



British Lime Association

Seventh Sustainable Development Report 2017

Lime - the reliable material





Reflecting on 2016

2016 was a tough year for the lime industry. Less demand from the iron and steel sector meant that production levels fell to the same low as at the start of the recession.

The downturn in UK steel production, coupled with a diminishing competitive position due to uncompensated costs from the UK's energy and carbon policies, continued to put pressure on the industry throughout the year.

Yet despite these setbacks, the industry remained resilient, continuing production of high quality lime products for the UK and export markets whilst working in partnership with the Environment Agency to deliver improved environmental performance.

The lime industry's commitment to continuous improvement in the face of adversity is exemplified by its excellence in health and safety, which received high praise in 2016.

It is the incremental performance improvement and continued efforts of the UK lime industry to find new markets that ensures the ongoing, cost effective availability of this material essential to our daily lives.

AN ESSENTIAL MATERIAL

Lime is the essential material we rely on every day. Lime is working for you when you:

Go for a drive:

By removing impurities from iron, lime is essential for manufacturing steel. Without steel there would be no engines, no cars - so every time you get in your car - you are relying on lime.

More than that though, lime is used to strengthen the ground under roads and buildings, and sometimes to lock-in contaminants. This way, weak or contaminated soils can be reused in situ, and so avoid the need for new materials to be brought in.

Lime is also used in asphalt mixtures to give roads and runways greater durability and longevity.

Turn on a tap:

Think about how often we use water in our daily lives, for drinking, for washing, for cleaning, for cooking. All of this is made possible by lime when it's used in the purification of water. Strictly controlled by

British Standards, lime is used to remove dangerous heavy metals and regulate the acidity/alkalinity of the water.

Make sugar:

Lime is integral to the production of sugar; it is used to remove impurities from sugar made from home-grown sugar beet.

Visit a heritage site:

Perhaps the most commonly known use, lime has a proud history of use in building mortars, plasters and renders. Although traditional, lime mortars and renders are still specified by architects and engineers when designing modern buildings, particularly where aesthetic considerations are important and because lime products are breathable and flexible.

Have your 5 a day:

Did you know that lime is used in storage sheds to keep fruit and vegetables fresher for longer?





Flush the loo:

Just like purifying water, lime is used to treat wastewater so it is safe to return to the water cycle, removing dangerous and undesirable materials and controlling acidity/alkalinity.

Lime is also used to treat residual sewage sludge so that it can be used by farmers to restore nutrients to land in a safe way.

Sit down for dinner:

We know lime is used to treat the water needed for cooking and washing, for the steel in pans, kitchen knives and cutlery, but many foods also make use of lime before they get to your plate.

Lime is used to improve the quality of soil so that farmers produce higher yields of crops. Lime is used to keep animal bedding clean and help animals stay healthy. Used in chicken feed, it ensures a strong eggshell.

Clean your teeth:

As a primary ingredient for making high grade calcium products, lime is used to make many medicines and cosmetics, including toothpaste, dietary supplements and antacids. It's also used in the manufacturing of washing powders and other cleaning products.

Switch on the lights:

Lime is used to make the metals found in the pylons and substations that bring electricity from distant generating sites to us.

Lime is also used in power generation and industrial processes, to remove pollutants from gases emitted to the air.

Without lime, acid rain from air pollution would be a big problem.

Take the train:

Lime is essential for the railways. Whether it's making the metals for rails, trains, signals, or overhead electrification, or generating the power to run trains, without lime the trains wouldn't run.

Go to work:

Lime is used in manufacturing the construction products for office blocks, schools, hospitals, warehouses, and shopping centres. Lime is also used in processing metals, and so for laptops, phones, pens, light fittings, display screens - in fact, almost every metal containing object you use.



FUTURE DEVELOPMENTS



The lime industry remains optimistic for the future despite the significant production drop in 2016.

Environmental protection, chemical and similar markets are now the predominant uses of lime produced in the UK.

Recent work by the European Lime Association (EuLA) has highlighted the benefits of lime in asphalt, increasing road life by up to 25%, and reducing the overall carbon impact of the infrastructure.

Responding to increased interest by highway engineers who are being asked to do more with less, the BLA 2017 conference is drawing in expertise from Europe and the USA to highlight the practical benefits of lime in asphalt, and to provide a forum for sharing international experience.

Investing in the future

Demonstrating their belief in the future, BLA members continue to invest in apprenticeships across their businesses, with 26 apprentices in place across their lime manufacturing sites in 2016.

Apprentices are highly regarded within the lime sector which

recognises that able and committed young individuals can develop to their full potential under the expert guidance of experienced mentors, providing the valuable succession of skills required to ensure the sector stays fit for the future.

Case Study

Commemorating local heroes

The War Years' Quarry Exhibition, was held by Tarmac during November 2016, and featured images from Tarmac's archive photographs of the local area that date back to the late 1800s, including pictures from the site during the First and Second World Wars.

Viv Russell, Lime and Powders Director at Tarmac's Tunstead site near Buxton, said: "We thought it was fitting to hold this event in the year of the Battle of the Somme centenary and give local people the chance to find out more about the lives of people from the quarries during these difficult times."

Over 700 people visited the exhibition, which raised £480 for

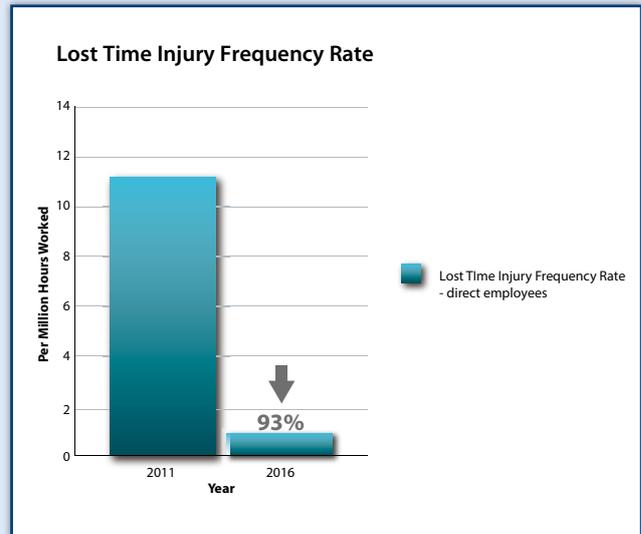
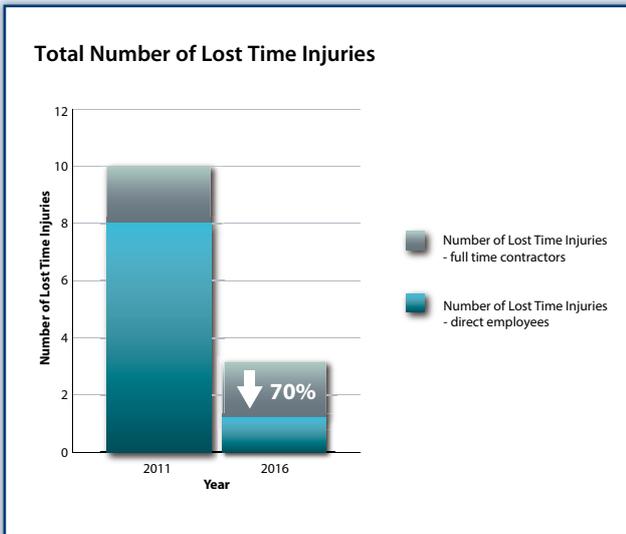
the Royal British Legion (Buxton branch) and the charity Help for Heroes.

In addition, the 15 men who worked at the Buxton Lime Firms and laid down their lives at the Battle of the Somme were commemorated with a special metallic poppy produced by three of Tarmac's apprentices.

On each of the petals are engraved the names of the men who lost their lives. The poppy is kept at Tarmac's office at Tunstead House as a permanent memorial to the men who died in battle.



HEALTH AND SAFETY



Statistics

The health and safety of employees and contractors remains the top priority for the UK lime industry - and all BLA members continue to target zero incidents.

Knowledge sharing and active engagement by the sector have been rewarded with a significant reduction in recorded incidents across sites.

The UK lime industry has lowered the number of Lost Time Injuries for direct employees and contractors by 70% between 2011 and 2016 (BLA members only), and reduced the Lost Time Injury frequency rate by 93% (direct employees, BLA members only).

Health and safety survey and peer reviews

BLA has continued with its successful programme of inter-site peer reviews, demonstrating the UK industry's active commitment to share best practice.

BLA engaged the Health and Safety Laboratory to deliver their 'safety climate survey' as a means of understanding perceptions of health and safety across BLA member employees. The information differed for each site, and focus groups are prioritising local issues, with any cross-sector issues to be identified for BLA action.

European perspective

BLA members are taking a leading role in the newly formed European Lime Association Health and Safety Task Force. Seen as a bastion of good practice, during 2017, BLA members are offering European colleagues a peer review opportunity, with live demonstrations of UK best practice.

Wider health and safety strategies

The lime sector is part of the Mineral Products Association (MPA), which has underpinned its commitment to health and safety through its new Membership Charter.

BLA members have participated in the MPA Safer by Sharing seminars, Safer by Competence initiative and Safer by Leadership course. Additionally, BLA members have shared learning points from incidents with the wider minerals industry.

For more information on the MPA Charter go to:

http://www.mineralproducts.org/documents/MPA_Charter.pdf



BLA scoops top awards at the MPA H&S Awards

The outstanding health & safety improvements implemented by BLA members were acknowledged at the 2016 MPA H&S Conference and Awards.

Lhoist's continuing high standards led to them scooping the top industry prize, The John Crabbe Trophy for Outstanding Excellence in Health & Safety. The judges commented that Lhoist have "a successful health & safety culture based on a strong and committed leadership team".



Singleton Birch were awarded an MPA Special Award for "excellent health and safety standards and being a consistent contributor to health and safety initiatives within the MPA membership and in Europe".

The BLA H&S Committee, led by Viv Russell of Tarmac, have recently introduced industry peer reviews and these were acknowledged by the judges as "providing an opportunity for employees to visit other sites and partake in safety discussions, share best practice and develop an inter-company safety network. Learnings are then shared with the workforce during monthly safety meetings".

Automating the recovery of saleable product

At Lhoist's Steetley Dolomite plant in Whitwell, Nottinghamshire, a major health and safety problem was solved by installing a lump-breaking machine, allowing the kiln to safely continue burning low-cost fuels. The 'W2 Kiln' is a Preheater Rotary Kiln (PRK) which uses a shaft preheater to produce Ultra-Low Carbon Dolime (ULCD).

The kiln burns a mixture of fuels, including coal, waste liquid solvent and tyre derived fuel, which causes ash rings to form in the burning zone of the kiln. When lumps of ash break off, or are removed, the material travels through the kiln into the product cooler, which is a grate type cooler with bars to prevent large lumps from entering the jaw-crusher.

The existing method of work involved opening the cooler doors every couple of hours to let the red-hot lumps fall out onto the floor. Hand tools were used to clear remaining lumps from the bars. The lumps were left to cool before being broken with large sledge hammers, again by hand, and then being

pushed down to the jaw-crusher. A safer alternative to manually breaking the lumps was to load them into a skip for disposal in the quarry tip with the resulting loss of around £150k of potentially saleable material a year.

After an evaluation of the different types of crushers available, the solution chosen was a hydraulic breaker (or "pecker") on an articulated hydraulic arm.

The cooler was modified so that the angle of the bars was steeper and the cooler door was changed to a series of self-closing slats. These two modifications made the lumps exit the cooler automatically. The floor in front of the slatted-door was installed with coarse grids of the same spacing as the cooler bars. Finally, the whole cooler-exit area was enclosed by guards to prevent people being injured by the lumps or the pecker. The lumps are allowed to cool on these grids and then broken into smaller lumps by the pecker.

ENVIRONMENTAL PERFORMANCE

Implementing European Best Practice

During 2016, the lime sector worked actively with the Environment Agency to implement European Best Practice in industrial emissions for the sector.

Case Study

Automatic process control on a Maerz kiln

At Lhoist UK's Hindlow plant, the second of the two Maerz kilns has now been upgraded to a fully automated kiln process control system. The first of the kilns was upgraded to full automatic control in autumn 2014.

The investment provides significant benefits in operability and productivity. Running in automatic mode allows for fine and instantaneous adjustment of key process parameters

and ensures the best product quality is maintained with less variability. This innovation allows for improved efficiency of the energy used within the kiln process.

The benefits of the fully automated control system will be monitored over the next reporting period and is expected to continue to show improved process efficiency, along with the increased production tonnages of high quality lime products.

Case Study

Electricity from natural gas

Singleton Birch has recently purchased an Edina 800kW gas engine, augmenting the anaerobic digestion plant already installed at the Melton Ross site and driving down on site electricity prices.

Commissioned on 30th March 2017, the engine produces

electricity from mains natural gas at far greater efficiencies than on-grid power stations.

Furthermore, Singleton Birch aim to use the waste heat in the lime manufacturing process, raising the overall engine efficiency up to 80% and providing extra heat to Singleton Birch processes.



Volunteering in the National Park

In June 2016, Tarmac officially launched a five year partnership with the Peak District National Park (PDNP) with Tunstead's willing volunteers marking the occasion by taking part in dry stone walling.

The PDNP is a longstanding neighbour with whom Tarmac have built a positive relationship with over many years. The new partnership aims to help them maintain and protect a precious natural asset. Tarmac will also contribute towards the Park's employment of a Conservation Volunteer Co-ordinator, to assist in the conservation of the UK's first National Park.

"This partnership is a fantastic opportunity to play a key role in the maintenance and protection of a very special piece of landscape," said Andy Corrigan, Director of Communications and Corporate Affairs. "Not only can we help our neighbour, but the volunteering opportunities are significant in helping us reach our sustainability target of 50,000 employee volunteering hours per annum by 2020."

Sarah Fowler, Chief Executive of the PDNP, added: "We are absolutely delighted to be working alongside Tarmac to help look after this wonderful place. It's a great example of a business determined to invest back into its local communities."



	Unit	High calcium lime		Dolime	
		2011	2016	2011	2016
Dust emissions to air per tonne manufactured	kg/t	0.05	0.05	0.46	0.20
NOx emissions to air per tonne manufactured	kg/t	0.25	0.12	12.77	16.19
SO ₂ emissions to air per tonne manufactured	kg/t	0.14	0.05	4.92	0.96
Emissions of CO ₂ from combustion of fossil fuel per tonne manufactured	kg/t	221	215	636	532
Emissions of CO ₂ from combustion of fossil fuel per tonne manufactured – standard purity lime [1]	kg/t	231	212		
Process CO ₂ emissions per tonne lime product	kg/t	731	685	708	779
Process emissions of CO ₂ per tonne manufactured – standard purity lime [1]	kg/t	672	674		
Combustion fuel use per tonne manufactured	kWh/t	746	661	2,092	1,757
Electricity use per tonne manufactured	kWh/t	76	67	67	68
	Unit	2011		2016	
Waste disposed of in landfill per tonne lime manufactured	kg/t	0.77		0.49	
Water use per tonne of lime manufactured	l/t	647		1,143	
Number of category 3 incidents per BLA member [2]	no	2		2	
Number of category 4 incidents per BLA member [2]	no	6		3	
Number of Lost Time Injuries – direct employees	no	8		1	
Number of Lost Time Injuries – full time contractors	no	2		2	
Lost Time Injury frequency rate – direct employees	no per million hrs worked	11.85		0.84	

A 2011 baseline was previously selected to align the BLA Sustainable Development Report with the baseline in the Environment Agency 2011 Sector Plan. The 2011 baseline has been retained for consistency.

Higher NOx emissions, process CO₂ emissions, and water use in 2016 result from changing product mix compared to 2011.

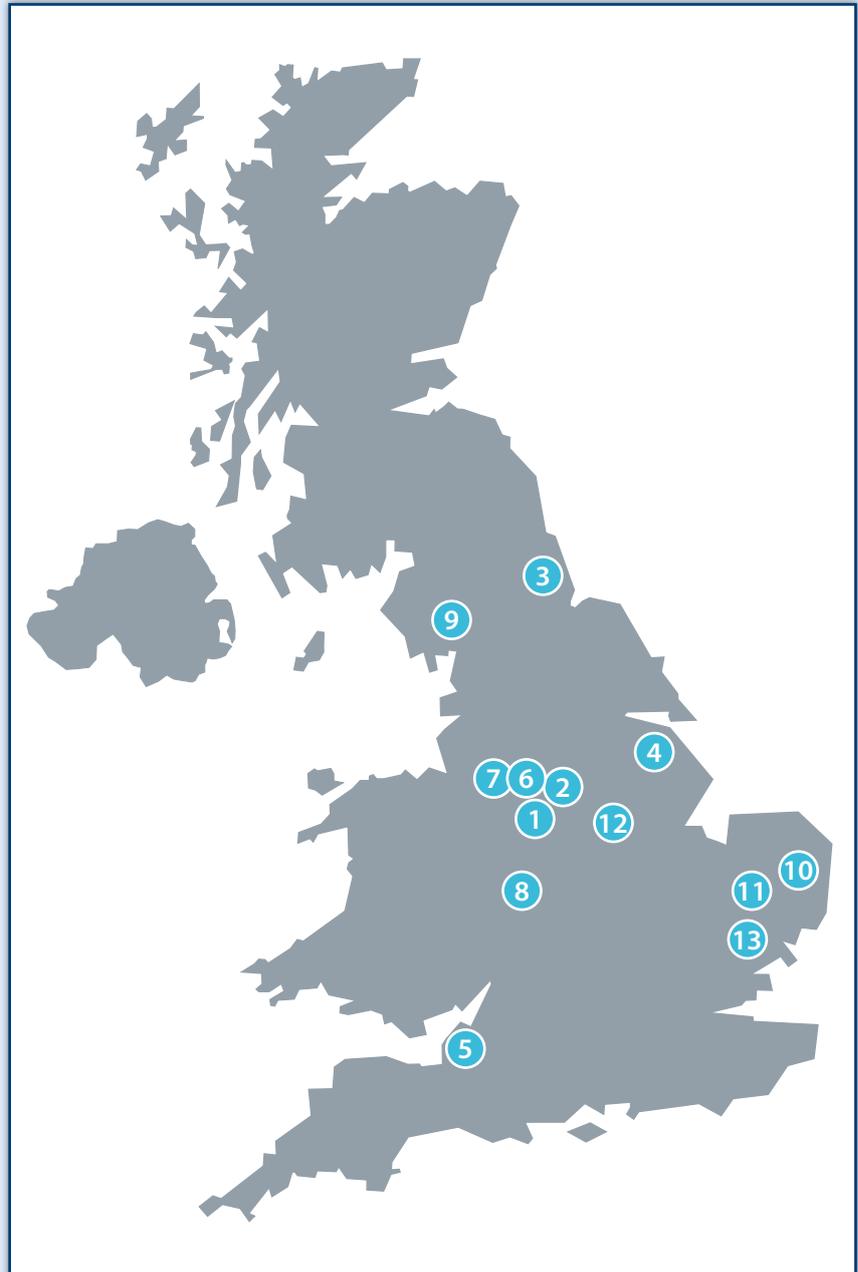
LIME PLANTS

BLA members

Factory/Site Owner	Location
	Buxton 1
	Whitwell 2
	Thrislington 3
www.lhoist.co.uk	
	Melton Ross 4
	Batts Combe 5
www.singletonbirch.co.uk	
	Tunstead 6
	Hindlow 7
www.tarmac.com/lime-and-powders	

BLA associate members

Factory/Site Owner	Location
	Birmingham 8
www.specialtyminerals.com	
	Shapfell 9
www.tatasteel.com	
	Cantly 10
	Wissington 11
	Newark 12
	Bury St Edmunds 13



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 37 Available: <http://eur-lex.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".