



British Lime Association

# Sustainable Development Report 2011

# FOREWORD

**This second report from the British Lime Association (BLA) incorporates an exciting development from our first ever report. For 2011, the BLA's three Associate members have also contributed data. This means that all of the UK's lime producers now feed into this report, and the increased coverage means that we can present a more accurate picture of lime production. This report highlights all of the BLA members' important sustainability strategies and progress in achieving environmental, social and economic improvements.**

Another significant development since the last report is the formulation of the Environment Agency's *Sector Plan*, which incorporates the lime sector. This plan sets out the agreed environmental priorities and objectives of the sector and how the Environment Agency will regulate the industry. The establishment of this commitment with the Environment Agency is significant and reflects the industry's dedication to best practice, compliance with environmental legislation and maximising the efficiency of lime production.

Both the *Sector Plan* and our sustainable development report will enable the industry to look forward and focus on building on previous achievements. With ever-increasing challenges from UK and European environmental policy, this will be essential to ensure that lime manufacture remains within the UK and sustains its position as a significant contributor to the UK economy.



**John Carill**  
Steetley Dolomite Ltd



**David Patigny**  
Lhoist UK



**Phil Richards**  
Tarmac Buxton Lime and Cement



**Richard Stansfield**  
Singleton Birch Ltd



**Robert Brown**  
Specialty Minerals



**Alastair Dunn**  
TATA Steel



**Richard Pike**  
British Sugar plc



**Chris Queen**  
TATA Steel

# HIGHLIGHTS (2005-2011 COMPARISON)

- Total CO<sub>2</sub> emissions per tonne of high calcium lime manufactured reduced by 11%.
- Total CO<sub>2</sub> emissions per tonne of dolomite manufactured reduced by 8%.
- NO<sub>x</sub> emissions per tonne of high calcium lime manufactured reduced by 8%.
- SO<sub>2</sub> emissions per tonne of high calcium lime manufactured decreased by 78%.
- SO<sub>2</sub> emissions per tonne of dolomite manufactured decreased by 20%.
- Point source dust emissions per tonne of high calcium lime manufactured decreased by 39%.
- Point source dust emissions per tonne of dolomite manufactured reduced by 77%.
- Waste sent to landfill reduced by 94% per tonne of lime manufactured.
- Waste derived material made up 36% of combustion fuel used for dolomite production.
- Environmental incidents reduced by 60%.

## THE UK LIME INDUSTRY IN 2011

There are two types of lime; high calcium lime and dolomite. High calcium lime is produced from burning calcium carbonate (CaCO<sub>3</sub>), in the form of limestone or chalk at temperatures of up to 1400°C in either a vertical kiln or horizontal rotary kiln. Dolomite is produced from burning dolomitic limestone, which consists of CaCO<sub>3</sub> and magnesia (magnesium oxide, MgO) at temperatures of up to 2000°C in a horizontal rotary kiln. Due to the significant variation in the processing required for each type of lime, the majority of the data in this report has been separated, to ensure an accurate reflection of the industry is presented.

For 2011, the data presented in this report now incorporates the three Associate

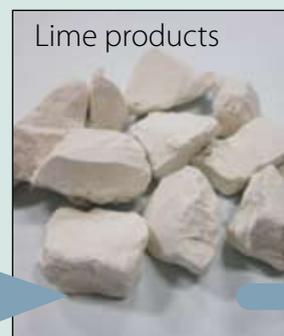
members of the BLA, who are British Sugar plc, Specialty Minerals and Tata Steel. The increase of the scope of the data collection this year may lead to an increase in some key performance indicators compared with data from 2005, which only encompassed four BLA members.

UK lime production has decreased significantly since 2005; a 17% reduction has been experienced by full BLA members. In 2011, the industry is still experiencing the negative effects of the economic downturn and production remains significantly lower than before the recession. This is largely due to the reduction in UK construction and manufacturing activities, which directly impacts the sale of lime products.

## AN ESSENTIAL INGREDIENT

Lime products provide a key ingredient for many essential processes, such as purifying drinking water, purification in the manufacture of sugar, cleaning gases from power stations, constructing buildings,

producing iron and steel and treating contaminated land. Lime and its derivatives are also important additives for making paper, pharmaceuticals and even toothpaste.



- Pharmaceuticals
- Glass
- Iron and steel
- Food manufacture
- Drinking water
- Paper
- Construction materials
- Emissions cleansing
- Waste treatment
- Soil stabilisation

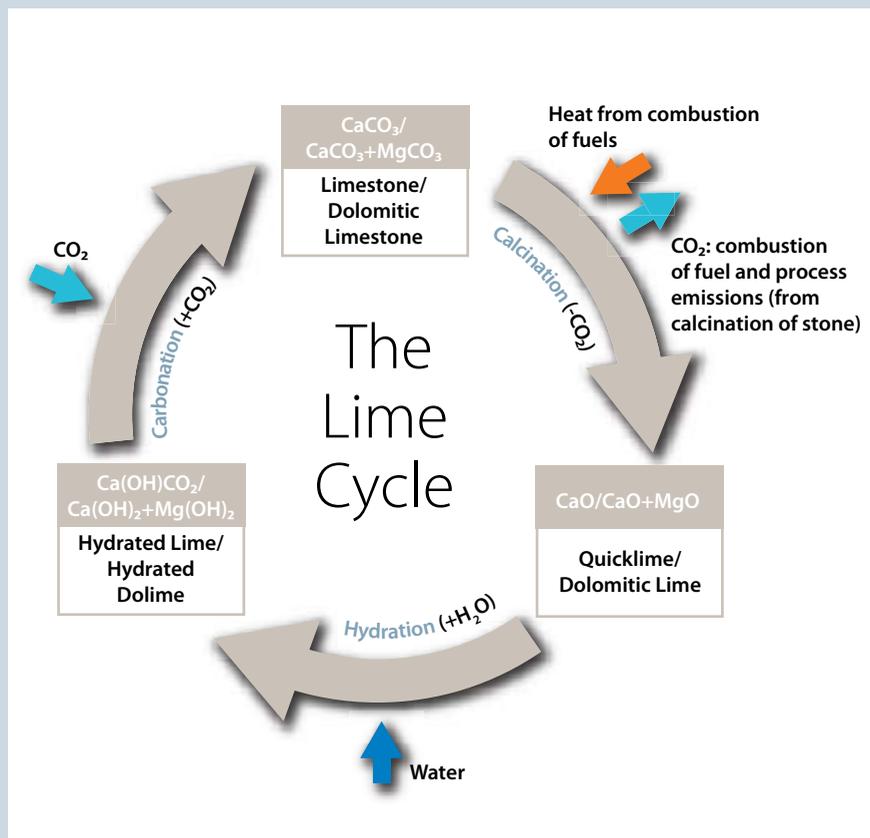
# CO<sub>2</sub> EMISSIONS

## The Lime Cycle

When limestone, chalk (CaCO<sub>3</sub>) or dolomitic limestone (CaCO<sub>3</sub>, MgCO<sub>3</sub>) rock is heated to high temperatures inside a kiln, a chemical reaction is triggered which releases CO<sub>2</sub> from the rock. This reaction is unavoidable, and the released CO<sub>2</sub> is called 'Process CO<sub>2</sub>' and makes up around 75% of the CO<sub>2</sub> generated

from high calcium lime production and 53% from dolomite production.

Over its lifetime, lime reabsorbs CO<sub>2</sub> from the air around it. This natural process is known as carbonation and forms the last link in the lime cycle.



## CO<sub>2</sub> mitigation

The other source of CO<sub>2</sub> is from fuel combustion to drive production. The cleanest, highest quality fuels are required to produce many lime products, due to their utilisation for pharmaceuticals and drinking water purification. This restricts the usage of fossil fuel substitutes for these products. However, where technically feasible, BLA members use alternative fuels to power lime production. These fuels consist of waste materials, such as end of life tyres. CO<sub>2</sub> reduction is high on the agenda of the lime sector. All BLA members are part of a UK Climate Change Agreement and the EU Emissions Trading Scheme, which illustrates their commitment to reducing both CO<sub>2</sub> emissions and energy consumption.

## Dolomite<sup>3</sup>

CO<sub>2</sub> emissions per tonne from the production of dolomite have reduced by 8% since 2005. CO<sub>2</sub> emissions from the combustion of fuels have decreased by 4%. It is important to note that process emissions from dolomite are lower than chemically expected in 2011, due to the utilisation of waste dust to manufacture products resulting in lower emission figures per tonne of product.

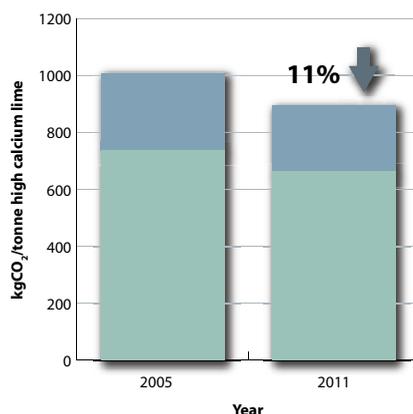
The use of waste derived alternative fuels has also increased from an average of 30% between 2005 and 2010 to 36% in 2011. This change reflects the long term commitment to mitigate the impacts dolomite production has on the environment and utilise waste products as a replacement for fossil fuels.

## High calcium lime

High calcium lime producers achieved an 11% reduction in total CO<sub>2</sub> emissions in 2011, at standard purity<sup>1</sup>. CO<sub>2</sub> emissions from the combustion of fuels have decreased by 15%, which is highly encouraging. Process emissions are chemically fixed in the production of lime. However, there has been a slight reduction in 2011, which is caused by the addition of British Sugar and Specialty Minerals into the data collection. Both lime producers utilise the CO<sub>2</sub> that is released from the limestone as an input into either the sugar purification process or to produce Precipitated Calcium Carbonate, thus creating a closed system.

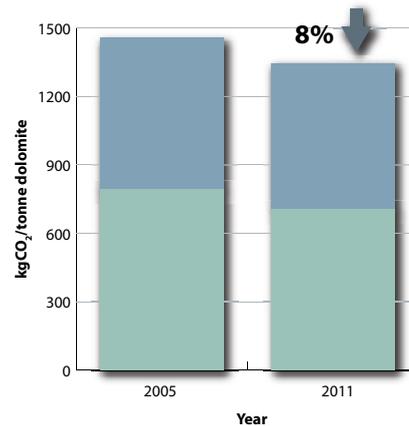
### Emissions of CO<sub>2</sub> per tonne of standard purity high calcium lime

- Combustion CO<sub>2</sub> per tonne of high calcium lime manufactured at standard purity
- Process CO<sub>2</sub> per tonne of high calcium lime manufactured at standard purity



### Emissions of CO<sub>2</sub> per tonne of dolomite

- Combustion CO<sub>2</sub>
- Process CO<sub>2</sub>

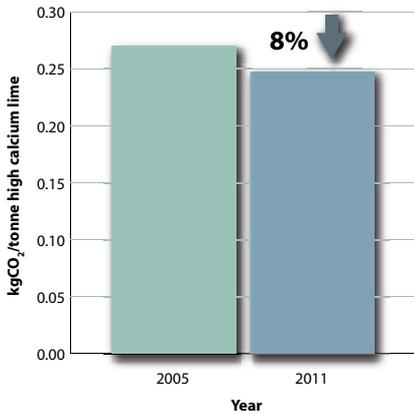


# EMISSIONS (excluding CO<sub>2</sub>)

## High calcium lime

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

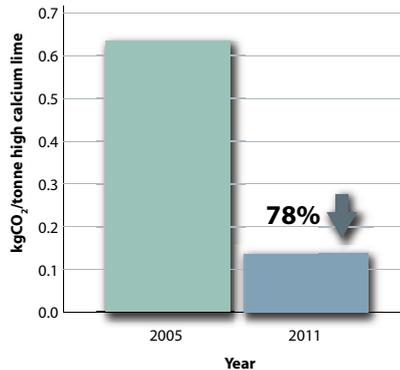
NO<sub>x</sub> emissions to air per tonne high calcium lime manufactured



NO<sub>x</sub> emissions from high calcium lime production have reduced by 8% since 2005. The increase in the number of companies participating in the data collection could have resulted in an increase in certain emissions; however it is very positive that even with the additional lime sites there has been a decrease in NO<sub>x</sub> emissions. This is due to the commitment by lime producers to emissions abatement.

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

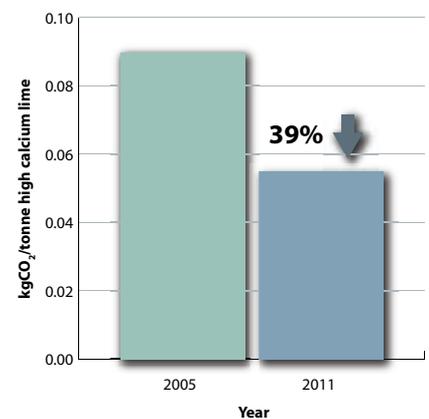
SO<sub>2</sub> emissions to air per tonne high calcium lime manufactured



There has been a significant decrease in SO<sub>2</sub> emissions since 2005. The 78% reduction reflects the increased investment in emissions control equipment and dedication from the industry to reduce their environmental impacts.

### Point Source Dust Emissions

Point Source Dust emissions to air per tonne high calcium lime manufactured

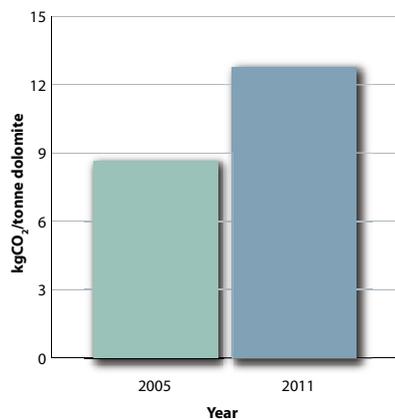


Since 2005, point source dust emissions per tonne of high calcium lime manufactured have decreased by 39%. This is very encouraging, because even though there are a larger number of data contributors there was still a reduction. This is due to widespread investment and upgrades to dust abatement equipment, which controls and minimises the amount of dust that is emitted to the air.

## Dolomite

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

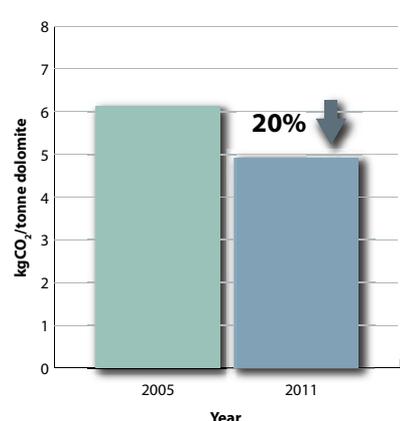
NO<sub>x</sub> emissions to air per tonne dolomite manufactured



NO<sub>x</sub> emissions increased by 4.1kg per tonne of dolomite manufactured in 2011. This was due to increased production of sintered dolomite products to meet the higher market demand for refractory products. These very dense and high quality products require a manufacturing process operating at higher temperatures and two passes through the kiln.

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

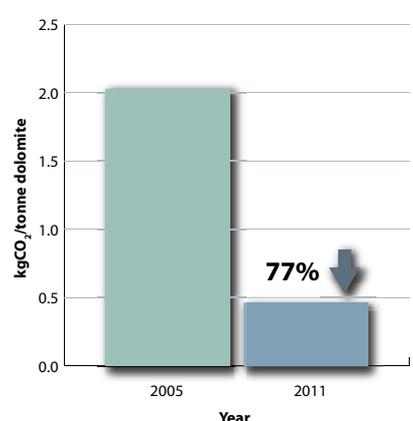
SO<sub>2</sub> emissions to air per tonne dolomite manufactured



There was a 20% decrease in SO<sub>2</sub> emissions since 2005. This is due to the increased usage of alternative fuels in the production process and this trend is likely to continue throughout 2012 and beyond.

### Point Source Dust Emissions

Point Source Dust emissions to air per tonne dolomite manufactured

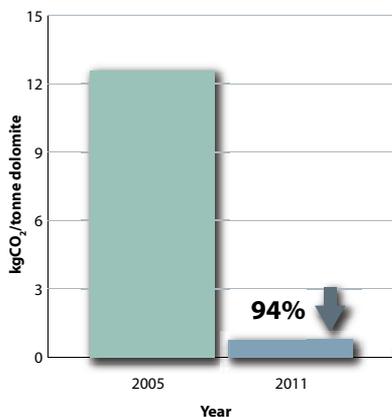


There was a large reduction of 77% in point source dust emissions per tonne of dolomite manufactured since 2005. This is due to investment in dust abatement equipment to make early steps to meet with future European emissions legislation, which is due to be launched within the next five years.

# ENVIRONMENTAL IMPROVEMENTS

## Waste minimisation

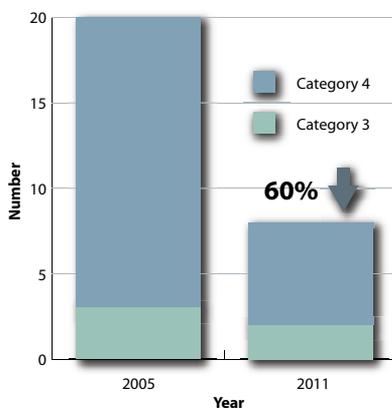
### Total waste disposed to landfill per tonne lime manufactured



Waste sent to landfill has decreased by 94% since 2005. This dramatic and very positive result is a consequence of the lime industry's commitment to the reuse of waste or recycling of waste material for alternative uses. Mineral waste may be used as a backfill material as part of a quarry restoration programme, put back into the process or utilised to manufacture specific products.

## Environmental management

### Number of Category 3 and 4 Environmental Incidents



All of the BLA member's production sites operate to an ISO 14001 certified Environmental Management System (EMS). The industry is also regulated by the Environment Agency, who issue permits for each lime producer. The permits ensure any environmental impacts from lime production are minimised, in accordance with the Environment Agency's Compliance Classification Scheme<sup>2</sup>. This scheme provides classifications for any environmental incidents that occur and result in records of non-compliance with a permit. In 2011, there were no category 1 and 2 incidents, two category 3<sup>2</sup> and six category 4<sup>2</sup> incidents. This resulted in a 60% decrease in environmental incidents since 2005. Notably, there were no formal cautions, enforcement notices or environmental prosecutions in 2011.

## Community engagement



BLA members welcomed 360 visitors to their production sites in 2011. There were also 16 community liaison meetings attended by both operators and the Environment Agency. Site operators benefit from this opportunity to engage with local stakeholders, residents and regulators and therefore sustain their positive relationship with local communities.

## DID YOU KNOW?

Lime can be used to:



Purify sugar



Produce toothpaste



Make an additive for engine oil



Control water pH in fish farming



Produce chicken feed



Make tap water safe to drink



Keep fruit fresh



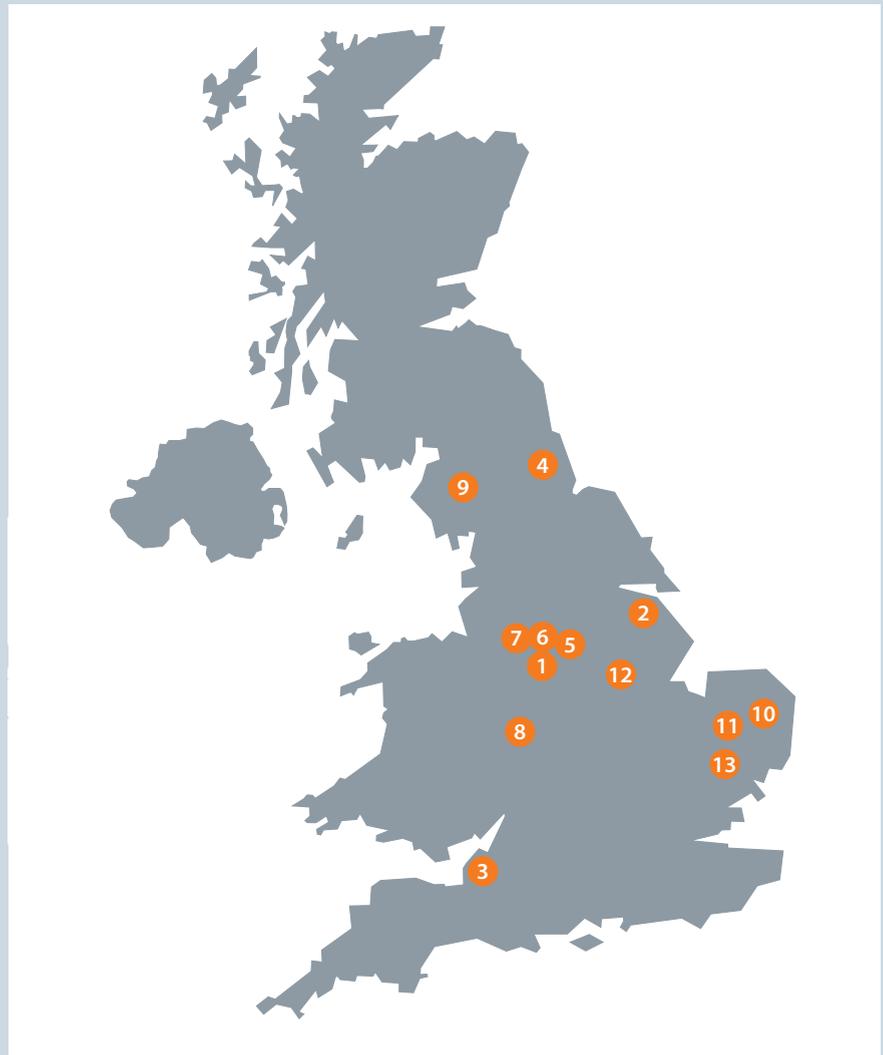
Clean gasses produced by Energy from Waste plants

## LIME PLANTS BLA members

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

## Associate members

Factory/Site Owner	Location	
 <b>Specialty Minerals</b>	<b>Birmingham</b>	<b>8</b>
 <b>TATA STEEL</b>	<b>Shapfell</b>	<b>9</b>
 <b>BRITISH SUGAR</b>	<b>Norwich</b>	<b>10</b>
	<b>Norfolk</b>	<b>11</b>
	<b>Notts</b>	<b>12</b>
	<b>Suffolk</b>	<b>13</b>



## NOTES

- 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 37 Available: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:130:001:0045:EN:PDF>
- 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.environment-agency.gov.uk/business/regulation/31825.aspx>

- Dolomite includes the three products: Ultra Low Carbon Dolime, Dolime and Sintered Dolime

## KEY FACTS AND FIGURES FOR 2011

### BLA Members

Lhoist UK  
Singleton Birch Ltd  
Steetley Dolomite Ltd  
Tarmac Buxton Lime and Cement

### BLA Associate Members

British Sugar plc  
Specialty Minerals  
Tata Steel

**Total production 1.6 million tonnes**

**Production Sites 13**

**Total direct employees and full-time contractors 638**

### 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](mailto:bla@mineralproducts.org) [www.britishlime.org](http://www.britishlime.org)