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Performance 2009

A sector plan report from the UK cement industry

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

Highlights

In a comparison with 2008 industry performance:

- Use of substitute raw materials increased by 19%
- Substitute fuels now represent 35% of all kiln fuels burned
- Dust emissions were down by 31%
- Oxides of nitrogen (NO_x) emissions fell by 25%
- Sulphur dioxide (SO_2) emissions reduced by 39%
- Carbon dioxide (CO_2) emissions down by 6%

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Foreword

This is the sixth year that MPA Cement members have reported collectively on their environmental performance. Good progress was made in 2009 against objectives in the industry sector plan agreed with the Environment Agency, notwithstanding tough market conditions caused by a poor economic climate.

Against the backdrop of an investment-constrained economic environment the industry once again reduced its carbon dioxide emissions – a major step forward in the fight to prevent and mitigate climate change. A significant part of this achievement is down to the use of waste-derived fuels that went up to 35% of the fuel mix. The industry is determined to do more and is well on course to meet its target of 50% substitution by waste-derived fuels by 2015.

Other emissions, such as NO_x SO_2 and dust once again fell, highlighting the fact that the industry continues to put environmental control at the heart of its operations, even in difficult economic conditions. While the country, and indeed the world, depends on cement for its homes, schools, hospitals, roads, railways and much more, the UK cement industry will continue to meet domestic demand in the most environmentally responsible way.

Pal Chana
Executive Director
MPA Cement

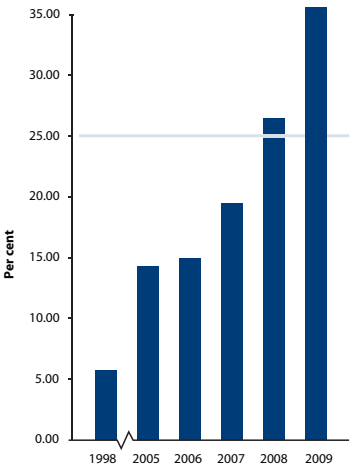
As previously, data from MPA Cement member company plants in England, Wales, Scotland and Northern Ireland are included in this report, despite the Environment Agency remit covering only England and Wales.

Performance indicators

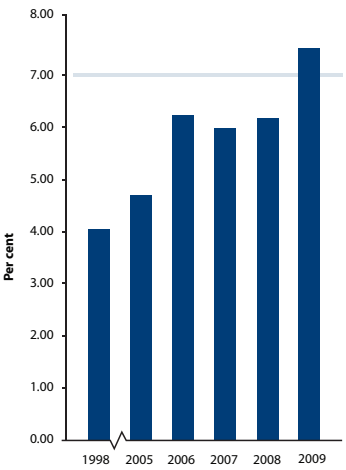
1.1 Use of natural raw materials per tonne manufactured
1.2 Use of fossil fuels (coal, petcoke, oil, gas) for primary energy
1.3 Mass of waste recovered as fuel per tonne manufactured
1.4 Mass of waste recovered as raw materials per tonne manufactured
1.5 Proportion of fuel comprising waste material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

		Base	Actual	Targets	
	units	1998	2009	2010	2015
1.1	kg/t	1498	1377.8	1420	1400
1.2	% thermal	94.3	64.9	75.0	70.0
1.3	kg/t	9.6	54.3	45.0	60.0
1.4	kg/t	63.1	112.4	115.0	135.0
1.5	% thermal	5.7	35.1	25.0	30.0
1.6	% mass	4.0	7.5	7.0	11.0

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)

In 2009, the overall amount of waste and industrial by-products used on a per tonne basis of cement manufactured increased both in terms of raw material and fuel. Against 2008 figures, raw material increased 94.1 kg/t to 112.4 kg/t and for fuel from 43.5 kg/t to 54.3 kg/t. However, the reduction in demand for cement due to the poor economic climate, led to the total tonnage of waste and by-products used falling from 1.4 million tonnes to 1.2 million tonnes.

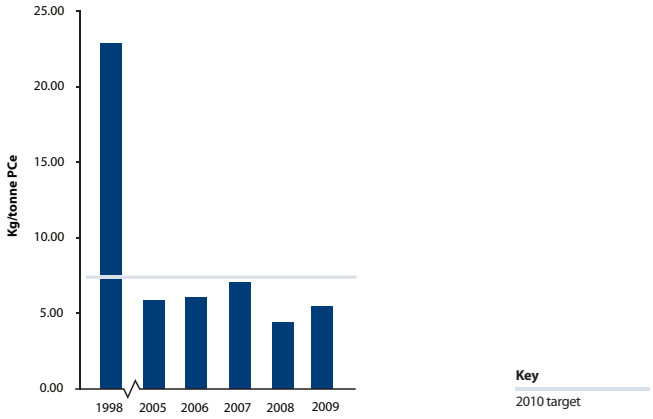
Biomass – the waste derived from organic matter – is an important material for the cement industry in its efforts to reduce its carbon emissions. Under the EU Emissions Trading System (EU ETS) biomass is rated as carbon neutral. The industry already uses processed sewage sludge and meat and bone meal (MBM), which are classified as 100 per cent carbon neutral. Additionally, it burns scrap tyres and paper/plastic mixed fuels from refuse and commercial waste that are deemed to have a biomass content. Competition for biomass is intensifying and it will become increasingly difficult for the cement industry to source adequate supplies. This is likely to have a detrimental impact on the industry's long term carbon reduction strategy.

The supply and use of processed waste and by-products as fuel or raw material is vitally important to the cement industry and helps underwrite recent and future major investment. In 2009, CEMEX opened a £49 million cement grinding and blending facility at Tilbury, east London. Its range of cement products are based on Portland cement clinker, ground and blended with by-products from other industries.

Tarmac Buxton Lime and Cement already uses waste-derived products – MBM and tyre chips – for fuel and recycled plasterboard as a partial gypsum replacement at its Buxton plant in Derbyshire. It has recently been granted permission by the Environment Agency to trial two further new fuels at the works, Calfuel - processed paper and plastic waste – and wood chips.

Lafarge Cement UK made an application during the year to burn waste-derived liquid fuel (WDLF) at its Cauldon works. WDLF is made up of liquids including paints and waste solvents and is already used at the company's Dunbar works. Lafarge also asked the Environment Agency for permission to use solid recovered fuel (SRF) on a permanent basis at Cauldon. SRF comes from domestic and industrial sources and is nominally 50 per cent biomass.

CKD disposed of per tonne manufactured



The cement industry uses far more waste than it produces – such as this sterilised meat and bone meal for kiln fuel

Objective two

To reduce waste disposal from cement manufacturing

Against the 1.2 million tonnes of waste and by-products the industry used as fuel or raw materials, it produced only 45,549 tonnes of waste for disposal in 2009.

The bulk of this disposal was kiln dust (CKD) a by-product of cement manufacture, although the industry was able, where technically feasible, to reclaim 13,336 tonnes of CKD during the year by reusing it in the manufacturing process.

Hanson Cement and CEMEX UK supplied CKD for agricultural use. Response from farmers has been very positive saying as a result of applying the material, they are experiencing improved crops from the addition of potassium and the correction of soil acidity. Pre-2007, CKD had been widely used for agricultural purposes, especially to create fertile soil in land reclamation projects. Changes to legislation prevented this continuing so this recent development is to be welcomed.

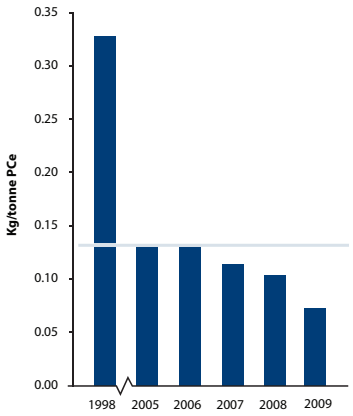
Spreading kiln dust on agricultural land as a fertiliser

Performance indicators

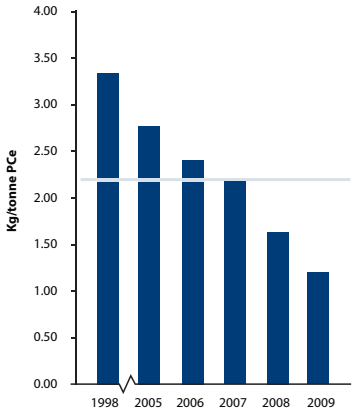
2.1 CKD disposal of per tonne manufactured

		Base	Actual	Targets	
	units	1998	2009	2010	2015
2.1	kg/t	22.9	5.9	7.5	7.0

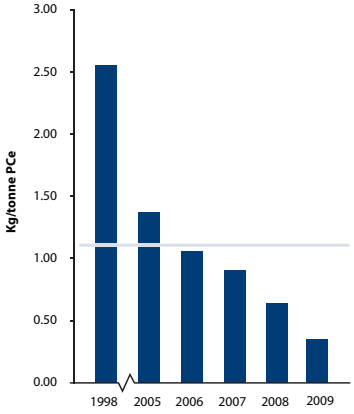
Dust emissions to air per tonne manufactured



NO_x emissions to air per tonne manufactured



SO_x emissions to air per tonne manufactured



Key

2010 target

Objective three

To reduce air pollution from cement manufacturing

Good progress continued to be made in emissions of dust, oxides of nitrogen (NO_x) and sulphur dioxide (SO_2) during 2009.

Dust emissions reduced from 0.1 to 0.07 kilogrammes per tonne of Portland cement equivalent (kg/tonne PCe – please see *Notes to the performance indicators 1* on page eight). This, to a degree, reflects the closure of less efficient manufacturing plant. Increased use of waste-derived fuels certainly contributed greatly to the reduction in NO_x with industry emissions reducing from 1.63 to 1.23 kg/tonne PCe. SO_2 emissions fell too, reducing from 0.64 to 0.39 kg/tonne PCe. Emissions of SO_2 largely relate to the natural sulphur found in the raw materials and released when burnt in the kiln. Use of extenders such as pulverised fuel ash and ground limestone means less clinker is required per tonne of cement produced hence helping reduce SO_2 emissions.

The industry is now reviewing SO_2 emissions targets annually with the Environment Agency. In 2010, emission limits in all Environment Agency permits were reviewed for suitability in line with current regulatory best practice in Europe. This has resulted in the lowering of some SO_2 limits. In 2011, the industry will report on how these limit reductions have influenced SO_2 emissions.

Lafarge Cement UK, reported improved maintenance and optimisation of best available techniques as being the main factors in its reductions in company emissions over the year.

Use of scrap tyres as fuel has helped improve the industry's environmental performance

CEMEX attributed its more than 30 per cent reductions in NO_x and SO_2 to increased use of waste-derived fuels.

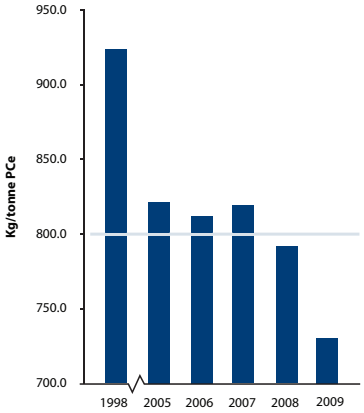
Tarmac Buxton Lime and Cement upgraded its kiln bag filter system which has resulted in significant reductions in dust emissions. Hanson Cement continues to operate all three of its plants with SO_2 emissions significantly below EU best available techniques levels.

Performance indicators

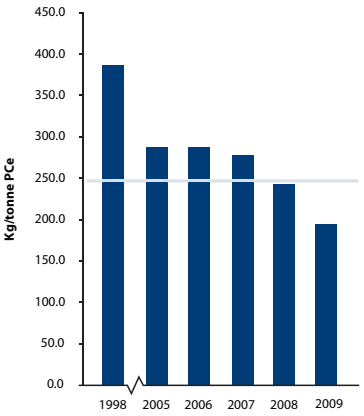
3.1 Dust emissions to air per tonne manufactured
3.2 NO_x emissions to air per tonne manufactured
3.3 SO_2 emissions to air per tonne manufactured

		Base	Actual	Targets	
	units	1998	2009	2010	2015
3.1	kg/t	0.33	0.07	0.13	0.10
3.2	kg/t	3.34	1.23	2.20	2.00
3.3	kg/t	2.56	0.39	1.10	1.1

Emissions of CO_2 directly from cement plants per tonne manufactured



Emissions of CO_2 from combustion of fossil fuel at cement plants manufactured



Performance indicators

4.1 Emissions of CO_2 directly from cement plants per tonne manufactured
4.2 Emissions of CO_2 from combustion of fossil fuel (coal petcoke, oil, gas) at cement plants manufactured
4.3 Emissions of CO_2 from calcination of raw materials per tonne manufactured

		Base	Actual	Targets	
	units	1998	2009	2010	2015
4.1	kg/t	924	731.8	800.0	775.0
4.2	kg/t	387	198.0	244.0	225.0
4.3	kg/t	520	479.8	500.0	490.0

Key
2010 target

Objective four

To reduce emissions of greenhouse gases per tonne of cement

The cement industry's efforts to reduce its carbon dioxide (CO_2) emissions must be set against the fact that 65 per cent of CO_2 produced directly from cement manufacturing comes from the decomposition of limestone, the remaining 35 per cent from the kiln fuel used. It must also be realised that the industry has a very real need to reduce its energy costs to remain competitive in a world market.

The industry continued to achieve CO_2 reductions in 2009. Emissions of carbon dioxide were 731.8 kg per tonne of Portland Cement equivalent product produced compared to 776.8 kg in 2008. Perhaps more significantly, the 2009 absolute emission of CO_2 was 58 per cent lower than the cement industry emissions in 1990, the year used as the international baseline for greenhouse gas reporting under the Kyoto Protocol. This means that the emissions from the UK cement industry in 2009 were 7.7 million tonnes lower than the industry emissions in 1990. This reduction exceeds the performance of the UK as a whole and can be attributed to a combination of factors including reduced production, plant rationalisation, significant investment in modern manufacturing processes and fuel switching.

The industry surpassed in 2009 its 2015 sector plan target for CO_2 emissions arising from the combustion of fossil fuel for clinker production. Its reported 198 kg/tonne PCe compares well against the target of 225 kg/tonne PCe.

Continued investment in new plant such as this cement blending plant in east London has helped reduce CO_2 emissions by cutting back clinker production

Some of the CO_2 reduction in recent times is attributable to falling output brought about by the global economic recession but the fundamental improvement has come about through concerted industry effort:

- High investment in new kiln technology
- Use of waste-derived fuels – now replacing 35 per cent of the thermal energy needed for the industry's kilns
- Increased use of biomass and part-biomass fuels – these currently represent 15 per cent of the thermal energy needed in the kilns
- Using waste-derived or by-products as alternative raw materials to make more cement from less clinker.

The industry's ability to continue to achieve its CO_2 emissions reduction targets, in the short to medium term, is closely linked to its use of waste derived fuels, especially biomass. With the coalition government currently reviewing its position on the Climate Change Levy, Climate Change Agreements, carbon taxes and the Renewable Heat Incentive, it is crucial that no new measures are taken to increase costs on the industry and expose it to 'carbon leakage' – where manufacturing is moved to less carbon-restrained countries.

School visits help the industry explain its role in society

Objective five

To improve regulatory compliance and stakeholder perception of sites

The industry continues to keep its stakeholders aware of its activities. At local level, regular community liaison committees are held, open days arranged and local people consulted over company plans through newsletters, exhibitions and local media.

Lafarge Cement UK introduced for 2010 the concept of works managers' environmental commitments. These focus each works on its own local environmental activities, communications programmes and mandatory stakeholder events.

Currently, the industry's manufacturing operations in England and Wales are governed by the Environmental Permitting Regulations enforced by the Environment Agency. Similar legislation in other regions is covered by the Scottish Environment Protection Agency and in Northern Ireland, the Industrial Pollution and Radiochemical Inspectorate. In 2009, all of the industry's works retained accreditation to ISO 14001 and/or EMAS.

There was one prosecution of an MPA Cement member during the year, when CEMEX was fined for breaking its permit conditions following a coal dust release from a silo at its Rugby plant in 2007. This was despite the company taking immediate action to clean up the dust nuisance locally, cooperating fully with the Environment Agency to prevent a recurrence of this type of incident and experts concluding that there was no lasting environmental or health impacts.

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 days[3]
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 prosecutions[4]
5.5 Number of category 3 incidents and breaches[5]
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	2009	2010	2015
5.1	%/number	68 (15)	100 (3)	100	100
5.2	average per works	year 2000 = 255	348	to be reported	to be reported
5.3	%/number	91 (20)	100 (12)	100	100
5.4	number in each category[7]		1	0	0
5.5	number in each category		15	to be reported	to be reported
5.6	%/number		0	100	100
5.7	%/number[8]		0% (4)	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 this sector plan, the UK cement industry and the Environment Agency also set out a vision for 2020. Details of this vision can be seen and downloaded by clicking here.

A copy of the current Mineral Products Association Sustainable development report may be downloaded by clicking here.

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 SO_2 will be reviewed annually.

3 Complaint free day = 24hr period starting at midnight that the EP 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 four variations none of which were determined by the Environment Agency within its target time of three months.

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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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