



Performance 2010

A sector plan report from the UK
cement industry

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MPA Cement has four member companies which produce Portland cement. These are CEMEX UK, Hanson Cement, Lafarge Cement UK and Tarmac Buxton Lime and Cement. MPA Cement forms part of the Mineral Products Association, the representative body for the aggregates, asphalt, cement, concrete, lime, mortar and silica sand industries.

Highlights

All figures relate to 2010 actual performance against a 1998 baseline:

Oxides of nitrogen	emissions down 59 per cent
Sulphur dioxide	emissions down 87 per cent
Dust	emissions down 83 per cent
Carbon dioxide	emissions down 22 per cent

Introduction

This, our eighth annual *Performance* report is a landmark for the cement industry: we are now able to report final progress against the 2010 milestone targets agreed between the industry and the Environment Agency back in 2005. It also provides an opportunity for the sector to look to the future and how we build on the strong performance. The past decade has been characterised by step changes in the UK cement industry's environmental performance and these are now locked into our everyday operations. This has not only produced outstanding results for the natural environment and our communities, but also the companies themselves. They are now more efficient, resourceful, transparent and respected than at any time in the past. We are immensely proud of this achievement and determined to maintain these high standards as we move forward.

I am delighted to report that against our 2010 Environment Agency Sector Plan targets, MPA Cement members have not only met them, but surpassed them by some considerable margin in most cases. It is worth reminding ourselves of just how significant this progress has been in some particularly important headline areas as shown in the highlights above.

In addition, the UK cement industry is now a net consumer of waste. Against a total of 14,021 tonnes disposed of, the industry actually used 1.32 million tonnes of waste and by-products as fuels and raw materials.

This step change in performance has not come easily or cheaply. It has taken multi-million pound investments against a backdrop of changing environmental legislation and ever-more challenging EU and UK climate change policies. Yet the industry has done everything asked of it and more.

The industry now looks forward to achieving its next milestone targets set for 2015. However, it will take the opportunity of this landmark report, to reflect on current reporting methods and whether there is scope to make our annual reports more meaningful in terms of the contribution our products make to sustainable construction.

Pal Chana

Executive Director

MPA Cement

As previously, data from MPA Cement member company plants in England, Wales, Scotland and Northern Ireland are included in this report, despite the Environment Agency remit covering only England and Wales.

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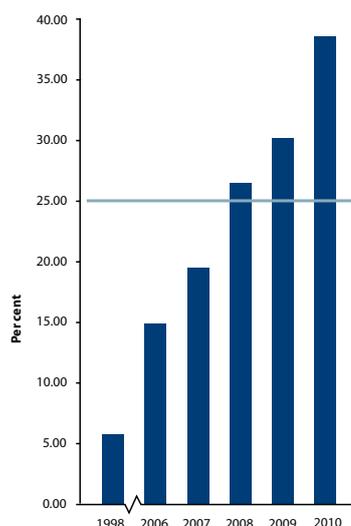
Performance indicators

- 1.1 Use of natural raw materials per tonne manufactured
- 1.2 Use of fossil fuels (coal, petcoke, oil, gas) for primary energy
- 1.3 Mass of waste recovered as fuel per tonne manufactured
- 1.4 Mass of waste recovered as raw materials per tonne manufactured
- 1.5 Proportion of fuel comprising waste material
- 1.6 Proportion of raw materials comprising waste material

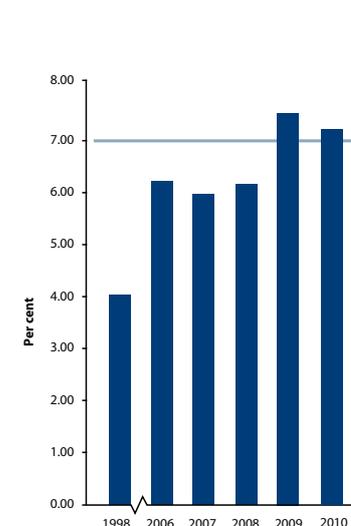
		Base	Actual	Targets	
	units	1998	2010	2010	2015
1.1	kg/t	1498	1377.6	1420	1400
1.2	% thermal	94.3	61.9	75.0	70.0
1.3	kg/t	9.6	58.5	45.0	60.0
1.4	kg/t	63.1	108.5	115.0	135.0
1.5	% thermal	5.7	38.1	25.0	30.0
1.6	% mass	4.0	7.2	7.0	11.0

Key
2010 target

Proportion of fuel comprising waste material



Proportion of raw materials comprising waste material



Objective one

To increase the use of waste used as raw materials or fuel in cement works (resource efficiency)



Chipped waste tyres provide a kiln fuel and improve environmental performance

The cement industry's outstanding success over the last decade has been its ability to assist greatly UK waste management while surpassing targets for replacing virgin raw materials and fossil fuels.

Starting from a 1998 baseline of 1498 kilogrammes per tonne of Portland cement equivalent (kg/t PCe – please see *Notes to the performance indicators 1* on page eight) of natural raw materials employed, the industry has reduced its use to 1377.6 kg/t against its agreed 2010 target of 1420 kg/t, an 8 per cent actual improvement. This represents a 7.2 per cent replacement of virgin raw materials in 2010 compared to the 4.0 per cent achieved in 1998.

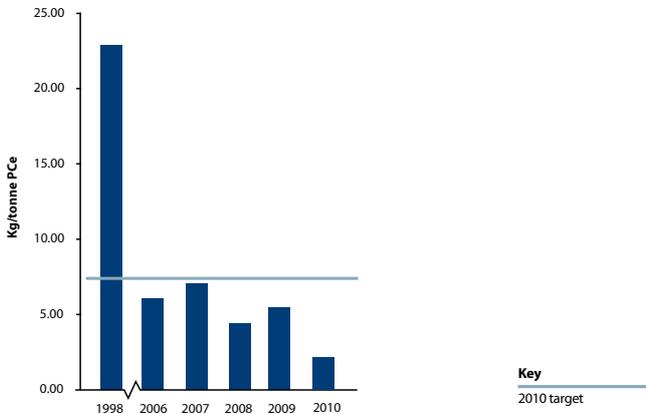
Various waste streams have been used productively. These include construction waste, ceramic moulds, foundry sand, gypsum from plasterboard, mill scale, cement kiln dust, refractory bricks and road sweepings.

In terms of fossil fuels, a 2010 target of 25.0 per cent replacement against a 1998 baseline of 5.7 per cent has also been surpassed with the actual 2010 industry figure being 38.1 per cent. This level is higher than the replacement target for 2015 of 30.0 per cent.

To reach this high level of replacement, a wide variety of wastes have been used including solvents, waste tyres, paper and plastics, waste oils and wood, sewage sludge, meat and bone meal.

Throughout its development of using waste-derived materials for fuel and natural raw material replacement, the industry has applied strict parameters: it will only use wastes as long as they provide no health hazard to employees or neighbours and cause no deterioration in environmental performance or product quality.

CKD disposed of per tonne manufactured



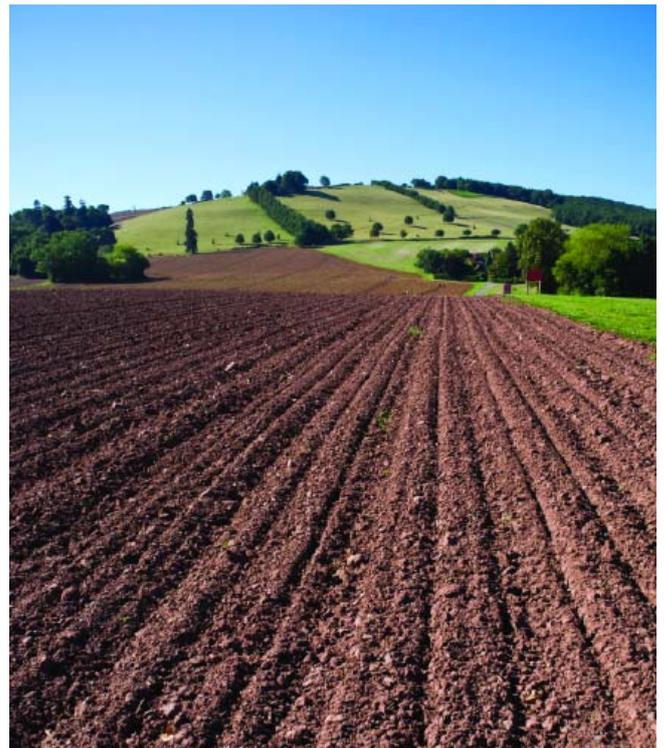
Cement kiln dust is returned to the production process whenever technically feasible

Objective two

To reduce waste disposal from cement manufacturing

The industry continues to be a net user rather than producer of waste. Against the 1.32 million tonnes of waste and by-products the industry used as fuel and raw materials in 2010, it produced only 14,021 tonnes for disposal.

In past years, the greatest bulk for disposal has been cement kiln dust (CKD). By 2010 – and against a target of 7.5 kg/t PCe – the industry was able to report a disposal rate of 1.8 kg/t PCe. This is a 92 per cent reduction on the 1998 baseline. This has been achieved through improved process control, reusing CKD in cement production where technically feasible and using the material as an agricultural fertiliser and for land reclamation projects. The use of kiln dust on land has been re-introduced through close liaison with the Environment Agency. Reports show improved crops through the addition of potassium and the correction of soil acidity.



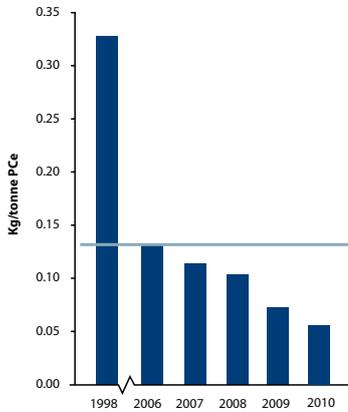
CKD used in agriculture improves crop yields

Performance indicators

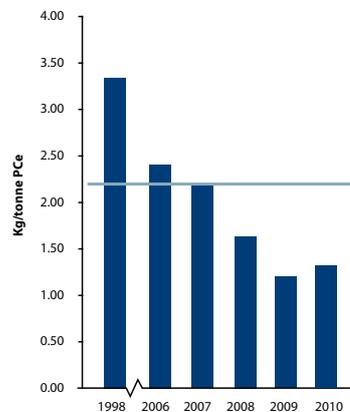
2.1 CKD disposal of per tonne manufactured

	Base	Actual	Targets	
units	1998	2010	2010	2015
2.1 kg/t	22.9	1.84	7.5	7.0

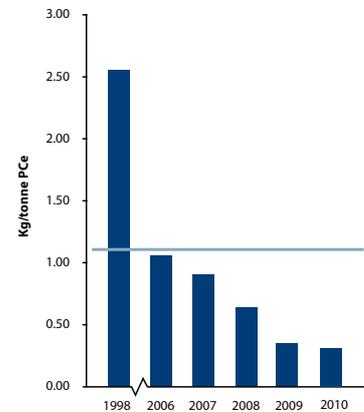
Dust emissions to air per tonne manufactured



NO_x emissions to air per tonne manufactured



SO₂ emissions to air per tonne manufactured



Key
2010 target

Objective three

To reduce air pollution from cement manufacturing

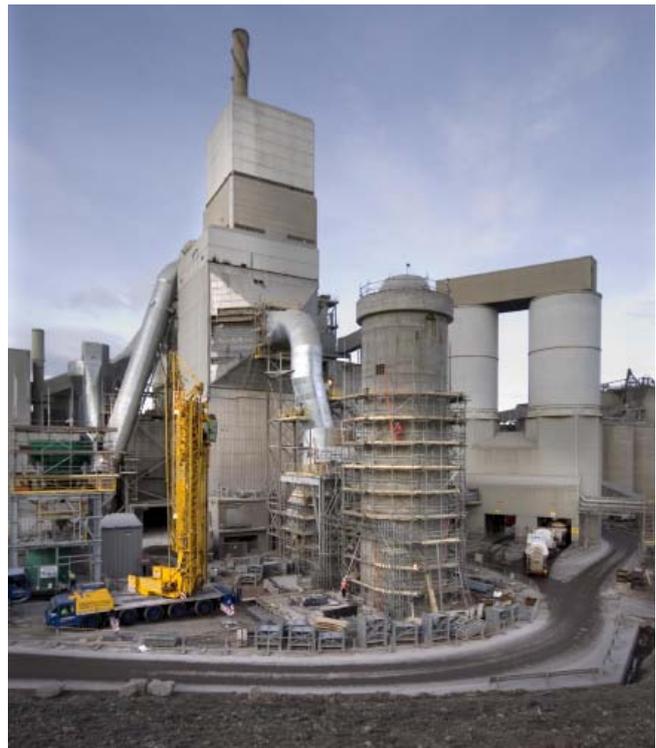
Each 2010 target has been met for reductions in emissions of dust, oxides of nitrogen (NO_x) and sulphur dioxide (SO₂).

Dust emission levels against the 2010 target of 0.13 kg/t PCe have fallen to 0.06 kg/t PCe against a baseline figure of 0.33 kg/t PCe. This has primarily been achieved through the closure of less efficient plant and the introduction of highly efficient dust collection equipment.

NO_x emissions have fallen aided by the increased use of waste-derived fuels. Against a baseline of 3.34 kg/t PCe and a target of 2.20 kg/t PCe, the industry achieved an actual level of 1.35 kg/t PCe in 2010.

An 87 per cent reduction in SO₂ emissions against baseline levels was achieved by the industry in 2010. Its actual emissions were 0.33 kg/t PCe against a baseline of 2.56 kg/t PCe and a target of 1.10 kg/t PCe.

Investment in new plant, gas scrubbing equipment and closure of less efficient operations, have all contributed to this major improvement as has the use of extenders such as pulverised fuel ash, ground granulated blastfurnace slag and ground limestone. This means less clinker is required per tonne of cement produced, helping reduce further SO₂ emission levels.



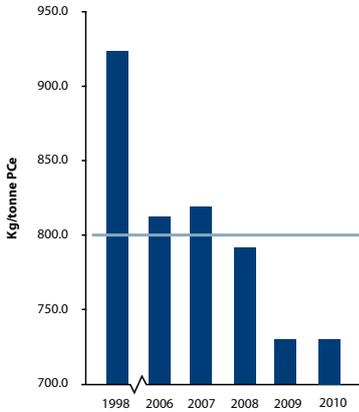
Construction of specialist equipment such as this gas scrubber has radically reduced sulphur dioxide emissions

Performance indicators

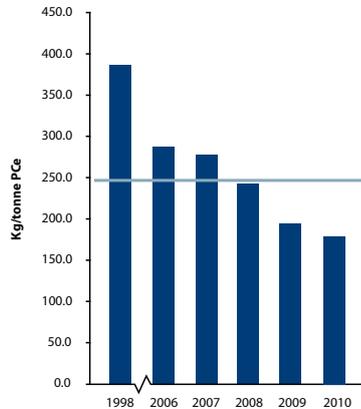
- 3.1 Dust emissions to air per tonne manufactured
- 3.2 NO_x emissions to air per tonne manufactured
- 3.3 SO₂ emissions to air per tonne manufactured

	Base	Actual	Targets	
units	1998	2010	2010	2015
3.1 kg/t	0.33	0.06	0.13	0.10
3.2 kg/t	3.34	1.35	2.20	2.00
3.3 kg/t	2.56	0.33	1.10	1.10

Emissions of CO₂ directly from cement plants per tonne manufactured



Emissions of CO₂ from combustion of fossil fuel at cement plants manufactured



Performance indicators

- 4.1 Emissions of CO₂ directly from cement plants per tonne manufactured
- 4.2 Emissions of CO₂ from combustion of fossil fuel (coal petcoke, oil, gas) at cement plants manufactured
- 4.3 Emissions of CO₂ from calcination of raw materials per tonne manufactured

	Base	Actual	Targets	
units	1998	2010	2010	2015
4.1 kg/t	924	725.0	800.0	775.0
4.2 kg/t	387	188.7	244.0	225.0
4.3 kg/t	520	474.0	500.0	490.0

Key
2010 target

Objective four

To reduce emissions of greenhouse gases per tonne of cement

High investment in new kilns, introduction of new technology, closure of less efficient operations and use of waste-derived materials, have all contributed to the industry's overall reduction in emissions of carbon dioxide (CO₂). Against a 2010 target of 800.0 kg/t PCe, emissions reported in the year were 725.0 kg/t PCe against a 1998 baseline of 924 kg/t PCe. In practical terms, this means that the 2010 CO₂ emissions for MPA Cement members were 5.94 million tonnes below the 1998 baseline and 7.62 million tonnes below 1990. This needs to be set against the fact that 65 per cent of CO₂ produced by cement manufacture arises from the burning of limestone to produce clinker, the remaining 35 per cent coming from the kiln fuel used.

The industry is also operating well below both its 2010 and 2015 targets for CO₂ emissions from combustion of fossil fuels. Use of waste-derived materials, especially biomass, led to actual emissions of 188.7 kg/t PCe against 244.0 kg/t PCe (2010 target) and 225.0 (2015).



Investment in new kilns has removed old, inefficient plant and enabled rationalisation of company production

In 2005 the industry published its first carbon strategy which mapped out three primary routes to carbon reduction: increased use of waste-derived fuels, especially biomass in the short to medium term; use of greater quantities of pre-calcined, waste-derived materials with cement clinker in the medium term; and carbon capture and storage in the long term. Since then promising developments have been taking place in entirely new types of cement, low carbon cements and low carbon concretes, all of which may play a part in short, medium and long term measures to reduce carbon. This is an exciting time for cement technology innovation and MPA members are playing a full and active role.



Student visits to works have broadened understanding of the UK cement industry

Objective five

To improve regulatory compliance and stakeholder perception of sites

Over the last decade, the industry has done much to improve communication with its various stakeholders, particularly those living close to its operations. Each cement manufacturing operation holds regular community liaison meetings involving representatives from the locality and the Environment Agency. In addition, MPA Cement member companies produce newsletters and hold exhibitions and open days.

The industry's manufacturing activities in England and Wales are governed by the Environmental Permitting Regulations enforced by the Environment Agency. The Scottish Environment Protection Agency and the Industrial Pollution and Radiochemical Inspectorate in Northern Ireland cover similar legislation in their regions.

All of the industry's works in 2010 retained accreditation to ISO 14001 and/or EMAS.

Performance indicators

- 5.1 Proportion of substitute fuels proposals communicated, to local communities, in accordance with the MPA Code of Practice
- 5.2 Number of justified complaint free days³
- 5.3 Number (and proportion) of sites with ISO 14001 and/or EMAS certification or equivalent
- 5.4 Number of enforcement notices, formal cautions and successful prosecutions⁴
- 5.5 Number of category 3 incidents and breaches⁵
- 5.6 Number (and proportion) of PPC permit or variation applications where public participation is required, or deemed appropriate, determined within target time of four months (this target relates to Environment Agency performance)⁶
- 5.7 Number (and proportion) of other variations and applications determined (this target relates to Environment Agency performance)⁷

	Base	Actual	Targets	
units	1998	2010	2010	2015
5.1 %/number	68 (15)	100 (2)	100	100
5.2 average per works	year 2000 = 255	351	to be reported	to be reported
5.3 %/number	91 (20)	100 (11)	100	100
5.4 number in each category ⁴		1	0	0
5.5 number in each category		13	to be reported	to be reported
5.6 %/number ⁷		0	100	100
5.7 %/number ⁸		82 (14)	100	100

All of the data in this table relates only to Environment Agency sites in England and Wales

2020 vision

In agreeing the objectives set out in its sector plan, MPA Cement members and the Environment Agency also set out a vision for 2020. Details of this vision can be seen and downloaded by following this link: http://cement.mineralproducts.org/documents/cement_performance_report_2010.pdf

This sector plan report forms part of the Mineral Products Association's long term sustainable development commitments as set out on its dedicated microsite, which can be accessed by following this link: <http://www.mineralproducts.org/sustainability/>

Notes to the performance indicators

- 1 All objectives are per tonne of cement manufactured (calculated as Portland Cement Equivalent) unless otherwise stated. Portland Cement Equivalent (PCe) is a normalising factor related to cement output often used by the cement industry, which enables a comparison of impacts such as environmental between sites whilst taking into consideration differing production methods.
- 2 The 2015 targets for SO₂ will be reviewed annually.
- 3 Complaint free day = 24hr period starting at midnight that the regulated installation (including associated quarries but excluding landfills) carried out its operations without receiving a justified complaint. 'Justified means where a complaint is related to an occurrence that can be directly attributable to site activities'. Base year: 2000.
- 4 Refer to the Environment Agency Enforcement and Prosecution Policy. This indicator excludes prosecutions under appeal.
- 5 Refer to the Environment Agency Common Incident Classifications Scheme. CICS Categories 1, 2 and 3 are major, significant and minor incidents respectively.
- 6 The determination periods quoted can lengthen where: (i) decisions are required as to whether information is sensitive due to commercial or industrial confidentiality and/or national security; and/or (ii) further information is required to determine the application. The 'clock stops' on the determination period where the regulator has served a notice requiring further information (Schedule 5 paragraph 16(3)(a) of the EP regulations). The clock starts again once the regulator has received all notice information required.
- 7 During the year, there were three variations none of which were determined by the Environment Agency within its target time of three months.

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essential materials
sustainable solutions

MPA Cement is part of the Mineral Products Association, the trade association for the aggregates, asphalt, cement, concrete, lime, mortar and silica sand industries

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