

By email
May 15, 2023

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State of California
Building Standards Commission
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Dear Commissioners:

BSC 2022 Intervening Code Cycle, California Code of Regulations, Title 24 Part 11 **Support for proposed code amendments that address embodied carbon**

Arup is a global engineering firm with a California practice based in offices in San Francisco, Oakland, and Los Angeles. As the leader of our structural engineering practice in California, I am writing in support of the embodied carbon standards proposed for BSC and DSA-SS in the *Initial Express Terms for Proposed Building standards of the California Building Standards Commission regarding the 2022 intervening code adoption cycle, California Code of Regulations, Title 24, Part 11 (BSC 04/22)*.

Our support applies to both the proposed BSC and DSA-SS amendments that address embodied carbon of construction materials including sections 5.105.1, 5.105.2, 5.409.1, 5.409.2 and 5.409.3. Setting explicit limits on the embodied global warming potential of materials used in constructing projects in California, backed by verifiable environmental product declarations is an important step towards the commitments made by the state including those in Senate Bill 596, Executive Order B-55-18 and Assembly Bill 2246.

We recognize that the amendments proposed in this intervening code cycle are only a first step in the journey towards achieving the stated objectives of net-zero no later than 2045. Since this is the case, and recognizing the extensive work already put into this proposal by the CALGreen Carbon Reduction Collaborative (CCRC), we are limiting these further comments to observations that we hope will be addressed in the next full code adoption cycle:

1. We do not believe that the Initial Express Terms referenced above are sufficiently ambitious to leverage current industry capabilities, nor so they match the urgency of emission reduction necessary to reach net zero no later than 2045.
2. The Express Terms provisions for structural materials in Table 5.409.3, set prescriptive Global Warming Potential (GWP) limits on steel and concrete products. In our view, the limits set in that table at 175% of Buy Clean Limits / 175% National Ready Mix Concrete

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Association (NRMCA) benchmark values will have minimal impact on business as usual. For example, the GWP limit given by this table for 4000 psi normal weight concrete (a common concrete specification) would be 566 kg CO₂e/m³. In 2019 the NRMCA survey of typical concrete mixes found that the average GWP value for this category of concrete in the US region which includes California was 347 kg CO₂e/m³. Furthermore, a database of Environmental Product Declarations (EPDs) managed by buildingtransparency.org indicates that 80% of the EPDs submitted for this category of concrete achieve a GWP below 461 kg CO₂e/m³. The standard set by Table 5.409.3 seems only to limit a small number of outliers.

3. California's building standards should be aligned with California's overall climate change strategy. Senate Bill 596 specifically requires the development of a strategy to bring the state's concrete sector to net-zero greenhouse gas emissions before December 31, 2045, and furthermore sets an interim 2035 emissions target of 40% below 2019 levels. Taking the NRMCA average value as representative of 2019 emission intensity in the cement industry, the 2035 target for 4000 psi concrete would need to be 63% below the value provided in Table 5.409.3. The limits established for the 2025 Building Code Cycle (affecting construction starting in 2026) will need to be tightened significantly in line with best practice.

We recommend that the Building Standards Commission chart a greenhouse gas emissions reduction path which consistently pushes towards the targets set by California's legislature. Like regulation of VOCs and energy standards, each standard set by the Commission should ensure that the industry average improves with each code adoption cycle. Emissions limits should be set near the average achieved by the industry at the time that the standard is set, so that most emitters will be required to make some modification to their practices.

In developing earthquake resistant design standards, California has led the way nationally and internationally. California again has the chance to lead, and we hope that the state will lead boldly.

Sincerely,



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