Concrete decarbonisation – unscrambling the acronyms

IStructE Head of Climate Action, Will Arnold, guides readers through the alphabet soup of organisations working to advance decarbonisation of concrete within the UK.

Concrete decarbonisation in the UK is suffering from 'acronymitis'. Our industry is now home to the LCCG, CZ, ICG CDA, AC-DG, AMC, and more. Each plays a key role in decarbonising our concrete – but to the uninitiated, this alphabet soup can be confusing. And, of course, they all operate in the wider context of work by long-established institutions such as the IStructE and MPA The Concrete Centre, which have been providing guidance and advice on sustainable concrete for decades.

So, what are each of these groups, what roles are they playing, and how do they overlap? This article aims to explain the main objectives and opportunities behind all five, and calls on members to get involved to help accelerate the transition to a lower-carbon-concrete world. Each of the five are outlined below (with a shorter summary in **Table 1**) in chronological order based on year of inception.

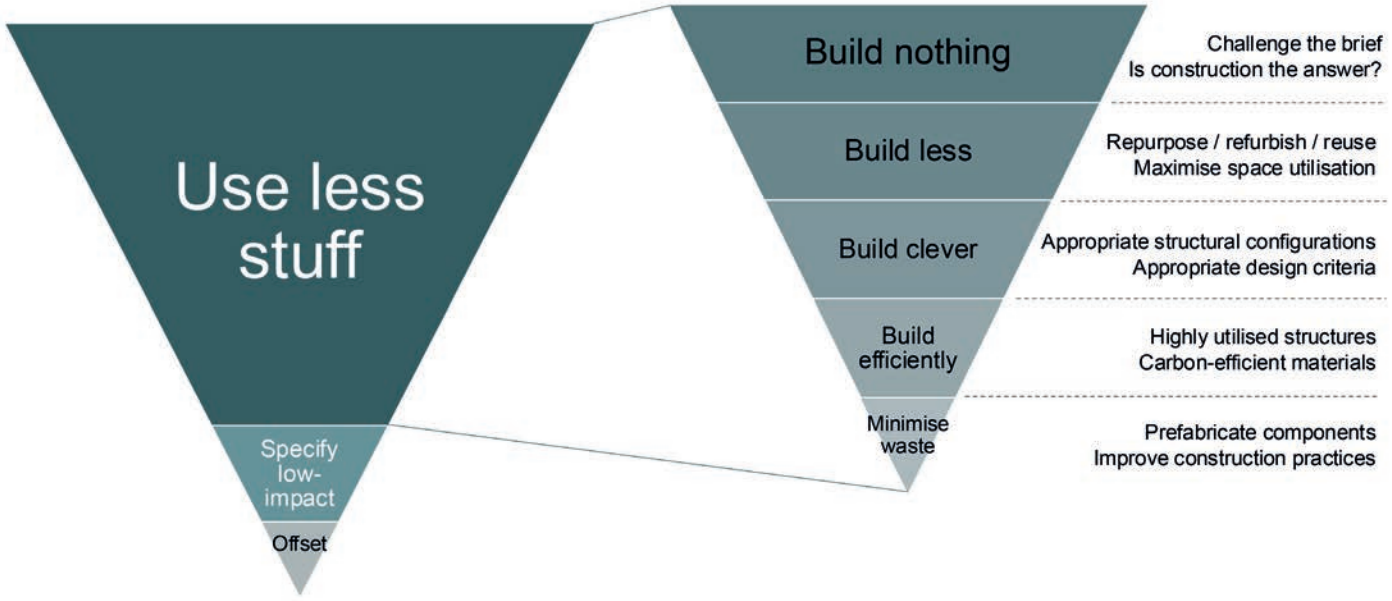
LCCG – the Lower Carbon Concrete Group

Established by the UK's Green Construction Board in January 2020, the LCCG comprises professionals from a wide cross-section of the concrete and cement industry, including academia, engineering, contractors, materials technologists, clients, and more. Members attend as individuals, often volunteering their own time to help accelerate concrete decarbonisation.

The group has 14 different workstreams, with focus areas including collecting and analysing data from the industry and conducting ongoing benchmarking of concrete's embodied carbon. In 2022, the group developed and published the UK Low Carbon Concrete Routemap[1], outlining strategies to reduce carbon emissions in concrete production. This was followed by the UK Market Benchmark[2] to understand the embodied

Table 1: Simplified overview of the five initiatives

Acronym	LCCG	CZ	ICG CDA	AC-DG	AMC
Full title	UK Lower Carbon Concrete Group	Climate Group ConcreteZero	Infrastructure Client Group Concrete Decarbonisation Accelerator	Accelerating Concrete Decarbonisation Group	Innovate UK Advance Market Commitment for innovative low-carbon concrete
Web address	www.lccg.uk/	www.theclimategroup.org/concretezero	www.ice.org.uk/news-views-insights/inside-infrastructure/ways-uk-infra-clients-speed-decarbonising-concrete	N/A	https://iuk-business-connect.org.uk/programme/advance-market-commitments/
Flavour	Convening Concrete experts	Commitment Global	Convening Infrastructure-led	Convening Developer-led	Commitment (semi-contractual)
Main actors	Technologists, consultants, contractors	Consultants, contractors, asset owners	National critical infrastructure owners	Asset owners, developers	Asset owners, developers, contractors
Actions	Data & benchmarking, routemap, insurance, specifications, Flex 350, 'low carbon' definition and benchmarking	Commitment, data gathering, 'low carbon' definition, specifications, innovations	Data gathering, client standards/specifications	Data & benchmarking, insurance, specifications, project prototypes	Commitment (by volume), defining target projects, engaging insurers
Format	14 workstreams	Online commitment	7 commitment areas	6 working groups	Commitment



↗FIGURE 1: IStructE hierarchy of net-zero design tells us to prioritise material reduction, and then supplement this through low-impact specifications

carbon associated with different typical concrete mixes in the UK.

In 2023, the LCCG also endorsed the cross-industry paper, *The efficient use of GGBS in reducing global emissions*[3], whose production was led by the IStructE. Finally, the group was heavily involved with the production of BSI Flex 350[4], *Alternative binder systems for lower carbon concrete*, of which version 2 was published in 2024.

CZ – Climate Group's ConcreteZero commitment

ConcreteZero is a global initiative that was formed in 2022 to unite concrete buyers, users and specifiers to create a market for net-zero concrete. Commitments are made by companies which then nominate representatives to join regular knowledge-sharing meetings and technical workshops convened by Climate Group. As of 2024, the commitment requires members to demonstrate improvements to concrete use efficiency alongside setting time-bound targets for reducing the embodied carbon of concrete.

By harnessing the collective purchasing power and influence of these members, ConcreteZero aims to send a strong demand signal to shift global markets, investments and policies towards the sustainable production and sourcing of concrete. While the initiative was set up with a global view, it has been strongly led by UK involvement in the initial years. However, focuses on other countries, such as Singapore, are now starting to emerge. The initiative is devoted to driving innovation and adoption of low-carbon concrete solutions across the construction industry.

ICG CDA – Infrastructure Client Group Concrete Decarbonisation Accelerator

The ICG is made up of nine of the largest owners of critical national infrastructure in the UK, such as Network Rail and the Environment Agency. Alongside many other programmes of work, in 2024 the organisations came together to set out seven key commitments under the banner of the CDA.

The seven commitments were designed to bring consistency to the nine owners' approach to reducing their individual carbon impacts. These commitments include the need to use concrete more efficiently, to embed low-carbon concrete requirements in projects, and to improve carbon and concrete data up and down the supply chain.

It is estimated that, together, the nine organisations account for around a quarter of total infrastructure concrete use in the UK. Their priority is to focus on activities best led by clients, while collaborating with the other groups in this list to use outputs that they have produced – such as the Market Benchmark from the LCCG.

AC-DG – the Accelerating Concrete Decarbonisation Group

In 2024, a group of 10 London-based property developers, led by Derwent London, came together to form the AC-DG, with the aim of finding ways to catalyse faster uptake of lower-carbon concretes within the London market.

Over time, the group has grown to include designers, contractors, supply chain and cross-industry bodies. It is estimated that the main developers involved will collectively use around 10M tonnes of concrete by the end of the decade. The group has six workstreams working on different aspects, such as looking at the insurance and specification aspects of using lower-carbon concrete.

Its intention is again to amplify the work of other groups, translating this specifically into actions for property developers, and to reduce existing barriers to implementation. It also aims to conduct large-scale trials of a number of alternative concrete technologies during 2026 (subject to agreeing the scope, location and funding) to help grow confidence in using these products at scale.

AMC – Innovate UK's Advance Market Commitment for innovative low-carbon concrete

Finally, the low-carbon concrete AMC was established in 2024 by Innovate UK, and is being implemented by Carbon Limiting Technologies. The initiative brings together a group of organisations that commit to buying low-carbon concrete innovations in the future, if they meet an agreed set of technical and commercial criteria. The AMC is a commitment wording, rather than a group of individuals or organisations – although it is, of course, organisations signing up to the AMC that will drive change.

The AMC is designed to send a

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collective demand signal to provide financial certainty and support investment in innovative low-carbon concretes. The AMC also supports access to insurance markets for customers using these new concretes. Demand-side organisations, such as asset owners, will use the AMC to make commitments to purchase minimum volumes of specific categories of innovative low-carbon concrete over a certain period, and to then feed this commitment into supply contracts. This reduces the risk related to investing in these innovations, thus accelerating their development and scale-up.

While the initiative is focused on asset owners/developers, there are complementary commitments for consultants and contractors to support specification and procurement for their projects.

Similarities and themes

The LCCG, ICG CDA and AC-DG are convening groups that bring experts together on a regular basis to progress a series of different aspects that are required to help bring lower-carbon concrete technologies to market. CZ and the AMC each act primarily as a commitment to provide demand-side signals to bring market certainty to those who would invest and insure these technologies. The ICG CDA has a clear infrastructure client remit, while the AC-DG is focused on London-based property developers. The other three work across both buildings and infrastructure. CZ is an outlier as a global initiative (though with heavy UK interest), while the other four are primarily based in the UK.

These are, of course, all oversimplifications; each group has given itself a broader set of objectives than the above, and each involves more experts bringing different views than I can describe in a few hundred words.

And while each of the initiatives has its own 'flavour', there is significant collaboration and overlap between the five groups. More broadly, all are pushing for consistency in the way the industry includes embodied carbon within concrete specifications. All are reviewing the innovation landscape, to identify which concrete products can most readily be brought to market, and which will result in the greatest reduction in emissions (for this, see the IStructE's concrete technology tracker[5]). And, of course, all five have also been set up with the aim of quickly enabling non-codified concretes to be used on real-world construction projects.

> **"DON'T BE AFRAID TO OFFER ALTERNATIVE SOLUTIONS TO YOUR CLIENT AND CHALLENGE THEIR BRIEF**

It's also worth noting the significant overlap with, and involvement of, groups such as the IStructE, the Institution of Civil Engineers (ICE), and MPA The Concrete Centre across all five. For example, the Market Benchmark was developed by the LCCG, using data collected by MPA The Concrete Centre. The GGBS paper was endorsed by the IStructE, MPA The Concrete Centre, CZ and the LCCG. And BSI Flex 350 was supported by the LCCG, CZ, IStructE, ICE and more...

What next?

For practising structural engineers looking to help accelerate concrete decarbonisation, I would suggest three things.

First, if your company hasn't already made some kind of commitment to lower the carbon of your concrete usage, you can do so by looking into either the CZ or AMC initiatives.

Next, waste no time – you can start reducing the carbon in your designs today. As always, this must start by aiming to simply 'use less stuff' **(Figure 1)**. This means prioritising reuse and circularity, driving for efficient structural configurations, and embracing design and construction technologies that can maximise design utilisations. The IStructE guide *Design for zero*[6] provides practical guidance for all of these, as do more and more articles in *The Structural Engineer*[7].

Don't be afraid to offer alternative solutions to your client and challenge their brief – if leaner design options aren't presented and costed, they will never be implemented. Once the most efficient solution has been agreed, the remaining concrete that you do use should be specified in as low-impact a way as possible. For guidance on this, refer to the recently released CZ Concrete Specification Guidance[8].

Finally, if you are already working with lower-carbon concretes in some way, get in touch with any of the groups, or at climateemergency@istructe.org, and tell us what you're doing. At a recent meeting of one of the five groups, a representative involved in a demonstration pour of Ecocem's ACT concrete (a cement mix that uses ground limestone as the primary ingredient) offered to share test data with the wider group. This might not have happened if it wasn't for that meeting, highlighting the need to find more ways to enable sharing. Such data is invaluable to those working at the forefront of concrete decarbonisation, and it is only through speaking about our trials with others that our knowledge can help advance the whole industry.

Unconcerted overlap makes for nervous insurers and investors, and so it's vital that all five of these groups, along with the IStructE and organisations like MPA The Concrete Centre, continue to work hard to communicate and collaborate effectively. The same extends to Structural Engineers Declare, the Engineers Reuse Collective, and more. We need to keep making ourselves available to each other, and embracing our inboxes that are full of these acronyms.

As a mentor of mine reminds me from time to time, climate action across our industry is 'more like a ceilidh than line dancing', and this certainly feels true for concrete decarbonisation. The set-up may be a little messy, and we have to keep switching who we work with on different parts, but, ultimately, we're all trying to move in the same direction.

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