

## CLIMATE CHANGE

# fuelling the debate

Lafarge, the cement group, has been experimenting in East Africa with different ways of reducing the significant levels of carbon dioxide emissions associated with its plants. As a result it is providing new employment for local communities – and saving money

Cement is an energy intensive business that is responsible for five per cent of all man-made carbon dioxide emissions. It's not hard to see why: to make it you need to heat a kiln to almost 1500 degrees centigrade, and that's not even the primary source of the carbon dioxide. The principal ingredient is limestone, and it is necessary to remove carbon dioxide from the limestone. That process is the source of almost two-thirds of the industry's emissions.

What's more, demand for cement is exploding. The nature of economic growth in emerging markets, with its need for essential infrastructure such as roads and power stations along with domestic and commercial buildings, is such that cement sales are a proxy for development, typically expanding at about twice the rate of the increase in gross domestic product.

Currently 80 per cent of cement is sold in emerging markets, with China alone responsible for half of all global demand. This growing need, the runaway increase in the price of fuel of all kinds and the fact that cement is responsible for such a significant percentage of all man-made carbon emissions, mean that cement companies all over the world are having to look at how they can cut their use of fossil fuels.

French company Lafarge, one of the largest groups in the industry, has said that by 2010 it will have reduced its absolute gross carbon dioxide emissions in industrialized countries by ten per cent, and its net

emissions per tonne of cement by 20 per cent globally, compared with 1990 levels. It is one thing to make absolute reductions in mature markets, where growth is slower, but another thing to do this in emerging countries, where growth is much faster, so the company has committed to only an emissions intensity target in these markets.

'Cutting our emissions by half in Europe does not deal with the problem of emissions from cement', concedes Vincent Mages, the company's vice-president for climate change initiatives. While absolute emissions are down slightly in Europe, the overall total in emerging markets is climbing – in 2006, it was 94.4 million tonnes compared with 79.2m tonnes in 1990.

Jean-Paul Jeanrenaud of WWF, the international environmental network with which the company has a partnership to improve its performance, says the situation is critical. 'There has been little evolution of the fuel mix since 2004, and the company should now develop a strategy for reducing its dependence on fossil fuels, while setting challenging targets to increase the share of biomass in its fuel use', he says.

One place the company is taking up this challenge is in East Africa, where it has begun a programme to reduce the amount of coal used at the Mombasa plant of its Kenyan subsidiary Bamburi. As part of the group's wider efforts to meet its 20 per cent global reduction target, the company has set aside 900 hectares (2224



■ Lafarge's plant in Mombasa, where, as part of the company's wider efforts to reduce emissions, 900 hectares of land have been set aside for tree planting

WHO/TDR

acres) of land that forms part of its limestone reserves for the planting of hundreds of thousands of trees. The trees will be planted and cropped every six years, with the first batch cut for fuel in 2013. The wood from the trees will be used for co-firing in the company's kilns, replacing nine per cent of the coal the company uses in Mombasa.

'Not only is biofuel going to significantly reduce our carbon dioxide emissions, but it will also cost 20 per cent less than coal', says Michel Puchercos, director of Lafarge Bamburi. The company made an initial investment of around 36m shillings (\$580,000, €370,000, £290,000) in the reserve, and this is likely to be doubled over the course of 2008.

Planting trees to use as fuel serves several purposes for Lafarge. As well as cutting coal use and emissions, the company has applied for credits, under the Clean Development Mechanism of the Kyoto Protocol, that will help it meet its obligations within the European Union's Emissions Trading Scheme.

The programme has also involved the local population, creating 180 full-time jobs planting and cultivating the trees. The land will eventually be mined for its limestone, but this will not happen for many years and in the interim the plantation puts the area to a practical and resource-efficient use.

Lafarge's other East African plants, in Tanzania and Uganda, will create similar plantations, learning from the Kenyan experience. At Hima Cement, the Ugandan subsidiary of the French group, 240 hectares of land is set to be planted with trees at the company's plant in Kasese, in the west of the country.

The company also has a range of other projects to cut its fossil fuel use at various plants around the world, each partly dictated by the local circumstances of the installation. Hima, for example, is using another approach in Uganda, where cement prices are two to three times the world average. This is mainly because the country's electricity comes from hydroelectric plants, and power supply has been unreliable because drought has hit water levels in the dams. Furthermore, Ugandan cement plants use fuel oil transported 1500km (938 miles) from Mombasa to fire their kilns. This time-consuming operation produces more emissions from the transportation and becomes ever more expensive as oil prices continue to rise.

The company has therefore been looking at alternative fuels, mainly coffee husks. When the coffee is produced, the beans are separated from the husks, which are then generally put into landfill (where they release methane, a far worse greenhouse gas than carbon dioxide) or used as fertilizer. Hima buys the husks from coffee farmers and throws them directly into its kiln.

Using this method has cut fossil fuel use by more

**the project has created an estimated 180 jobs for local people, who plant and cultivate the trees**

## the company

Lafarge is a France-based cement and building materials manufacturer with around 90,000 employees in 76 countries and an annual turnover of €17.6billion, \$27bn, £13.8bn). It:

- has had, since 2003, a nine-person Sustainability Stakeholder Panel that advises the company on sustainability matters and provides a commentary in Lafarge's annual sustainability report
- has signed an Agreement on Corporate Social Responsibility and Industrial Relations with a group of trade unions, including the Energy, Mine and General Workers' Union
- has rehabilitation plans in place for 75 per cent of its quarries
- spends a quarter of its research and development budget on looking for ways to reduce greenhouse gas emissions

than 30 per cent, bringing emissions down by 78,000 tonnes. In 2006 it saved \$2.4m in fuel and transport costs. Feedstock availability is unlikely to be a problem, given the size of Uganda's coffee industry, which accounts for 50 per cent of exports. Emissions are further cut through the use of pozzolan, a widely available rock in Uganda that has binding qualities and can therefore be used as an alternative to limestone.

In Malaysia, Lafarge uses palm kernel shells as an alternative fuel, while in Morocco 50 per cent of the electricity the company's plant uses comes from a wind farm and an Indian factory has cut use of limestone by replacing it with fly ash. These three projects save 160,000 tons of carbon dioxide, equivalent to planting 10.6 million trees per year.

Mages says Lafarge recognizes that cement production makes a major contribution to climate change, but wants to make itself 'part of the solution'. In doing so, the company also aims to 'provide a model for emerging markets that is a combination of growth

■ Further information: [anne.larroquette@lafarge.com](mailto:anne.larroquette@lafarge.com)

## ibe comment LAFARGE

Lafarge has two big problems: to supply enough cement to satiate accelerating worldwide demand, and to do this in a way that reduces high carbon dioxide emissions from the process. It has set itself a tough target: to reduce by 20 per cent the net emissions per tonne of cement by 2010 from a 1990 starting point. In East Africa it is making progress towards this target by diversifying fuel use away from fossil fuels – and by planting hundred of thousands of trees on limestone reserves to use on a six year cycle.

### Features that impress are:

- Lafarge has a vice president in charge of climate change initiatives
- a quarter of the company's research budget is devoted to ways of reducing greenhouse gas emissions
- new local employment opportunities (tree planters) are opening up
- economic necessity is helping drive good environmental protection practice

SIMON WEBLEY, INSTITUTE OF BUSINESS ETHICS