SUMMARY OF PERFORMANCE

INTRODUCTION

Following the launch of the MPA Charter in 2017, MPA Cement’s Sustainable Development Report is aligned with the seven MPA strategic priorities. In particular, this report highlights the positive contribution the cement industry made in 2018 on Communicating Industry Value, Health and Safety, People, Resource Use, Climate Change and Energy, the Natural Environment and the Built Environment.

**MPA Vision** 'to be valued as an essential and economically, socially and environmentally sustainable industry of significance to the economy and our way of life.'

**MPA’s 7 Strategic Priorities**

- **Health & Safety**
- **People**
- **Resource Use**
- **Climate Change & Energy**
- **Natural Environment**
- **Built Environment**
- **Communicating Industry Value**
Cement is a great British invention and an essential material for a modern society.

In 1824, British inventor Joseph Aspdin patented the production of 'Portland Cement' as a building material which resembled 'Portland stone'. Modern cement is a great invention that has been critical to our ability to provide water supply and sewerage systems, transport systems, energy supply, housing and other buildings and infrastructure for the 20th and 21st centuries.

Today, the cement industry is a vital component of the concrete supply chain. The five companies manufacturing cement in the UK, Aggregate Industries (operating as Lafarge Cement), Breedon Cement, CEMEX, Hanson, and Tarmac, together supplied 78% of the cement consumed in the UK in 2018.

Domestic cement production provides skilled jobs and training opportunities across the UK.

The industry is committed to the highest standards of health and safety for employees, contractors, neighbours and customers.

The annual Kiln Shutdown Maintenance guide underwent a major review following industry consultation and a re-examination of historical incidents/near misses. Hazards were defined along with control measures and examples of good practice within the industry. Confined Spaces, Isolation Procedures, Lifts & Lifting, Falls from Height, Falling Materials and Wrong Person/Wrong Place were a particular focus. The remote wrecking robot used by CEMEX was widely promoted across the industry as a solution that removed people from risk.

A Customer Site Safety Working Group was formed in response to a number of silo over-pressurisation incidents that occurred at customer sites. Customer Site Assessments have been updated and Driver’s Safety Cards have been produced.
The UK Cement industry’s use of alternative waste derived fuels and raw materials is a great example of the circular economy.

The cement production process has a unique capability to recycle minerals and recover heat simultaneously (known as co-processing). Cement producers take low/zero value waste material from other sectors of the economy and turn it into an essential and strategic material, cement. In 2018, 1.4 million tonnes of waste and by-products from other industries were co-processed in cement production. This resulted in a recycled content of cement of almost 10%.

![Recycled Content of Cement](image)

Figure 2: The proportion of recycled content in UK produced cement from kiln dust (KD) recovered on site, fuel ash recycled as mineral content, alternative raw materials (ARM) that are ground with clinker to produce cement and ARM fed to the kiln (kiln feed).

![Percentage of kiln thermal input](image)

Figure 3: Waste derived fuel use in 1998 (base year) and from 2005-2018

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1 Portland cement equivalent (PCe) is a normalising factor related to cement output, which enables a comparison of impacts, such as environmental impacts, between sites whilst taking into consideration differing production methods, cement product types and movement of intermediate products.
Climate Change and Energy

The UK cement industry is committed to innovative sustainable and efficient production.

The UK cement industry has been successful in improving its carbon footprint by increasing energy efficiency, using alternative fuels instead of traditional fossil fuels, and utilising renewable energy sources. Further decarbonisation will be challenging and will require innovations such as Carbon Capture and Utilisation/Storage.

In 2018, direct emissions of CO₂ per tonne PCe from the UK cement industry were 25% lower than in 1998. Waste derived fuels made up 43% of the thermal input with waste biomass fuels composing 17% of the thermal input to the cement manufacturing process.

Looking ahead, from 2019 MPA is leading a project looking at innovative ways to fuel switch to a near net zero fossil fuel CO₂ cement manufacturing process.

Figure 4: Reduction in direct emissions of CO₂ in 1998 (base year) and 2010-2018

Natural Environment

Through continuous investment, rationalisation and innovation, the UK cement industry has negligible impact on air quality.

In 2018, MPA actively engaged with Defra on development of its Clean Air Strategy for England and the UK-wide National Air Pollution Control Programme. The cement industry has already invested heavily in cleaner processes and made considerable progress in reducing its impact on the natural environment. Emissions of Oxides of Nitrogen (NOx), Particulate Matter (PM) and Sulphur Dioxide (SO₂) per tonne PCe were 68%, 87% and 84% lower than in 1998 respectively.

Figure 5: Emissions of NOx, PM and SO₂ in 1998 (base year) and from 2005 to 2018 - since 2008, emissions have been at a steady low rate with only very minor fluctuations since 2009
Cement is a sustainable material that has unique properties throughout its life cycle.

The main use of cement is in concrete. Concrete is...

- An essential material for our homes, buildings and infrastructure
- Sustainable, local and responsibly sourced
- Safe and protects people and properties against fire and other threats
- Tackling climate change and key to a net zero carbon economy
- Innovating to meet the future needs of society
- Enabling great design that enhances our quality of life

The unique properties of cement and concrete make it a sustainable construction material which also keeps us safe and comfortable in our homes.

WHAT MAKES CONCRETE THE IDEAL BUILDING MATERIAL?

- **Responsibly sourced:** locally available, abundant
- **Affordable:** low cost and easy to use
- **Resilient:** resists flood, fire, rot and pests
- **Long lasting:** durable, low maintenance
- **Versatile:** can be poured, placed or stacked onsite or offsite for use in buildings and infrastructure
- **Energy efficient:** resists steep fluctuations in heat/cool cycle
- **Safe:** high strength, healthy buildings, comfortable, acoustic isolation, fire safe
- **Environmental:** 100% recyclable, high recycle rate, low carbon, absorbs CO₂
### RESOURCE USE

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<tbody>
<tr>
<td>Total waste and by-products used as fuel and raw materials</td>
<td>tonnes</td>
<td>446,511</td>
<td>1,528,315</td>
<td>2,481,106</td>
<td>1,811,200</td>
<td>1,452,553</td>
<td>1,612,584</td>
<td>1,619,766</td>
<td>1,454,354</td>
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<td>Proportion of raw material comprising waste</td>
<td>%</td>
<td>4.0</td>
<td>7.2</td>
<td>7.6</td>
<td>7.6</td>
<td>7.0</td>
<td>7.7</td>
<td>7.4</td>
<td>5.9</td>
<td>6.9</td>
<td>5.8</td>
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<tr>
<td>Proportion of fuel comprising waste material</td>
<td>%</td>
<td>5.7</td>
<td>38.2</td>
<td>39.7</td>
<td>40.4</td>
<td>44.0</td>
<td>43.0</td>
<td>41.6</td>
<td>39.2</td>
<td>43.8</td>
<td>43.2</td>
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<td>Biomass fraction of fuel input (100% and part biomass fuels)</td>
<td>%</td>
<td>Not available</td>
<td>16.7</td>
<td>16.8</td>
<td>17.2</td>
<td>18.9</td>
<td>19.9</td>
<td>18.5</td>
<td>16.7</td>
<td>18.3</td>
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<td>Process waste recovered on-site</td>
<td>tonnes</td>
<td>Not available</td>
<td>11,379</td>
<td>9,195</td>
<td>2,819</td>
<td>10,390</td>
<td>1,513</td>
<td>11,009</td>
<td>4,086</td>
<td>2,270</td>
<td>1,401</td>
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<td>Process waste recovered off site</td>
<td>tonnes</td>
<td>0</td>
<td>36,945</td>
<td>47,796</td>
<td>57,471</td>
<td>47,238</td>
<td>33,988</td>
<td>35,103</td>
<td>49,238</td>
<td>43,273</td>
<td>41,186</td>
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<td>Process waste sent to landfill</td>
<td>tonnes</td>
<td>289,207</td>
<td>14,021</td>
<td>4,631</td>
<td>0</td>
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### CLIMATE CHANGE AND ENERGY

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<tr>
<td>CO₂ emissions from calcination (process emissions)</td>
<td>kgCO₂/tpCe</td>
<td>520</td>
<td>471</td>
<td>468</td>
<td>459</td>
<td>468</td>
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<td>476</td>
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<td>CO₂ emissions from combustion of fossil fuels</td>
<td>kgCO₂/tpCe</td>
<td>387</td>
<td>187</td>
<td>177</td>
<td>169</td>
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<tr>
<td>Indirect CO₂ emissions from electricity use</td>
<td>kgCO₂/tpCe</td>
<td>Not available</td>
<td>55</td>
<td>61</td>
<td>56</td>
<td>44</td>
<td>58</td>
<td>57</td>
<td>48</td>
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### NATURAL ENVIRONMENT

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<tbody>
<tr>
<td>Emissions of NOx</td>
<td>kg NOx/tpCe</td>
<td>3.34</td>
<td>1.35</td>
<td>1.31</td>
<td>1.31</td>
<td>1.25</td>
<td>1.27</td>
<td>1.04</td>
<td>1.12</td>
<td>1.03</td>
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<td>Emissions of PM</td>
<td>kg PM/tpCe</td>
<td>0</td>
<td>0.06</td>
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<tr>
<td>Emissions of SO₂</td>
<td>kg SO₂/tpCe</td>
<td>2.56</td>
<td>0.33</td>
<td>0.40</td>
<td>0.48</td>
<td>0.48</td>
<td>0.41</td>
<td>0.31</td>
<td>0.45</td>
<td>0.38</td>
<td>0.42</td>
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<td>Mains water use</td>
<td>m³/tpCe</td>
<td>Not available</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.04</td>
<td>0.04</td>
<td>0.03</td>
<td>0.03</td>
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<tr>
<td>Licensed abstraction</td>
<td>m³/tpCe</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>0.04</td>
<td>0.04</td>
<td>0.05</td>
<td>0.07</td>
<td>0.10</td>
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This report has been titled as 2019 to follow the general MPA nomenclature to use the year of data collection rather than the year of performance.

*Imerys are members of MPA but data from their operations has not been included in this report because they produce calcium aluminate cements rather than Portland cement.