The mineral products industry at a glance - key facts 2014 Edition

This review aims at providing a valuable source of information, documenting the changing patterns in the way we produce and consume our minerals and mineral products. It provides an analysis of the latest data for each product, and highlights important trends. Good data is essential if we are to assess and manage the challenges and the opportunities that the industry and our stakeholders face.

I very much hope that you find this issue interesting. We will welcome feedback and ideas about ways in which we can continue to improve this review.

Nigel Jackson
Chief Executive
Mineral Products Association

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MPA Agenda
- Economic conditions that support investment
- Better Government support for an essential industry
- A reasonable “licence to operate”
- Proportionate legislation and regulation
- Recognition of progress
1 At a glance

250mt Annual production
£9bn Annual industry turnover
£400bn Turnover of industries we supply
£120bn Value of construction, our main customer
70,000 People employed in our Industry
2.5m Jobs supported through our supply chain

Construction uses (GB, 2013)

<table>
<thead>
<tr>
<th>Aggregates</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>of which:</td>
<td></td>
</tr>
<tr>
<td>Crushed Rock</td>
<td>200m tonnes</td>
</tr>
<tr>
<td>Sand &amp; Gravel</td>
<td>90m tonnes</td>
</tr>
<tr>
<td>Land won</td>
<td>54m tonnes</td>
</tr>
<tr>
<td>Marine</td>
<td>44m tonnes</td>
</tr>
<tr>
<td>Recycled</td>
<td>10m tonnes</td>
</tr>
<tr>
<td>Recycled</td>
<td>56m tonnes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cementitious</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>of which:</td>
<td></td>
</tr>
<tr>
<td>Cement</td>
<td>12m tonnes</td>
</tr>
<tr>
<td>Other cementitious materials</td>
<td>10m tonnes</td>
</tr>
<tr>
<td>Other cementitious materials</td>
<td>2m tonnes</td>
</tr>
</tbody>
</table>

| Ready-Mixed Concrete        | 15m cubic metres |
| Concrete products           | 25m tonnes       |
| Asphalt                     | 20m tonnes       |
| Dimension Stone*            | 1m tonnes        |

Non-construction uses (GB, 2013)

<table>
<thead>
<tr>
<th>Rock*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>of which:</td>
<td></td>
</tr>
<tr>
<td>Industrial Lime</td>
<td>16m tonnes</td>
</tr>
<tr>
<td>Agricultural Lime</td>
<td>1m tonnes</td>
</tr>
</tbody>
</table>

| Industrial Sand*            | 4m tonnes      |

*2012
2 An essential sector

2.1 Mineral production

The mineral products sector is a key enabling sector of the UK economy which has a broad impact on overall economic activity. As the largest element of the construction supply chain, a supplier of key materials to many other industries, and the largest material flow in the UK economy, a healthy domestic mineral products industry is essential for the UK. The majority of the industry output is used in the UK construction industry – improving our housing stock, transport networks, commercial and industrial buildings, utilities, schools and hospitals. Non-construction markets include iron and steel manufacture, glass making, agriculture, cleaning power station emissions and pharmaceuticals.

About 250 million tonnes of aggregates and other minerals are produced each year, with aggregates imports accounting for no more than 3% of the UK market. UK sources also supply about 90% of the cement market.

Essential to other industries

UK production of minerals in 2012 (BGS, MPA)
2.2 GVA

The Mineral Products Industry directly contributes to the UK economy by generating over £4bn in gross value added, greater than industries such as architecture and television and radio, and not far short of motor vehicles and aerospace. It has an annual turnover of £9bn, generates £1bn of taxes, and contributes to over £40bn turnover in industries downstream of the supply chain, just over a quarter of the UK GDP.

2.3 Productivity

Employing some 70,000 people and supporting over 2.5 million jobs through its supply chain, the Mineral Products Industry is also a highly competitive industry: each worker produces about 2½ times more value added each year than the national average.

GVA of selected industries (Capital Economics)

<table>
<thead>
<tr>
<th>Industry</th>
<th>GVA of selected industries, £m, 2011 prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacture of computer, electronics &amp; optical products</td>
<td>10,000</td>
</tr>
<tr>
<td>Motor vehicles</td>
<td>8,000</td>
</tr>
<tr>
<td>Aerospace</td>
<td>7,000</td>
</tr>
<tr>
<td>Television &amp; radio</td>
<td>6,000</td>
</tr>
<tr>
<td>Manufacture of electrical equipment</td>
<td>5,000</td>
</tr>
<tr>
<td><strong>Mineral products</strong>*</td>
<td>4,000</td>
</tr>
<tr>
<td>Architecture</td>
<td>3,000</td>
</tr>
<tr>
<td>Film, video, photography</td>
<td>2,000</td>
</tr>
<tr>
<td>Furniture</td>
<td>1,500</td>
</tr>
<tr>
<td>Wood &amp; wood products</td>
<td>1,000</td>
</tr>
<tr>
<td>Textiles</td>
<td>500</td>
</tr>
<tr>
<td>Video games</td>
<td>200</td>
</tr>
</tbody>
</table>

Productivity of selected industries (Capital Economics)

<table>
<thead>
<tr>
<th>Industry</th>
<th>Productivity: GVA per employee for selected industries, £, 2011 prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial services, except insurance &amp; pension funding</td>
<td>160,000</td>
</tr>
<tr>
<td>Mining support service activities</td>
<td>140,000</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>120,000</td>
</tr>
<tr>
<td>Construction of buildings</td>
<td>100,000</td>
</tr>
<tr>
<td><strong>Mineral products</strong>*</td>
<td>90,000</td>
</tr>
<tr>
<td>Manufacture of computer, electronic &amp; optical products</td>
<td>80,000</td>
</tr>
<tr>
<td>Architectural &amp; engineering activities; technical testing &amp; analysis</td>
<td>60,000</td>
</tr>
<tr>
<td>Manufacture of air &amp; spacecraft &amp; related machinery</td>
<td>40,000</td>
</tr>
<tr>
<td><strong>National average</strong></td>
<td>20,000</td>
</tr>
<tr>
<td>Manufacture of motor vehicles, trailers &amp; semi-trailers</td>
<td>20,000</td>
</tr>
<tr>
<td>Scientific research &amp; development</td>
<td>10,000</td>
</tr>
</tbody>
</table>

*These are not an official ONS Standard Industrial Classification (SIC), but reflect MPA members’ activities.
3 Mineral product profiles

The Mineral Products industry, represented by MPA, comprises aggregates, asphalt, cement, ready-mixed and precast concrete, industrial sand, lime, mortar, slag, and dimension stone.

3.1 Aggregates (crushed rock and sand & gravel)

The main element of aggregates supply is crushed rock with significant contributions from sand and gravel, recycled and secondary materials. Sand and gravel supply comprises both land won and marine dredged materials. This broad breakdown disguises the fact that local and regional markets may be highly dependent on a particular type or source of aggregate as a consequence of the physical availability of particular resource types and/or the market demand for particular products.

NB 2012/13 MPA sales volumes growth rates for England, Scotland and Wales are applied to official 2012 AMRI (DCLG) production figures.
Over the last 60 years, there have been some variations in the relative importance of the different sources of aggregates, most notably the increase in the supply of recycled and secondary materials evident since the early 1990s. Aggregates sales have been depressed since the onset of the recession in 2008, reflecting the significant decline in construction markets, but are now showing the early indications of recovery.
Marine aggregates satisfy about 20% of the construction needs for sand and gravel in England and Wales. Marine aggregates also support beach nourishment and contract fill projects in the UK and are exported overseas for use in construction. Total production of sand and gravel for UK construction, export, beach nourishment and contract fill, shows that total marine aggregates production levels have been consistently lower than the total tonnage amount permitted across all operators’ production licences. The difference reflects the fact that individual dredging areas can offer a variety of materials, from fine sand to coarse gravel, so multiple licence areas in each dredging region ensure that there are enough materials for each operator to supply both current and future market needs, and also provide the industry with the flexibility to respond to any future changes in market demand that may occur. Multiple licences also ensure dredging areas are near to customers. The biggest use for marine dredged aggregates is the construction market in the UK.

**Inter-regional flows of aggregates**

The underlying geology of the UK determines the local availability of mineral products which are only transported long distances when necessary. However, resources are not always distributed evenly and some inter-regional movements are necessary. The South East, for example, has its own supplies of sand and gravel but relies heavily on crushed rock brought in by rail from the East Midlands and South West and by sea from Scotland. It also requires marine dredged sand and gravel from coastal waters. The charts below show the main inter-regional crushed rock and sand and gravel movements.
3.2 Cementitious

Cement is the key component in producing ready-mixed and precast concrete and mortar. Following a stable market in the early and mid-2000s, recent years have seen a significant reduction in sales of cementitious materials, although markets started to improve in 2013.

Cement is made by crushing and heating limestone or chalk with small amounts of other natural materials, such as clay or shale, in a rotating kiln to a temperature of 1450°C Celsius. This chemically combines the stones into a hard substance called clinker, essentially changing calcium carbonate (CaCO₃) to calcium oxide (CaO) which then reacts with silica (SiO₂) to form calcium silicates. This is ground to a powder with about five per cent gypsum, added to control the setting time of the end-product.

The manufacturing process depends on the moisture content of the raw materials. Chalk has a high moisture content and chalk-based processes tend to be less energy efficient than those based on hard limestone.

Three broad classifications of cement are on sale in the UK:
- **CEM I** – made from ground cement clinker and a small percentage of gypsum to control the material’s setting time when mixed with water.
- **CEM II** – is a cement containing between 6 and 35% fly ash, limestone or blastfurnace slag, a by-product of steel production.
- **CEM III** – is a cement containing between 36 and 95% blastfurnace slag.

There are a variety of cement products designed for specific end-uses.
3.3 Ready-mixed concrete

Ready-mixed concrete is used throughout the construction industry and therefore is an indicator of general construction activity. As a result, although it is produced in all GB regions, London and the South East, where the population and economic activity is highly concentrated, produce 2 to 3 times more than most other regions. Ready-mixed concrete has an average delivery distance of less than 8 miles.
3.4 Asphalt

Roads are the economic and social arteries of the nation and we depend upon asphalt for road maintenance and construction. Asphalt is generally produced locally, which explains the relative balance between many GB regions. Following the recession, these markets declined very steeply in 2012 but there was a modest improvement in markets towards the end of 2013.

**Asphalt sales in GB (million tonnes) (MPA)**

**Asphalt sales volumes 2013 (MPA)**

**UK Asphalt production, 2013 (million tonnes) (MPA, QPA Northern Ireland)**

NB Estimates for England, Scotland & Wales based on the assumption that MPA sales represent 90% of the total GB market for asphalt.
3.5 Precast concrete

Precast concrete is an essential ingredient of many buildings and civil engineering projects. For instance, 80% of all new roofs are made from concrete tiles, whilst concrete masonry provided strength, thermal mass and fire protection to 85% of new homes over the last 30 years. The market is mainly supplied from domestic sources but the chart opposite points to the vulnerability of this sector to international competition, as the UK has moved from a trade surplus to a trade deficit over the last 10 years. The UK has been a net importer of concrete products since 2009.

Concrete products* trade balance (£m, current prices) (BIS)

*Includes concrete blocks and bricks, roof tiles, other tiles & paving, pipes & prefabricated concrete products.

3.6 Mortar

Mortar plays an essential role in the building and construction industries, providing the 'glue' that bonds bricks, blocks and stones into masonry. About 70% of mortars used in the UK comes from factory-produced sources, as opposed to being mixed on site, reflecting the ever-increasing demands for quality building products in the development of our built environment.

Estimated GB market for mortar (million tonnes) (MPA)
3.7 Lime

3.7.1 Industrial Lime

Industries as diverse as steel, chemicals and glass all rely heavily on industrial lime, as does the treatment of contaminated land, the desulphurisation of flue gases from power stations, and the purification of water for human consumption. The sector also contributes positively to the UK trade balance, with about 20% of all industrial lime sales being exported.

3.7.2 Agricultural Lime

Meanwhile, agricultural lime is mainly used to maintain the fertility of our farmland by countering acidity. Lime plays a key role at a time when governments around the world are recognising that, with a growing population, ensuring food supply is a major challenge. The agricultural sector uses about 2 million tonnes of agricultural lime each year.
3.8 **Dimension stone**

The UK industry for dimension stone has declined since the 19th century in the face of overseas competition, but still plays an important role in ensuring that the unique local characteristics of natural stone-built areas of the UK can be maintained. In 2012, there was just over 1 million tonnes of dimension stone produced in GB, mainly sandstone and limestone.

![Dimension stone production in GB (million tonnes) (DCLG)](chart)

3.9 **Industrial sand**

As well as being used for glass making, paints, plastic and computer chips, industrial sand is also employed in making foundry moulds for applications such as car engines. After declining significantly between 2006 and 2009, the production of industrial sand in GB stabilised at about 4 million tonnes per year.

![Production of Industrial sand in GB (million tonnes) (DCLG)](chart)
4 Long term aggregate supply

Subject to the geological conditions, a key factor influencing the supply of aggregates is the operation of the mineral planning system. In England, the managed aggregates supply system is designed to ensure a steady and adequate supply of aggregates. The chart below indicates permitted reserves of aggregates since the early 1990s.

However, replenishment rates are more meaningful statistics as they provide information on the long term availability of supply.

If the amount of aggregates receiving planning permission equals the level of production the replenishment rate is 100%. The chart opposite indicates that whilst replenishment rates for crushed rock have been close to parity in recent years, sand and gravel is being replaced at a much slower pace: for every 100 tonnes of sand and gravel used, only 40 tonnes is being replaced through new planning permissions, which has resulted in significant decline in permitted reserves of sand and gravel over the last 15 years. The implication of long term replenishment rates below 100% is that at some point shortages of supply may become apparent. This is an issue of particular concern for supplies of sand and gravel in areas where reserves are low.
5 Taxation

The cumulative burden of environmental and planning related taxation and regulation on mineral products cuts deeply into the industry’s GVA, and the pressures are also set to increase in the coming years.

The industry is in the scope of the European Union Emissions Trading Scheme (EUETS), Climate Change Agreements (CCA) linked to the UK Climate Change Levy (CCL) and the Carbon Reduction Commitment Energy Efficiency Scheme (CRC), all of which are focused on carbon reduction. In addition the industry has to manage the indirect impact of measures and associated costs related to the costs of generating and supplying the energy used by the industry.

Climate change and energy measures were in 2013 equivalent to 15% of the Gross Value Added (GVA) of the Cement industry, but this proportion could increase to 65% by 2020 (from £51 million to over £250 million per annum). The annual cost of the aggregates levy alone is equivalent to 31% of industry GVA in 2012.

### GVA and cost of energy & climate change measures for the cement industry (£m)
*(ONS, MPA)*

<table>
<thead>
<tr>
<th>Year</th>
<th>GVA*</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td></td>
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</table>

*GVA is assumed to rise at a pace of 2.5% per annum

### Aggregate Levy compared to GVA in the aggregates industry, 2012 (£m) *(ONS, HMRC)*

<table>
<thead>
<tr>
<th></th>
<th>GVA</th>
<th>AGL</th>
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</tbody>
</table>
6 Sustainability

6.1 Recycling

Recycled materials now account for 28% of the GB aggregates market. They include construction and demolition waste, asphalt planings, used railway ballast, iron and steel slag, waste glass, incinerator and furnace bottom ash and waste from extractive activities such as china clay and slate.

The share of recycled and secondary materials in the total GB aggregates market is also the highest share in Europe; the European average stands at about 10%.

Sales of Portland cement are supplemented by the use of other cementitious materials including ground granulated blast furnace slag (GGBS) and fly ash. These cementitious materials are supplied either as a component of blended cements or directly to concrete manufacturing facilities.
6.2 Resource efficiency

UK sales of both aggregates and cement are relatively low in comparison with the rest of Europe. The charts below indicate that the use of aggregates and cement per capita is about 35% and 60% respectively below the European average.
6.3 Carbon emissions

Cement manufacture is, by its nature, energy and carbon intensive. The UK industry has been a world leader in its carbon reduction drive to date, reducing CO₂ emissions by 58.5% between 1990 and 2012. This was achieved through heavy investment and a progressive move toward using alternative waste-derived fuels.

![Carbon dioxide, kilogrammes per tonne of cement produced (MPA)](chart)

6.4 MPA National Nature Park

The minerals industry is uniquely placed to contribute to delivery of national and local biodiversity targets. It has already delivered 5,000 hectares of priority habitats through restoration of old quarries, the equivalent of at least five 'Richmond Parks', and a further 5,000 hectares are planned.

Opposite is a map of some of the main restoration sites, a nationwide network of quarries that have been restored for wildlife and which are accessible to the public. This initial map includes 50 sites around the country totalling 4,000 hectares, with a range of facilities including nature trails, viewing hides and visitor centres.

Collectively they form MPA’s National Nature Park.

You can view the map in more detail at: www.mineralproducts.org/nature_map.htm

Map data ©2014 GeoBasis-DE/BKG (©2009), Google
6.5 Sustainable Development Reports

Links to Sustainable Development Reports

http://www.mineralproducts.org/sustainability/reports.html
About the MPA

Each year the industry supplies £9 billion of materials and services to the £120 billion construction sector. Industry production represents the largest materials flow in the UK economy and is also one of the largest manufacturing sectors.

Aim of the MPA

MPA members will be recognised and valued for supplying essential materials for a sustainable future in a manner that is economically viable and socially and environmentally responsible.

Role of the MPA

MPA is the voice of the mineral products sector and represents and promotes its members in order to:

- Secure and maintain the 'licence to operate' for the safe, sustainable and responsible supply of essential mineral products from the UK;
- Raise awareness of the industry, its activities and contribution to the economy and to protect and grow its markets;
- Influence the development of technical and environmental standards and codes of practice;
- Encourage innovation and the delivery of sustainable and responsible environmental, product and market solutions;
- Advocate and influence the design and product choice of members' products;
- Maintain existing and develop new markets which are stable, 'level' and certain & minimise cumulative impacts;
- Educate stakeholders to 'Make the link' between the sources of mineral products and their use.

MPA members are:

- Committed to the principles of sustainable development;
- Committed to achieving TARGET ZERO & ZERO HARM and raising skill levels;
- Committed to protecting and enhancing UK Biodiversity;
- Committed to reducing carbon and other industrial emissions and maximising recycling of materials and high quality restoration of land and improving resource efficiency;
- Committed to the sustainable use of their products by end users;
- Socially and environmentally responsible suppliers of essential materials;
- Valuable and active members of their communities particularly in rural areas;
- Able to provide a range of career opportunities and career development and respond to skills shortages;
- Innovative and share good and best practice particularly in health and safety and sustainable development.
For further information:

**MPA’s constituent bodies and affiliated organisations:**

Mineral Products - Mineral Products Association: www.mineralproducts.org
Mineral Products - Northern Ireland, QPANI: www.qpani.org
Cement - MPA Cement: http://cement.mineralproducts.org
Precast Concrete - British Precast: www.britishprecast.org
Ready Mixed Concrete – BRMCA: www.brmca.org.uk
Lime - British Lime Association: www.britishlime.org
Marine Aggregates - BMAPA: www.bmapa.org
Mortar - Mortar Industry Association: www.mortar.org.uk
Agricultural Lime - ALA: www.aglime.org
Industrial Sand – SAMS: www.samsa.org.uk
The Concrete Centre: www.concretecentre.com
Reinforcing Steel - British Association of Reinforcement: www.uk-bar.org
Asphalt Industry Alliance, in partnership with the Refined Bitumen Association: www.asphaltindustryalliance.com

**Capital Economics report, 2012. The foundation for a strong economy: Initial assessment of the contribution of the mineral products industry to the UK economy.**

Available at:
www.mineralproducts.org/documents/The_foundation_for_a_strong_economy.pdf

**Other official websites used as data sources:**

Annual minerals raised inquiry survey, DCLG: www.gov.uk/government/collections/minerals
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The Mineral Products Association is the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries.