



MPA Cement

Sustainable Development Report 2011



Foreword

The UK cement industry has reported on its environmental performance since 2004. Reporting began before the industry and the Environment Agency's (EA) had agreed a sector plan for the cement industry.

The industry's historic sector plan expired at the end of 2010 and we are currently in a state of transition to a new one, as agreed with the EA. Firm targets to be included in the plan have been agreed and are used where appropriate in this report. The industry has not rested on its laurels during the transition to a new sector plan and has continued to drive forward its environmental performance.

This report on the UK cement industry's environmental performance in 2011 marks a break from the past format of annual reports. As the highlights shown on the back page demonstrate, the industry has once again reduced its overall environmental impact at a time when we are facing the most difficult trading conditions since records began in the 1950s. This is particularly relevant as investment is hard to come by in a globally competitive market.

I never cease to be impressed by our members' determination to improve performance regardless of the tough challenges they face and I pay tribute to their ongoing efforts. Unlike previous performance reports, this one concentrates on the industry's vision for the future. Despite our good historic record, there is less emphasis on past performance. Next year, we will complete the transition to a new sustainable development report which will include our visionary aspirations and an update against our new sector plan targets.

Pal Chana
Executive Director

Front cover: The dramatic diving boards at the London Olympics Aquatics Centre demonstrate the sheer versatility of concrete. Photo courtesy London 2012.

Priorities INDUSTRIAL EMISSIONS

As a critical ingredient in concrete, the second most consumed substance on the planet after water, cement is the material on which our modern lives are built and is essential for economic and social development. But the human benefits that flow from cement are only possible because of the highly industrialised production process that brings with it some unavoidable industrial emissions. Oxides of nitrogen; sulphur dioxide; dust and carbon dioxide are the principal emissions from the cement manufacturing process.

In its 2005 landmark sector

plan agreement with the Environment Agency, the industry undertook to meet highly demanding reduction targets for all of these emissions by 2010. Information on how the industry performed against these targets can be found in its 2010 Sector Plan Performance Report which can be accessed at www.cementindustry.co.uk.

The industry surpassed its 2010 targets by some considerable margin, and did so two to three years early. These outstanding results were achieved through multi-million pound investments and changes in production techniques that



INDUSTRIAL EMISSIONS

have transformed the industry's environmental footprint.

This trend was continued in 2011 with emissions of nitrogen, and carbon dioxide per tonne of PCe¹ declining again. Dust emissions remained the same and only emissions of sulphur

dioxide went up fractionally due to natural fluctuations in quarried stone composition.

The charts on pages 5 and 6 of this report set out overall emissions reductions against sector plan baseline years to the end of 2011. The UK cement

industry will continue to strive for technological breakthroughs that will enable it to reduce its industrial emissions even further and meet its new sector plan targets.

RESOURCE EFFICIENCY

Cement plants in the UK are now routinely using scrap tyres, pelletised sewage sludge, waste-derived liquid and solid fuels, and meat and bone meal as alternatives to virgin fossil fuels to heat their kilns. In 2005, the Environment Agency set a target for 2010 of 25 per cent of the thermal input to the kiln process to come from waste derived fuels. By the end of 2011, the industry was achieving almost 40 per cent. New targets agreed with the Environment Agency for 2015 and 2020 are 52 per cent and 65 per cent respectively.

The common factor with all the wastes used as fuels in the cement industry is that each

of these has a usable energy content; each would otherwise have gone to landfill or been incinerated, often without energy recovery, and burning them in the highly controlled conditions of a cement kiln is an environmentally preferable option.

Using other industries' wastes, either as alternative fuels or as raw materials, enables the cement industry to avoid burning around 500,000 tonnes of traditional fossil fuels like coal per year. This highly resource efficient approach to the basic materials that go into making cement adds up to over one million tonnes of waste avoided

from landfill. Wastes and by-products used as alternative raw materials include pulverised fuel ash from power stations, ground granulated blast furnace slag, plasterboard and moulds from the ceramic industry.

Ambitious targets for 2015 and 2020 have been agreed with the Environment Agency which should see the amount of waste recovered as raw materials increase to 135 kg/te PCe² and 162 kg/te PCe respectively, or 8.5 per cent as the proportion of raw materials comprising waste and by-products by 2015 and 10 per cent by 2020.

In addition, while the industry is already a net consumer of waste, using over a million tonnes more waste and by-products than it produces, we have agreed to pursue a target of zero cement kiln dust being disposed of, the only process waste from cement production by 2020.

The industry will press forward with its continued resource efficiency strategy, including the use of waste derived fuels, raw materials and the elimination of cement kiln dust disposed of, but will also turn its attention to other areas of resource efficiency where it can reduce its overall environmental impact, such as its use of water.



¹ Portland Cement equivalent ² kilogrammes per tonne Portland Cement equivalent

CLIMATE CHANGE

Globally, cement production accounts for around five per cent of total CO₂ emissions. Here in the UK, the industry is responsible for less than two per cent of the nation's greenhouse gas emissions and long ago accepted that it had an important part to play in tackling climate change.

The industry strategy has three key stages: short term to 2015; medium term to 2030; and long term to 2050. The short-term campaign recognises that 60 per cent of the CO₂ arising directly from cement manufacture comes from the decomposition of limestone, a chemical process that is unavoidable in Portland cement manufacture. The

remainder comes from the kiln fuel. Smaller amounts of CO₂ are produced from delivery of the end-product and emitted by power stations during the generation of electricity used by the industry.

Between 1990 and 2011 emissions of CO₂ were reduced from 924 to 719 kilogrammes per tonne produced. This means that the industry emission in 2011 was 54.5 per cent or 7.3 million tonnes of CO₂ lower than in 1990. The industry has recently agreed with the Environment Agency to set new targets for the emission of CO₂ from the combustion of fossil fuels at 166 kg/te PCe for 2015 and 144 kg/te PCe for 2020 against a 2010 baseline of 188 kg/te PCe.

Future breakthroughs to reduce CO₂ emissions even further will come from the increased use of carbon neutral biomass fuels; increasing the production of factory-made composite cements which involve replacing cement clinker with wastes or by-products from other industries such as pulverised fuel ash and ground granulated blast

furnace slag.

The industry is also investing in research into new low-carbon cements and concretes that have a lower embodied CO₂ content. Crucially, it will also play a more proactive role as a key player in the construction supply chain, and work with designers to increase recognition of the energy efficiency properties of concrete when used in buildings. Cutting the industry's carbon footprint in the longer term will necessitate advances in the evolution of carbon capture and storage.

There is a long way to go but, in theory, capture and storage could lead to net-zero CO₂ emissions when employed in conjunction with extensive use of biomass and waste derived fuels. Our vision for what can be achieved in carbon reduction by 2050 will be set out in a major strategy paper to be published shortly. This will set a demanding level of ambition, but that can only be realised if all influencing parties, ie government and industry, play their parts.



HEALTH & SAFETY

"Zero Harm" is the overriding health and safety priority for MPA Cement. Having reduced Lost Time Injuries from 101 in 2003 to 15 by 2011, as part of its Revitalising Health and Safety campaign; MPA Cement has now set a further target of:

- halving the 2009 rate of lost time injuries by the end of 2014 for employees and;
- halving the 2009 number of lost time injuries by the end of 2014 for contractors.

MPA Cement is committed to:

- **'Safer by Competence'**: the ambitious campaign to deliver demonstrable competence across the sector. This comprises a series of targets, encompassing employees and contractors, to meet National Occupational Standards relevant to job function.
- **'Safer by Design'**: comprising voluntary

guidance to address the design vacuum that exists between many manufacturers and users of heavy mobile plant. 'Safer by Design' is supportive of the European and International standards-making systems but recognises that these are necessarily cumbersome and produce standards that are way short of the 'state of the art' claimed to be represented by the CE mark.

HEALTH & SAFETY



■ **'Safer by Sharing'**: MPA brokers 1-2-1 expert mentoring and, furthermore, addresses a wide variety of operational audiences through the series of 'Safer by Sharing' mini seminars. These involve expert speakers addressing prioritised topics with major audience participation. Thirteen such CPD seminars have been delivered from mid-2011 to date.

■ **'Safer by Partnership'**: Focusing on contractor safety, this MPA initiative, launched in 2012, is a package of measures aimed at improving contractors' and members' mutual understanding, needs and communications and thus contributes directly towards the goal of "Zero Harm".

■ **Stay Safe and Cycle Safe Campaigns**: Looking beyond safety of employees and contractors to the general public, MPA Cement

is also part of the *Stay Safe* and *Cycle Safe* campaigns. *Stay Safe* operates every year and aims to raise awareness amongst younger children, teenagers, parents, teachers and youth workers about the dangers of entering quarries uninformed and unsupervised. MPA's *Cycle Safe* campaign aims to prevent collisions between cyclists and Large Goods Vehicles (LGVs) by raising awareness on both sides of how to cycle and drive safely.

MPA's "Safer by ..." family of initiatives



Contractor initiatives

As well as the launch of a new Contractor Database and Charter at the MPA Health & Safety Conference and Awards 2012, MPA Cement has been running other contractor initiatives

specific to cement:

- Contract driver incidents were recognised as a continuing and major source of Lost Time Injuries for the cement industry and consequently a major contract haulier workshop was held with the industry's contract hauliers.
- A pre-heater tower workshop was organised with the aim of working together with the industry's

contractors to identify best practice and improve safety for all.

MPA Cement will continue to work with its member companies to drive up health and safety awareness and standards until it is so deeply rooted in the industry's culture and working practices for employees and contractors that we can achieve our ambition of "Zero Harm".



BIODIVERSITY

Improvement of wildlife habitats has long been a priority for the industry's land management and



restoration work. Restoration and after-use focuses on making the best use of sites, taking account of the views of local residents, landowners, special interest groups and decision makers.

This can deliver significant benefits to wildlife and people. An example of how a disused quarry at a cement manufacturing site has been brought back into valuable use is the old shale quarry at Lafarge's Caudon Works in Staffordshire Moorlands.

Lafarge Cement, in partnership with Staffordshire Wildlife Trust, won a coveted MPA national restoration award for its work at the former shale quarry. The project is based on a 17-hectare site, which was worked for raw materials for the plant for more than 40 years from the 1950s.

The shale quarry, which has been restored into a haven for biodiversity, and a source for

recycled water, has four zones:

- A shale lake
- Grazing land
- Post-industrial biodiversity area
- Reed beds

The site now benefits from a rich diversity of habitats for wildlife, including herons, little grebes and kingfishers.

This is just one example of many in the cement industry.

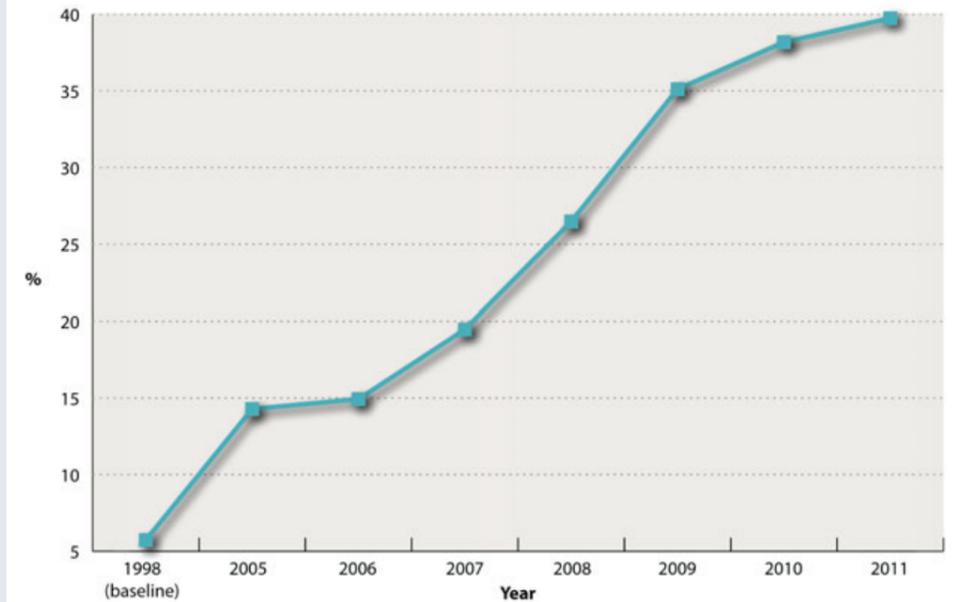
Nature After Minerals is a successful initiative, run by Natural England and the RSPB, designed to help identify and deliver biodiversity opportunities on former minerals sites. The UK cement industry, along with MPA as a whole, is committed to playing its part. The project aims to capitalise on the opportunities provided by quarry restoration to make a significant contribution to national biodiversity targets.

Highlights

All figures relate to 2011 actual performance against a 1998 baseline and are on a per tonne of product basis:

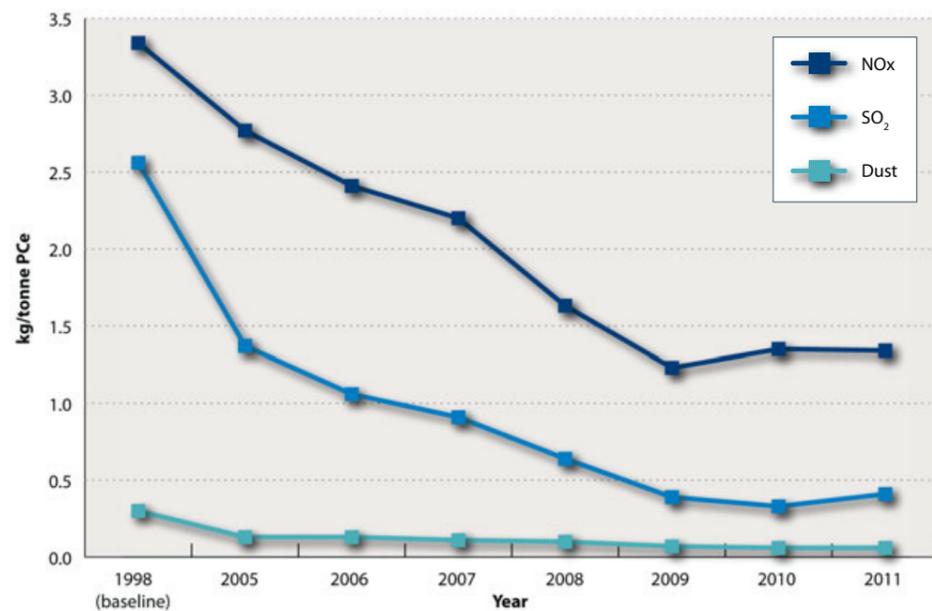
- Oxides of nitrogen emissions down 60 per cent
- Sulphur dioxide emissions down 84 per cent
- Dust emissions down 82 per cent
- Carbon dioxide emissions down 22 per cent

Proportion of fuel comprising waste material

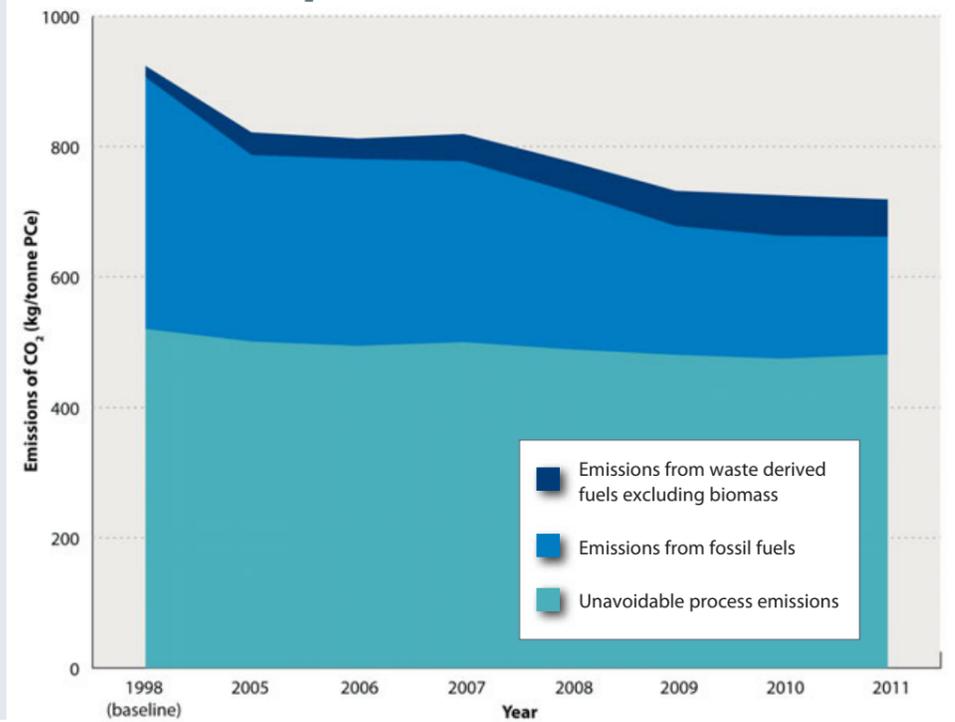


Highlights

NO_x, SO₂ and Dust emissions to air per tonne PCe manufactured 1998-2011 kg/tonne PCe



Emissions of CO₂ 1998-2011





essential materials
sustainable solutions

MPA Cement is part of the Mineral Products Association, the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries. MPA Cement members are CEMEX UK, Hanson Cement, Lafarge Cement UK and Tarmac Buxton Lime & Cement

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