



British Lime Association

# Sustainable Development Report 2010

# FOREWORD

The British Lime Association (BLA) is delighted to produce this first sustainable development report, which has been created as a result of a large collaborative data collection exercise by all 4 BLA Members, that represent about 75% of the UK's 2010 industrial lime production.

This initial report compares key environmental data collected from 2005 and 2010, in order to generate a baseline for future environmental reporting for the industry. For 2011 and beyond we want to build on the scope of this report and enhance our data collection techniques to reflect the industry's commitment to achieving sustainable production.

On a day to day basis, most people do not recognise the value that the lime industry's products add to their lives. When we turn on a tap we expect good, clean, drinking water to come out. We hardly spare a thought for what goes into purifying that water in the first place, yet this simple, but critical, part of our everyday lives depends on the lime industry. BLA Members know the importance of their products to society and continually strive to produce and supply these products in the most sustainable way possible, which minimises the impact on the environment and communities.

While future sustainable development reports will record actual performance against targets and offer an insight into key developments in the industry, we present this report to you as a starting point for our sustainability commitment.



**John Carlill**  
Steetley Dolomite Ltd



**David Patigny**  
Lhoist UK



**Phil Richards**  
Tarmac Buxton Lime and Cement



**Richard Stansfield**  
Singleton Birch Ltd

## The Importance of Lime



Lime is one of the most important alkaline chemicals. Lime has been used as a construction material for over 10,000 years and played a major part in the building of the Roman Empire. Today, lime is widely used in construction materials such as mortar and concrete blocks. It is a key ingredient in making our drinking water safe, farming and

food production and pharmaceuticals. It is also used to stabilise soil in preparation for construction and is an important component in the iron and steel making processes. It is used in the remediation of contaminated land, as an important ingredient in paper production and to neutralise gases generated from power stations and Energy from Waste plants.

## Producing Lime



There are two main types of lime and both are produced by burning rock at high temperatures in a kiln. High calcium lime is made from burning limestone or chalk, which is chemically known as calcium carbonate ( $\text{CaCO}_3$ ) at temperatures of up to  $1000^\circ\text{C}$  in either a vertical or horizontal kiln. Dolomitic lime is made from burning limestone and

magnesia (magnesium oxide,  $\text{MgO}$ ) at temperatures of around  $2000^\circ\text{C}$  in a horizontal rotary kiln. How the product is used is highly dependent upon the chemical makeup of the raw material, which also determines the kiln type and fuel mix.

Where possible, data in this report has been combined to reflect both high calcium lime and Dolomitic lime production. However, because the processes and materials are different for the two principle products, for some of the sustainability measures the data has been disaggregated to ensure an accurate representation of both types of lime.

## The UK Lime Industry



In 2010 BLA Members produced just over 1.2 million tonnes of lime. Since 2005, there has been approximately £45 million invested in lime production by BLA Members, which has resulted in improvements to environmental performance. For more key industry facts and figures please refer to Annex 1. In recent years, the economic recession has

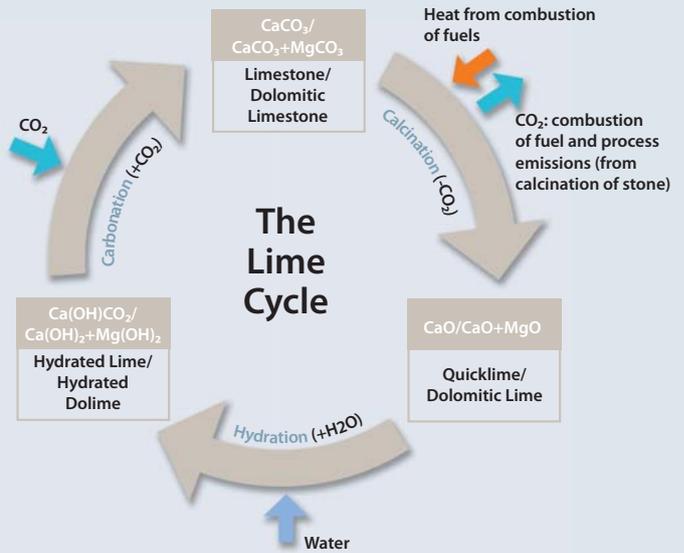
directly affected UK lime production, with notable decreases in demand linked to the downturn in UK manufacturing. There was an encouraging increase in production experienced in 2010, however the industry has not fully recovered and any significant growth in the future may influence environmental performance figures.

# CO<sub>2</sub> EMISSIONS

When limestone and/or chalk (CaCO<sub>3</sub>) or Dolomitic limestone (CaCO<sub>3</sub>, MgCO<sub>3</sub>) are burnt in the kiln, the inevitable result from the chemical reaction is the production of high calcium lime (CaO) or Dolomitic lime (CaO, MgO) and the release of carbon dioxide (CO<sub>2</sub>).

The chemical release of CO<sub>2</sub> is often referred to as 'process CO<sub>2</sub>' and comprises around 75% of the total CO<sub>2</sub> emissions for high calcium lime products and around 53% for Dolomitic lime products. Some of the released CO<sub>2</sub> is re-absorbed by the lime during its lifetime, which is known as carbonation, and which completes the lime cycle.

The remaining CO<sub>2</sub> emissions result from fuel combustion. The industry recognises the importance of climate change mitigation and remains fully committed to reducing emissions of CO<sub>2</sub>, one of the principle greenhouse gases. All BLA Members participate in a number of Government regulated carbon reduction schemes, such as the European Union Emissions Trading Scheme and Climate Change Agreements.

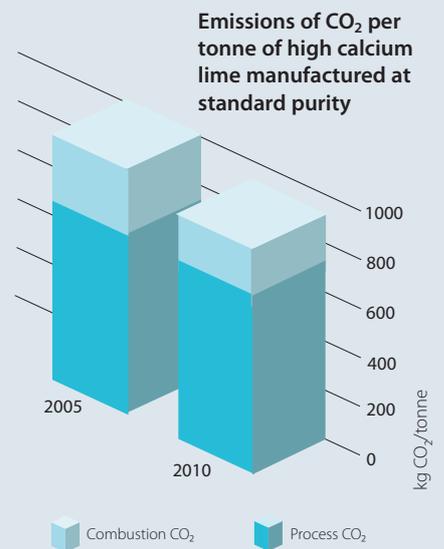


## High calcium lime

**KEY FACT** Combustion CO<sub>2</sub> emissions per tonne of high calcium lime manufactured reduced by 17%.

High calcium lime producers have achieved a 5% decrease in total CO<sub>2</sub> emissions per tonne of product between 2005 and 2010. Process CO<sub>2</sub> emissions are directly related to the purity of the product and at standard purity<sup>1</sup>, they are constant. In terms of combustion, there has been a 17% reduction in CO<sub>2</sub> emissions per tonne of product. This is a consequence of strategic investment in more efficient kilns and upgrading processing technology.

Identifying suitable renewable fuel sources to replace fossil fuels is a major challenge for high calcium lime producers. This is because many customers require high purity lime products suitable for pharmaceutical and water treatment uses and the industry is therefore limited to using only the highest quality fuels.



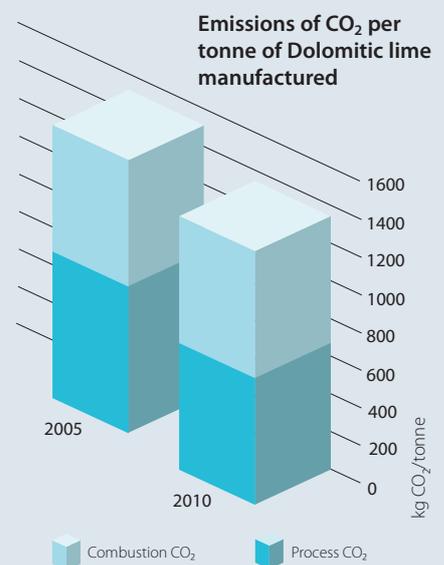
## Dolomitic lime

**KEY FACT** Total CO<sub>2</sub> emissions per tonne of Dolomitic lime manufactured reduced by 7%

Between 2005 and 2010 CO<sub>2</sub> emissions per tonne generated from the production of Dolomitic lime have reduced by 7%. Process emissions per tonne of Dolomitic lime produced have reduced between 2005 and 2010 due to increased recycling in the manufacturing process.

Steetley Dolomite Limited has identified a suitable alternative energy source to reduce its reliance upon fossil fuels. On average, between 2005 and 2010 30% of combustion fuels used for Dolomitic lime production comprised waste derived material. This has helped to mitigate CO<sub>2</sub> emissions and utilise waste. Steetley Dolomite Limited remains fully committed to increasing usage of alternative fuels in the future.

**KEY FACT** On average, 30% of combustion fuels used for Dolomitic lime production comprised waste derived material



### Recovering Dust

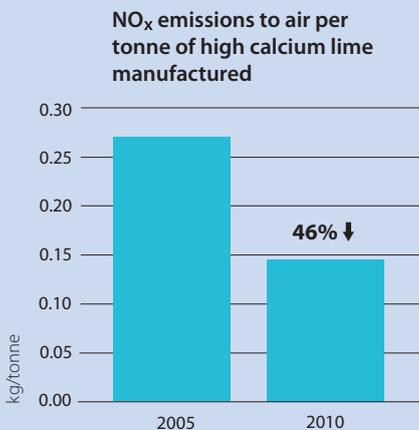
Steetley Dolomite Limited collects lime kiln dust using Electrostatic Precipitators and recovers this waste product for alternative uses. The dust can be used to produce soil fertiliser, used as a replacement for virgin aggregate in asphalt or used during quarry restoration to stabilise backfilled material.

# ENVIRONMENTAL IMPROVEMENTS

## High calcium lime

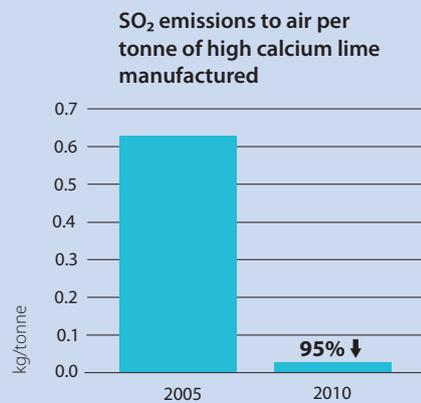
### Oxides of Nitrogen (NO<sub>x</sub>) Emissions

**KEY FACT** NO<sub>x</sub> emissions per tonne of high calcium lime manufactured reduced by 46%



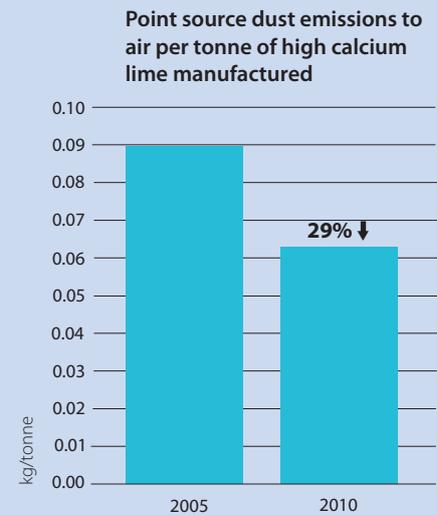
### Sulphur Dioxide (SO<sub>2</sub>) Emissions

**KEY FACT** SO<sub>2</sub> emissions per tonne of high calcium lime manufactured decreased by 95%



### Point Source Dust Emissions

**KEY FACT** Point source dust emissions per tonne of high calcium lime manufactured decreased by 29%.



The flue gas treatment process at this Energy from Waste plant in Grimsby uses hydrated lime which reduces acid gas emissions such as hydrochloric and sulphuric acids by turning them into harmless solid calcium salts.

The industry has taken early action to proactively reduce emissions to air. There has been substantial investment in new processing equipment by high calcium lime producers, which has reduced oxides of nitrogen (NO<sub>x</sub>) emissions by 46% and sulphur dioxide (SO<sub>2</sub>) emissions by 95% between 2005 and 2010.

Point source dust is emitted directly from the stack of the kiln during the lime burning process. Point source dust emissions have decreased by 29% between 2005 and 2010. Permitted limits are set by the Environment Agency and producers use the best available techniques for monitoring and kiln maintenance to keep emissions to a minimum.

**Investing in Energy Efficient Technology**  
Tarmac Buxton Lime and Cement invested in a £13.4 million Parallel Flow Regenerative (Maerz) kiln at their Tunstead site in Derbyshire in 2010, which has replaced two older rotary kilns. The new kiln recovers heat more efficiently and as a consequence, uses less energy. The upgrade has resulted in a 98% reduction in SO<sub>2</sub> emissions compared to the older kilns.

#### Minimising Emissions

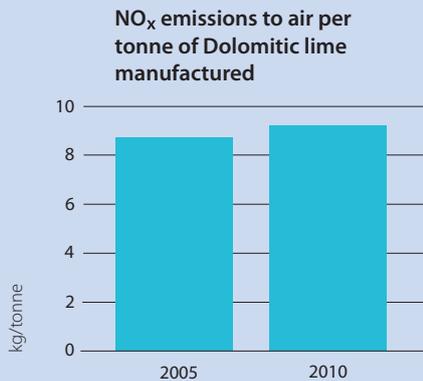
Lhoist UK has an ongoing environmental improvement programme to minimise dust emissions from point source and fugitive locations. In line with industry best practice guidance, significant investment has been made to install bag filters at all release points (including non-kiln sources) and continuous emission monitors on the kilns. This is to ensure dust emissions remain low and in compliance with emission limit values.

# ENVIRONMENTAL IMPROVEMENTS

# ENVIRONMENTAL COMPLIANCE

## Dolomitic lime

### Oxides of Nitrogen (NO<sub>x</sub>) Emissions



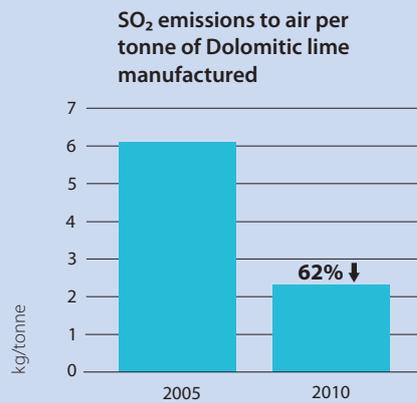
2010 saw a noticeable increase in demand for sintered Dolomitic lime products, which require higher burning temperatures in the kiln for longer periods to achieve a high quality, dense product. These are the requirements for products which are used in refractories or in steel manufacture. As a consequence, there was a 5% increase in NO<sub>x</sub> emissions between 2005 and 2010. This highlights the issue of market driven product specification for Dolomitic lime products and its direct impact upon NO<sub>x</sub> emissions.



Lime is a key ingredient in the iron and steel making process. It is used as a desulphurising agent and for fluxing impurities. Sintered Dolomitic lime products are also used as a refractory material, which contains the molten metal and has a high resilience to heat.

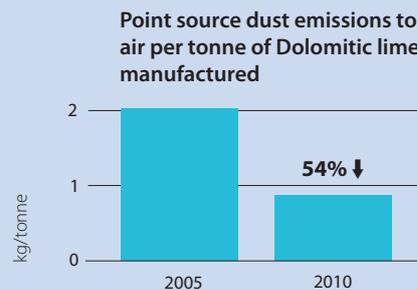
### Sulphur Dioxide (SO<sub>2</sub>) Emissions

**KEY FACT** SO<sub>2</sub> emissions per tonne of Dolomitic lime manufactured decreased by 62%.



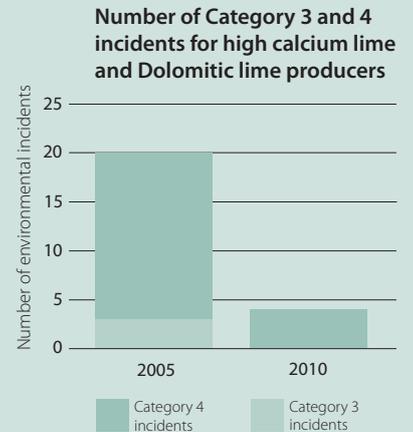
### Point Source Dust Emissions

**KEY FACT** Point source dust emissions per tonne of Dolomitic lime manufactured reduced by 54%



Investment in improving the Dolomitic lime combustion process has produced encouraging results for other emissions to air, with SO<sub>2</sub> emissions decreasing by 62% and point source dust emissions decreasing by 54% between 2005 and 2010.

**KEY FACT** Environmental incidents reduced by 80%.



The lime industry in England and Wales is regulated by the Environment Agency. The Environment Agency issues permits which place restrictions on the industry to ensure any environmental impacts are kept to a minimum. The Environment Agency's Compliance Classification Scheme<sup>2</sup> is a method of classifying any environmental incidents that result in non-compliance with a permit.

Between 2005 and 2010 there were no category 1 or 2 incidents<sup>2</sup>. An 80% reduction in category 3 and category 4 incidents<sup>2</sup> was achieved, and there were no category 3 incidents<sup>2</sup> in 2010. Furthermore, there were no environmental prosecutions between 2005 and 2010.

# ENVIRONMENTAL MANAGEMENT

**KEY FACT** Since 2009, all BLA lime production sites have gained accredited Environmental Management Systems.

Environmental Management Systems (EMS) are tools used by lime producers to monitor and report on environmental performance and ensure that environmental regulations are adhered to. Since 2009, all BLA Members have been operating ISO 14001 certified Environmental Management Systems.

## COMMUNITY ENGAGEMENT

The geographical availability of natural deposits determines the location of lime production facilities. Local community support is therefore key to successful operations and lime producers actively encourage engagement.

There were five community liaison meetings held in 2010. These meetings provide a forum for site operators, local stakeholders and regulators (including the Environment Agency) to discuss site operations and any community concerns. In addition, between 2005 and 2010 lime producers welcomed 2,105 visitors to production sites.

### Community Consultation

Singleton Birch's Melton Ross Quarry has been around since the mid-1800's. Between 2005 and 2010, the company submitted two major planning applications: one for an extension to the quarry for the next 25 years reserves and one for a 100,000 tonnes a year Energy from Waste facility. Ahead of any formal planning application ideas were discussed with local stakeholders, presentations were given at the three local Parish Councils and road-shows and open days were held to inform the public of the plans. Both planning applications were approved with no public or Parish objections.

## NOTES

1 Standard purity stated for lime (94.5%) is sourced from the EU Commission Decision of 27 April 2011 "determining transitional Union-wide rules for harmonised free allocation of emission allowances pursuant to Article 10a of Directive 2003/87/EC of the European Parliament and of the Council", Page L130/20 (Available: <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:130:0001:0045:EN:PDF>).

2 Environment Agency's Compliance Classification Scheme (CCS):

Category 1 incident defined as "a non-compliance which would have the potential to have a major environmental impact"

Category 2 incident defined as "a non-compliance which would have the potential to have a significant environmental impact"

Category 3 incident defined as "a non-compliance which would have the potential to have a minor environmental impact"

Category 4 incident defined as "a non-compliance which has no potential to have an environmental impact"

(Available: <http://www.environmentagency.gov.uk/business/regulation/31825.aspx>).

## ANNEX 1

### BLA Key Facts and Figures: 2010

#### Operating Companies

- 1 Lhoist UK
- 2 Singleton Birch Ltd
- 3 Steetley Dolomite Ltd
- 4 Tarmac Buxton Lime and Cement

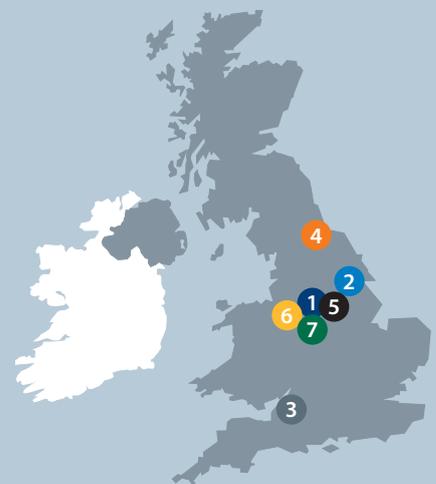
Total Production 1,227,603 tonnes

Total Turnover (excluding VAT) £111,710,000

Direct Employment 377

Indirect Employment 68

## Lime plants



Factory/Site Owner	Location	
Lhoist UK <small>Lhoist Group</small>	Hindlow	1
Singleton Birch	Melton Ross Batts Combe	2 3
Steetley Dolomite Limited	Thrislington Whitwell	4 5
Tarmac Buxton Lime and Cement	Tunstead Hindlow	6 7



essential materials  
sustainable solutions

BLA is part of the Mineral Products Association, the trade association for the aggregates, asphalt, cement, concrete, lime, mortar and silica sand industries.

### British Lime Association

Gillingham House 38 - 44 Gillingham Street  
London SW1V 1HU  
Tel +44 (0)20 7963 8000 Fax +44 (0)20 7963 8001  
bla@mineralproducts.org www.britishlime.org