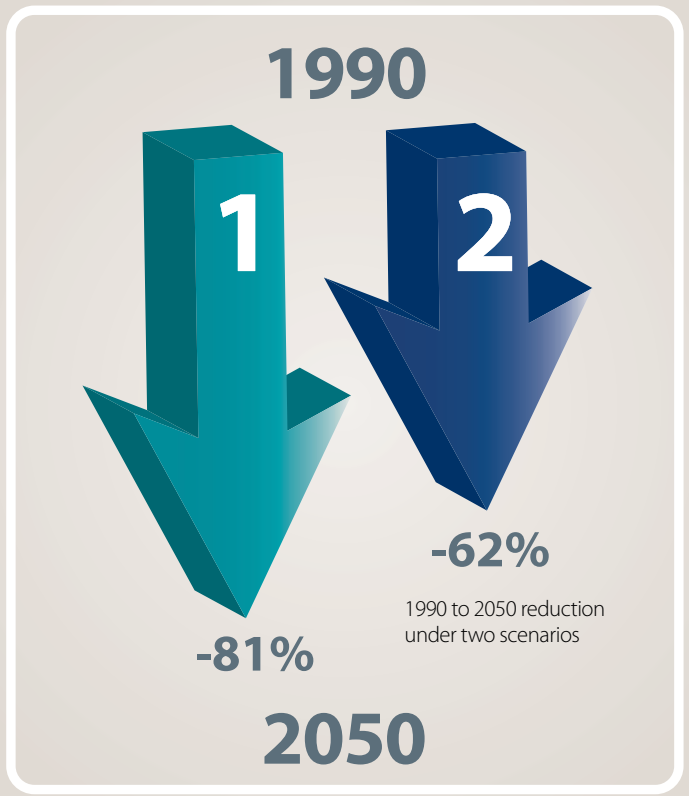
mpa
essential materials
sustainable solutions

The UK cement industry aims to reduce greenhouse gases by 81% by 2050

The UK is the first country in the world to legally commit to greenhouse gas reduction targets as far ahead as 2050. The target set is an ambitious one – a cut of at least 80 per cent compared with 1990 levels. As an industry that emits CO_2, we are fully committed to playing our part and have already reduced our absolute CO_2 emissions by over 55 per cent since 1990. We are now launching an ambitious new strategy to achieve an overall reduction of 81 per cent in greenhouse gases by 2050. This strategy sets out how we aim to achieve our goal – and the support we will need along the way.



Scenarios for greenhouse gas reduction to 2050

Our members and this report

MPA Cement is part of the Mineral Products Association, the representative body for the aggregates, asphalt, cement, concrete, lime, mortar and silica sand industries. It has three members that produce Portland cement and who have signed up to the targets in this report. They are:

- CEMEX UK
- Hanson Cement
- Lafarge Tarmac

In addition, associate members include Kerneos, a producer of aluminate cements and Quinn Cement.

Key facts

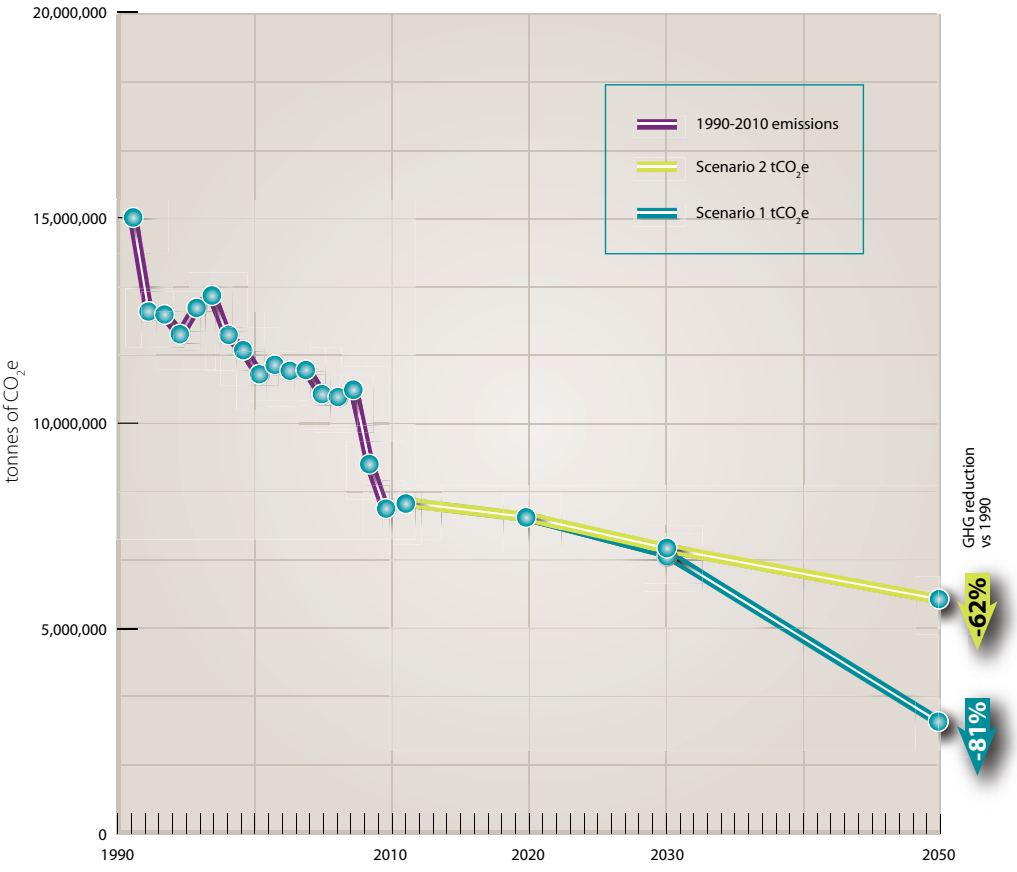
- Alternative waste-derived fuels replaced 40 per cent of the energy requirements from fossil fuels
- The industry is a net consumer of waste. In 2011 it produced just 4,600 tonnes but consumed 1.5 million tonnes as fuels and raw materials
- Emissions of oxides of nitrogen were down 59 per cent, sulphur dioxide down 84 per cent and dust down 82 per cent compared with 1998.[1]

Achievement to date

We have been a world leader in our CO_2 reduction drive to date. Since 1990, the UK cement industry has cut emissions faster and deeper than the UK economy as a whole and has reduced absolute CO_2 emissions by over 55 per cent. The achievement is all the greater when you consider that some 60 per cent of our CO_2 emissions arise when CO_2 is liberated from the limestone, which is a critical and unavoidable part of the cement-making process.

This huge reduction has been achieved through innovation, investment in efficient plant, closures and rationalisation.

MPA Cement greenhouse gas reduction 1990-2050 Trajectories of two scenarios



[1]1998 is the baseline year against which MPA members began reporting of these variables.

Cement = Portland cement equivalent

Why now?

We launched our first carbon strategy in 2005 as the British Cement Association (BCA)[2]. Since then, the world has recognised the need for greater urgency in bringing down greenhouse gases, particularly CO_2. The UK is the only country in the world to have enshrined its greenhouse gas reduction targets in legislation looking out as far as 2050 and has set an ambitious target of reducing by at least 80 per cent against a 1990 baseline. The global cement industry was the first to develop a 2050 roadmap as part of the World Business Council for Sustainable Development cement sustainability initiative[3]. What counts is real action and the UK industry is clear on what it needs to do to help the UK achieve its ambitious targets.

The opportunity is substantial. We have, therefore, published a detailed strategy to reduce our CO_2 footprint by up to 81 per cent to align with both UK and EU ambition. The full strategy can be accessed at http://cement.mineralproducts.org

Our strategy in summary

We have identified two potential reduction scenarios:

- Scenario 1 – 81 per cent reduction
- Scenario 2 – 62 per cent reduction

Crucially, the fundamental difference between the two scenarios is the more ambitious target anticipates carbon capture and storage technology not only being economically available in the cement industry but also being effectively deployed. Scenario 1 requires the huge technical and financial barriers of CCS to be overcome before CCS can be deployed in the cement industry. Scenario 2 is not without its own technical and financial challenges.

Both scenarios require significant action by the industry, by Government and by others. Our aim is, by working in partnership, to achieve an 81 per cent reduction.

The route

Our strategy is achievable through a combination of the following:

Our commitment + action	Support needed from Government and others
More alternative waste-derived fuels	Policies on the deregulation of waste that do not drive this valuable source of energy elsewhere
More carbon-neutral biomass fuels	Policies put in place to maximize use by industry
Lower carbon cements	Spending that underpins locally sourced construction materials and drives growth in the construction sector such that investors can commit to the UK with confidence
Fewer indirect CO_2 emissions by improving electrical efficiency and by the decarbonisation of the electricity sector	Electricity costs must stay in line with those charged to our international competitors to stop production moving off-shore
Carbon capture and storage	Must be made viable for the cement industry along with the required transport infrastructure and industrial storage sites readily available. The industry is carrying out extensive research at a European level.
Reduced transport emissions	Incentives are needed to shift distribution transport to low carbon options
Robust carbon accounting	The whole-life performance of a building must be the key measure rather than simply the embodied CO_2 of its constituent products

[2] The British Cement Association merged with the Quarry Products Association and the Concrete Centre in 2009 to form the Mineral Products Association. MPA Cement is part of the Mineral Products Association.

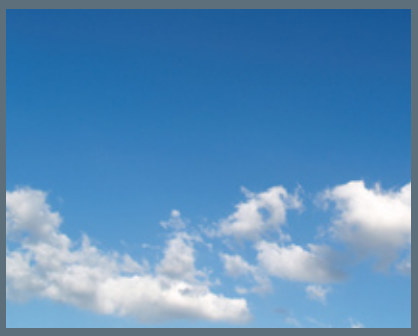
[3] In 2009, the International Energy Agency (IEA) and the WBCSD together developed a cement industry technology roadmap. It outlines existing and potential technologies, and how they may help the industry support a halving of global CO_2 emissions across all areas of business and society.

Alternative waste-derived fuels

Alternative fuels coupled with substantial investment in new technology, helped MPA members make significant reductions in each of their key emissions between 1990 and 2011. UK plants are now routinely using carbon-neutral fuels as a substitute for virgin fossil fuels. The range includes processed household and commercial wastes, solvents, scrap tyres, pelletised sewage sludge, and meat and bone meal. The common factor is that each has a high caloric value and would otherwise have gone either to landfill or incineration without energy recovery. Burning them in the highly controlled conditions of a cement kiln is safe and has no negative impact on the environment.

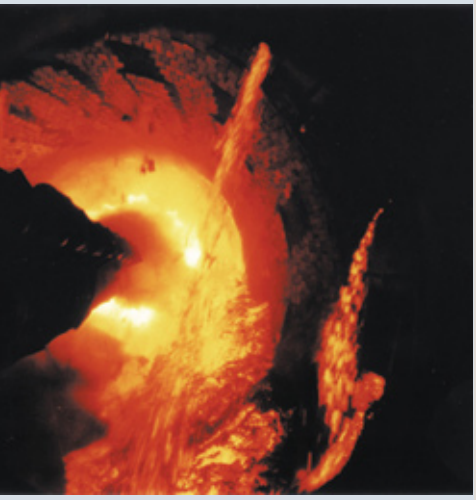
Alternative raw materials

We have made good progress also in replacing virgin raw materials with a variety of substitutes. The waste streams used with success include construction waste, ceramic moulds, foundry sand, gypsum from plasterboard, mill scale, cement kiln dust, refractory bricks and road sweepings. The result of the impetus to date is that the industry recorded a 7.6 per cent replacement of virgin raw materials in 2011 compared with 1998.



Carbon capture & storage

In the long term, carbon capture and storage is seen as one of the biggest opportunities to make further large-scale CO_2 emission reductions. Some early exploration work has been undertaken which shows that there are two types of technology that could work, but additional research is needed, and the heavy investment will not be justified until Government resolves the practical issues of transport and storage – and the political issue of unequal carbon prices. That is why the two scenarios we present are critically dependent on the deployment of CCS technology in the cement industry.



Delivering on our commitments

The key assumptions for our two scenarios are based on a normalised output of 10Mt cement.

	Key assumptions for the two scenarios	
UK production output	10 Mt cement	
Alternative waste derived fuel (ie switching from virgin fossil fuels)	80% thermal input by 2050	
Biomass fuels and biomass fractions (ie renewable fuels that are either entirely or partially carbon neutral)	40% of thermal input will be bio-alternative waste-derived fuel in 2050	
Lower carbon cements (cements that contain lower embodied carbon)	0.5 Mt cement	
Cementitious substitution (ie reducing the amount of high energy cement clinker in the final cement mix)	30% replacement by 2050	
Decarbonisation of the electricity sector	Total decarbonisation by 2050 to align with DECC ambition	
	Scenario 1	**Scenario 2**
Carbon capture and storage	3.0Mt CO_2 capture by 2050	0Mt CO_2 capture by 2050
Transport emissions (ie switching to lower CO_2 transport modes and transport fuels)	60% lower CO_2e in 2050	
Plant efficiency	22% improvement in thermal efficiency by 2050	

Output: In order to compare like with like, output has been assumed to be 10 Mt cement equivalent per year for the milestones (set out in our full strategy document available at http://cement.mineralproducts.org). This approach ensures that the effects of production output do not influence the scenario trajectories.

Photo courtesy London 2012

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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.

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