Global Cement and Concrete Association

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GCCA Policy Document on Low Carbon Product Procurement

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

Registered office:
Paddington Central, 6th Floor,
2 Kingdom Street, London,
W2 6JP, United Kingdom

T +44 2035 804268

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This document was submitted to Board for approval.

It was circulated to all members and affiliates for consultation, having previously had formal consultation with Working Group 2 and Consultative Network.

Purpose of document:

The purpose of this policy document is to provide the GCCA position on low carbon procurement to enable a common understanding and common advocacy by all in the GCCA family: members, affiliates, and net zero value chain partners.

Throughout 2022 the emerging GCCA position was used to successfully influence IDDI public procurement pledge (September 2022) and FMC Coalition commitment (November 2022) to be more closely aligned with the GCCA position.

This has continued into 2023, where detailed work with IDDI has resulted in GCCA now, in effect, holding the pen, on defining bands for low carbon concrete – albeit within broad parameters set by IDDI – and GCCA recommending that targets are set locally using these bands as a common language.

Having this document as a formal GCCA Policy paper, will strengthen advocacy activity of our sector.

This document IS NOT the end of the story. This document gathers together what can be agreed now. It is expected that a revised version will be developed September 2023 to March 2024 in the expectation that a revision A will be approved by Board in June 2024 at annual CEO leaders conference in Bangkok.

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1.0 Position Statement

GCCA and its members welcome the creation of market demand for low-carbon and near zero carbon construction and decarbonised value chains, and more specifically they welcome stimulation of demand for low-carbon and near zero cement and concrete products through public procurement policy.

Low carbon procurement of products should:

- be based on comparison of products with the same functional performance.
- use recognised Environmental Product Declarations.
- use definitions of low/lower carbon and near zero carbon that are commonly agreed and unambiguous.

Definitions themselves, or reference or benchmark values from which they are sometimes derived, should recognise the:

- wide range of concrete products.
- variation by geography (countries/states/regions) of current embodied carbon of cement and concrete products, and ability to decarbonise in the future, due to variation in access to decarbonisation levers.
- incentivise all decarbonisation levers.

Targets for reduction compared with definitions/references/benchmarks must be:

- stretching and provide the long-term certainty needed to deliver the demand signal to enable the industry to decarbonise.
- realistic to ensure customers can find suppliers.
- congruent with GCCA global roadmap taking into account national opportunities/ challenges, or national roadmaps where they exist.

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2.0 Introduction

As part of The GCCA 2050 Cement and Concrete Industry Roadmap for Net Zero Concrete[1], the collective commitment of the world's leading cement and concrete companies, these companies called for the **creation of market demand for carbon neutral construction and decarbonised value chains, and more specifically they called for stimulation of demand for low-carbon cement and concrete products through public procurement policy.**

The context for this creation of demand for low-carbon cement and concrete products, is that **the ultimate goal is for society to have a sustainable built environment.** This means that the built environment contributes to achieving the UN Sustainability Development Goals and addresses the challenges of biodiversity, climate adaptation (resilience) and climate mitigation.

With respect to the last of these, society needs a low carbon, and ultimately net zero carbon, built environment when assessed on a **whole project and whole lifecycle basis.** Whole project means accounting for the interrelationship between all elements of a project. Whole lifecycle means considering both, the embodied emissions (upfront, maintenance/replacement/use and end of life) and the operational carbon emissions, and considering these together.

3.0 Scope of this paper

Notwithstanding the criticality of whole project whole lifecycle assessment, the scope for this document is low carbon procurement of product. This scope is a subset of the wider subject of sustainable design and construction. This wider subject is covered in a separate GCCA policy paper "Material Neutrality in Policies that Impact Construction Material Choices" (see box out).

Material Neutrality in Policies that Impact Construction Material Choices

Position statement:

"Sustainability must become a key criterion for the design and construction of the built environment of the future and be firmly embedded in policies, codes and regulations. GCCA believe that the most sustainable outcomes can be achieved by policies, codes and regulations that avoid explicit or implicit preference for one construction material over another.

There are many factors that determine which is the most appropriate building material for a given structure, location, or purpose. Mandating or promoting one particular building material over others will invariably result in unintended consequences and sub-optimal sustainable performance. To achieve the optimum design and performance, comparison of construction materials should:

1. Only be made in the context of, and at the scale of, a whole building or infrastructure asset;
2. Consider the full range of economic, technical and sustainability performance issues;
3. Assess performance over the whole lifecycle of a building or infrastructure asset;
4. Be undertaken by professionals, such as architects, engineers and surveyors, to optimise all aspects of performance and cost;
5. Be based on robust data – transparent, relevant, consistent, comparable, complete, and accurate

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This low carbon product procurement paper defines product as cement, readymixed concrete and precast (factory made) concrete elements. The scope of this paper is low carbon procurement (not specification) of these products.

Low carbon procurement of a square metre of built flooring will be considered elsewhere or in a future revision of this paper (see box out).

PER SQUARE METRE FLOORING

With regards procurement in terms of square metre of flooring it is noted:

- the cement and concrete industry do not sell this product*.
- cost ($) or GWP($CO_2e$) per square metre of flooring in **concrete construction** typically applies to total cost of concrete frame walls, columns, beams, and floors divided by total floor area. The design and specification, and hence cost/GWP, is contingent on many architectural, structural and construction constraints, and average values are contingent on building type, use and geography
- cost ($) or GWP($CO_2e$) per square metre of flooring **in overall construction** takes account structure (as above) plus services, plus facades, plus finishes.

Concrete can minimise the need for services and finishes and hence per square metre flooring metrics for overall construction is the preference of cement/concrete industry to capture the reduced GWP impacts afforded by concrete. (These reductions are possible with concrete due to the inherent properties and performance benefits of concrete such as thermal mass, fire resistance and acoustic performance.)

*The product "square metre of flooring" is either viewed from a structural perspective and includes for example precast flooring, support beams and structural topping or from a building perspective and includes all structure, architectural finishes and services provision.

Low carbon product procurement can be at cement level or concrete level to suit the typical supply and construction practice in a country.

In countries where it is typical for the construction sector to purchase cement and for the concrete to be mixed on project sites, then low carbon procurement should be on the cement level.

Where concrete (readymixed or precast) is the product purchased by the construction sector, then low carbon procurement should be on the concrete level. This is logical and has the following advantages:

- specification by purchaser of the concrete and evidence of compliance by supplier of the concrete does not necessitate involvement of a third party – the cement supplier.
- all decarbonisation levers available in the manufacture of the concrete and all its constituents, are included in the procurement.

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4.0 Reporting Product Carbon Footprint

The data underpinning low carbon product procurement should be from Environmental Product Declarations (EPDs). EPDs have been established in standards. Furthermore, the infrastructure to deliver EPDs (for example programme operators, EPD third party verifiers and software) is already in place, is developing or can be transferred to, and developed in, all countries (recognizing that this may take time and all countries are on different pathways). Every EPD has an indicator for carbon footprint (GWP).

A carbon footprint is fundamental for low carbon procurement, and GWP as defined by EPDs should be the chosen definition for carbon footprint.

It is sometimes asked, why have a full EPD when only GWP indicator is being used?

- EPD's are a tool that is established through standards, programme operators and verifiers.
- There are cases when other indicators are required over and above GWP.
- It would be a regressive step to establish a system for GWP data only: little would be saved, and it is likely in a short time that full EPDs would be reintroduced to enable sustainable procurement over more indicators.

It is recognised that calculation of product GWP impacts alone, in accordance with EPD standards, could be used as underpinning data, but this should be seen as an interim measure and not be positioned as the preferred option. It is preferrable to provide EPDs (and hence all the indicators) for the reasons given in final two bullet points in previous paragraph.

The standards and product category rules for EPDs explain in detail what is and is not included in the environmental impact of a product. As part of this there are clear definitions of life cycle stages, and clarity on what should and should not be included. European standards (adopted widely around the world) enable whole life assessment ("cradle-to-grave") for concrete products, and "cradle-to-gate" (A1-A3) for cement: the reduced scope for cement reflecting that the vast majority of cement is an ingredient for concrete. The North American standards are currently "cradle-to-gate" for concrete and cement, but there is a desire to extend the scope to whole life for concrete products in next revisions.

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5.0 Defining Reference/Benchmark Values

Purchasers need to assess what "low carbon" and "near zero" is for different products. This necessitates the setting of a reference/benchmark value for each product. Then, relative to these reference/benchmark values, "low carbon" and "near zero" can be numerically defined and targets established.

5.1 Product categories

Concrete is not one product but a wide range of products. It cannot be treated as one product but nor is it practical at the outset to have a different reference/benchmark value for each and every concrete product.

We recommend that:

1. cast in place concrete should be considered in different strength bands, perhaps six or eight products.

2. concrete cast in a factory (precast concrete products) should either be:

    a. considered together with cast in place concrete in same strength bands, or
    b. considered as distinct products such as blocks, floor slabs, bridge beams, railway sleepers. This could easily number in excess of 20 products. The higher the number, the better the resolution (because the product definition is more precise), and more effective the low carbon procurement will be. This is more complex than option a) above, and arguably should be a future option. It recognises that precast concrete EPDs account for reinforcement, moulds and casting and that precast products are often different products from those formed from cast in place concrete.

Cement also is a range of products with different performance parameters, and some specialist cements have different applications. Therefore, there is a logic to having a reference/benchmark for different cements. On the other hand, for simplicity a reference or benchmark for Ordinary Portland (CEM1) Cement could be used across all cements. No recommendation is made here regarding the decision whether to have categories for cement, and what these might be.

5.2 Geographical variation

GCCA recommend that reference/benchmark values for concrete products can and should be determined typically for each country, and more locally at state level for large countries such as China, India, and USA because:

1. For each product category, there is no single definition globally. Categories are dictated by the country product standards and construction practice.

2. Carbon footprint values of products – even in cases where definitions are the same across borders – vary because local practice, standards, accessibility to decarbonisation levers all influence the starting point and abatement rate and potential.

3. Concrete is a local material in that it does not get transported far (primarily because it is relatively heavy and in addition if in readymixed form it has a limited plastic life), and hence there is no necessity to compromise or overcome points 1 and 2 above.

Industry groups, in each country, should be engaged when developing benchmarks and banding.

UNIDO through its "Industrial Deep Decarbonisation Initiative" (IDDI) has an emerging concrete framework of banding. The IDDI have stipulated that reference/benchmark values for concrete will be set at a global level. Countries adopting the initiative will then set their own targets in recognition of different starting points and potential rates of decarbonisation. To help facilitate a workable framework, GCCA are actively collaborating with the IDDI. This is despite the IDDI requirement for global reference/benchmarks being counter to GCCA recommendation that these be set more locally.

As is the case for concrete, cement also has different product standards and carbon footprints across the globe, and whilst traded internationally more than concrete, it is still only a small percentage (approx. 5%) that is internationally traded. Therefore, there is a case for different reference/benchmark values geographically. (Note carbon pricing and carbon taxation risks distorting cement markets and increasing international trade).

5.3 Incentivising all decarbonisation levers

GCCA recommend that the reference/benchmark incentivises all decarbonisation levers along the manufacturing value chain.

To achieve this for concrete and precast concrete GCCA recommend the following:

1. Reference/benchmarks for each product category should be based on product being manufactured using Ordinary Portland Cement (CEMI). *This ensures that there is incentive to optimise the use of SCMs (whether via blended cements from cement supplier or at concrete production stage) to reduce embodied carbon.*

2. GWP impact of Ordinary Portland Cement (CEMI) should be based on a fixed base year (2020 recommended to enable consistency). *This ensures there is incentive for the concrete producer to purchase cements that have reduced carbon emissions through clinker and cement production decarbonisation measures that are introduced subsequent to the reference year. In turn, and by implication, the fixed base year results in the concrete purchasers' application of low carbon procurement accounting for and thereby incentivising decarbonisation measures that are introduced subsequent to the reference year.*

3. GWP is calculated using EPD standards.

Similarly for cement, GCCA recommend that the reference/benchmark should be established as follows:

1. GWP impact of Ordinary Portland Cement (CEMI) (and other cements if this option chosen) should be based on a fixed base year (2020 recommended to enable consistency). *This ensures there is incentive for the cement producer to reduce carbon emissions through clinker and cement production decarbonisation measures that are introduced subsequent to the reference year.*

2. GWP should be calculated using EPD standards.

GCCA recommend the above, but recognise other definitions for reference/benchmark are possible. It is important to note that reference/benchmark definitions and targets (that are set compared to that reference/benchmark) are inextricably linked. For example, the choice to use OPC/CEMI in concrete product mixes in the recommended definition and the consequential reference/benchmark values should come with a commensurate need for targets to account for current SCM usage and the GWP reduction already being achieved.

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6.0 Establishing Tiers/Bands

In addition to reference/benchmark values, some low carbon procurement frameworks use tiers/bands.

Tiers/bands can be numerically defined as absolute or percentage reductions from reference/benchmark values. This has been done for example by IEA[2] with bands "E" to "A" (for example, "A" is a GWP reduction of between 67% and 83% of a benchmark/reference value) and Concrete Sustainability Council[3] with a star rating from one star to four star (for example, "four star" is a GWP reduction exceeding 60% of a benchmark/reference value).

GCCA recommend that such banding can be helpful, as it enables wider use of the low carbon procurement system compared with single ambitious targets. Furthermore, where a reference/benchmark value has been set below GWP for most currently supplied products, extending the banding range above the reference/benchmark can encourage adoption of the framework across the majority, if not all, the demand and supply industry. For example, in the IEA system, bands "F" and "G" could be defined as percentages above the IEA reference/benchmark GWP value in recognition that in some locations it is not yet possible to supply product that meets band "E", which is immediately below the reference/benchmark.

7.0 Setting Targets

This section on targets must be read in conjunction with "defining reference/benchmark values" (section 5.0) where product categories, geographical variation and incentivising all decarbonisation levers is already covered.

Targets in terms of percentage or numerical reduction against a reference/benchmark should not be set in isolation of other factors. There needs to be an inter-relationship between magnitude of targeted reduction, percentage of volume purchased for which the target applies, and the time period until the target is to be achieved.

The larger the targeted reductions, then the longer the time frame for achievement and the smaller percentage of overall purchased volume this should (and can) be applied to.

The setting of targets/volume/time period must recognise the timeframe, scale and significance for investment to deliver lower carbon and near zero carbon products.

In order to encourage wide engagement, rather than single percentage or numerical reduction targets, there is value in targets using tiers/bands (see section 6.0) to reflect time, place and volume being procured.

It is worth noting that **some countries have already made greater strides than others and some have easier opportunities now. Specific targets and the pathway to achieving them should be determined at country, state or market level.**

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8.0 Defining Low Carbon Product and Near Zero Product

Definitions for low carbon product are typically a function of reference/benchmark values. For example, exceeding a target percentage or a numerical reduction compared with the reference/benchmark is chosen as defining low carbon. Tiers/bands (section 6.0) can also be used to define levels of low carbon.

Definitions of near zero product can follow a similar logic and simply be more ambitious. For example, First Movers Coalition establish numerical GWP value "near-zero thresholds" for cement ($kgCO_2/t$) and concrete products ($kgCO_2/m^3$) by applying an ambitious percentage reduction compared with references/benchmarks from USA data for cement and concrete of different strengths.

An alternative methodology for defining near zero has been used by the IEA. For cement, they have defined a near zero band as being GWP values less than a threshold determined from residual emissions from the cement sector in 2050. The IEA then use this near zero threshold value and a reference/benchmark value considered as the current upper limit of low carbon, to define five equal bands/tiers of low carbon.

The International Industrial Deep Decarbonisation Initiative (IDDI) has adopted the IEA system of low carbon bands and near zero threshold for cement and desires the same logic for concrete and GCCA is developing this with IDDI.

9.0 Policy Recommendations

GCCA recommends implementation of policies that send clear and workable demand signals through the complex construction value chain to stimulate a green premium for low carbon and near zero carbon products thereby enabling the materials industry to have requisite confidence to bring these products to market.

More specifically GCCA recommend that low carbon product procurement should:

1. be part of procurement of resilient and low carbon projects assessed over their whole lifecycle.
2. be based on comparison of products with the same functional performance.
3. take into account other sustainability issues such as accounted for in responsible sourcing schemes.
4. use recognised environmental product declarations thereby ensuring transparency and verification of data.
5. use definitions of low/lower carbon and near zero carbon that are commonly agreed and unambiguous.
6. be stretching to deliver the demand signal needed by manufacturing industry.
7. be realistic to ensure customers can find suppliers.
8. account for variation by geography of rate at which supply industry can de-carbonise.
9. be congruent with GCCA global Concrete Future Roadmap taking into account national opportunities/challenges, or national roadmaps where they exist.

Low carbon procurement should be promoted through application in government and government agency projects and enabled by material and building standards being updated to permit low and near zero carbon product to be specified.

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10.0 GCCA Member Commitments

Low carbon procurement is a key policy ask in the GCCA global Concrete Future Roadmap which sets out a net zero pathway to help limit global warming to 1.5°C. The Concrete Future Roadmap is the collective commitment of the world's leading cement and concrete companies to fully contribute to building the sustainable world of tomorrow. The sector is committed to producing net zero concrete by 2050 and is committed to acting now, with a 2030 milestone of reducing cement and concrete carbon footprint by 20% and 25% respectively compared with 2020 baselines.

To support governments, other construction clients and actors in the supply chain, GCCA and its members will:

1. continuously improve the environmental, social and economic sustainability credentials of our products and their performance throughout their lifecycle.

2. provide robust data for lifecycle assessment and sustainability assessment methods including EPDs.

3. support development of lifecycle assessment (LCA) tools and standards for use by professionals and in digital design tools.

4. facilitate R&D collaboration targeting sustainability of the built environment, in particular lower carbon.

5. promote best practices in sustainable construction.

11.0 References

1. Global Cement and Concrete Association. (2020) The GCCA 2050 Cement and Concrete Industry Roadmap for Net Zero Concrete. https://gccassociation.org/concretefuture/wp-content/uploads/2022/10/GCCA-Concrete-Future-Roadmap-Document-AW-2022.pdf

2. International Energy Agency. (2022) Achieving Net Zero Heavy Industry Sectors in G7 Members. https://www.iea.org/reports/achieving-net-zero-heavy-industry-sectors-in-g7-members

3. Concrete Sustainability Council. (2021) Technical Manual – Version 2.1. https://csc.eco/wp-content/uploads/sites/9/2022/04/Technical-Manual-CSC-CO2-Module_20220103.pdf