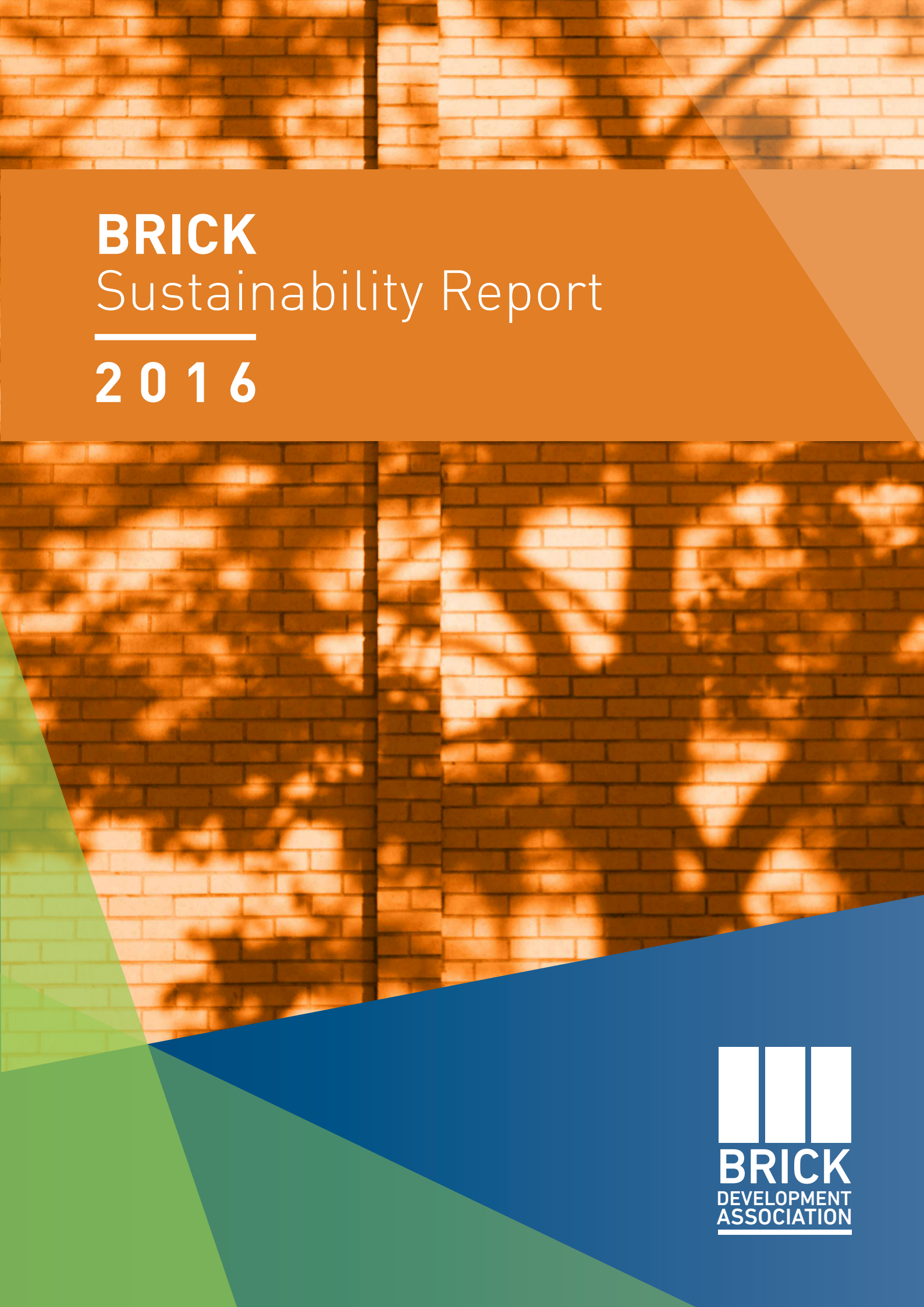


BRICK
Sustainability Report
2016

BRICK
DEVELOPMENT
ASSOCIATION

Chairman's Introduction

Welcome to the 2016 Brick Sustainability Report, which provides a detailed account of how the sector has performed against its collective sustainability strategy and demonstrates the progress we have made since the launch of our first sustainability report in 2001. We continue to report against the targets set through our collaborative Resource Efficiency Action Plan and have made significant progress particularly in the areas of waste and water consumption. The robustness of energy and carbon data contained in this report is much improved and we have restated our 2011 baseline for both.

One of the strengths of this report is that it covers a diverse range of activities, from the selection of alternative raw materials, approaches to resource efficiency and the circular economy, to biodiversity, its links to developing a natural capital strategy and health and safety measures that affect the wellbeing of our employees. Case studies supplement data where applicable.

The Sustainable Production Working Party's focus in 2017 will be on continuing to demonstrate that clay brick fulfils an important role in the circular economy, formulating water and waste strategy documents, as well as developing the message around our production process and how it can contribute to the natural capital agenda. A new Brick Development Association website due to launch in the second half of 2017 will also act as a platform to showcase our sustainability credentials in a relevant, accessible format.

Dave Manley, Chairman of the Sustainable Production Working Party.

Executive Summary

This Brick Sustainability Report provides an overview of the activities and progress made by Brick Development Association members, regarding sustainability. Companies that contribute to quoted statistics account for 95% of UK brick manufacturing capacity.

A collaborative effort to develop a clear understanding of the circular economy, and its applicability to the built environment, has led to the conclusion that clay bricks offer a salient example of product longevity and lifetime value.

The specific energy consumption (SEC) performance in 2014 was maintained in 2015 and is on track to meet the 2016 target. In 2015, 95% of UK capacity (association members) was covered by ISO 50001, which represents an annual increase of over 100%. Carbon emissions from direct fuels and indirect electricity consumption have remained relatively constant during this period, within the respective targets for 2016. Members are also considering longer-term objectives through the Decarbonisation and Energy Efficiency Roadmap Project, which looks ahead to 2050. The standard BES 6001: Responsible Sourcing of Construction Products, covers a majority of the sector's production capacity. The 2016 waste reduction target has been surpassed, with the long-term trend demonstrating a significant drop in the volume of waste generated per tonne of production. 2015 also saw the introduction of the sector's first collective Waste Policy.

The volume of mains water used in 2015 evidences a 5% reduction since 2014 and a 17% reduction against the 2011 baseline. The recently created Water Policy will soon be followed by a strategy and action plan.

In 2015, 99% of brick manufacturing plant production capacity was covered by a certified Environmental Management System and 96% covered by a Quality Management System. Furthermore, over 90% of companies stated that they have a health and safety management system in place. In fact, 90% of brick manufacturing employees are covered by the Ceramic Industry's pioneering Health and Safety Pledge. The targets for 2016 relating to the number of accidents, days of absence due to accidents, and number of injuries have all been met. This commitment to continual improvement is further demonstrated through collaborative efforts with the concrete sector in the shape of a joint **Resource Efficiency Action Plan (REAP)**.

The sector continues to take its role as a champion of a successful UK economy seriously, investing a further £42 million in plants and machinery during 2015, a 50% increase on 2014.

1.

Clay Brick and the Circular Economy

The concept of circular economy has gained considerable momentum, influencing business practices across a broad range of sectors and informing new policy. Organisations such as the Ellen MacArthur Foundation advocate for an accelerated transition to a circular economy in the UK and abroad, but in order to achieve meaningful progress on a global scale, it is incumbent on individual industries to adapt circular economy principles in a way that works effectively in context.

In the case of manufacturing it has become clear that one size does not 'fit all'. A significant proportion of the modelling work already undertaken has focused on high value, short service-life products such as white goods and other electronics. In contrast, UK manufactured bricks are highly durable, boast a long service-life and therefore represent a unique contribution to the circular economy of our built environment.

The sector has developed a model that identifies certain activities and design priorities suitable for application across the manufacturing and construction industries. Manufacturers of building components, such as brick, have most control over the implementation of circular economy principles at the point of manufacture. As the product makes its way through the supply chain, that influence diminishes and thereby necessitates the collaboration of multiple stakeholders. One of the ways in which this is achieved is through the Clay Bricks and Clay Blocks Resource Efficiency Action Plan (REAP) which acts as a platform on which to tackle future challenges.

The contribution of clay bricks and pavers

Clay bricks are made from abundant natural materials. If the correct considerations are made in the early stages of manufacture, design and construction, bricks can have a typical lifecycle of 150 years. The adaptability of brick means that it can be used on projects including extensions, internal configuration alterations and façade renovations, to meet the specific needs of multiple users. The durable nature of brick also allows brick buildings to stand the hard wear of multiple occupants over an extended period of time. Additionally, brick has low maintenance demands and offers resilience to the resulting factors of climate change.

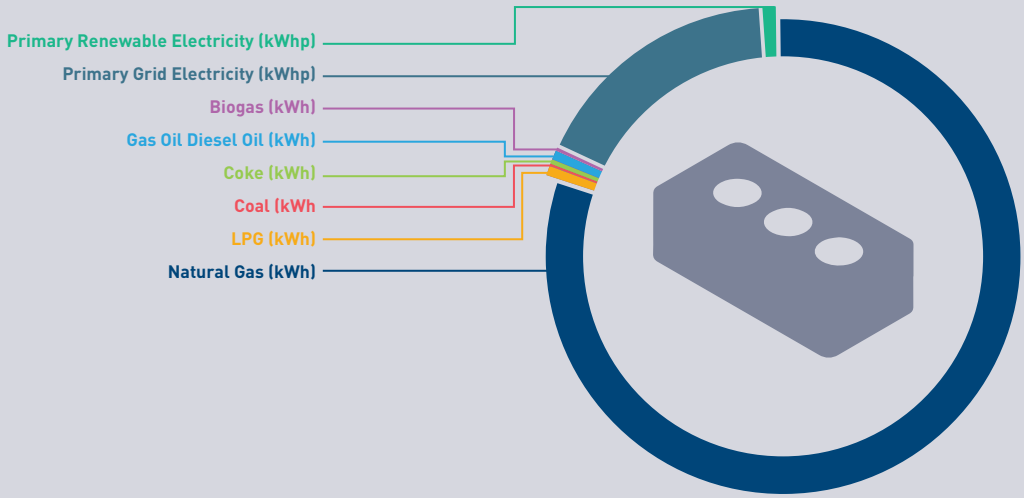
Essentially, the objective is to ensure that the full potential of resources is realised. It is no longer considered acceptable for products to be disposed of at the end of first use (commonly referred to as a 'linear economy'). With correct installation and adaptable building design, clay bricks and pavers can last for generations, re-used and recycled each time a particular configuration has served its purpose. For further information on this topic see the BDA Comment on the use of Reclaimed Bricks.

Through the Brick Development Association, the sector will continue to report on the actions and progress made in the challenge to create a circular economy.

2. Energy

Brick manufacturing requires the firing of products to around 1,000°C. Achieving such temperatures makes brick production an energy-intensive process. Energy efficiency is therefore, of high importance to our members and their business operations.

FUEL CONSUMPTION PROFILE OF UK BRICK PRODUCTION IN 2015



The sector is mindful of the environmental impact of different types of energy source, such as fossil fuels and renewables, and associated emissions. Members of the Brick Development Association continue to invest heavily in manufacturing plant and processes that maximise productivity and thereby increase levels of energy efficiency. Some members also participate in a UK Climate Change Agreement (CCA), which includes individual energy efficiency targets, alongside the requirements of EU and UK climate-related regulation. The membership continually seeks opportunities to further improve energy efficiency in an effort to reduce overall consumption at the manufacturing stage.

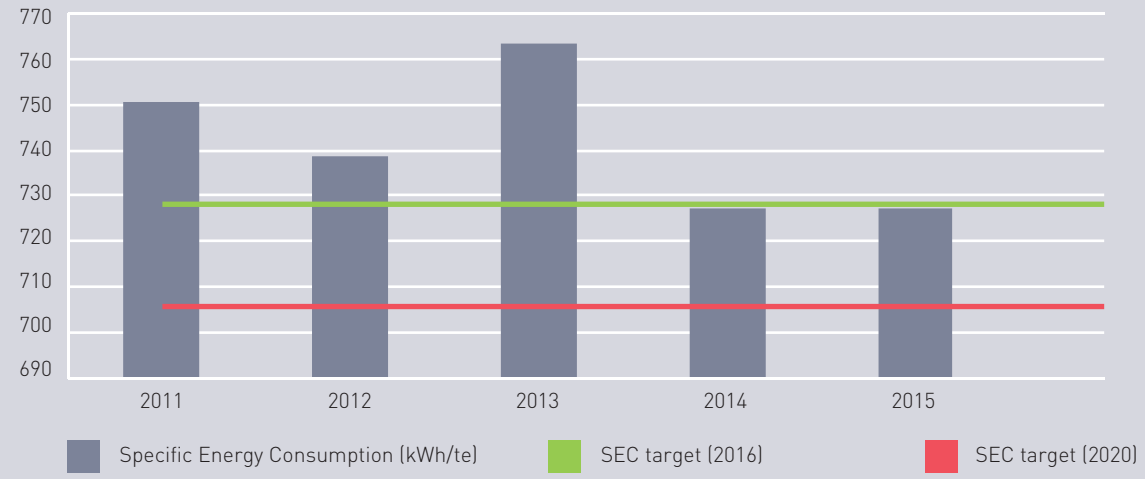
ACTION Energy

				Baseline	Result				Targets	
Sustainability Principal		Objective	Key Performance Indicator	2011 *	2012	2013	2014	2015	2016	2020
1a	Energy Efficiency	To reduce specific energy consumption per tonne of output	Specific energy consumption (KWh per fired per tonne of output) of direct fuels and metered electricity	751 KWh / tonne	738 KWh / tonne	763 KWh / tonne	727 KWh / tonne	727 KWh / tonne	**728 KWh / tonne**	**706 KWh / tonne**

NB: * The 2011 baseline has been re-assessed in 2016 following provision of more-comprehensive data for the sector.

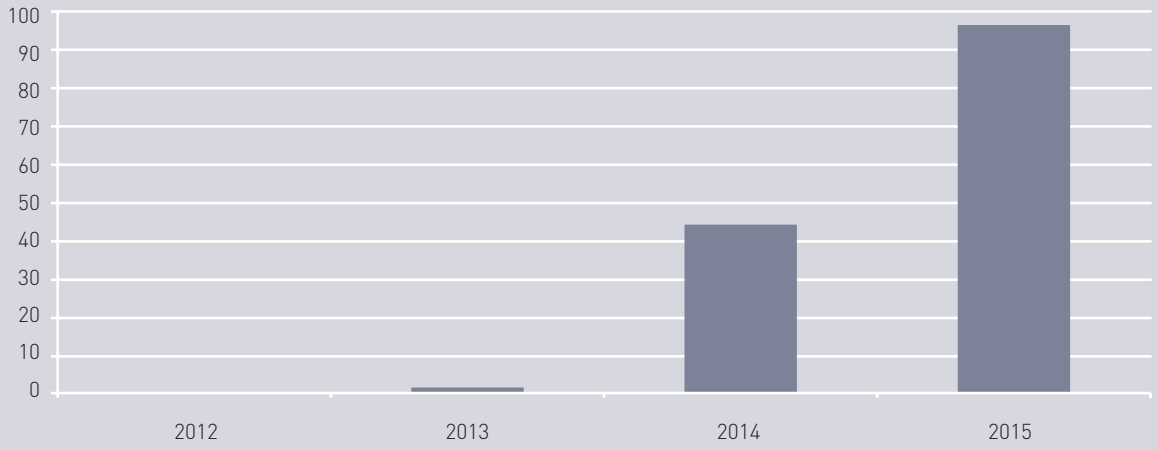
Production is one of the most significant influences on energy efficiency in the manufacturing process. A slight increase in total production from 2014 to 2015 ensured that specific energy consumption (SEC) has remained consistent and indicates strong progress towards the 2016 SEC target.

ACTION Energy: SPECIFIC ENERGY CONSUMPTION (2011 - 2015)



The brick manufacturing sector is mindful of the importance of energy management and is subject to the Energy Savings Opportunity Scheme (ESOS). ESOS requires large organisations (or corporate groups that include large organisations) to identify potential energy efficiency savings through an 'energy audit'. Implementation of the international energy management standard ISO 50001 is one route to achieving ESOS compliance. The framework this provides to effectively monitor, manage and potentially reduce energy consumption is complemented by further guidance, which extends beyond the minimum requirements of ESOS. 95% of UK brick manufacturing operated to ISO 50001 during 2015, over double the proportion that did so during 2014.

ACTION Energy: % OF BRICK PRODUCTION COVERED BY ISO 50001 ENERGY MANAGEMENT SYSTEM



The future →

Alongside the importance in a commercial sense, of energy efficiency in brick manufacturers' operations, improvements will continue to be driven by legislative change. The retention of CCAs until 2023 and the introduction of a new energy-efficiency reporting framework will both help to prioritise the matter. Although significant progress has been made towards achieving the 2016 SEC target, the interdependence between energy efficiency and productivity, means that for sustainable improvements, production levels must be maintained.

Case Study

Ibstock Brick Ltd - Power Factor Correction

A power factor represents the ratio of actual power in a circuit to the apparent values of current and voltage. Put simply, a power factor of less than 1 signifies that power is being expended without doing any useful work. Any measures to bring the power factor as close to 1 as possible will reduce additional costs on bills and increase efficiency of systems and processes. Ibstock Brick is the UK's largest manufacturer of clay building products and wanted to ensure the best possible performance regarding the power factor of its electrical systems.

In order to do this, Ibstock commenced a programme to ensure site power factor correction achieved the highest possible industry standards, to improve efficiency and reduce costs that result from a poor power factor. In one factory, power factor data had shown a slight improvement since 2009, but was still below the industry standard of 0.95. To achieve Ibstock's ambitions at this particular site, a significant percentage reduction in maximum demand kVA was essential. It was determined this could only be achieved through capacitor improvement.

The company instigated a project to make the desired improvements a reality. An old, inefficient compressor that was running at full capacity and struggling to cope with demand was replaced with new, more efficient equipment. Immediate benefits included automated control and a reduction in noise levels. In the longer-term, the project delivered a reduction in the amount of current drawn from the electricity supply of around 7.5%; carbon emissions reduced, as did stress on the electrical infrastructure, which gives more stable voltage requirements. The result is a payback period of less than two years. Crucially, the underlying power factor correction has led to an improvement over the typical industry standard, consistently achieved a power factor of 1.0 during the past 12 months.

Michael McGowan is Quality, Environmental & Energy Manager for Ibstock Brick: "As an energy-intensive industry brick manufacturers are naturally cost sensitive around energy. It's absolutely essential that as little electricity as possible is wasted by having a good power factor for our plant and electrical systems. Ibstock Brick is very proud of our power factor correction project, which has already shown some meaningful environmental benefits in terms of energy efficiency."

Case Study

Wienerberger - ISO 50001

To transform clay from the ground into a durable brick suitable for construction applications, the clay must undergo a chemical transformation that can only take place in temperatures exceeding a 1,000°C. This is an energy intensive process, so efficiency measures are always high on the agenda for brick manufacturers as well as their environmentally-conscious customers.

Wienerberger is a leading provider of wall, roof and landscaping innovations, with 14 production sites across the UK. With operations in 30 countries, Wienerberger is also the world's largest brick manufacturer. In 2015 the company decided to pursue ISO 50001 as a more effective route to ESOS compliance, however, the scheme has a much wider positive impact: supporting efforts to achieve ambitious energy efficiency and carbon dioxide emissions reduction targets and demonstrating the business' environmental credentials to stakeholders.

The energy management system standard ISO 50001 provides organisations with a framework to continually improve energy efficiency and integrate energy management into daily business operations. Within the framework are a range of objectives: developing an energy policy, setting objectives and targets, improving the quality of data collection and analysis, use of data for effective decision making, measuring results and holding regular reviews to encourage continual improvement.

Following an in depth review of energy procedures within the company and an investment in new energy teams and processes, Wienerberger's energy management system achieved ISO 50001 certification with assessment by an independent auditor. This was no small undertaking as the management system covers the manufacture and distribution of all UK manufactured products including bricks, pavers and roof tiles along with the associated office administrative and support functions.

Wienerberger's Energy Manager, Brian Cowley commented: "It is fantastic to have received certification to ISO 50001:2011 for all our operations within the UK. The certification demonstrates Wienerberger's commitment to continual improvement and is an important step toward achieving our 2020 energy efficiency and carbon emissions reduction targets."

3. Carbon

With the UK Government's requirements for a low carbon, sustainable construction sector, carbon emissions are naturally a key focus for members of the Brick Development Association. The majority of members' sites participate in the EU Emissions Trading Scheme (EU ETS) or UK Small Emitters Opt-Out Scheme. This requires an annual assessment and report on carbon emissions (externally verified in most cases), and for companies to purchase a sufficient number of emission allowances.

"Around 98% of the sector's carbon emissions from direct fuel consumption and process emissions are within the scope of EU ETS"

ACTION Carbon				Baseline	Results				Targets	
Sustainability Principal		**Objective**	**Key Performance Indicator**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2020**
				Direct fuels & indirect electricity consumption						
1b	Carbon Emissions in Production	To reduce carbon emissions generated during the manufacture of bricks	Carbon emissions per m^2 of brickwork	23.7 kg CO_2 / m^2	23.4 kg CO_2 / m^2	24.5 kg CO_2 / m^2	23.2 kg CO_2 / m^2	23. 2 kg CO_2 / m^2	**23.2* kg CO_2 / m^2** BRICKWORK	**22.5* kg CO_2 / m^2** BRICKWORK
				Process emissions						
				n/a	n/a	n/a	n/a	11.0 kg CO_2 / m^2	**n/a**	**10.89 kg CO_2 / m^2** BRICKWORK
1c	Renewable Energy	To monitor renewable energy use	The provision of information on the use of renewable energy by BDA members	n/a	Limited data available	Limited data available	Limited data available	Limited data available	**n/a**	**n/a**
1d	Transport	To collect information on transport utilisation by BDA members	The provision of relevant transport information	n/a	Limited data available	Limited data available	Limited data available	Limited data available	**n/a**	**n/a**

NB: - The 2011 baseline for direct fuels and indirect electricity consumption has been re-assessed following provision of more comprehensive data for the sector.

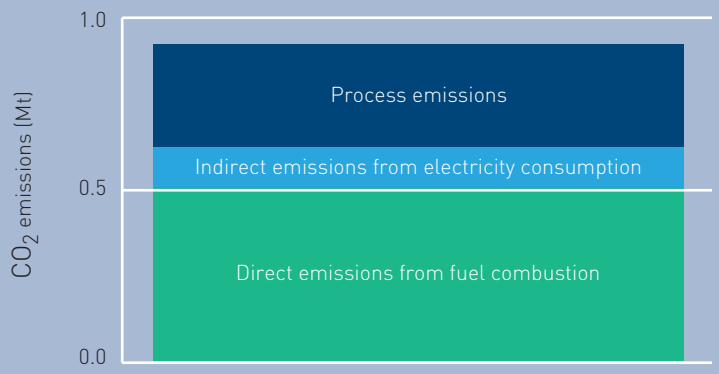
- An improved emissions data collection procedure is now in place, based on carbon emissions data from EU ETS verification reports (for installations in EU ETS) and estimated for non-ETS installations using CCA carbon emission factors / BCC process emissions methodology v17. A new 'process emission reporting' KPI has been established.
- Calculation of carbon emissions per m^2 is based on an assumed brick weight of 2.5kg and requirement of 60 bricks per m^2.

There are three distinct areas that give rise to carbon emissions within the brick production process:

- Emissions associated with direct fuels which are used on site e.g. gas or fuel oils
- Process emissions (direct) from the raw materials e.g. clays and absorbent media used in air abatement systems
- Indirect emissions e.g. through off-site electricity generation

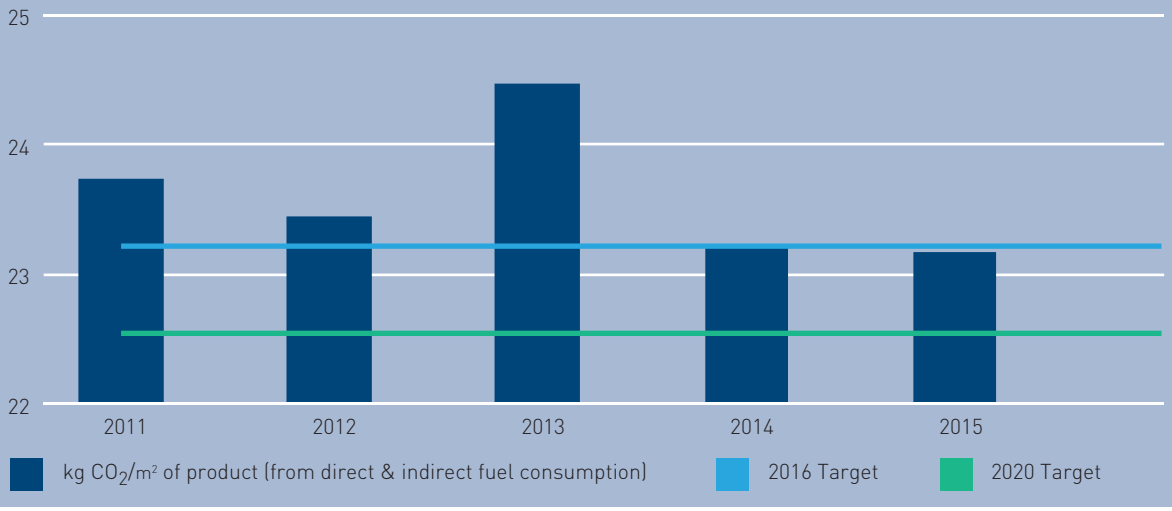
An improved data collection exercise was implemented in 2015 to more accurately delineate the carbon emissions associated with these respective components. This has allowed more appropriate individual KPIs to be established for carbon emissions from direct fuels and indirect electricity consumption (where the greatest potential carbon reduction can be achieved), and process emissions (which are currently technologically more difficult to abate, other than through substitution of raw materials).

TOTAL CO_2 EMISSIONS ($MtCO_2$) FROM THE BRICK MANUFACTURING SECTOR IN 2015



Carbon emissions from direct fuels and indirect electricity consumption remained relatively constant in 2014 and 2015, closely aligning with the respective carbon emissions reduction target for 2016 (a 2% reduction from the 2011 baseline).

ACTION Carbon: CO_2 EMISSIONS FROM DIRECT & INDIRECT FUEL CONSUMPTION



Process emissions from raw materials and abatement plant (see above) accounted for approximately one third of carbon emissions in 2015. The reduction of these emissions is limited by current technological capabilities and although raw material substitution, through the use of alternative clays or other materials can help, there are a number of practical considerations that affect their potential benefit. For example, most brick production plants are sited directly adjacent to clay quarrying operations in order to minimise transportation of raw materials, so if materials are substituted it is likely to lead to greater transport requirements, and consequently, potentially wider community and environmental impacts. Therefore, although the reduction of process emissions is a priority for manufacturers, consideration must be given to the 'bigger picture'. For further information, please see the Materials section of this report.

Carbon emissions from the distribution of products are also a matter that requires the attention of Brick Development Association members. Transport is an integral part of the brick supply chain and as such, members continually review transport planning (back hauling wherever possible), fleet maintenance and vehicle efficiency, to ensure resources are deployed most effectively. Due to the complexity of transport movements, it can be difficult to collect meaningful information on haulage-associated emissions. The absence of substantial reporting therefore does not reflect the level of engagement and action taking place across the membership to address this issue.

The future →

Climate change and emissions reduction remains a national, European and global focus. In addition to continued participation in EU ETS, Brick Development Association members (as part of the wider ceramic sector) have been involved in the **Decarbonisation and Energy Efficiency Roadmap project**, and are actively engaged with the production of Sector Action Plans, which look at emissions reductions to 2050. Transport data collected from members will be kept under review by the Association's Sustainable Production Working Party.

Case Study

Forterra - Weighbridges

Transport, including the shipping of goods, has a significant environmental impact. According to the Olso-based Center for International Climate and Environmental Research, the road transport subsector is among the biggest contributors to global warming due to its use of petroleum fuel and resulting emissions of carbon dioxide. It is therefore imperative that manufacturers ensure their logistical operations are as efficient as possible, minimising unnecessary journeys by making sure hauliers are carrying optimum loads. Forterra plc is the UK's second largest manufacturer of bricks, and operates from sites across most regions in England. The company wanted to improve its fleet optimisation with the ambition of reducing the carbon emitted through the transportation of its products to customers.

To do this, the company embarked on a project to install "dynamic drive-over weighbridges" at eight production sites. The measure was intended to improve efficiency by gathering accurate data on loads that could be used to better plan logistics. This would lead to improved load optimization and carbon emission reduction, simultaneously ensuring regulatory compliance on

vehicle weights. Forterra opted for a solution from Axtec that occupies less than two square metres and can weigh vehicles of any axle configuration and length, including maximum length drawbar trailers. When a laden truck arrives at the weighbridge the driver inputs the vehicle and trailer identity numbers. These are checked against a database and a ticket printed showing the axle weights and the legal limits for that vehicle. If they are exceeded, a warning is printed out enabling remedial action to be taken.

Crucially for emissions reduction, the system includes a fleet management programme which stores information on every truck and trailer in the fleet and captures data on the percentage utilisation of the payload for the 55,000 vehicles that are weighed each year. This allows the distribution team to analyse fleet utilisation and make efficiency improvements, such as optimising payloads or using different vehicle configurations.

Building products project engineer, Mark Hawes, explained the business and environmental value of the new weighbridge technology. "Improving fleet utilisation, especially with third party hauliers, will help to reduce our costs and support our sustainability targets to reduce CO_2 emissions per tonne of product delivered." Just a few months after the implementation of the new technology, efficiency improvements were already being achieved. The company estimate the scheme would result in a payback in a matter of months. "Axtec supplied and installed the units using their own engineers and showed considerable flexibility as each site had its own specific layout and operational requirements," said Hawes, "the fleet management programme has also been tailored to our requirements and is specific to our vehicles."

4. Materials

The principal material used for manufacturing bricks is clay. Members carefully plan the extraction of clay from quarries to ensure that as much material as possible is put to use and, once extraction is complete, sites are carefully restored to their original or enhanced condition (see Biodiversity).

There are opportunities to use Materials from Alternative, Recycled and Secondary Sources (MARSS) to manufacture bricks, however, the benefits of this approach must be carefully balanced against potential implications on product durability, performance specifications, and other logistical and environmental considerations:

- To ensure the durability of clay bricks in the UK, the products must satisfy a range of quality standards. For example, tests that measure a brick's ability to withstand the variance between microclimates and seasonal weather conditions. Every clay brick 'recipe' must be developed to meet these standards as well as particular customer specifications.
- Some MARSS materials can bring benefits to the manufacturing process, helping to reduce firing times, temperatures and carbon emissions, but the potential for products to be recycled or reused at the end of a building's life may be restricted.
- New production plants require significant capital investment, informed by long-term planning and investment cycles typically spanning around 40 years, and access to clay reserves is required for a similar timespan. The use of MARSS materials may lead to difficulties for established companies that have made strategic, long-term investment decisions on the location of manufacturing plant and quarries.
- Most clay brick manufacturing plants are located adjacent to the quarry from which the clay is extracted, minimising transport of raw materials. If MARSS materials are used they are likely to need to be transported over greater distances.
- The origin of extracted clay used for the manufacture of bricks can be clearly identified, but if MARSS materials are used their provenance can be less clear.

In summary, individual companies must make decisions relating to different materials based on their particular business strategy and context. Currently, an average of 9% of materials used in the manufacture of clay bricks can be classified as MARSS.

Performance

The majority of the sector's production capacity is covered by the standard BES 6001: Responsible Sourcing of Construction Products, which is used by companies to communicate effectively to stakeholders that all materials have been sourced responsibly. Members collate information on the use of MARSS materials and regularly research opportunities to increase their use.

ACTION Materials				Baseline	Results				Targets	
Sustainability Principal		**Objective**	**Key Performance Indicator**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2020**
5a	Responsible Sourcing	To maintain the high level of manufacturing capacity covered by BES 6001	The % of production capacity certified to the BES 6001 Responsible Sourcing standard	n/a	90%	90%	90%	88%	**90% of production capacity covered by BES 6001**	**90% of production capacity covered by BES 6001**
5b	Materials	To monitor the proportion of raw materials derived from sources other than clay extraction, in the manufacture of brick	The provision of information on the proportion of raw materials derived from sources other than clay extraction	n/a	~ 9%		n/a	~ 9%	**n/a**	**n/a**
5c	Environmental Product Declaration	To ensure that valid and current Environmental Product Declaration are maintained for BDA members' products	The provision of information on Environmental Product Declaration for BDA members' products	n/a	n/a	A BRE verified EPD for generic brick was published at the end of 2012	n/a	The EPD is to be reviewed in 2018	**n/a**	**n/a**

THE PROPORTION OF PRODUCTION COVERED BY BES 6001 IN 2015

BES 6001: Framework Standard for Responsible Sourcing.

The construction industry is a major consumer of resources and has an impact on the sustainability of the UK and the rest of the world. In 2008, BRE Global introduced a Framework Standard for Responsible Sourcing (BES 6001) along with an associated independent third-party certification scheme, to help organisations manage and reduce negative impact throughout the supply chain. This Standard provides manufacturers with a means by which their products can be independently assessed and certified as being responsibly sourced. The scheme is recognised by the BREEAM family of certification schemes where credits can be awarded for construction products that are independently certified through BES 6001.

The future →

The concept of natural capital has gained momentum recently and represents an opportunity for the sector to demonstrate how it can make a positive contribution to environmental improvement. An important point-to-note is that raw materials have an ongoing value, over and above that which they offer when first extracted. The extraction of clay as part of the brick manufacturing process may be viewed as an environmental 'cost'. However, its transformation into a finished product, which over its lifetime provides use for several generations, demonstrates impressive credentials for the responsible use of natural capital.

The sector recognises the importance of providing clear information about the environmental performance of its products. In 2018, we plan to review and update the existing generic brick EPD so that it reflects current performance.

Natural Capital

Natural capital is another term for the stock of renewable and non-renewable resources (e.g. plants, animals, air, water, soils, minerals) that combine to yield a myriad benefits to people. The benefits provided by natural capital include clean air, food, useable water, energy, shelter, medicine, and the raw materials used to create products. It also provides less obvious benefits such as flood defence, climate regulation, pollination and recreation. Natural capital is one of several commonly recognized forms of capital. Others include financial, manufactured, social and relationship, human, and intellectual capital. Natural capital supports all of the other capitals by providing essential resources that support a healthy planet, societal progress and prosperous economies. Referenced: http://naturalcapitalcoalition.org/natural-capital/

Case Study

MBH PLC

The team at MBH PLC's Michelmersh plant in Romsey, Hampshire, found an innovative way of recycling some of the site's waste raw materials through a collaborative project with three local schools. Holy Family Catholic School, Sinclair Primary & Nursery School and Bitterne Park Primary School held a joint Arts week that facilitated pupils' exploration of a wide variety of artistic techniques. The schools joined forces with MBH PLC to widen the experiential learning opportunity of experimenting with physical clay modelling skills.

Following an initial approach from teachers, the manufacturer made the most of an opportunity to provide potential craftsmen of the future with an enriching practical experience, by donating a tonne of clay. All pupils were offered the opportunity to handle clay in its raw form, building an understanding of its properties, purposes and provenance. Each child had access to a portion of clay with which, over the course of a week, they experimented with modelling ideas. The children were left with an appreciation of clay that MBH PLC hopes will translate into greater awareness of clay brick's merit as part of our built environment.

The project also tied in with the local history of brickmaking at Bursledon Victorian Brickworks. When the site was operational, employees would often pick out fossils by hand, reducing the risk of firing defects when the clay was heated in the kilns. This became a theme in much of the children's artwork with model dinosaurs, bones, eggs, and fossils. By the end of the week the children had created over 1000 tiles, fired at Bursledon Brickworks and returned to the schools. These formed a large clay frieze, now a permanent exhibition.

Matt Grace, one of the teachers behind the joint venture with MBH PLC explained: "Many children said that the clay modelling was the best part of the week. It has been really helpful to have access to this huge supply of clay; it was the foundation of the week's activities – large scale modelling – alongside pupil's exploration of the rest of the arts.

5. Waste

Within our sector, the volume of waste per tonne of production is very low.

This is the result of long-term investment by the industry in minimising the amount of waste it generates, and a conscious effort to ensure that any waste that is produced is handled responsibly.

Typical 'wastes' associated with brick production can include fired brick waste, paper, wood, cardboard, plastic, refractories, abatement plant residue, as well as obsolete plant and machinery. Wherever possible, these materials are re-used or recycled, for example, by crushing and re-using the waste again in the same process, or as raw material for other products. For some materials such as abatement waste, the only current option is disposal.

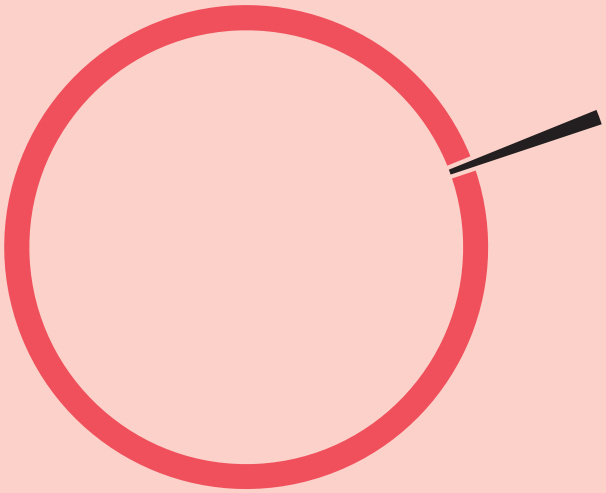
The industry realises that although a significant amount of work has taken place, there are still opportunities to further reduce the volume of waste generated and to minimise disposal to landfill. It is also recognised that further success in this area will lead to additional carbon and water saving benefits.

Performance

ACTION Waste			Baseline	Result				Targets	
Sustainability Principal	Objective	Key Performance Indicator	2011	2012	2013	2014	2015	2016	2020
4a Waste Minimisation	To reduce the quantity of waste per tonne of production disposed of to landfill by BDA members	Kilograms of waste sent to landfill (after recovery operations at waste transfer stations), per tonne of product manufactured	1.21 kg waste / tonne of production sent to landfill	0.79 kg / tonne	0.99 kg / tonne	1.12 kg / tonne	0.94 kg / tonne	**1.03 kg waste sent to landfill / tonne**	**0.48 kg waste sent to landfill / tonne**
4b Waste Minimisation	To monitor hazardous and non-hazardous waste generated by BDA members	The provision of information on the quantity of waste generated (kilograms), per tonne of production	n/a	**Hazardous waste generated per tonne of production**				**n/a**	**n/a**
				0.97 kg / tonne	0.26 kg / tonne	0.83kg / tonne	0.16 kg / tonne		
				Non-hazardous waste generated per tonne of production					
				10.12 kg / tonne	6.27 kg / tonne	6.71 kg / tonne	9.98 kg / tonne		
				Total waste generated per tonne of production					
				11.09 kg / tonne	6.53 kg / tonne	7.53 kg / tonne	10.14 kg / tonne		
4c Waste Strategy	To develop a waste strategy, produce case studies and encourage the sharing of best practice on waste reduction and management	Production of a waste strategy. Number of case studies developed	n/a	n/a	n/a	n/a	Development of Waste Policy	**To have developed a Waste Strategy**	**n/a**

Although the overall quantity of waste generated marginally increased in 2013 and 2014 (due to factory refurbishment projects), 2015 saw a reduction and the 2016 target has been surpassed. The long-term trend demonstrates a significant drop in the volume of waste generated per tonne of production:

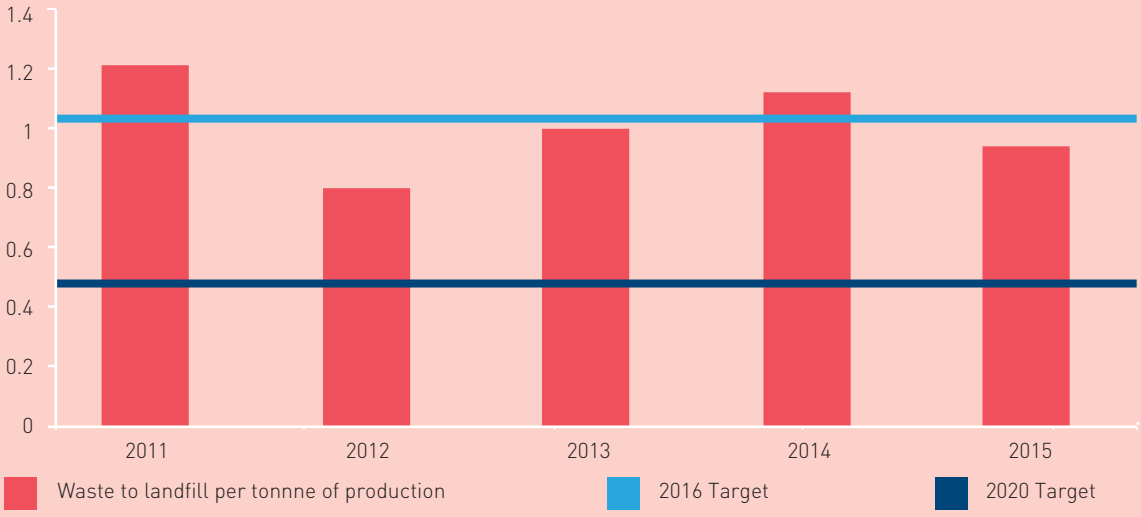
THE PROPORTION OF WASTE GENERATED PER TONNE OF BRICK PRODUCTION (2015)



In 2015, the overall quantity of waste disposed to landfill per tonne of product was around 1/3 of that in 2004.

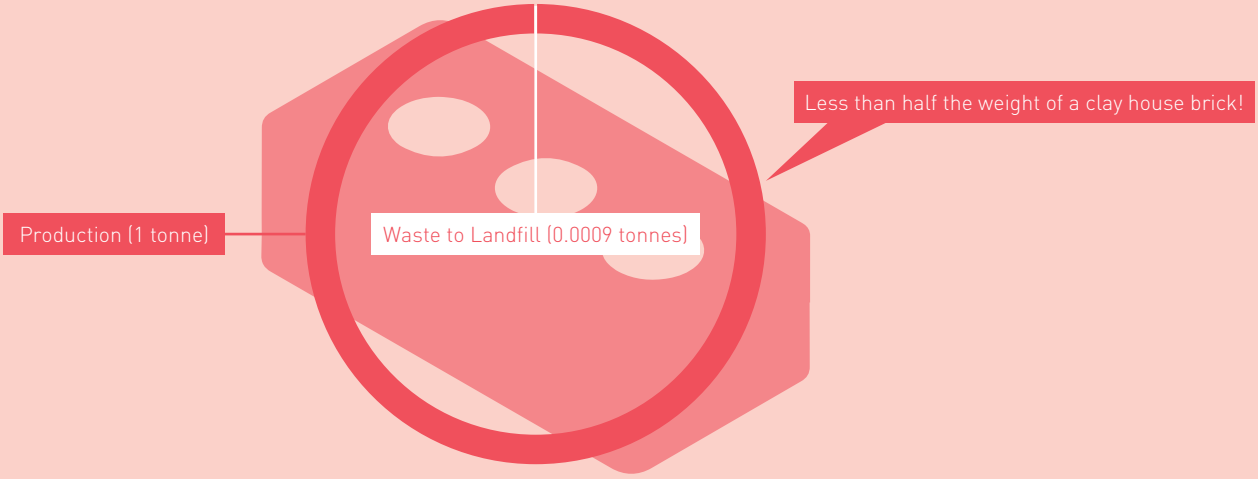
In 2015, the sector developed its first Waste Policy.

ACTION Waste: WASTE TO LANDFILL PER TONNE OF PRODUCTION (2011 - 2015)



Levels of hazardous waste (both relative to production and absolute) were lower in 2015 than in 2014. Conversely, there has been an increase in the amount of non-hazardous waste generated. An important point-to-note is that due to the small volumes of waste produced per tonne of production, any changes in the amount of waste generated can appear to be significant, when in fact they can be the result of a single factory refurbishment project. It is therefore likely that the waste trends here illustrated, relate to a number of ongoing on-site refurbishment projects or site maintenance cycles.

TONNES OF WASTE SENT TO LANDFILL PER TONNE OF BRICK PRODUCTION (2015)



For every house built (3 bedroom, semi-detached using 10,000 bricks), the manufacturing process generates the equivalent of 9 bricks of waste that is disposed of to landfill.

The future →

During 2015 the sector developed its first waste policy which focuses on the following themes: developing a better understanding of waste generation across the industry; minimising the amount of waste produced; establishing the contribution that the industry can make to the circular economy; ensuring that the sector is a good steward of the materials used; and where there are no further opportunities to minimise waste, working together with designers and contractors to reduce waste in the construction and demolition process to divert waste from landfill. Over the next 12 months, the sector will take this waste policy forward by developing a strategy.

6. Water

Water is essential to the brick manufacturing process and can be obtained from both mains and non-mains sources. As a limited, sensitive natural resource, water supply is coming under increasing pressure due to the impacts of climate change and population growth. It is therefore crucial that water resources are managed efficiently and responsibly, and that the brick manufacturing sector fulfils its role.

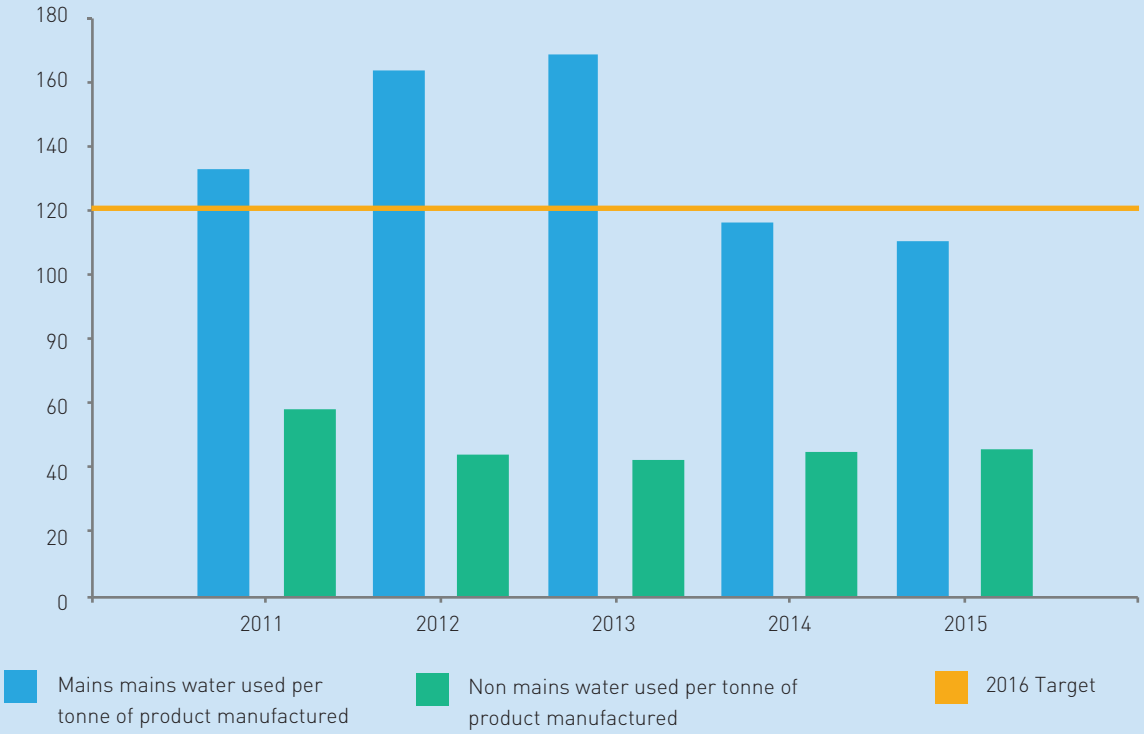
Mains water and water abstracted under licence, used in the clay extraction and brick manufacturing process, is monitored by brick manufacturers. In an effort to diversify their water sources, options including harvested water and water re-use are utilised. A key objective of manufacturers is to reduce reliance on potable water supplies.

ACTION Water			**Baseline**	**Result**				**Targets**	
Sustainability Principal	**Objective**	**Key Performance Indicator**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2020**
2a Water Efficiency	To reduce the use of mains water during the manufacturing process	Litres of mains water used per tonne of product manufactured	133 l (mains water) / tonne	163 l / tonne	168 l / tonne	117 l / tonne	111 l / tonne	120l (mains water) / tonne	n/a
2b Non Mains Water	To monitor use of non mains water	Litres of non mains water used per tonne of product manufactured	58 l / tonne (non mains water)	44 l / tonne	42 l / tonne	45l / tonne	45 l / tonne	n/a	n/a
2c Water Strategy	To develop a water strategy, produce case studies and encourage the sharing of best practice on water management, recycling, and rainwater harvesting	Production of a water strategy. Number of case studies developed	n/a	n/a	n/a	A water policy has been developed and work is being carried out to develop a strategy and actions	Production of a water strategy is temporarily on hold, pending ongoing changes to water abstraction regulations	To develop a water strategy for the industry, guidance notes on best practice, and at least three industry case studies on water management, recycling and rainwater harvesting	n/a
2d Rainwater Harvesting	To develop a rainwater harvesting assessment tool	Rainwater harvesting assessment tool	n/a	n/a	n/a	A rainwater harvesting assessment tool is available on the BDA website	n/a	n/a	n/a

The volume of mains water used per tonne of product manufactured in 2015 evidences a 5% reduction from 2014 performance and a 17% reduction against the 2011 baseline. The 2016 mains water consumption target was actually achieved in 2014 and this performance has since been maintained. The volume of non-mains water used per tonne of product manufactured has remained relatively constant since 2012 and a marginal increase from 2013 onwards.

The overall total (mains and non-mains) water used per tonne of product manufactured significantly reduced between 2013 and 2015 and continues at a level lower than that of the 2011 baseline. Although overall water consumption has decreased, the proportion of mains water used during 2015 represents a relative constant (~70%) since the 2011 baseline.

ACTION Water: MAINS & NON-MAINS SPECIFIC WATER CONSUMPTION (2011 - 2015)



The future →

The Brick Development Association is committed to the production of a water strategy. This will set out how our members will achieve the water policy aims: to improve understanding of the quantity of water consumed, its source and impact on local resources; to demonstrate the implementation of measures to reduce water consumption; to use available water sources in the most sustainable manner and maintain water quality. However, imminent changes to water abstraction regulations in the UK could affect water resource management in the sector, therefore the water strategy will need to take full account of these changes. This work will continue once there is greater clarity about the regulatory framework.

7.

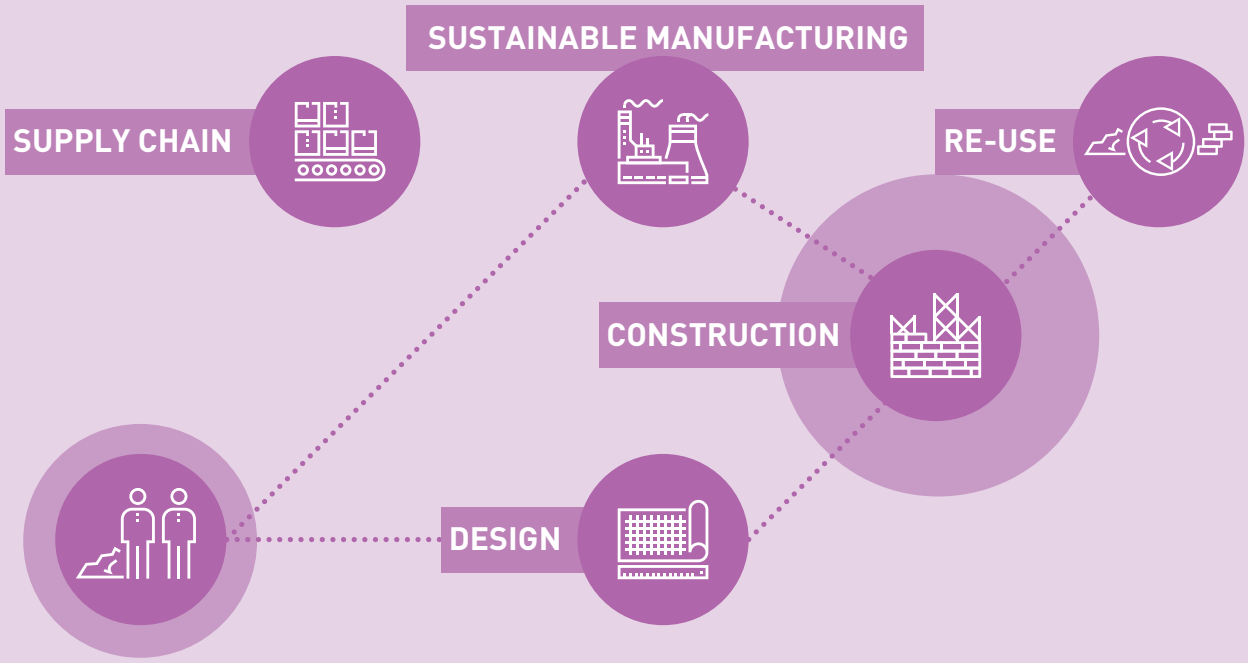
Continual improvement

Brick manufacturers recognise the need for continual improvement and constantly seek to identify ways to improve performance, whether this relates to processes of extraction or manufacturing, or indeed the performance of products throughout their lifecycle.

Many certified management systems have been adopted by Brick Development Association members, with a sharp increase recently in the number of certified ISO 50001 Energy Management Systems. This demonstrates the sector's commitment to improving energy management performance.

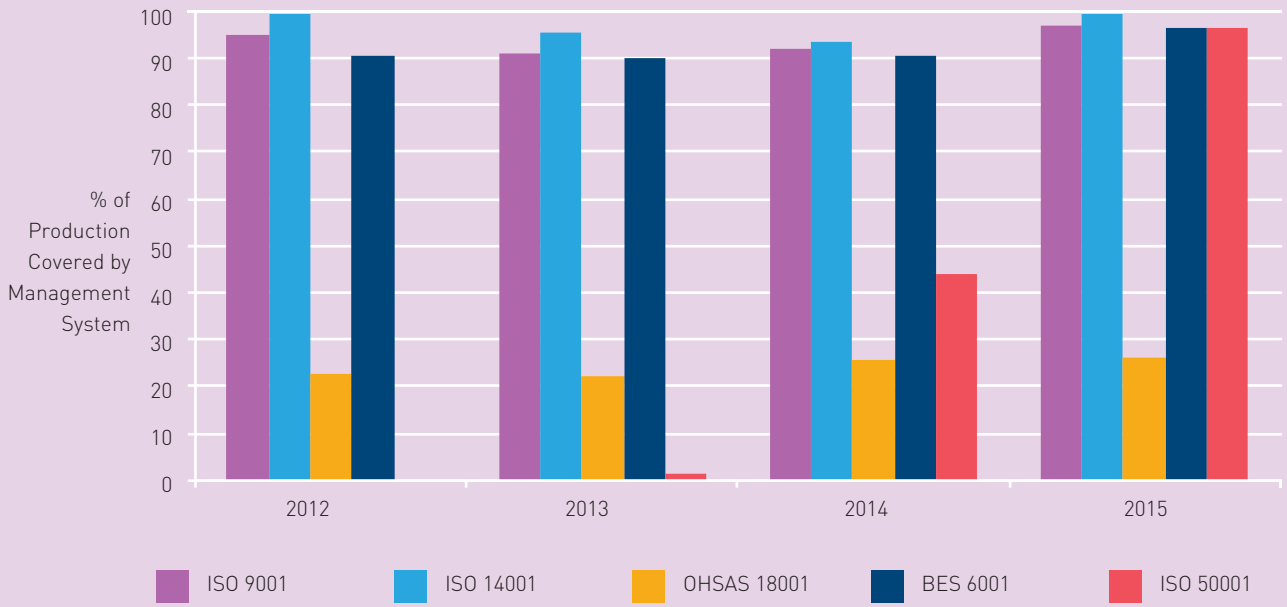
The sector continues to invest in new technology and systems that help to improve sustainability in the broadest sense, from energy and water efficiency, to waste minimisation and supporting the wellbeing of employees and other stakeholders. The case studies contained in this report provide examples of projects, which are designed to increase efficiency, improve biodiversity, create rainwater harvesting systems and execute carbon reduction measures, to name a few.

The brick manufacturing sector has also continued to collaborate with the concrete sector, in particular on resource efficiency work started in 2012. The Clay Bricks and Clay Blocks Resource Efficiency Action Plan (REAP) is one of a suite of 3 linked REAPs, which also includes the Ready Mix Concrete and Precast Concrete REAPs. The documents are focused on resource efficiency actions that could take place at various points in the manufacturing supply chain. Many of these actions have now been completed or are included in established work programmes, laying a strong foundation from which to work towards a circular economy. An animation explaining the work of the REAP and how it links to the circular economy can be accessed here.



ACTION Continual Improvement				Baseline	Result				Targets	
Sustainability Principal		Objective	Key Performance Indicator	2011	2012	2013	2014	2015	2016	2020
7a	Data Collection	For sustainability data to be representative of all BDA members	The % of BDA members that submit a sustainability data return	n/a	79%	100%	95%	90%	100% of BDA members to submit a sustainability data return	100% of BDA members to submit a sustainability data return
7b	Environmental Management	To maintain the high level of production capacity covered by a UKAS certified environmental management system	The % of production capacity covered by a UKAS certified environmental management system	n/a	99%	93%	93%	99%	95% of production capacity covered by a UKAS certified environmental management system	95% of production capacity covered by a UKAS certified environmental management system
7c	Quality Management	To monitor the % production capacity covered by a UKAS certified quality management system	The % of production capacity covered by a UKAS certified quality management system	n/a	95.1%	91%	92%	96%	n/a	n/a
7d	Investment	To monitor investment in plant and machinery by BDA members	The provision of information on total financial investment in plant and machinery	n/a	£22.5 million	£20 million	£28 million	£42 million	n/a	n/a

ACTION Wellbeing, Materials & Continual Improvement: MANAGEMENT SYSTEMS (2012 - 2015)



99%

of production capacity is covered by a certified Environmental Management System

96%

is covered by a Quality Management System

95%

is covered by the ISO 50001 Energy Management System.

Although there are relatively few members certified to 18001, the health and safety management systems that are in place are robust. Investment in new plant and equipment also increased in 2015 to around £42 million.

The future →

The Brick Development Association's membership will continue their drive for continual improvement at all stages of the manufacturing process. Members will continue to share best practice in order to further enhance collective sustainability performance. The Association's Sustainable Production Working Party will continue to provide a forum through which the exchange of ideas can turn into action and facilitate the sector's participation in the collaborative REAP projects.

Case Study

Forterra - 'In Touch'

Forterra PLC's Howley Park plant near Dewsbury, Yorkshire, makes around 40 million bricks per year and employs 60 people. Originally constructed in 1975 the plant is one of the older brick factories in operation in the UK. However, through a series of continuous improvement projects aimed at achieving 'smarter working', the site continues to hold its own against more modern facilities. One such venture was the implementation of a new process management system called InTouch.

Howley Park was an early adopter of process management software with the InTouch system's predecessor monitoring the site's extruder. Computerised process management replaced paper-monitoring systems by providing faster data analysis and production graphs, which make it easier to focus on problems early and address them. The aim of the new InTouch solution was to build on existing insights by monitoring more of the production process, specifically the factory's de-hacking machinery. "During the recession we knew that eventually construction would pick up and we'd need to increase production levels" remembers Plant Manager Ged Long. "I was firmly of the belief that we could improve our production capacity through efficiency, so we looked at our process management tools".

The objective of the project was to improve the runtime of equipment and hasten the speed at which bricks are produced without compromising quality; in other words, Overall Equipment Effectiveness (OEE). In addition to the obvious commercial benefits of greater productivity, OEE has a positive impact on sustainability, generating the same quantity of end product but requiring less energy, water, clay, and other resources. In view of this, the InTouch system was an important part of the plant gaining ISO 50001 accreditation and fits with the Howley Park team's whole operational approach.

The system works through a simple touchscreen unit at each workstation. If an extruder or de-hacker stops at any point, operatives enter the reason why through a multi-choice selection. One of the challenges to implementing the system correctly was making sure that the 'options' were suitable: specific enough to be able to pinpoint underlying issues, but not so detailed as to be cumbersome or counterintuitive for operatives. The information gathered, which includes data on the number of bricks produced per hour and headline OEE for each piece of monitored plant, is displayed as a simple dashboard on monitors in management offices, the operations room and even remotely through mobile computing.

"The information which InTouch provides is great," says Long, "but it is what you do with the information that is really important. The fact that we have the data to hand in the operations room, alongside KPIs and other operational information like standard operating procedures, means that during daily meetings we can identify almost in real-time our top problems and work out how to address the root causes quickly." A further benefit of the system is the facility to assimilate experienced operatives' tactics for solving the problems. Often members of staff instinctively understand the problem and corrective action, the InTouch data supplements this with corresponding business and environmental data.

At Howley Park, Forterra has increased production by nearly 20 percent without extending the working week. Improved OEE means that the environmental impact of that growth has been minimised, and an unanticipated benefit is improved staff morale. The dashboard displays in the operations room make visible for employees, the success of their trouble-shooting. This provides the production team with a sense of ownership. The company has now implemented InTouch in all of its UK brickmaking facilities. A success story of note.

8.
Biodiversity

Human activity often has a detrimental effect on the state of the planet. Businesses are increasingly put under the spotlight for real and perceived threats to biodiversity, be it through their use of resources such as fossil fuels and water, the physical footprint of operations and infrastructure, or the many substances emitted to land, air and sea.

All of these factors can impact biodiversity and so a concerted effort is made by responsible industries to operate in a way that minimises this impact and seek ways to make a positive contribution.

Due to the nature of brick manufacturing operations, the sector has an opportunity to support and enhance biodiversity through good site management and the sympathetic restoration of extraction sites. Due to the long term nature of clay quarries, individual areas of an extraction site are often restored successively, which means it is not unusual to find wildlife havens, rich in species as diverse as great crested newts, orchids and birds of prey (to name a few). There are many such sites in the UK, providing valuable natural capital and benefiting biodiversity. These sites also often work in partnership with conservation and wildlife organisations.

Performance

The regulation of planning permissions associated with mineral extraction, requires all sites to be restored once the minerals have been extracted. In 2015, the majority of extraction sites had a restoration plan, biodiversity plan, or geological diversity plan, with some sites having a combination of two or more. Forward planning of this nature helps to minimise any negative environmental impact and ensure that opportunities for positive outcomes for wildlife and biodiversity are used to maximum effect. Many sites also host open days, inviting the local community to visit quarries and learn more about how sensitive management can benefit local wildlife and biodiversity.

ACTION Biodiversity				Baseline	Result				Targets	
Sustainability Principal		Objective	Key Performance Indicator	2011	2012	2013	2014	2015	2016	2020
6a	Site Stewardship and Biodiversity	To provide information on site specific action plans that are in place at relevant sites	The provision of information on the % of relevant extraction sites that have site specific action plans	n/a	Sites with Action Plans 96%	 92%	Sites with Restoration Plans 77% Sites with Biodiversity Action Plans 17% Sites with Geological Diversity Plans 7% Additional information 4 sites have no formal plan in place, but sites to be restored as part of planning permission	 80% 11% 3% n/a	n/a	n/a

The future →

The brick manufacturing sector is committed to improving biodiversity and habitat creation through the sympathetic management and restoration of sites used for extraction, notably quarries. Capacity for the sector to contribute to the UK's stock of Natural Capital and associated opportunities is currently being assessed, and is a topic that will receive the attention of the Association's Sustainable Production Working Party going forward.

Case Study

As the UK's largest manufacturer of clay building products, Ibstock Brick Ltd, employs nearly 1400 people across 19 sites. In response to growing demand for bricks the company took a major investment decision to upscale its operations at the headquarter site in Ibstock, Leicestershire. It proposed building a new, ultra-efficient, additional brick factory that would increase the number of bricks produced each year on the site from around 90 million to 190 million. The new factory would be located on previously developed land and employ an additional 50 people. Planning permission was granted in late 2015 and construction is now underway.

As part of the project, Ibstock Brick wanted to provide the maximum possible environmental amenity while engaging with the local community. During the planning phase, the company launched a website designed to make project information easily accessible for local residents. A physical information leaflet was also delivered to houses in the immediate vicinity. The company

hosted an open exhibition, which provided a forum for neighbours to air concerns. Vitally, and in keeping with the ethos of the project, these concerns were taken on-board and appropriate modifications were made to the planning application before it was submitted. Moving into the construction phase, the website was maintained and now holds information about the project ready for the community to access.

Since planning consent was granted and construction began, Ibstock Brick has maintained its community engagement efforts. One scheme got local children from three nearby schools involved in the landscaping, designed to screen the expanded operation. Staff from the company visited the children to explain more about the project and show how tree planting would create attractive and biodiverse forested areas linking to existing woodland. A total of nearly 300 students at St Denys Church of England Infant School, Ibstock Junior School and Ibstock Community College, were then invited to help plant some of the 7000 trees being introduced onto the site in Spring 2016 under phase one of the landscaping plan. By the time the new factory is complete, 15000 new trees will have been planted.

Simon Ingram, Planning and Estates Manager at Ibstock Brick was clear about the multiple benefits of the company's approach to community engagement: "The outreach project was a success on numerous fronts. The screening undoubtedly improved the visual amenity of the development, a crucial consideration in the planning process. The planting of trees will improve the biodiversity and natural capital of the site and it was an excellent opportunity to engage with our local community".

As well as the inherent environmental value of the planting scheme and the social benefits of engaging with multiple generations of neighbouring residents, the project was also an undoubted public relations success. It generated positive coverage for the company in four local newspaper titles.

9. Wellbeing

Key to any company's success is its people and for success to be maintained, businesses must operate in a responsible manner with regard for the wellbeing of employees and other stakeholders in the community. This can be achieved in many ways, not least through good health and safety management, suitable investment in training, as well as the support of and participation in activities that benefit local communities.

In 2015, over 90% of companies stated that they had a health and safety management system in place, with 26% of overall production capacity covered by a certified health and safety management system.

Accident Rate = Total No. of Accidents / No. of Shop Floor Employees

Absence Rate = Total No. of Days Lost / No. of Shop Floor Employees

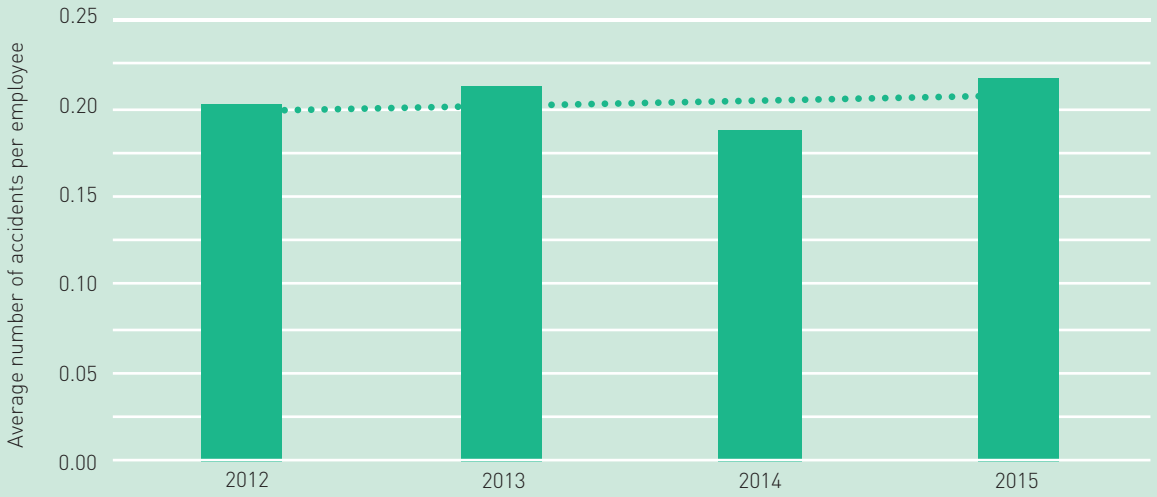
All injury rate = No. of Accidents Reportable Under RIDDOR / No. of Shop Floor Employees

The Ceramic Industry's pioneering Health and Safety Pledge was set up in 2001 and over 90% of employees in the brick manufacturing sector are covered by the pledge. Under the Pledge, signatories are asked to supply data on the total number of accidents, total number of days lost and number of accidents reportable under government regulations (RIDDOR), and this data is used to calculate industry-wide performance indicators.

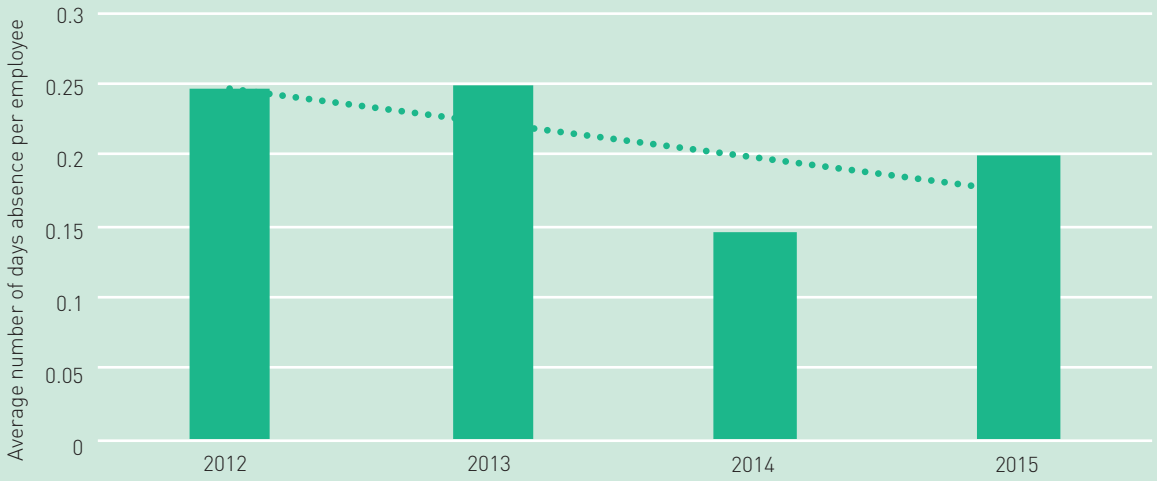
Since its establishment, the pledge has supported significant improvements in the health and safety of the brick manufacturing sector. This success is demonstrated by the fact that the number of accidents, days absence due to workplace accidents, and injuries per employee have all reduced since 2011. However, in the spirit of continual improvement the pledge will evolve and continue to seek the most effective ways to measure health and safety (see case study) and to provide a useful template for other industries.

ACTION Wellbeing			Baseline	Result				Targets	
Sustainability Principal	**Objective**	**Key Performance Indicator**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2020**
3a Health and Safety	To ensure successful implementation of the ceramic industry Pledge in BDA member companies	The % of employees covered by the ceramic industry Pledge (or recognised equivalent)	n/a	→ 90%	→ 90%	→ 90%	→90%	n/a	n/a
3b Health and Safety	To ensure the accident incidence rate of BDA members does not increase	The average number of accidents per employee	0.24	0.20	0.21	0.19	0.21	0.24 accidents / employee.	0.24 accidents / employee.
3c Health and Safety	To ensure the absence incidence rate of BDA members due to workplace accidents does not increase	The average number of days absence due to workplace accidents per employee	0.24	0.25	0.25	0.15	0.20	0.24 days absence due to workplace accidents / employee.	0.24 days absence due to workplace accidents / employee.
3d Health and Safety	To ensure the all injury incidence rate of BDA members does not increase	The average number of injuries per employee	0.009	0.010	0.008	0.007	0.007	0.009 injuries / employee	0.009 injuries / employee
3e Health and Safety	To monitor the % production capacity covered by a UKAS certified health and safety management system	The % of production capacity covered by a UKAS certified health and safety management system	n/a	22.5%	22.5%	26%	26%	n/a	n/a
3f Local Community	To provide information about community liaison activities that take place at relevant sites	The provision of information on the % of relevant sites that have community liaison activities	n/a	**% of sites with community liaison activities**				n/a	n/a
				34%	77.6%	92%	95%		
				% of sites with an active liaison committee					
				n/a	25%	25%	32%		
				% of sites with formal lines of communication in place					
				29.5%	9%	32%	31%		
				% of sites with informal lines of communication in place					
				59%	43%	59%	42%		
				Additional information					
				n/a	Some sites may have multiple community liaison activities in place.	Some sites may have multiple community liaison activities in place.	Some sites may have multiple community liaison activities in place.		

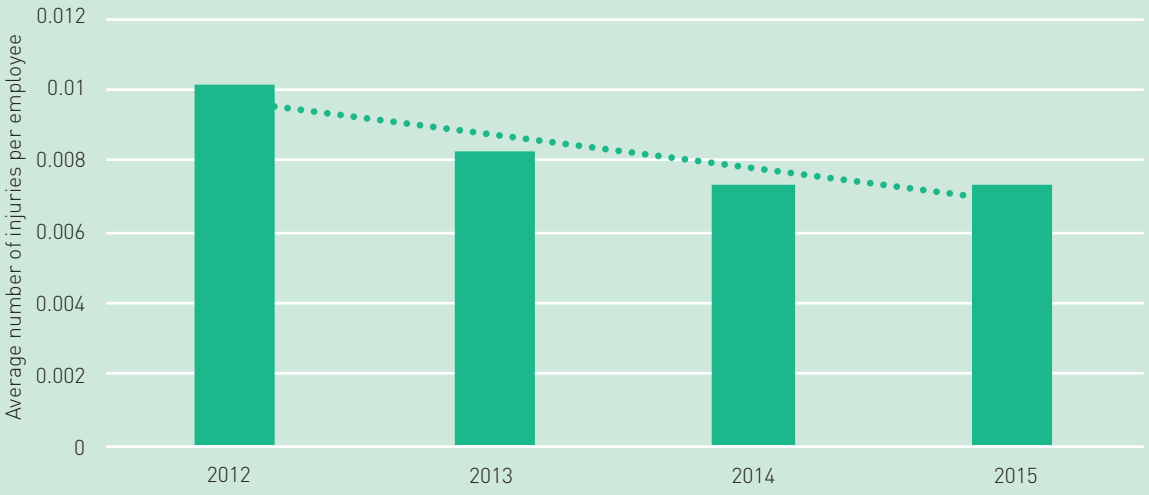
ACCIDENT RATE (HEAVY CLAY SECTOR)



ABSENCE RATE (HEAVY CLAY SECTOR)



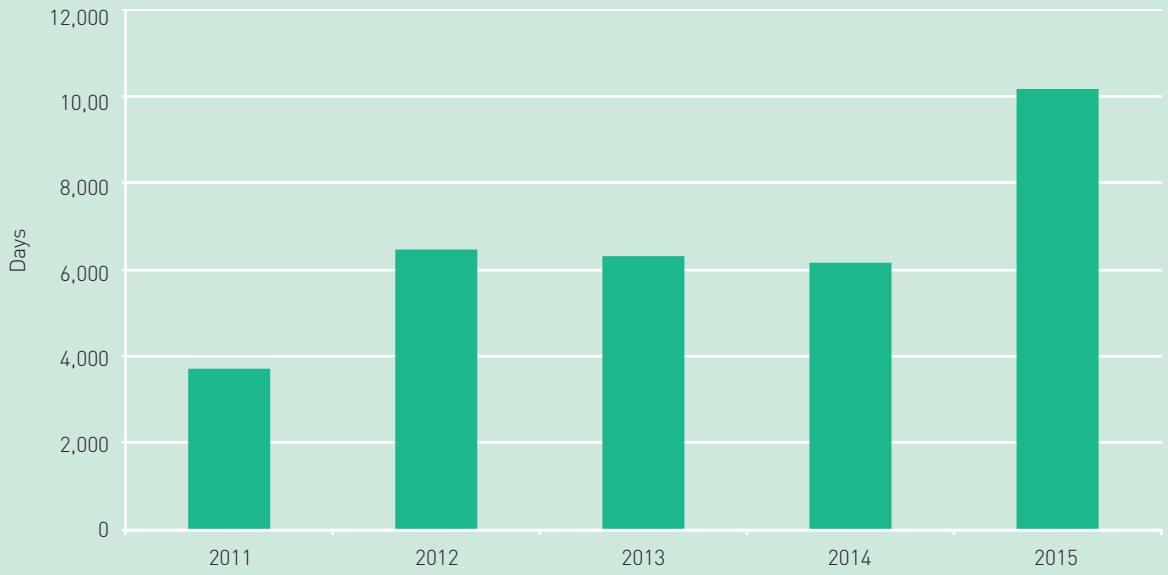
ALL INJURY RATE (HEAVY CLAY SECTOR)



In 2015 just over 10,000 days of training were carried out across member companies, demonstrating the sector's ongoing commitment to investing in staff. The industry also works in partnership with IOM3 to deliver a health and safety Continuing Professional Development scheme for Quarry Managers and Responsible Persons, set up especially to meet the needs of the clay quarry sector. Information on the number of apprenticeships was collected for the first time in 2015, indicating that there are currently 60 apprenticeships underway within the sector.

The Institute of Materials, Minerals and Mining

THE NUMBER OF TRAINING DAYS PROVIDED 2011 - 2015



Many activities that support the local community take place as part of businesses' everyday activities. During 2015, 57 of the Association's member sites hosted open days and educational field visits for schools, colleges and universities, with an additional 14 sites also hosting tours for special interest groups such as local history societies. These activities have provided a wonderful opportunity for participants to learn more about the operations at clay quarries and brick manufacturing plants, with one company alone welcoming over 4,000 visitors. 18 sites also sponsor community groups, for example the local junior football team, and 17 give donations to charity. These activities demonstrate the importance members place on their local community.

The future →

The next phase of the Health and Safety Pledge (Pledge Phase 4) will begin in 2017 and is closely aligned with the HSE's Strategy, with priority work areas including health, the sharing of good practice, and providing additional support to companies, particularly SMEs, to make improvements. For further information, see the case study below.

Investment in staff at all levels will continue, including through apprenticeships and steps to promote the sector as a positive career choice.

Members will continue efforts to reach out to and support local communities, and to provide opportunities for individuals and groups to visit and learn more about the operation of clay quarries and brick manufacturing plants. The Brick Development Association's Sustainable Production Working Party will continue to report on progress of the sector's external stakeholder activity, to ensure the transparency and integrity of operations.

Case Study

The Ceramic Sector Health and Safety Pledge

In 2000 the Government published a Strategy Statement entitled 'Revitalising Health and Safety'. This statement was significant for a number of reasons. Most notably, it introduced health and safety targets, provided some relevant direction 25 years after the enactment of The Health and Safety at Work Act 1974, and it effectively required sectors to work collectively to meet the challenge. In response, the British Ceramic Confederation (BCC) worked with the support of the Health and Safety Executive (HSE), trade unions and wider industry to establish the Ceramic Industry Health and Safety Pledge.

This now established industry programme consists of a number of initiatives that are designed to reduce the incidence of work-related injury and ill-health within the ceramics sector, which includes the following sub sectors: bricks, clay roof tiles, clay pipes and land drains, domestic and commercial tableware and giftware, sanitaryware, wall and floor tiles, industrial ceramics, refractories, and sector material suppliers. Activities include:

- Collation of annual accident statistics to monitor performance and allow benchmarking;
- Annual Pledge Conference and Awards to celebrate good health and safety performance;
- The implementation of specialist working parties to develop sector specific toolkits and guidance e.g. on health surveillance and the safe operation of kilns;
- Annual 'Directors Day' to raise awareness about health and safety matters;
- Annual quarry management CPD seminar;
- Sharing of best practice among members.

Phases 1 and 2 of the Pledge focused on achieving quantitative targets to improve health and safety performance. Phase 3 is ongoing and the focus is on the maintenance and further improvement of performance, particularly in those companies that may require further support. Pledge Phase 4 will start in 2017 and will build on Phases 1-3. It is aligned with the HSE's 2016 Strategy 'Helping Great Britain Work Well' and sets out the steps that will be taken to 2021 to further improve health and safety performance in the ceramics sector. The 6 key themes of the HSEs' Strategy are:

- Acting Together. Promoting ownership of H&S in Britain;
- Tackling Ill Health. Tackling and highlighting the costs of work related ill health;
- Managing Risk Well. Simplifying risk management and helping business to grow;
- Supporting Small Employers. Giving SMEs simple advice so they know what they must do;
- Keeping Pace with Change. Anticipating and tackling new health and safety challenges;
- Sharing our Success. Promoting the benefits of Britain's world class health and safety system.

For further information about the Pledge, see www.ceramfed.co.uk

Members of the Brick Development Association

Carlton Brick Ltd www.carltonbrick.co.uk
Coleford Brick & Tile Ltd www.colefordbrick.co.uk
Bulmer Brick & Tile Co Ltd www.bulmerbrickandtile.co.uk
Furness Brick & Tile Co Ltd www.furnessbrick.com
Forterra Building Products Ltd www.forterra.co.uk
H.G. Matthews www.hgmatthews.com
Ibstock Brick Ltd www.ibstock.co.uk
Ketley Brick Company Ltd www.ketley-brick.co.uk
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Michelmersh Brick Holdings Plc www.mbhplc.co.uk
Northcot Brick Ltd www.northcotbrick.co.uk
Raeburn Brick www.raeburnbrick.co.uk
W H Collier Ltd www.whcollier.co.uk
Wienerberger Ltd www.wienerberger.co.uk
York Handmade Brick Company Ltd www.yorkhandmade.co.uk

Copies of this document can be viewed on and downloaded from the Brick Development Association website.

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