

# Performance

a corporate responsibility report from the UK cement industry

18.5%  
reduction in carbon dioxide emissions since 1998

£77.5 billion industry turnover

1,000,000 tonnes of waste consumed

**BCA**  
British Cement Association

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**Front cover** kiln inspection and maintenance underway at Westbury works  
**Inside front cover** concrete provides structural strength to the roof of the Canary Wharf underground station

#### BCA and the UK cement industry

The British Cement Association (BCA) is the trade and research organisation that represents the interests of the UK cement industry in its relations with Her Majesty's Government, the European Union and relevant organisations in the United Kingdom.

It has four members: Buxton Lime Industries, Castle Cement, CEMEX UK Operations and Lafarge Cement UK. These are the major domestic manufacturers of Portland cement, producing 12 million tonnes a year, which represents about 90 per cent of the cement sold in the UK.

BCA members operate 15 manufacturing plants and employ 3,400 people directly while supporting a further 15,000 jobs indirectly. The cement industry has an annual turnover of £775 million.

# This review



For the UK cement industry, 2005 was a year of achievement and challenge. The achievement came with the completion of a one-year project to establish a clear, shared vision on the future steps towards greater sustainability. The challenge saw the industry live up to its commitments to responsibility when one of our members had to deal with an incident of cement test data falsification. The industry also fell short of its health and safety targets and has therefore set itself tougher goals for 2006 to achieve its overall accident reduction targets by 2010.

A sector plan for the industry was published by the Environment Agency, the first for any UK industry that includes established benchmarks and targets that go well beyond statutory requirements. Our two previous annual editions of *Performance* have reported progress against draft sector plan objectives. This year we have been able to include the full reporting requirements.

The industry's Sustainable Development Task Force completed its one-year programme during 2005 and established parameters and industry targets for the future. The goal is to demonstrate continually improving performance by setting and reviewing targets on environmental, economic and social objectives. A first national stakeholder event was held in July and valuable feedback from a diverse audience of interested groups has helped shape the industry's long-term strategy. It was particularly interesting to see that the industry had undervalued the contribution it makes to society through providing a vital material for the built environment, a factor clearly recognised by stakeholders.

During the year, CEMEX purchased the RMC Group so the former Rugby Cement now operates under the name CEMEX UK Operations. The three other members of the British Cement Association (BCA) remain Buxton Lime Industries, Castle Cement and Lafarge Cement UK.

By the end of the year, all four BCA members had introduced programmes to ensure compliance with the European Union's Waste Incineration Directive that came into effect on 28 December 2005. In total, the cement manufacturers invested over £12 million to bring their operations into line. Last year the UK cement industry used 268,000 tonnes of waste as fuel, saving about 225,000 tonnes of coal. This plays an important role in providing solutions for treating some of the UK's more intractable waste streams and provides an

environmentally sound alternative to illegal dumping, landfill or incineration. Use of waste-derived fuels has the added benefit of reducing overall emissions from cement kilns.

The industry welcomed the changes to the Substitute Fuels Protocol (SFP) made by the Environment Agency after wide public consultation. The SFP is an extra-statutory procedure that allows the Environment Agency to control the introduction of waste-derived fuels to replace conventional fuel such as coal. The objective of the changes was to provide a more efficient procedure for the introduction of waste-derived fuels, whilst retaining the provision for extensive public consultation and rigorous environmental control. Although some of the anticipated improvements were achieved, the effect of these has been substantially offset by the introduction of the Public Participation Directive (PPD). The cement industry fully supports public participation but the implementation of the PPD duplicated the consultation provisions of the SFP, adding a further time delay to the overall procedure. All of the provisions of the SFP are now included in statutory legislation and it is time to review its usefulness.

BCA itself is under new chairmanship as Jean-Francois (Jeff) Sautin, managing director of Lafarge Cement UK, took over in March 2006. He replaced Michael Lodge who had led BCA to make significant advances and who has provided outstanding service to the UK cement industry, firstly as managing director of Castle Cement, then in his role as BCA chairman and president of CEMBUREAU.

It is pleasing to record that the technical director of the BCA, Dr Pal Chana, was appointed a visiting industrial professor at the University of Dundee, in recognition of his valued contribution to the work of the university and to acknowledge his national and international reputation.

Perhaps this is one sign that the industry is not only doing a good job for the country and its stakeholders but is also being seen to be doing so.

A handwritten signature in dark ink that reads "Mike Gilbert". The signature is written in a cursive style and is positioned above a thin horizontal line.

Mike Gilbert  
BCA CHIEF EXECUTIVE

July 2006

# Working towards sustainability



Photograph Rachel Ninis. Courtesy of The Concrete Centre.

Concrete panels at the Thames Barrier Park Memorial



The Sustainable development task force report

In the autumn of 2005, the UK cement industry's Sustainable Development Task Force published its report on progress towards sustainability at a reception at the House of Commons. At the event, the then Minister for Industry at the Department of Trade and Industry, the Rt Hon Alun Michael MP, welcomed the industry's initiative and said:

'Cement is an essential building material for this country and it is good to see an industry looking to foster a dialogue with those it affects, for the benefit of all.'

The Task Force had worked for a year to set an agenda for the future and developed the following vision and objectives:

## *The vision*

'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.'

## *The 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.

The Task Force focused on five principal areas: improving communications; a business case for the industry for use in discussion with stakeholders; a carbon strategy to 2050; a cement makers' code; and annual publication of a corporate responsibility report, *Performance*.

## KEY POINTS

industry sets sustainable development objectives  
first expert stakeholder meeting held  
business case developed for the UK cement industry

### Improving communications

Working with Forum for the Future, the industry undertook a mapping exercise to identify key stakeholders in the cement and sustainability agenda so that future communication would be better targeted to the right audiences. This formed the basis of the meeting of expert stakeholders in July 2005, the first of a planned series of open forums, which was to review a draft business case and to help define what the industry's objective of 'leading the way in sustainable development' should encompass.

### Business case

Development of a business case was carried out by Forum for the Future on behalf of BCA. It assessed the overall costs and benefits of the UK cement industry in terms of its economic, environmental and social impacts. A new technique, a sustainability accounting method, was used in the work, designed to provide industries and organisations with a real appreciation of the overall impact they may have.

The work to date showed a positive business case for the cement industry and more work is required to complete the study across the entire cement and concrete supply chain.

### Carbon strategy

The industry is taking a two-part approach to the development of a carbon strategy. The first part is the reduction of direct emissions from its kilns and associated matters such as transport and electricity use. The second is to work with the design and construction industries to promote low-carbon, long-life dwellings, offices and other buildings that can adapt to a changing climate through the effective use of cement and concrete.



Cement is the essential ingredient for construction with mortar

### Cement makers' code

The industry is working on production of a Cement Makers' code which will be implemented by the middle of 2006 and will be reported on in next year's *Performance*. It will set out the shared values, ethics and standards that should be followed in pursuit of all industry activities.

### Corporate responsibility report

The Environment Agency sector plan calls for a yearly report on the industry's progress. This publication, the third issue of *Performance*, meets that requirement through the *Environment* section, starting on page 12.

## KEY POINTS

industry annual turnover reaches £775 million

cement is an essential material for the £83 billion construction industry

high investment in new plant and emission control equipment continues



Rugby works, where CEMEX supports 730 local jobs and contributes £25.5 million annually to the local economy



Kiln maintenance

### National economy

The industry has an annual turnover of £775 million and is a major supplier to the construction industry, itself generating over £83 billion a year and employing 650,000 people.

Cement is sold in bulk to ready mixed concrete producers and precast concrete manufacturers. In broad terms, 52 per cent of cement produced goes into ready mix concrete production and 27 per cent into precast concrete. The remaining 21 per cent becomes packed cement, generally sold via builders' merchants to the end-user, ranging from the man and woman in the street to major contractors. A wide variety of cement products is available with differing strength, setting and general performance characteristics or designed for use in special circumstances such as contaminated ground or in soils with high sulphate content.

### Local economics

Cement manufacturing operations are generally in rural areas close to their source of raw materials. They make a significant contribution to the local economy, not only in terms of employment but also through the purchase of local products and services. It is estimated this can amount on average to around £15 million annually for the local economy, taking into account salaries, business rates and local spending.

### Investment

The industry continues to invest in its future to improve process and distribution efficiencies and to minimise its environmental impact.

During the year, Castle Cement commissioned a £60 million new kiln at Padeswood in north Wales. This replaced three existing old-technology kilns at the works and two further kilns in Lancashire.

Lafarge Cement UK announced a £20 million investment to cut emissions from its Dunbar works in Scotland while CEMEX stated it intends to spend £6.5 million on installing bag filters at its Rugby plant.

Across the industry, over £12 million has been spent on plant improvements to ensure compliance with the European Union's Waste Incineration Directive. Additionally, smaller individual sums have been invested in general site improvements, landscaping and restoration.



Part of Castle Cement's new £60 million kiln at Padeswood in north Wales



A thermal imaging camera is used to scan the kiln shell or other hot surfaces and check for abnormalities, particularly 'hot-spots' which are not visible to the naked eye but are visible via infra-red

The industry moved forward with production of health and safety guidance notes and continued its policy of consultation with stakeholders but did not meet its accident reduction target.



### Health and safety

In health and safety terms, 2005 was a disappointing year for the UK cement industry. As the table on this page shows, the industry did not achieve its 30 per cent, year-on-year reduction in injury rates and also recorded a fatality among its employees.

Four sets of guidance notes were completed during the year.

*Guidance to prevent slips, trips and falls* recommends minimum standards to be implemented. It advises on general maintenance, housekeeping, behavioural safety, inspections, hazard reporting and installation of new plant.

A further publication, *Guidance to prevent hot meal burns*, focuses on the hazards and associated risks posed by hot meal, the mixture of raw feed materials used in cement manufacture. It is applicable to people working in dry process pre-heater towers and the areas under cooling systems.

### UK cement industry accident statistics – January to December 2005

	2003 ACTUAL		2004 ACTUAL		2005 ACTUAL	
	Employees	Contractors	Employees	Contractors	Employees	Contractor
Number of lost time accidents	47	54	40	45	46	31
Number of fatal accidents	0	0	0	1	1	0
Number of lost work days	1259	–	1203	–	1253	–

To reach its overall accident target reduction by 2010, the industry has increased its 2006 target to a 36 per cent drop.

A second industry health and safety workshop was held during the year. It was well attended by industry representatives and benefited from two excellent guest speakers, Clive Brookes from the Health and Safety Executive (HSE) and John Spanswick, chairman of Bovis Lend Lease.

*Customer site safety* both for bulk and bagged cement deliveries has also been examined and guidance produced. Development of the literature follows a number of customer site incidents, some nearly causing fatal accidents. It covers a set of health and safety criteria concerning vehicle deliveries that should be considered as part of a customer's overall risk assessment.

*Mobile plant reversing and visibility aids* is the title of a further guidance note, designed to prevent accidents arising from poor visibility from mobile plant. The guidance covers such areas as reversing in safety, driver and vehicle visibility and reversing aids.



## KEY POINTS

industry increases its accident reduction target to a 36 per cent fall for 2006  
four sets of health and safety guidance notes published during 2005  
good levels of public consultation maintained at local levels

The general health and well-being of the industry's workforce and its neighbours is of paramount importance. In 2005, the industry's European cement association, CEMBUREAU, began a study into the historical health of cement workers to see if there is any link between poor health and the industry's operations. Also during the year, the HSE reviewed findings of recent studies and published a report, *Portland cement dust*. The report found no causal link between Portland cement exposure and cancer could be established. Nevertheless, the report maintains the uncertainty concerning a possible risk of cancer raised by the earlier data reviewed by HSE in 1994.

### Public consultation

On page four of this publication it is explained how the cement industry has focused its attention on communication with its stakeholders, a process which manifests itself at local, national and European levels.

At local levels, responsibility for fostering good relations is generally with the site manager, supported by specialist staff as necessary. This work involves liaison committee meetings, contact with elected representatives and developing or responding to media interest. The aim is to ensure local people are briefed on what a works may be planning and have the opportunity to make their views known before any formal permissions are granted.

### Recruitment and training

The cement industry offers a wide range of employment possibilities at operational, transport, IT, general management and support service levels. Its workforce is encouraged to achieve nationally recognised qualifications and as member companies are part of multi-national businesses, there are excellent opportunities for personal development.

During 2005, BCA member companies employed 30 apprentices.

### Advocacy

The industry also takes a structured approach to meetings with national and European politicians, civil servants and regulatory bodies. This ensures that the practical implications of forthcoming legislation are raised at an early stage and pragmatic, workable solutions are developed for the improvement of the environment, health and safety and other aspects of cement manufacture.

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

### All party groups

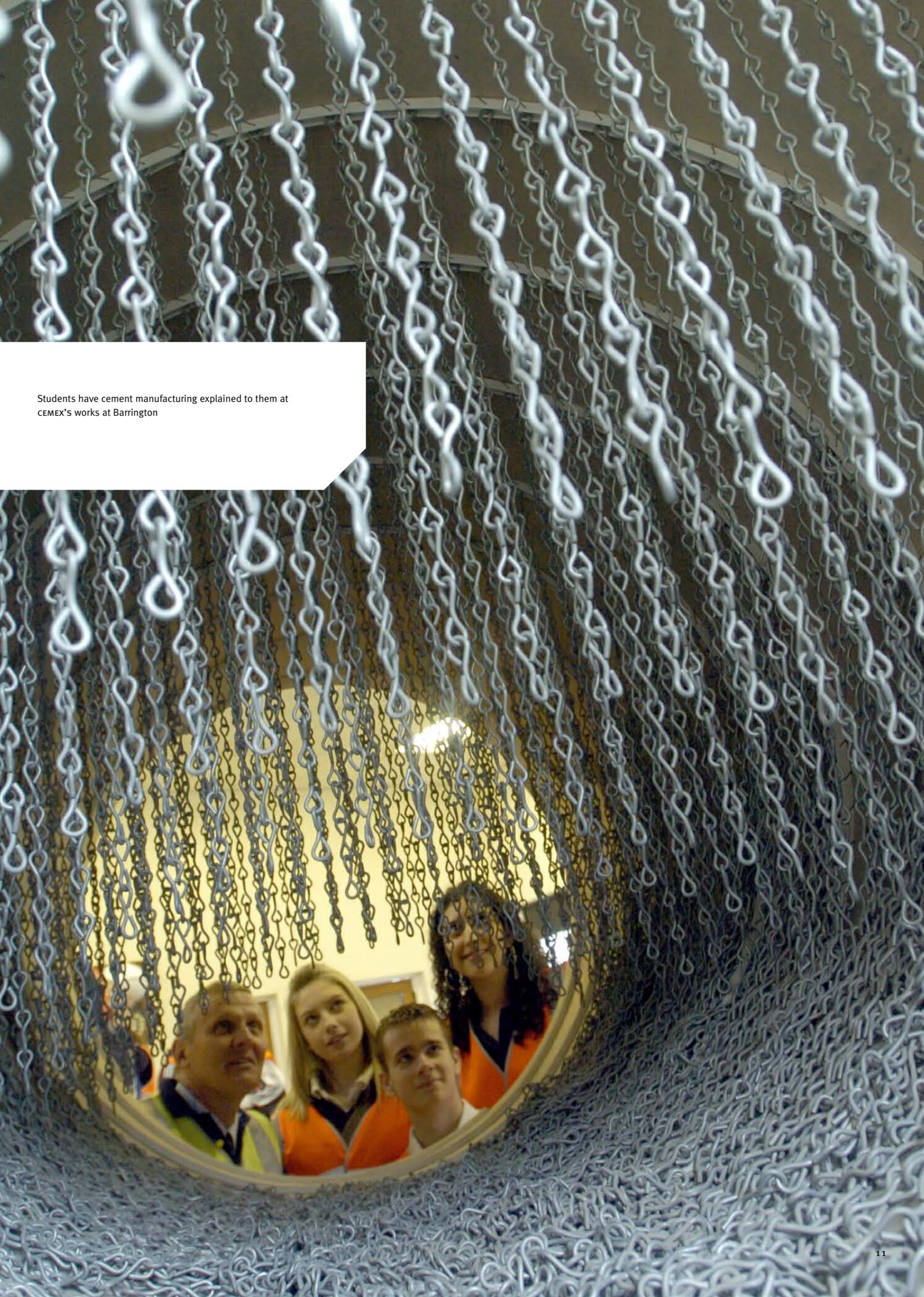
Minerals  
Sustainable waste  
Renewable and sustainable energy (PRASEG)  
Energy  
Environment

### Representation on EU/government groups

BREF (Best available techniques reference document) review  
Hazardous Waste Forum

### Other groups

CEMBUREAU  
CBI  
Construction Products Association  
The Concrete Centre  
The Concrete Society  
BSI  
British Business Bureau  
Forum in the European Parliament for Construction (FOCOPE)  
Environmental Industries Commission  
Forum for the Future  
National Society for Clean Air  
Chartered Institution of Waste Management  
Energy Intensive Users Group  
Ad Hoc Environmental Taxation Steering Group  
UK Emissions Trading Group

A large industrial tunnel filled with white, wavy, chain-like material, likely a conveyor system for cement. The material is suspended and forms a dense, textured wall. In the center, a circular opening reveals a group of four people (three men and one woman) wearing orange safety vests, looking towards the camera. The background shows the interior of the tunnel with a bright light source.

Students have cement manufacturing explained to them at CEMEX's works at Barrington

# Environment

Following detailed discussion with the UK cement industry, the Environment Agency published in November 2005, *Improving environmental performance – a sector plan for the cement industry*. The plan forms a framework of agreed national environmental objectives and priorities for the sector over the next five to ten years.



Controlling cement manufacture at Buxton Lime's Tunstead works

In the two previous annual editions of *Performance*, the BCA has reported the industry's progress against draft objectives expected to be covered in the cement industry sector plan. This year, it reports against the finalised objectives set out by the Environment Agency. Throughout, 1998 is used as the baseline; a year agreed with environmental auditors. Targets within the sector plan are for 2006 and 2010.

Notes to the performance indicator tables are included on the fold-out flap on the back cover of this document.



Extraction of virgin raw materials is reducing as more waste is used

## OBJECTIVE 1

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

The UK cement industry has continued to replace both raw materials and fossil fuels with waste-derived substitutes.

In 2005, 4.89 per cent of raw materials and 14.28 per cent of fossil fuels were replaced by waste materials, adding up to over one million tonnes of waste being used in the year.

Of the 15 cement-manufacturing plants covered by this report, nine were using at least one alternative fuel either permanently or under trial during 2005.

The performance indicator table alongside shows that there has been a 2.52 per cent reduction in the use of virgin raw materials per tonne of cement produced since the 1998 baseline with, on the same basis, a 22.67 per cent drop in fossil fuels.

## 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	2005	2006	2010
1.1 kg/te pce	1468	1437	1428	1413
1.2 kwh/te pce	1103	853	973	764



## KEY POINTS

over one million tonnes of waste used as raw material and kiln fuel  
 cement industry consumes more waste than it generates  
 fossil fuel replacement now over 14 per cent

### OBJECTIVE 2

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

Waste produced in the cement making process continues to fall. By far the largest amount is cement kiln dust (CKD). By adjustments to the cement-making recipe, a good proportion of this can be returned beneficially to the production process. As an example, during the year CKD waste going to landfill at the Lafarge Cement UK Northfleet plant fell from an annual 75,000 tonnes to zero with all of the waste product being returned to productive use. Unique within the manufacturing sector, the cement industry is a net user of waste and waste-derived materials.

In 1998 the industry reported 289,207 tonnes of CKD going to landfill sites while in 2005, that figure had decreased to 67,682 tonnes.

As can be seen in the performance indicator table, the proportion of other wastes is very small.

#### 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	2005	2006	2010
2.1(i) kg/te PCE	0	2.53	1.29	1.07
2.1(ii) kg/te PCE	22.9	5.84	10	7.5
2.2(i) kg/te PCE	0.79	0.49	1.50	1.50
2.2(ii) kg/te PCE	4.17	2.40	3.50	3.00



The gas scrubber under construction at Dunbar

### OBJECTIVE 3

#### *Reduce emissions from cement manufacturing*

Carbon dioxide (CO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>), sulphur dioxide (SO<sub>2</sub>) and dust, remain the most significant sources of emissions from cement manufacturing.

All emissions are falling as a result of investment in abatement technology and more modern plant that in turn allows closure of older, less efficient operations. For example, Castle Cement commissioned a new £60 million kiln at its Padeswood works in north Wales. Its more efficient dry process kiln operation has allowed the closure of two wet kilns and a dry one at that location but also two more old kilns at Clitheroe in Lancashire. The overall effect is a 17.5 per cent reduction in CO<sub>2</sub> emissions across the company's operations.

Lafarge Cement has also invested heavily in environmental control. At its Dunbar works in Scotland, the company has installed a £20 million gas scrubbing system that cuts emissions of both sulphur dioxide and dust by a half.

CEMEX announced a £6.5 million investment in bag filters at its Rugby plant. This is designed to achieve up to a 40 per cent reduction in dust emissions and should be operational early in 2007.

As will be seen in the performance indicator table below, none of the 15 manufacturing plants requires further action to reduce local environmental impacts identified by the Environment Agency, although all companies will continue to work to reduce further their overall environmental impacts.

With this in mind, it is gratifying to note that the industry's total environmental burden to air (see table footnote) had reduced by 35 per cent by the end of 2005, compared to the 1998 level.

#### 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	2005	2006	2010
3.1 number	2	2	2	0
3.2 kg/te PCE	0.33	0.13	0.20	0.15
3.3 kg/te PCE	3.34	2.77	2.80	2.50
3.4 kg/te PCE	2.56	1.37	1.50	1.10
3.5 burden value	1807	1157	1237	1054

#### OBJECTIVE 4

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

Burning fossil fuels and the calcination of limestone or chalk in the manufacturing process produces carbon dioxide (CO<sub>2</sub>). Smaller amounts are also produced through the manufacturers' transport fleets and the industry's use of electricity. Elsewhere in *Performance* the industry's carbon strategy is explained in more detail but the industry is making significant reductions in CO<sub>2</sub> emissions.

Use of alternative fuels reduces the overall carbon dioxide emitted while the growing use of materials such as ground limestone, pulverised fuel ash and ground granulated blast furnace slag as partial cement replacements, lowers the percentage of CO<sub>2</sub> produced per tonne of cement manufactured. Each manufacturer is moving towards these cements, classed as Cem II products under European specifications.

The BCA member companies support the principle of emissions trading as in the European Union emissions trading scheme, believing that market mechanisms will complement and possibly encourage other measures to reduce overall CO<sub>2</sub> emissions. However, the proposed auctioning of CO<sub>2</sub> emission allocations would be problematic for the industry in view of the high cost of carbon in relation to the cost per tonne of cement. This

makes the industry vulnerable to imports in a scheme that takes no account of the environmental impacts of transporting the material. Other potential buyers of allocations, such as the aviation industry, would face no such pricing pressures and would pass additional costs straight through to the end consumer. Along with other energy-intensive industries, BCA sees no continuing benefit from the UK Climate Change Levy scheme that continues to run alongside its EU counterpart. There appears to be little logic but a high level of bureaucracy involved in running two schemes ostensibly aimed at achieving the same result.

#### 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	2005	2006	2010
4.1	kg/te PCE	924	822	847	833
4.2	kg/te PCE	387	287	324	273
4.3	kg/te PCE	520	500	512	512



Chipped tyres for fuel at Castle Cement's Ribblesdale works

#### OBJECTIVE 5

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

The UK cement industry is playing an important role in minimising some of the country's waste disposal problems by processing selected wastes into alternative kiln fuels. The use of such materials also provides other environmental benefits such as a reduction of emissions to air of other pollutants, principally oxides of nitrogen.

Cement kilns can safely employ selected waste-derived fuels for several reasons:

- raw material temperatures reach over 1,450°C
- flame temperature inside the kiln is over 2,000°C
- gas residence times are over four seconds
- the turbulent atmosphere within a kiln ensures good mixing
- alkali atmosphere within the kiln prevents acid gas emissions
- ash from combustion is absorbed into the cement.

In 2005, all four BCA members introduced programmes to ensure compliance with the European Union Waste Incineration Directive, which applies to all plants that recover energy from waste or incinerate waste for disposal.

The most recent additions to the waste products used permanently by the industry are meat and bone meal at Castle's Ribblesdale works in Lancashire and sewage sludge by Lafarge's operation at Caudon.

#### 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	2005	2006	2010
5.1	kg/te PCE	9.64	23.14	14.00	21.00
5.2	kg/te PCE	25.70	73.94	50.00	100
5.3	mass %	5.7	14.28	10.00	15.00
5.4	mass %	1.7	4.89	4.00	8.00
5.5	%/NO	-	1	* <sup>1</sup>	* <sup>2</sup>

<sup>1</sup> 75% within six months <sup>2</sup> 75% within four months



## KEY POINTS

- 2010 target for CO<sub>2</sub> emissions from cement plants reached in 2005
- cement industry continues to play major role in UK waste management
- all 15 UK cement operations have site restoration plans



Dinosaur remains found at the CEMEX Barrington works

### OBJECTIVE 6

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

UK cement works and quarry sites have formal restoration plans under their existing planning permissions and under the Environment Agency Pollution Prevention Control permits. However, cement manufacturing operations have very long lives so definitive after-use plans for these areas are not practical.

Progressive restoration and the safeguarding and development of biodiversity at a quarry site is a different matter.

There are many examples of where the cement industry has done much to improve local habitats. Lafarge Cement UK has assessed centrally with English Nature each of its sites that have Site of Special Scientific Interest (SSSI) status with the intention of improving any not already of the highest standard.

Both Castle Cement and Lafarge Cement are working on the restoration of quarry faces to reduce visual impact and to introduce new habitat while the site is operational. Seeding and tree planting is carefully planned so that indigenous species are used.

Areas within cement works are being used to provide educational facilities for local children. At Cauldon works, plans are in train for the study of how post industrial land can return to nature, while at Padeswood, children can search for bugs and insects in specially developed areas.

CEMEX's Barrington quarry has been designated an SSSI on account of its nationally important geological exposures revealed through quarrying. Geology tours are especially popular among local schools and universities.

#### 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 action plans

	BASE	ACTUAL	TARGETS		
	1998	2005	2006	2010	
6.1	% (number)	94 (35)	100 (15)	100	100
6.2	% (number)	0 (0)	75 (10)	80 (12)	100 (15)

### OBJECTIVE 7

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

During 2005, the industry undertook a mapping process to identify its national stakeholders and this is covered in some detail in this document. This activity has given a central focus to the need to ensure all interested groups are fully aware of the industry's plans and objectives.

At a local level, works operate local liaison committees made up of representatives of local communities, the relevant local regulator and the companies themselves. Additionally, BCA member companies produce newsletters for distribution to their neighbouring communities and hold open days where people may see how a cement work operates.

The industry also holds regular meetings with politicians at local, national and European levels to ensure policy developers are aware of the industry's role in modern-day life. This area is covered more fully on page ten.

#### 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		
	1998	2005	2006	2010	
7.1	% (number)	68 (15)	100 (14)	100 (15)	100 (15)
7.2	% (number)	100 (2)	100 (7)	100 (2)	100
7.3	% (number)	N/A	100 (24)	100	100
7.4	% (number)	N/A	60 (5)	100	100



## KEY POINTS

each UK cement plant is covered by an environmental management system  
 no prosecutions of cement manufacturers during 2005 by the Environment Agency  
 BCA members begin to integrate sustainable development in all strategies



Discussion of work procedures at Castle Cement

### OBJECTIVE 8

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

Each BCA member plant is covered by the Pollution Prevention and Control regulations, enforced by the Environment Agency in England and Wales, the Scottish Environment Protection Agency and the Industrial Pollution and Radiochemical Inspectorate in Northern Ireland.

In 2005, no cement company was prosecuted although there have been three incidents.

The Environment Agency announced its intention to prosecute CEMEX over an incident during October at the Rugby works. In March, Castle Cement was served an enforcement notice at its Padeswood works requiring the company to close a kiln because of dioxin emissions. Lafarge Cement UK received a formal warning from the Environment Agency over management controls and environmental performance at Westbury works.

The industry recognizes this performance is not up to the high standards it sets itself and supported by the BCA continues to strive for improvement.

#### 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	2005	2006	2010
8.1	% (number)	91 (20)	100 (15)	100 (15)	100 (15)
8.2	% band A	N/A	85 (11)	80	100

Objectives 8.3 to 8.9 refer to Environment Agency reporting criteria that will be supplied by the regulator.



Ready-mixed concrete, a major user of cement

#### OBJECTIVE 9

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

The BCA works closely with other organisations to help define and inform users on the benefits of cement-based construction. Industry bodies with which it works include the Concrete Centre, The Concrete Society, British Precast Concrete Federation and the British Ready Mixed Concrete Association. The association also liaises with research and educational establishments, supporting, where relevant, research projects.

BCA members have taken measures to begin to integrate sustainable development into all cement industry strategies. What was put in hand during 2005 is covered in some detail on page four of this document.

#### 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:

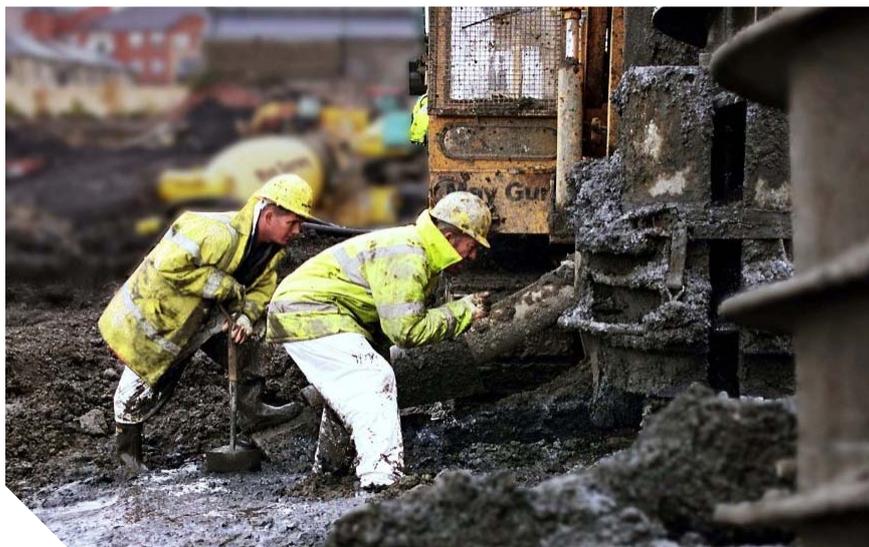
- 9.1 To develop guidelines demonstrating how the product can be used sustainably throughout its lifecycle.
- 9.2 To integrate sustainable development into all cement industry strategies, activities and communications.



A quality control procedure at Castle Cement's Padeswood works

# Cement and our future

Providing safe, cost-effective means of land reclamation and helping achieve sustainable construction remain targets for the UK cement industry while on a day-to-day level, it continues to advise specifier and end-user alike on the introduction of new technical standards.



Contaminated land: cement-based binders can provide an answer

## Contaminated land

BCA is working with The Concrete Centre, University College London and a consortium of 19 other organisations on the treatment of brownfield sites by stabilisation/solidification (s/s) using cement-based binders.

Under a three-year project, led by University College, four waste types are being assessed:

- metal-containing salts and sludges from physiochemical treatment of industrial wastes
- air pollution control residues from municipal solid waste incineration
- electric arc furnace dust from the iron and steel industry
- contaminated soil.

The project aims to develop process envelopes – operating windows – for generic s/s of the waste types and gain a better understanding of contaminant immobilisation mechanisms and long-term performance.

Immobilising binder systems will incorporate a variety of proportions of Portland cement, ground granulated blastfurnace slag, coal-fired power station fly ash, lime and silica fume.

The practical effect long term should be the faster, more effective clean up of brownfield land for development, helping preserve greenfield sites.

## Eurocodes for concrete design and specification

The key new codes are *BS EN 206-1:2000 Concrete. Specification, performance, production and conformity* and *BS EN 1992:2004 Eurocode 2. Design of concrete structures. General rules and rules for buildings*. The National Annexes for both these codes have now been published. The BCA has worked with partner organisations to ensure that authoritative guidance and support is available to make a smooth transition from British to European Standards. Eurocodes are welcomed, as the industry believes they are the most technically advanced suite of design codes available anywhere in the world and offer significant opportunities for the UK construction sector. The engineering community however is calling for government support with the introduction of Eurocodes, as they represent major expense to smaller- and medium-sized companies.

Further information and guidance is available from the cement and concrete sector at: [www.cementindustry.co.uk](http://www.cementindustry.co.uk), [www.eurocode2.info](http://www.eurocode2.info) and [www.concretecentre.com](http://www.concretecentre.com).

## Thermal mass

The sustainable advantages of concrete construction have been further underlined by recent research carried out by Arup Research + Development, commissioned by BCA and The Concrete Centre.

The research shows that if designers take advantage of the thermal mass in masonry housing, the whole-life carbon dioxide (CO<sub>2</sub>) emissions of the structure are lower than for an equivalent lightweight timber frame house. This takes account of embodied CO<sub>2</sub> in the construction materials as well as operational CO<sub>2</sub> from the buildings' heating and cooling systems. Masonry construction does have a slightly higher embodied level of CO<sub>2</sub> than an equivalent timber construction house, but only by about 4 per cent or 1.25 tonnes of CO<sub>2</sub> for a typical two-bed starter home. This small additional burden is completely offset in as little as 11 years if the thermal mass in the masonry house is used to save energy by reducing the need for air conditioning in summer and for heating in winter.

At present, houses in the UK are not generally air-conditioned but climate change is expected to alter the situation. Previous Arup research, using predictions from the UK Climate Impacts Programme, showed that by 2020, many houses will become increasingly warm and uncomfortable to live in during future summers.



Thermal mass principles have been put to good effect at Brighton's Jubilee Library, making it one of the country's most energy-efficient buildings

## 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.

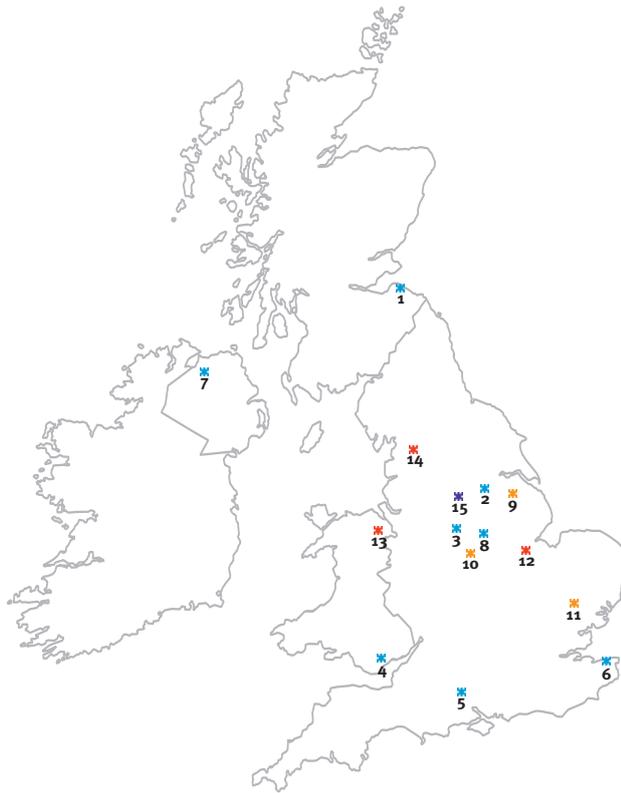
- 2 Number and proportion of sites where pollution reduction is required via a PPC improvement programme to satisfy an existing statutory local environment action plan. This assessment includes the impact of fugitive dust emissions.
- 3 Measured as total particulate. This comprises all particle fractions 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). Compliance rating scheme baseline data will be available from 2006.
- 8 Refer to the Environment Agency Common Incident Classifications Scheme ('cics'). cics categories 1, 2 and 3 are major, significant and minor incidents respectively. Current performance will be reported in 2006, pending development of an appropriate target.
- 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. Current performance will be reported in 2006, pending development of an appropriate target.
- 10 Refer to the Environment Agency Enforcement and Prosecution Policy. This indicator excludes prosecutions under appeal. Current performance will be reported in 2006, pending development of an appropriate target.
- 11 OMA (Operator Monitoring Assessment) currently covers emissions to air. Current performance will be reported in 2006, pending development of an appropriate target.
- 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)

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|----------------------------|---------------------------------|
| <b>■ Lafarge Cement UK</b> | <b>■ CEMEX</b>                  |
| 1 Dunbar                   | 9 S Ferriby                     |
| 2 Hope                     | 10 Rugby                        |
| 3 Cauldon                  | 11 Barrington                   |
| 4 Aberthaw                 | <b>■ Castle Cement</b>          |
| 5 Westbury                 | 12 Ketton                       |
| 6 Northfleet               | 13 Padeswood                    |
| 7 Cookstown                | 14 Ribblesdale                  |
| 8 Barnstone                | <b>■ Buxton Lime Industries</b> |
|                            | 15 Tunstead                     |