Global Cement and Concrete Association

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GCCA Policy Document on Providing The Infrastructure For Circular And Net Zero Manufacturing

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Global Cement and Concrete Association (GCCA) is registered in England & Wales, Company No 11191992

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Introduction

Decarbonisation of necessary-to-abate sectors, such as cement and concrete, requires the right policy and legal framework on the one hand, and supportive infrastructure that will be shared across industrial sectors on the other. A shared understanding of the infrastructure needs for a decarbonised economy is key to enabling not just decarbonisation of the cement sector but industry and society in general.

Ultimately, deployment of advanced technologies such as CCUS at full scale will eliminate the process emissions of cement manufacturing and result in the future delivery of carbon net zero concrete for our world.

[1] Policy instruments include regulation, planning, codes, standards and project briefs when policy makers are also project clients.

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What do we need

Whilst the cement and concrete sector is committed to advancing the deployment of advanced technologies such as CCUS, moving towards decarbonised manufacturing and markets is an endeavour that is larger than any individual sector. It requires the infrastructure that enables us to operationalise the transition to a sustainable low-carbon economy.

Low carbon production technologies, especially carbon capture and electrical heating, are increasing the cement and concrete industry's demand for clean energy from low-carbon sources at the same time as every industry's demand is growing for the same reason. The infrastructure needed to supply this demand must be in place.

Widespread deployment of CCUS will mean every cement plant needs transport and storage capacity to convey large volumes of CO_2 to distant sites where it can be stored or used in other industrial processes. For many this may mean a pipeline, rail-link or shipping route, with the significant funding needed coming from public sources.

CCUS isn't developing as fast as it might because clear policies affirming its long-term future are not yet developed and nor are enabling laws and regulations.

The development, therefore, of such a policy and legal framework and infrastructure will be, in many instances, not unique to the sector and will have broader benefits for industry and society. Nevertheless, to accelerate deployment of advanced technologies for the cement industry, this support is needed as a prerequisite and therefore it is imperative to develop near-term plans for deployment and implementation so that these are in place as CCUS comes online. Similarly, strategic public funding for the innovation and development of key elements of the supportive infrastructure will be needed.

Governments at all levels and society alike will need to make long-term commitments and define clear plans so that the industry can with confidence invest in technology development. This certainty will enable the sector to meet its carbon reduction potential and to ensure the continued availability of cement (and hence concrete) that are essential for economic and societal development.

This calls for:

- reliable access to abundant and competitively priced renewable energy, including hydrogen and H2 networks as part of the enabling infrastructure
- public-private partnerships to speed-up CCUS developments, including shared investment in CO_2 transport and storage networks
- regulatory certainty provided by long-term policy that continues to justify investment in carbon abatement technologies along with the appropriate fiscal, legal and regulatory support to speed-up their development e.g.
  - regulations to allow the construction of carbon storage facilities, determine liability for stored CO_2 and ensure long-term access to carbon stores
  - fiscal support for R&D in new uses in other sectors of CO_2 captured by the cement industry.

[1] www.gccassociation.org/gnr/

[2] lowcarboneconomy.cembureau.eu/5-parallel-routes/energy-efficiency/thermal-energy-efficiency/

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More details on energy infrastructure

Electricity:
As an energy and electricity intensive sector, sufficient and reliable availability of power is fundamental. For electricity this means not just access to the electricity grid, but often it will need a significantly improved capacity and reliability to meet the increased demands that low carbon technologies will require, especially carbon capture or even electrical heat options.

Electricity should preferably be from a renewable source, which of itself will often necessitate a fundamental transformation of the way in which electricity is generated and supplied. This is a clear example of a supportive policy that will benefit society and industry alike, impacting both scope 1 and scope 2 emissions. The costs of renewables deployment policies should not fall disproportionately on industry, which needs competitively priced electricity.

Hydrogen:
The availability of sufficient hydrogen for use by the industry is another key component. Therefore, the development of supportive hydrogen policies is necessary for countries and society to meet their CO_2 reduction ambitions. However, in developing the necessary policies and infrastructure it is vital that production and use of hydrogen is prioritised for uses where there are few if any alternatives such as in industry. Hydrogen is equally important to help decarbonise transport emissions associated with cement manufacture such as via Heavy Goods Vehicles (HGVs) or rail, and potentially the use of ammonia as a fuel for use by shipping.

3&4 www.gccassociation.org/gnr/

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More details on CCUS

The deployment of carbon capture technology in the cement sector is associated with key infrastructure requirements to enable the cement sector to use carbon capture technologies effectively.

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CO_2 transport and storage:
There needs to be a suitable and sustainable network to allow transport and storage of any captured carbon. The transport solutions will vary from site-to-site but, due to the volumes and distance involved, will likely need a pipeline, rail-enabled link, or shipping facility to take the CO_2 to a suitable storage site or for use in another industrial process.

Given the dispersed, often rural nature of cement plants this could be the significant infrastructure support needed to enable a plant to achieve its carbon reduction potential.

Public acceptance:
For geological CO_2 storage, either under land or sea will be required. In particular, if these are land-based then there will need to be a public acceptance of the solution; this will need politicians and communities alike to be supportive, backed by appropriate legal mechanisms.

Liability:
To facilitate long-term storage other issues such as liability for the CO_2 need to be resolved. It is preferable if these types of liabilities are public (or shared, as with interesting planned models in the UK); otherwise it will place an unaffordable burden on the sector.Likewise, access to any storage option will require robust, long-term legal certainty to facilitate investment. Similarly, where transportation and storage options are being supported by funds from the public purse, affordability is key to allow the cement manufacturing process to be competitive.

Use of carbon and carbon accounting:
Whilst storage presents its own challenges, there also needs to be a significant investment in use options for captured CO_2. The opportunity exists to create new industrial symbiosis relationships, with other sectors taking CO_2 supplied from the cement sector to produce products substituting more carbon intensive ones (e.g., e-fuels). The business case for deploying these technologies rests heavily on the ability for installations that capture CO_2 to discount it from their emissions, whether used for permanent geological storage, for mineralisation or for the production of products substituting more carbon intensive ones.

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