



Decarbonising UK Concrete and Cement

Accelerating the net zero journey

About UK Concrete

UK Concrete is part of the Mineral Products Association (MPA), the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries, and has been set up to represent the UK's concrete industry.

The concrete and cement sector is a key part of a combined mineral products industry, which contributes around £16 billion to the UK's GDP and directly employs 81,000 people, supporting a further 3.5 million jobs.

www.ThisisUKConcrete.co.uk

Front cover image:
Miriam Joyce, Graduate Trainee Manager at Hanson UK's Ribblesdale cement plant in Lancashire oversees a trial to use a net zero fuel in the cement kiln as part of a world first demonstration using hydrogen technology.

Foreword

Delivering net zero will require bold leadership from governments and industry around the world to make real change. The UK Government has an opportunity to establish new domestic measures to further support the net zero transition. Driving the continued decarbonisation of energy intensive manufacturing industries, which can help to accelerate the transition and create UK net zero jobs, is critical.

The UK concrete and cement industry is committed to working in close collaboration with Government to build a shared understanding and pathway to net zero. Policy, financial and infrastructure enablers must be coordinated to support the sector's decarbonisation and to manage a transition. This document sets out the UK concrete and cement industry's policy recommendations to Government to help support the pathway to net zero.

A roadmap to beyond net zero

As essential construction materials, decarbonising concrete and cement is one of the key opportunities for reaching net zero and beyond and helping to reduce emissions from the built environment. The UK concrete and cement industry has set out a clear roadmap* to deliver and go beyond net zero by 2050, removing more carbon dioxide (CO₂) from the atmosphere than it emits each year.

Early action

As a responsible industry, the concrete and cement sector has already taken considerable early action. Between 1990-2018, UK concrete and cement reduced absolute CO₂ emissions by 53% – decarbonising faster than the UK economy as a whole. We are under no illusion about the scale of the challenge facing our industry and the action still required.

Achieving net zero will require the wholesale decarbonisation of all aspects of concrete and cement production, supply and use. We cannot deliver net zero alone and we will need concerted support from Government, and significant change across the wider construction, energy and transportation sectors.

Retaining jobs and economic value

Our aim is to retain jobs and economic value in the UK whilst ensuring that the UK takes responsibility for the emissions it produces. It is therefore vital that we decarbonise the sector and ensure a 'just transition' to net zero – one that both retains the competitiveness of UK manufacturing and grows low carbon jobs, is fair to consumers and society, and encourages decarbonisation technology supply chains to ensure we have access to the technologies and skills required.

New jobs will be created by increasing demand for low carbon technologies and fuels including hydrogen. They will require new industrial skillsets to design, operate and maintain new plant technology to ensure it functions correctly with no detrimental impact on product quality.

Policy and financial enablers

Government support has already driven the decarbonisation of the power sector. A similar level of policy and financial support will be needed for trade-exposed, energy-intensive industries, including cement and concrete to decarbonise at the same scale and rate.

Government is supporting the trial of new technologies such as hydrogen for cement production. Future and ongoing support would enable the industry to invest in the multiple technologies outlined in our roadmap, all of which are required to reach net zero by 2050 or earlier.

We also need clear visibility of the financial support that will be available to dispersed industrial sites as well as net zero industrial clusters in the UK. This support needs to be flexible to adapt to the changing cost of developing technology as ultimately we want all producers to be able to compete on a level playing field with domestic and overseas competitors.

The task of deeper decarbonisation gets harder and more complex as we progress. The scale of investment increases and with it the exposure to international competition, requiring Government intervention to safeguard UK jobs and UK-generated economic value added. New domestic policies are needed to create and retain green manufacturing jobs in our industry.



Summary – our requests to Government:

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New domestic measures must eliminate the threat of carbon leakage and protect UK manufacturing jobs

2

Longer term visibility of funding and support for decarbonisation is needed to help businesses plan

3

Whole life carbon assessment should be incorporated into Government policy to cut carbon and deliver improved social outcomes

4

The UK must implement new carbon accounting measures including measurement of consumption emissions, to take full responsibility for its emissions

5

Government must use its procurement powers to drive adoption of new low-carbon cement and concrete technologies

1

New domestic measures must eliminate the threat of carbon leakage and protect UK manufacturing jobs

Consuming imported goods that offshore CO₂ and move responsibility for emissions abroad is called carbon leakage. It is a very real threat to both the global environment and the UK economy. It is often preceded by the loss of inward investment and UK manufacturing jobs.

Protecting UK jobs, delivering security of supply

With unequal carbon pricing across borders and the cumulative impact of high domestic electricity prices, carbon leakage is both a present and future threat. If not tackled it could see even more cement production move outside the UK, resulting in further loss of manufacturing jobs and increased uncertainty on security of supply.

The precursor to carbon leakage is always investment leakage. This manifests itself in the running down of UK assets before manufacturing is offshored and jobs are lost. Investment leakage is often invisible and not always considered when looking for evidence of carbon leakage. It often incorrectly leads to the conclusion that carbon leakage isn't happening.

Safeguarding UK production

Cement imports currently represent 26% of the UK market. Without a package of transitional domestic measures there will be more imports of cement, further erosion of the UK market and continued loss of UK Gross Value Added (GVA). Together this will undermine the conditions necessary for investment in net zero delivery in the sector.

As acknowledged in the Government's Industrial Decarbonisation Strategy, climate diplomacy and negotiation with other countries regarding carbon pricing is important to tackling the threat of offshoring. However, climate diplomacy is only one facet of how to protect against carbon leakage in the UK. This alone will not deliver the carbon leakage protection that is needed now to halt the erosion of domestic production.

Our recommendations

- Ensuring that the free allocation of CO₂ in the emissions trading system remains effective against carbon and investment leakage until a more effective mechanism can be implemented
- Narrowing the electricity cost disparity with other sectors and imports by addressing the indirect CO₂ costs passed on in electricity prices to UK cement producers. Increasing the Energy Intensive Industries (EII) exemption from 85% to 100% and introducing a discount on network charges for EIIs that recognises the contribution they make to system balancing. Defining carbon leakage vulnerable industries like cement as "vulnerable" so they are able to receive ongoing support through the Energy Bill Relief Scheme beyond 31st March 2023
- Ultimately, fully balancing unequal international carbon prices by introducing border adjustments on imports



2 Longer term visibility of funding and support for decarbonisation is needed to help businesses plan

Net zero will require significant capital expenditure and a considerable increase in operational spending for businesses across energy-intensive industries.

While Government has supported research and decarbonisation trials for the UK cement sector, there is a need for greater visibility of future financial support for decarbonisation infrastructure so that businesses can continue to implement and adopt low- and no-carbon technologies.

There is currently a lack of clarity of what funding might be available for carbon capture, usage and storage (CCUS) technology beyond the current Track 1 cluster projects.

Businesses investing in CCUS are taking considerable risk and facing high upfront costs for projects that may not receive consent and support from Government. This fuels a lack of investor confidence.

Industry needs clear visibility of business models and early certainty on the funding associated with CCUS projects, before significant costs are incurred.

Planning at a national level, not just clusters

Considerable infrastructure is required for the UK to decarbonise including a doubling or tripling of the electricity grid, hydrogen pipelines and CO₂ transport and storage. The Government focus for industrial decarbonisation currently centres on two industrial clusters in north west England & Wales, and the east coast.

50% of UK industrial emissions sit outside of the main cluster locations. The lack of national plans for development of the required hydrogen transport, electrical grid capacity upgrades and CO₂ transport and storage infrastructure is hindering long term investment decisions.

Our recommendations

- Provide clear sight of future financial support to assist business planning for research, innovation and deployment of low-carbon technologies
- Visibility of business models is urgently required for CCUS projects beyond Phase 2 cluster sequencing
- Ensure clear forward planning of wider industrial decarbonisation strategies beyond the two focus clusters to allow informed long term investment decisions

3 Whole life carbon impact assessment should be incorporated into Government policy to cut carbon and deliver improved social outcomes

The construction industry needs to be encouraged to measure embodied carbon over the whole-life of the building or assets life and assess the carbon impacts of new construction through a whole lifecycle assessment.

An exclusive focus on upfront embodied carbon fails to consider carbon over an asset's lifecycle. It does not give enough consideration to the relationship between embodied carbon and measures to reduce energy use. A holistic environmental approach is also required, to consider impacts of improved social outcomes such as fire protection, occupant safety and comfort, resilience to water escape and flooding.

Whole-life cycle analysis measures carbon impacts over the lifetime of a building or asset. This includes extraction of raw materials, product miles, construction, through to maintenance, repair, reuse, and end-of-life scenarios such as recyclability following demolition.

Measuring whole life, delivering long term impacts

To accurately reflect the carbon impacts of new construction, a whole lifecycle analysis is required to understand the embodied, operational and end-of-life carbon emissions.

Carbon should not be considered in isolation to climate adaptation, occupant safety, structural performance and circular economy principles such as re-use and recoverability.

Carbon should be measured to recognise international standards, such as EN 15804 and EN 15978.

The transition to a net zero society requires a greater understanding of holistic impacts. The Greater London Authority's London Plan 2021 requires designers and constructors to calculate the whole life carbon in materials emitted during the construction, maintenance and demolition of their projects. London's leadership on this issue is major step forward and should provide a template for Government policy moving forward.

If embodied carbon is measured this should be measured across the whole of the building, asset or systems.

Our recommendations

- Require that CO₂ emissions from buildings and infrastructure are assessed over their whole life and introduce this principle into public procurement policy
- Adopt the whole life carbon measures outlined in the London Plan into national planning policy
- Recognise that climate adaptation and resilience is an important part of sustainability and carbon reduction
- Ensure that embodied and operational CO₂ are never separated to ensure that comparisons are made on a whole-life basis



4 The UK must implement new carbon accounting measures including measurement of consumption emissions, to take full responsibility for its emission

The UK must provide an honest account of its progress to net zero by taking responsibility for emissions from both materials and goods produced in the UK, as well as those production emissions from foreign imports.

There is currently a significant shortcoming in UK net zero legislation because emissions targets can be met, or partially met, by buying more imported goods in place of domestic production. This simply moves emission responsibility to other countries.

Taking responsibility for import product emissions

For the UK to provide an honest account of its progress to net zero, it should take responsibility for emissions from materials and goods produced in the UK, as well as production emissions from imports consumed. A failure to do this will undermine the UK Government’s commitment to tackle climate change and the credibility of domestic action in the fight against climate change.

Tackling offshoring

The UK is increasingly ‘offshoring’ its environmental responsibility. The Office for National Statistics has highlighted the divergent trend between the UK’s territorial emissions and consumption-based emissions, including the net import of goods.

For concrete and cement imports/net imports currently equates to 2.2 million tonnes of manufactured cement and around 1.6 million tonnes of CO₂ that the UK is not taking environmental responsibility for via national carbon accounting.

Concrete is a local material. Over 95% of UK concrete is produced within the UK, whereas 67% of timber and 60% of steel is frequently imported from around the world.

Accounting for carbonation

Carbon accounting also needs to account for the process of carbonation – the ability of concrete to naturally absorb carbon dioxide from the atmosphere throughout its lifetime, at end of life and in any secondary use. The Sixth Assessment Report from the Intergovernmental Panel on Climate Change (IPCC) recognised concrete carbonation. There is not currently an approved method for calculating the emissions sink associated with the carbonation of concrete in the United Nations Framework Convention on Climate Change (UNFCCC) 2019 Refinement.

The Mineral Products Association has undertaken research to fill this gap. It has been working on behalf of Government to calculate and measure the CO₂ emissions that are naturally absorbed by concrete used in UK buildings and infrastructure.

The project creates a methodology which can inform the UK’s Greenhouse Gas Inventory and the UK’s national and international reporting obligations on climate change.

Government should embed this into policy, ensuring we are using fully informed methods to track the UK’s carbon emissions.

Our recommendations

- Set a national net zero goal on consumption emissions, in addition to current targets for territorial emissions, to ensure net zero is not met or partially met by closing UK manufacturing and importing goods instead
- Improve the accuracy of UK emissions reporting by ensuring national greenhouse gas accounting includes the CO₂ permanently captured and stored by the carbonation of concrete

5 Government must use its procurement powers to drive adoption of new low-carbon cement and concrete technologies

The Government is the largest construction client in the UK. It is therefore well placed to accelerate the adoption of new, low-carbon technologies to help the construction industry implement and maintain sustainable practices.

Significant collaborative effort throughout the supply chain and the wider construction sector is needed to embed more sustainable behaviours. This will enable the technologies to be deployed that form part of the journey to beyond net zero for concrete, buildings and infrastructure, and deliver the climate mitigation and adaptation needed to protect UK society.

Drive uptake of low-carbon cement and concrete

Lower-carbon cements and concretes are already manufactured and readily available across the UK but there is a need to drive greater demand.

The Government and its agencies have an important opportunity to specify these materials for projects and set an example. By using its buying power, Government can drive the speed of transition and help promote locally produced construction materials and support local economies.

The London 2012 Olympics provided an excellent example of where Government used its procurement power to ensure that responsible sourcing of materials was embedded into construction procurement. There is now scope to embed this same principle to support lower-carbon concrete adoption while supporting the creation and preservation of UK green manufacturing jobs in established UK manufacturing industries.

Government projects are the catalyst for change

Government procurement also provides an excellent opportunity to share and benchmark carbon performance data. Data on how built assets are delivered, how they are operated and managed, and what energy performance outcomes they create across their whole lifetime is not consistently collected or used effectively to improve performance. Government projects can be the catalyst for how the industry changes the way it collects, processes, manages, analyses and uses data to inform future construction decision making.

Our recommendations

- Promote the specification and use of locally produced, lower-carbon construction materials across public sector construction projects
- Work with the concrete and cement industry and the supply chain to accelerate the development and use of standards to promote the use of lower-carbon cements and concretes
- Share carbon benchmark data and best practice from public sector projects
- Ensure procurement maintains focus on climate adaptation, resilience and fire safety of products used across the built environment





UK concrete is...

- **Essential** for our economy, homes, buildings, infrastructure and quality of life
- **Sustainable**, local and responsibly sourced
- **Protecting people** and properties against fire, flooding 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 communities
- **95%** produced in the UK

UK concrete, both ready-mixed and precast, is produced from around

1,000
sites nationwide



10 cement plants



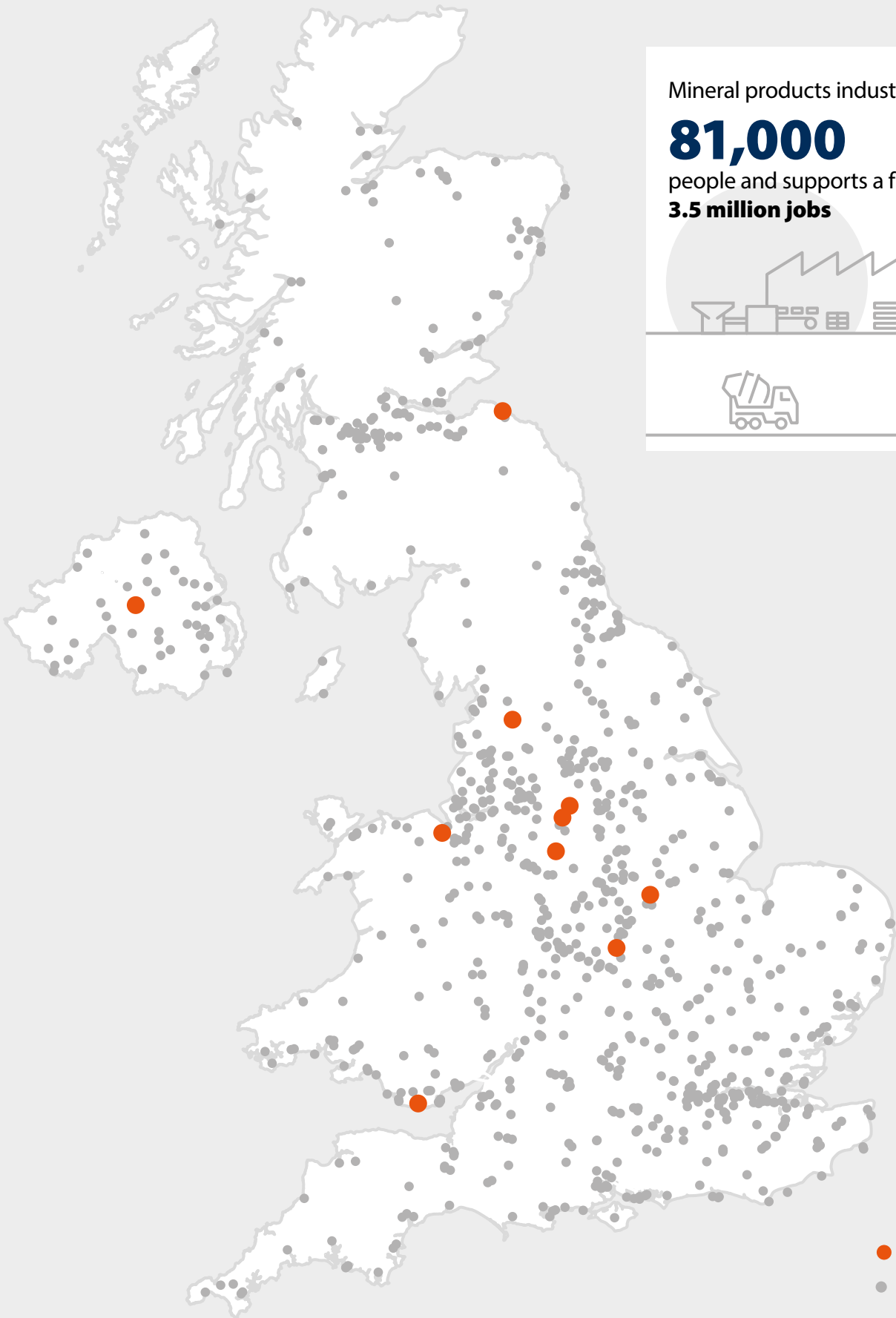
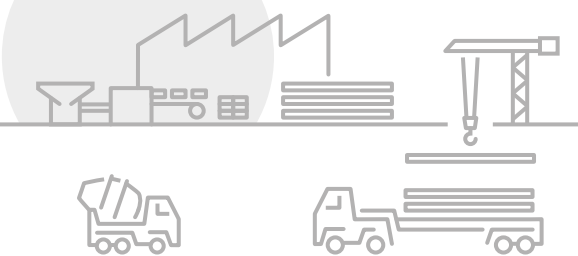
Combined mineral products industry contributes around

£16 billion
to UK GDP



Mineral products industry employs

81,000
people and supports a further
3.5 million jobs



● Cement plants
● Concrete & mortar plants

UK concrete is essential, sustainable, protecting people, innovating, helping to tackle climate change and enabling great design



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www.mineralproducts.org

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