for Business, Enterprise and Regulatory Reform Materials UK initiative and the UK Construction Platform research group.

Public policy task group

BCA representative – Damian Testa, head of public affairs and external communications

The group is reviewing the priorities of the cement and concrete sector with a view to identifying mutual opportunities for advocacy and shared engagement with government, officials and other key industry stakeholders. Early work has included consideration of industry sponsorship within government given the uncertainties over the future of the (now disbanded) Department for Trade and Industry. The group is chaired by Simon van der Byl, chief executive of the Quarry Products Association.

British Cement Association

Riverside House
4 Meadows Business Park
Station Approach
Blackwater, Camberley
Surrey, GU17 9AB

Telephone 01276 608700
Facsimile 01276 608701
Email info@bca.org.uk
Website www.cementindustry.co.uk



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|---------------------|---------------------------------|
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| 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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Where feasible, cement is transported in bulk by rail, as in this consignment for London from Castle Cement's Ketton works in Rutland

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