Climate change

We have a strategy for reducing CO_2 emissions from the manufacture of cement which includes process optimization and product innovation. This, together with sustainable construction, is how we see our business contributing to combating climate change. We are assisted by being part of a larger business which has adopted a leadership position in tackling the challenge of global warming.

Our strategy

We are taking multiple routes to reducing the emissions associated with cement manufacture. Burning fossil fuels to produce clinker (from which cement is manufactured) produces CO_2, so optimizing the combustion process and other types of energy efficiency reduce emissions, as does replacing fossil fuels with renewable or other alternatives. Thirdly, there is product innovation; the use of cement additives which are CO_2 neutral, allow us to develop products that have a lower CO_2 footprint.
Alongside these efforts, we are promoting sustainable construction which has the potential to improve energy efficiency and reduce emissions from buildings while they are in use; see pages 34 and 35.

Optimization and energy consumption

During 2010, there was a major drive at the Milaki plant to upgrade its industrial performance. This meant the application of the so-called Plant Operating Model (POM) which details organizational and technical approaches to operation. This resulted in achieving a very high Reliability Factor with a very low number of kiln stoppages, resulting in a very efficient energy performance of the plant. For this performance, the plant is rated as among the best-managed Lafarge plants.

Alternative fuels

The successful introduction of biomass as an alternative fuel at our Volos plant in 2009 has been followed by a similar development at Milaki using paper sludge. Biomass now accounts for 1% of fuel used in our plants.

In strategic terms, we see potential in the use of fuel derived from the residue of municipal waste recycling called solid shredded waste (SSW). The discussions that this has generated with the permitting authorities and our other stakeholders illustrates that it takes time to achieve the shared understanding required by all parties. This is a major influence on our progress with further emission reductions. We look forward to being able to proceed with the use of SSW at one plant in 2011 and at the others subsequently.

Innovation

Product innovation requires that we work with our customers to understand their needs, use our technical skills and introduce them to alternative, lower-CO_2 products that may be available. For instance, we already have the capacity to substitute pozzolan or fly ash for clinker; we may also deploy different additives to reduce emissions.

example

REDUCING THE TRANSPORT IMPACTS OF DISTRIBUTION

Thanks to the combined shipment routes model that we use, we have improved significantly our transport footprint. In 2010, we invested in video-conferencing for our six distribution centers and rationalized their organization into two discrete regions: North and South Greece. This has reduced the need to travel and the associated transport emissions. We are also piloting the use of LPG as an alternative fuel for cars and trucks. Additionally, we will then monitor fuel consumption and hence emissions; if the evaluation is positive there is scope to introduce this more widely in 2011.

Overall performance

In 2009 we out-performed our targeted reduction in CO_2 emissions per metric ton of cement; we achieved a 12.8% reduction while the target was 11% (compared to 1990 levels). We were not able to sustain this reduction in 2010; the reduction was 8.34%. This was largely the result of a shift in our customers' requirements in the current economic context; there was increased demand for high strength cement with a high proportion of clinker. There was a decline in total emissions as a consequence of market conditions in Greece in 2010.

8.34%

REDUCTION IN CO_2 EMISSIONS PER METRIC TON OF CEMENT SINCE 1990

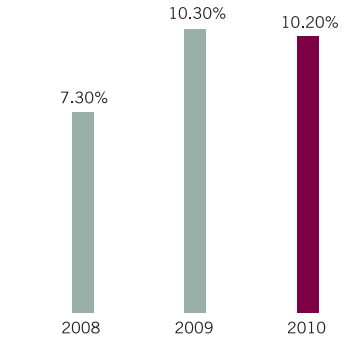
example

IMPROVED POWER CONSUMPTION AT THE VOLOS PLANT

Kiln 1 at the Volos plant is one of the biggest in the Lafarge. In 2010 we invested €10 million in an upgrading program; we introduced major changes in kiln design, replaced and renewed manufacturing equipment and changed kiln operations. State of the art fans and drives were installed in the kiln preheater tower, cyclone geometry was improved and new separator, fan and drives were installed in the raw mill.
As a result the power consumed, relative to the amount of clinker produced, has been reduced by 10% (6Kwh per metric ton of clinker). This corresponds to a reduction in CO_2 emissions of 9,000 metric tons. Volos Kiln 1 is now among the best in Lafarge in terms of specific power consumption.

Alternative raw materials

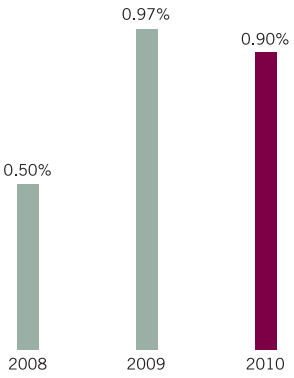
(Consumption of alternative materials as % of total raw materials consumed for cement and clinker production)



Our use of alternative raw materials remained more or less at the same level as in 2009.

Alternative fuels

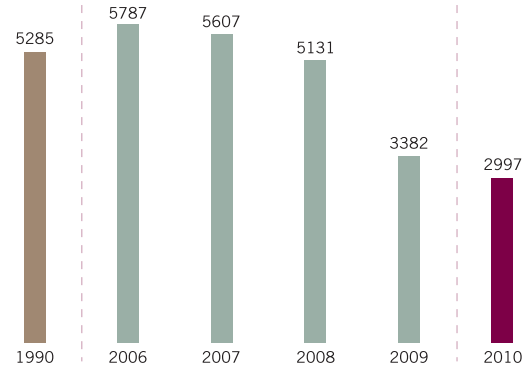
(Consumption of alternative fuels as % of thermal consumption)



Use of alternative fuels currently comprises only biomass and paper sludge and is not at a significant level. Our strategic aim is to use solid shredded waste (see text).

Total CO_2 emissions (gross and net)

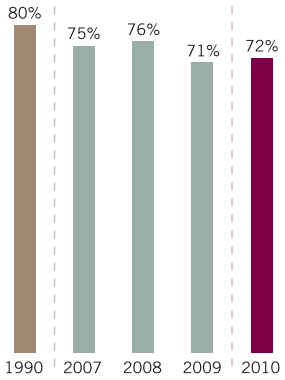
(Thousands of metric tons per year)



Total CO_2 emissions reduced as a result of market conditions. GRI and other international reporting protocols prescribe that net emissions differ from gross in the exclusion of emissions from combustion of waste. Because our use of waste as fuel is currently at very low levels, there is no significant difference between our gross and our net emissions.

Clinker factor

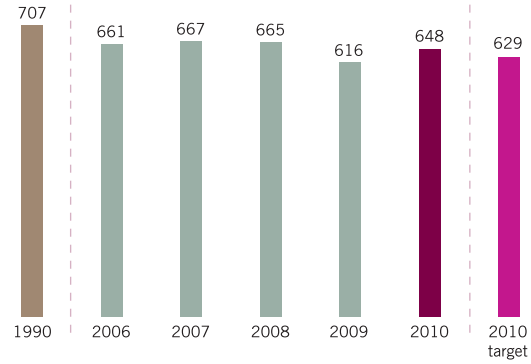
(Ratio between clinker consumption and cement production)



Improvements in recent years were partially reversed in 2010 due to the higher clinker proportion in the cement product mix.

CO_2 emissions per unit of product (gross and net)

(Kilograms per metric tons of cement)



Emissions per unit of cement produced increased in 2010 due to change in customer demand and product mix. Again, there is no significant difference between our gross and our net emissions.