Towards meaningful quota for low-carbon concrete in the Industrial Accelerator Act

Methodological paper

Brussels, May 2026

Through sensitivity analysis, we modelled 16 different scenarios to calculate what quota for low-carbon concrete can be set in the Industrial Accelerator Act. This was based upon data and assumptions derived from (i) Cement Europe roadmap, (ii) the IAA impact assessment and (iii) relevant studies on cement and concrete from the EC Joint Research Centre. Hereby we defined low-carbon concrete as a concrete which relies on a blended Portland cement containing (a) near-zero clinker (CCS or clinker recycling) and (b) supplementary cementitious materials (SCMs).

Our analysis shows that:

1) **In all 16 scenarios (even the most conservative ones) low-carbon concrete can supply between 90% and 115% of the public market by 2030**. Looking at the EU market as a whole, low-carbon concrete can supply between 23% and 48% of the total market by 2030.

2) **An IAA quota for low-carbon concrete should be significantly higher than the 5% currently proposed and ideally be lifted to at least 50% and potentially even up to 75%,**This will positively reward investments in low-carbon concrete, both at the level of cement (i.e. production of near zero cements) as well as continuing to incentivize optimizing concrete mix design (i.e. circularity). Furthermore, it would not result in market distortions for those private sector actor keen on sourcing low-carbon concrete, nor create upward price pressures for the public sector.

Introduction

On 4 March 2026, the European Commission unveiled a proposal for an Industrial Accelerator Act (IAA). It is meant to serve as a comprehensive policy package to accelerate the production and uptake of clean industrial products on the European single market, as such seeking to boost the competitiveness and decarbonisation of European industry.

For industrial goods like steel, aluminium or cement, the IAA seeks to harness the power of public procurement through the creation of so-called lead markets. This refers to the idea of creating stable and strong demand for low-carbon products through mandatory public procurement measures. In the IAA, this takes the shape of quotas for low-carbon concrete, as stipulated in Annex II of the proposal.

More precisely, the European Commission' proposal puts forward a requirement that for *"public procurement procedures launched on or after 1 January 2029 [...] contracting authorities shall require the following minimum percentage shares: [...] (b) concrete and mortar, and any product the performance of which depends mainly on concrete and mortar, intended for use in buildings and infrastructure for civil purposes:* ***at least 5% of the total volume of concrete and mortar used, including the clinker and cement used to produce them, shall be low-carbon and of Union origin;***

However, the accompanying IAA impact assessment conducted by the European Commission does not provide details as to why this 5% quota has been picked, nor its potential to serve as a strong and meaningful target for the creation of a lead-market for low-carbon concrete. Therefore, the main objective of this methodological paper is to deliver on these outstanding questions. In the remainder of this paper we will first provide our definition of a low-carbon concrete; followed by a methodological section in which we highlight the key variables and data sources used for the modelling. The third and final section will present the key results, showcasing the strong mismatch between the proposed 5% quota and the fast-growing availability of low-carbon concrete on the market.

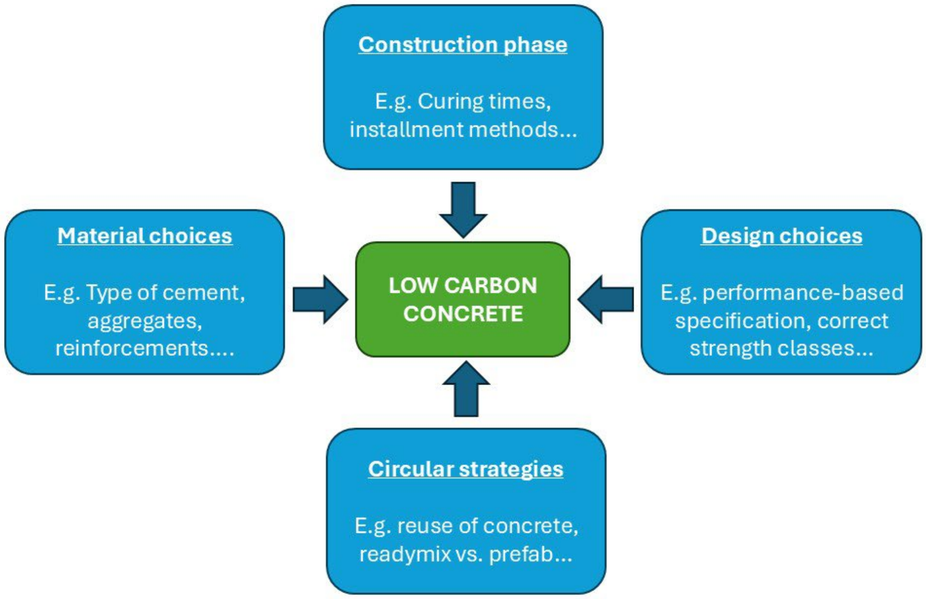
Defining low-carbon concrete

Conceptual framework

A major strength of the IAA is its proposal to introduce mandatory requirements (i.e. quotas) at the level of concrete, rather than cement. First, this offers a much simpler framework from an administrative burden point of view. Second, and as per explanatory memorandum of the IAA, this is justified by the simple fact that concrete (and mortar) are the relevant final products purchased on the market. Hence, what matters is delivering a performing low-carbon concrete to the market. And the simple reality is that while this might in virtually all cases require the use of a low-carbon cement (i.e. the main culprit of emissions in traditional concrete is traditional cement); this is not always a sufficient condition.

Indeed, and also important for the definition put forward in this methodological paper, is the fact that the carbon footprint of concrete is determined by a wider range of variables, including the type of materials used. Conceptually, this can be visualized as follows:

Figure 1: Variables influencing the carbon footprint of concrete



As reflects from figure 1, the carbon footprint of concrete is determined by several variables. As stated above already, material choices play a major role in most concretes placed on the market, stemming from the fact that traditional Portland cement is the main culprit of emissions of concrete today. This being said, carbon reductions can (and should) also come from the deployment of other additional levers. Optimizing concrete design mixes (e.g. avoiding overspecification of cement) is obviously key, but also small adjustments to the placement of the concrete on site (e.g. a working schedule that allows for slower strength development) can contribute substantially to reducing the footprint of the concrete. Finally, and very much emerging, we see a growing shift in construction as a whole – including concrete – to circular economy strategies. Amongst others, this might involve the reuse of concrete.

Having now established the above conceptual framework for low-carbon concrete, the following conclusions can be drawn:

- **A low-carbon concrete label is the only one capable of accommodating in a simple and straightforward way the - often complex – interplay between different variables impacting the material's carbon footprint.** In contrast, if one tried to achieve the same objective via the creation of a low-carbon cement label, one is likely to be unsuccessful as a label at the level of cement alone is never capable of also incentivizing and rewarding e.g. better design or material efficiency. Furthermore, it would also fail to prevent dynamics whereby a potential green premium associated with some types of cements (e.g. CCS) is offset from a cost perspective by using often cheaper and more carbon intensive other materials like virgin aggregates and/or BF/BOF steel for reinforcement.

While one could argue, that some of these dynamics could be tackled by introducing next to a low-carbon cement label a wide range of other labels and/or requirements for concrete, it goes without saying that this would make matters highly complex for procurement actors with no added-value to a simple and straightforward label at the level of concrete only.

- **A low-carbon concrete level needs to set sufficiently high requirements to ensure that these cannot be easily met by design choices only.** As pointed above, the main culprit of concrete emissions today is the (strong) overreliance on clinker intensive Portland cement. Therefore, it is crucial that lead markets incentivize both the reduction of clinker (e.g. SCMs, alkali-activate cements, novel cement) while also advancing on tackling the remaining residual emissions (e.g. clinker recycling, CCS). This can be achieved on the condition that quotas for low-carbon concrete are set at a level that cannot be met by e.g. improved material efficiency through better design choices. While obviously these levers are very important (see also supra) and need to be pushed through the IAA quotas; it is equally important to create the right incentives for derisking the deployment of several low-carbon concrete technologies.

Operational definition of low-carbon concrete

Arguably one of the more difficult questions for co-legislators is how to adopt quotas for low-carbon concrete in the absence of a clear definition (e.g. carbon footprint threshold) and the absence of publicly available data on the volume of low-carbon concrete on the market today and in the near future.

This paper overcomes this challenge by applying the following methodological approach:

- Based upon our conceptual framework and the intermediate conclusions put forward (see supra), **we define low-carbon concrete as any type of concrete which is using a cement that combines a near-zero clinker (i.e. CCS or recycled clinker) with supplementary cementitious materials (i.e. SCMs)**. This is motivated by 2 main reasons:

  1) Conceptually, this definition is closely aligned to industry roadmaps and mainstream thinking around cement and concrete decarbonisation (i.e. a certain share of CCS is required, which is ideally reduced as much as possible by the uptake of SCMs to reduce the overall costs and energy footprint of the cement associated with the deployment of carbon capture).

  2) Methodologically, this definition allows us to build upon available data from industry roadmaps and official sources (e.g. Joint Research Centre), as such overcoming the challenges associated with finding aggregated data at an EU level on the footprint of concrete.

Using the above operational definition of low-carbon concrete, we are confident that it translates 'on the ground' into to concrete with a footprint well below the market average – or in the logic of labelling falls within the top two classes of performance (i.e. typically top 20%). **This because our definition revolves around the use of (near)zero cements in concrete. This is the case because of two main reasons/assumptions:**

1) For the part of near-zero clinker: projected capture rates of CCS (i.e. being close to 100%) will be met by CCS projects in the short-term pipeline, in line with statements and claims made in context of innovation fund projects. For electric clinker recycling, we equally assume a near-zero footprint in line with data shared in leading international journals (e.g. Nature).

2) For the part of SCMs: environmental footprint is low already and will continue to further improve moving forward, justified by the fact that a lot of the thermal energy requirements (if relevant) will be electrified. Taking the example of one popular SCM, activated clays (e.g. LC3 mixes) – the activation of clay is happening through a fast-growing range of technologies from fully electrified already (e.g. mechanical activation) to use of waste-heat from (clinker) kilns…

- Important limitations to our definition of low-carbon concrete, however, is the fact that **(i) it does not take into account some of the other variables identified in our conceptual framework (cf. figure 1),** most notably optimizing concrete mixes ; and **(ii) conceptually restricts low-carbon concrete to mixes relying on Portland cement with near zero clinker (i.e. recycled clinker and CCS) and SCMs**, as such ignoring other low-carbon cement chemistries such as alkali-activated cements and new cement types. These limitations were remedied, however, in our modelling by introducing two variables (see also infra):

1) Variable on potential of circular economy: based on data provided in industry roadmaps, we included a variable that calculated the impact of circular economy, most notably optimizing mix designs, in different scenarios.

2) Variable on market potential of non-Portland cements: based on data provided by the EC's Joint Research Centre (JRC), as well as other sources, we included in several scenarios a variable which factored in the market uptake of these cement types in concrete on the EU market.

Interim summary: while in an ideal scenario, data would be available on the volumes of low-carbon concrete available on the EU market by 2030 to then be plotted against different (existing) labelling systems, such data is not existing to our knowledge. Therefore, the above methodological approach enabled us to overcome these data challenges, allowing us to run different models (see infra). **Importantly, this was done**

in a way whereby low-carbon concrete was not restricted to one type of solution (e.g. CCS) but set sufficiently broad to accommodate both Portland and non-Portland cement mixes, as well as the different variables identified in our conceptual model (cf. figure 1).

Methodology modelling

To calculate at what level quota for low-carbon concrete can realistically be set in the IAA by 2029, we depart from our conceptual definition of what constitutes a low-carbon concrete (cf. supra) and applied the following methodological approach:

1) **We apply our low-carbon concrete definition**, as presented in the previous section. From there, we focus on the key part of our definition, being the use of near-zero cement which are composed out of (i) near-zero clinker and (ii) SCMs. For both, we rely on EU data on total volume coming from industry roadmaps and other relevant sources. **For near-zero clinker, we adopted a conservative approach as we only included data on CCS projections**, stemming from the lack of EU wide data on electrical recycling of clinker. This means that we are potentially underestimating the market-size of near-zero cement by 2030 by not factoring in recycled clinker. This was motivated by the lack of public available data. However, it should be noted that in the case of (electric) recycling of clinker, significant advancements have been made already in the UK, with cements being deployed on the market already.

2) **We calculate the share of near-zero cement of the total cement market.** Note that we did this for 2030 (and not 2029) as industry roadmaps on which we relied for data did not contain specific data points for 2029.

3) **We assume that cement and concrete markets evolve in the same direction,** meaning that an increasing (or decreasing) share of near-zero cement on the total Portland cement market translates into an equal increase or decrease of low-carbon concrete on the market. Amongst others, this is justified by the fact that e.g. concrete standards in Europe contain clear provision on minimum cement content etc. ensuring a high degree of correlation between both markets. However, as pointed out in our conceptual framework, we do not assume that both markets move 100% aligned, most notably due to dynamics linked to what we've coined "circularity measures" as variable, referring to the fact that e.g. better design or specifications allow to supply a larger share of the concrete market with the same volume of cement. Note that for this variable, data is provided in both industry roadmaps and studies from the EU Joint Research Centre. In addition, and again in line with industry roadmaps and data from the JRC, we also correct for the market share of non-Portland cements.

4) **Based on steps 2 and 3 we calculate the total share of low-carbon concrete on the total market (private and public)**. Subsequently, and based on data on the share of the public market for cement/concrete in Europe, we can derive feasible quota for low-carbon concrete for the public sector in Europe by 2030.

This was operationalized as follows in our model, highlighting both the different variables (and data sources) as well as interactions between the different variables in the 16 different scenarios that were calculated:

Quota public (SPn) = Market (Mn) * Circularity (C/D) * Clinker ratio (E/F/G) * Public procurement share (I)

This was based on the following input variables for our sensitivity analysis:

Table 1: input variables DATA Modelling

	Variables	Value	Code	Source
INPUT DATA Modelling	Volume of CO2 capture in Mt	14	A	Cembureau roadmap, 2030 value
	Volume of CCS clinker in Mt (based on 0,55ton emissions per ton of clinker)	25,45	B	Joint Research Centre, 2024 (Marmier)
	Enhanced circularity (average) in %	7,5	C	Cembureau roadmap, 2030 value
	Enhanced circularity (upper bound) in %	10	D	Cembureau roadmap, 2030 value
	Clinker-to-cement ratio in % (CONSERVATIVE)	74	E	Cembureau roadmap, 2030 value
	Clinker-to-cement ratio in % (MODERATE)	57	F	Own calculation, average Cembureau & Detocs
	Clinker-to-cement ratio in % (OPTIMIST)	40	G	H2020 DETOCS
	Market share of low-carbon alternatives to Portland Cement (e.g. Alkali-acitaved cements) and substitution with low-carbon materials (e.g. biobased) of total	10	H	Joint Research Centre, 2025 (Walker et al)
	Share of public procurement of total cement market in %	31	I	VUB, 2025 (Wyns et al)
	Total EU production of cement in Mt	175	J	Cement Europe (website)
	Total EU demand of cement in MT	160,7	K	EC, IAA impact assesment

Table 2: derived variables

TOTAL VOLUME OF NEAR-ZERO CEMENT (near-zero CCS-SCM blend) requirend to supply entire EU market	Variables total EU market	Value	Name	Notes
	M1 = J*B	175	Cembureau	we opted for new variable names (M1-M4) for sake of clarity, with M standing for Market and the number for the different market size
	M2 = K*B	160,7	IAA	
	M3 = J*H*B	157,5	Cembureau*nonOPC	
	M4= K*H*B	144,63	IAA*nonOPC	

Which combined resulted in the following scenarios:

Table 3: scenarios (quota total market) + (quota public market)

SCENARIOS - Share of TOTAL MARKET DEMAND (in %) that can be supplied with low-carbon concrete	Variables interaction*	Value (in %)
	S1 = M1*C*E	23,4%
	S2 = M2*C*E	25,5%
	S3 = M3*C*E	26,0%
	S4 = M4*C*E	28,3%
	S5 = M1*C*F	27,6%
	S6 = M2*C*F	30,0%
	S7 = M3*C*F	30,7%
	S8 = M4*C*F	33,4%
	S9 = M1*C*G	39,3%
	S10 = M2*C*G	42,8%
	S11 = M3*C*G	43,7%
	S12 = M4*C*G	47,6%
	S13 = M1*D*G	40,4%
	S14= M2*D*G	44,0%
	S15 = M3*D*G	44,9%
	S16 = M4*D*G	48,9%

* note that we did not ran every possible scenario as some were irrelevant based on the assumptions and/or to much overlapping with other scenarios due to small differences in values of the underlying variables

SCENARIOS - Share of PUBLIC MARKET DEMAN (in %) that theoretically can be supplied with low-carbon concrete	Variables interaction (SnP = Sn * I)	Value (in %)
	S1P = S1*I	75,4%
	S2P = S2*I	82,1%
	S3P = S3*I	83,8%
	S4P = S4*I	91,2%
	S5P = S5*I	89,0%
	S6P = S6*I	96,9%
	S7P = S7*I	98,9%
	S8P = S8*I	107,7%
	S9P = S9*I	126,8%
	S10P = S10*I	138,1%
	S11P = S11*I	140,9%
	S12P = S12*I	153,4%
	S13P = S13*I	130,3%
	S14P = S14*I	141,9%
	S15P = S15*I	144,8%
	S16P = S16*I	157,7%

Results

Based on different assumptions and input data, 16 different scenarios were modelled to calculate at what level (in %) quota for low-carbon concrete can be introduced (see table 4). This builds upon data and assumptions derived from sources including (i) Cement Europe's roadmap, complemented with data from (ii) the IAA impact assessment and (iii) relevant studies on cement and concrete from the EC Joint Research Centre (see also table 1).

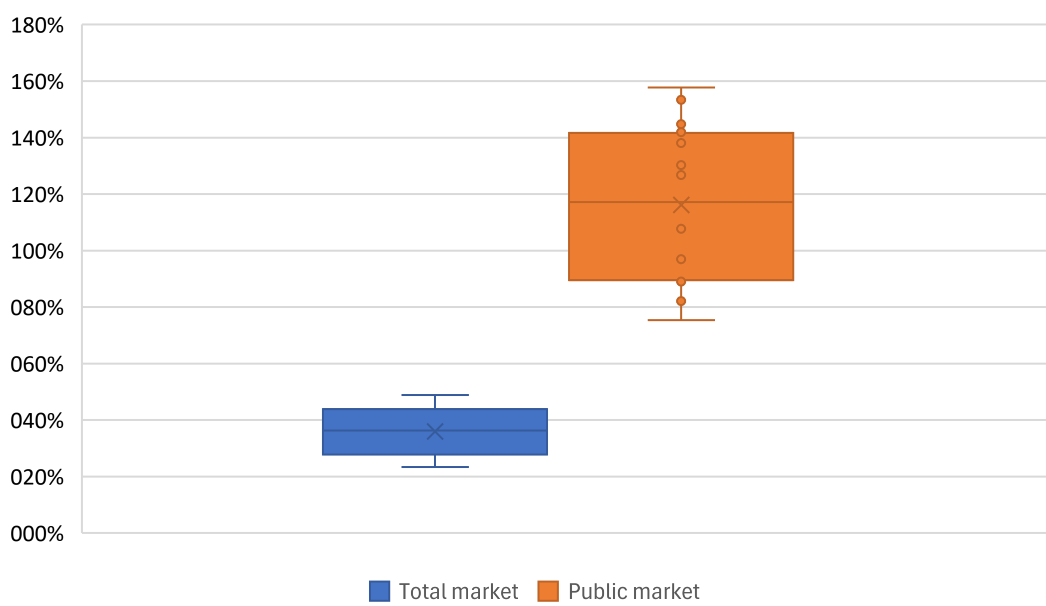
Based on our conceptual framework and definition of low-carbon concrete, as well as our methodology (see supra), we ran 16 different scenarios, the majority of which based on conservative assumptions. This choice was deliberate as it reduces the risk of overestimating the potential market share of low-carbon concrete by 2030.

As reflects from table 4, and the corresponding figures 2 and 3, all scenarios – even the most conservative (i.e. Scenario 1 (S1) relying entirely on data from the Cement Europe roadmap) – showcase that by 2030 the lion share of concrete on the public market can be supplied by low-carbon concrete. Indeed, all scenarios put forward quota % between 90% and 115% (cf. figure 2).

Table 4: summary table results

Results	Share of TOTAL market in 2030 with low-carbon concrete (in %)	Share of PUBLIC market in 2030 with low-carbon concrete (in %)
S1	23,37%	75,40%
S2	25,45%	82,11%
S3	25,97%	83,78%
S4	28,28%	91,24%
S5	27,59%	88,99%
S6	30,04%	96,91%
S7	30,65%	98,88%
S8	33,38%	107,68%
S9	39,31%	126,79%
S10	42,80%	138,07%
S11	43,67%	140,88%
S12	47,56%	153,41%
S13	40,40%	130,31%
S14	43,99%	141,91%
S15	44,89%	144,79%
S16	48,88%	157,68%

Figure 2: Theoretical share of market that can be supplied with low-carbon conrete



Taking a conservative approach and not wanting to create a market dynamic whereby public demand is crowding out low-carbon concrete from the private market segment, we do not think that it is possible, nor desirable to put a quota for low-carbon concrete in the IAA of 90% or higher, even though it can be theoretically justified by our findings (cf. figure 2). This is the case for two mean reasons:

- **Avoid unnecessary market distortions**: a wide range of economic actors, including construction companies, have come to set decarbonisation targets for themselves at company level. For those with little to no presence in the public market segment, sufficient supply of low-carbon concrete is critical to meet their decarbonisation targets.

- **Acknowledge existing market dynamics:** as is also the case for renewable electricity market, today's market includes a number of actors with a strong demand for low-carbon concrete and substantial financial power to source these materials (e.g. big tech and construction of data centers). As such, any type of policy which would (un)intentionally steer virtually-all low-carbon concrete to the public part of the market, risks creating unnecessary upward price pressure on low-carbon concrete at the expense of public budgets.

Therefore, combining the findings of our modelling with the above-described dynamics, **we believe that a meaningful target in the IAA for low-carbon concrete sits between 50% and 75%, with the option to being revised upwards periodically moving forward** (cf. figure 4). Such target seems politically feasible (i.e. it is creating a strong lead market for low-carbon concrete in line with industry roadmaps), while at the same time is sufficiently high to push the market to both move forward on the scaling of near-zero cements, as well as further advance on optimizing concrete mix designs from circularity point of view. This stands in sharp contrast to the current proposed 5% target which by no means corresponds to industry, roadmaps and other sources, nor will create meaningful change on the market.

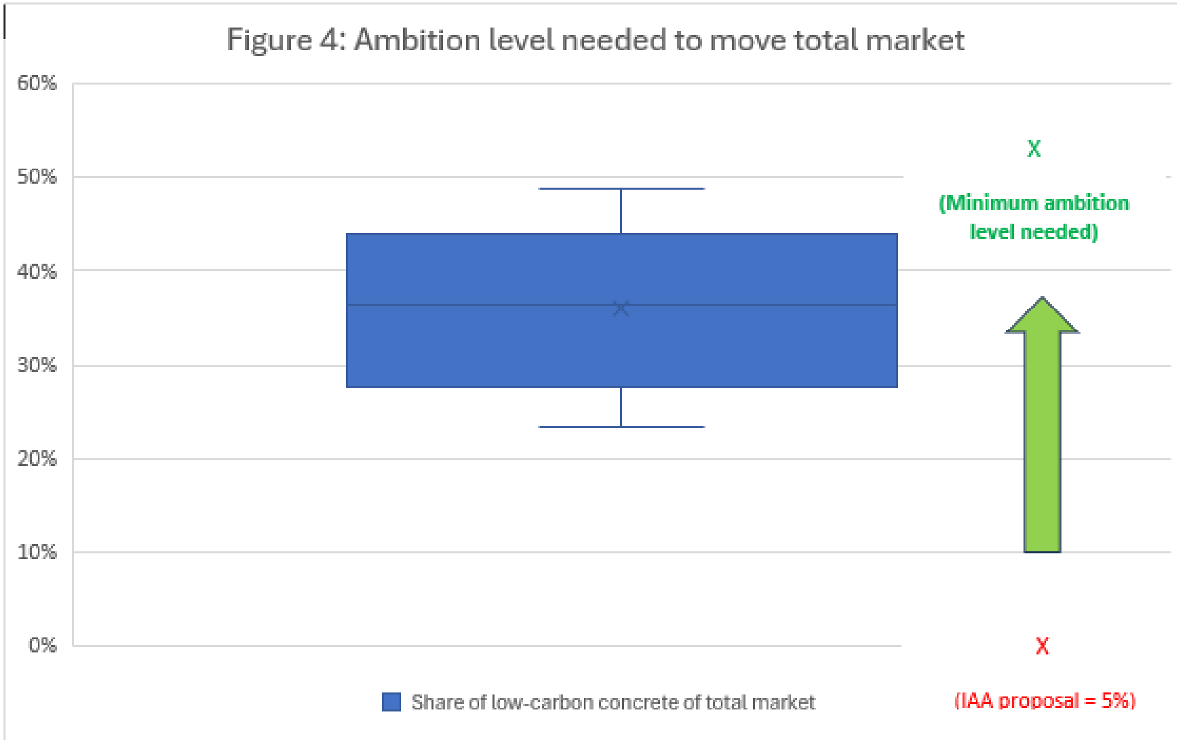


Figure 4: Ambition level needed to move total market
60%
50%
40%
30%
20%
10%
0%
X
(Minimum ambition level needed)
X
(IAA proposal = 5%)
Share of low-carbon concrete of total market