

Emissions compliance and improvement

Cement manufacture gives rise to emissions to air. These emissions are subject to legal limits which we respect and meet. But it is part of our sustainable business ambition to reduce these emissions further, using the technology and knowledge that are available to us.

Cement and air quality

Cement manufacture differs from many other industrial processes in that the key impact concerns emissions to air, especially dust, and not liquid waste or solid waste, which do not occur in the production process. Nitrogen oxides (NOx) are also released as a result of the combustion process, as is the case in other industrial combustion processes. Depending on the composition of raw materials used in the combustion process, sulfur dioxide (SO₂) can also be released during cement manufacture; such emissions are generally low in comparison with other industries because the sulfur oxides are captured during the clinker formation process.

Progress in 2010

There was a significant reduction in almost all measures of air emissions during 2010. The decrease was not only in absolute values (due to market conditions) but in emissions relative to the quantity of cement produced (known as specific emissions), which is the measure for improvement we use for our Sustainability Ambitions. This means that we are delivering real sustainability benefits, which will be sustained as market conditions improve. Our performance is discussed in more detail below.

NOx

In 2010 we brought emissions of NOx down below our target level for the first time. This very satisfactory result was largely due to the improvements we made at the Milaki plant (see example).

Stack Dust

This was the first full year in which all three of our cement plants operated with hybrid dust filters in place. There have been successive reductions in stack dust emissions since filter installation started and we are now performing significantly better than targeted.

SO₂

SO₂ emissions in our Volos and Halkis plant are almost zero as the raw materials used are free of sulfur compounds.

example

REDUCING NOx EMISSIONS - MILAKI PLANT

In 2010 operation of SNCR (Selective Non-Catalytic Reactor) technology began at the Milaki plant. This technology involves injecting urea solution into the hot gas stream as it leaves the kiln, is compatible with cement manufacture and has been an industry best practice used successfully in the cement industry. This investment has guaranteed operation at lower NOx emissions, significantly below the limit values.

Persistent pollutants

Heracles is included in the agreement that Lafarge has reached with WWF to reduce persistent pollutants. Measurements at our plants began in 2005; they now take place twice a year.

Fugitive dust

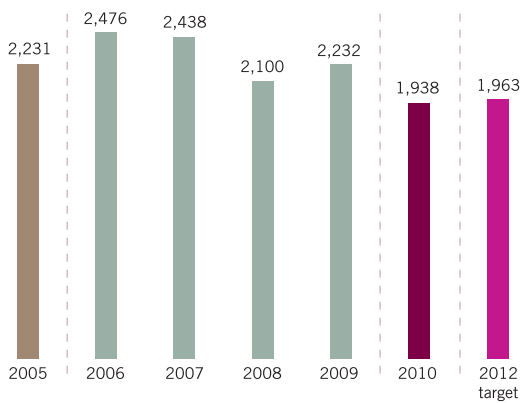
All our installations (plants, terminals and quarries) are taking steps to reduce and control sources of fugitive dust. For example, we avoid storing materials in open areas as much as possible. In 2010 we tested a pilot system for the automation of unloading of cement silos at distribution centers which has the potential to ensure better dust and spillage control. We will decide this year whether the system is suitable for wider use.

We have started the construction of a new building at our Volos plant for the storage of raw materials. Once completed, all handling and internal transport of these materials will take place under cover, thus reducing fugitive dust emissions.

We completed in 2010 the installation of continuous monitoring systems in the mills of all our plants which will also assist in improving dust control.

NOx emissions

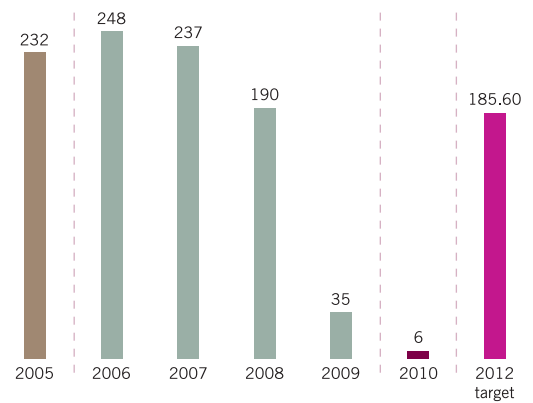
(Grams/metric ton clinker)



Total emissions of NOx were 6,800 metric tons (8,775 in 2009). Process mastery, proper fuel specification, selection and management as well as investment in SNCR technology in Milaki, contributed to significant reduction of NOx emissions. They are now below our target level two years ahead of our commitment.

SO2 Emissions

(Grams/metric ton clinker)



Total emissions of SO2 were 19.6 metric tons (137 in 2009). Emissions of SO2 are significantly below the target level.

Stack dust emissions

(Grams/metric ton clinker)



Total stack dust emissions were 20.7 metric tons (25.2 in 2009). Stack dust emissions are significantly lower than the target level.