NRDC Comments to the California Air Resources Board on Embodied Carbon in Buildings Workshop 2 April 2025

Introduction

The Natural Resources Defense Council (NRDC) appreciates the opportunity to provide comments in response to the California Air Resources Board's (CARB) second workshop on Embodied Carbon in Buildings. NRDC is a membership-based environmental organization with 800 advocates, lawyers, scientists and engineers, dedicated to helping California and the US meet decarbonization targets in an efficient, cost-effective, and equitable way.

Overall, CARB's initial proposal for the implementation of AB 43/AB2446 provides a robust framework for data reporting and baseline development. In our comments, we provide affirmations of key components of the proposed concepts and offer potential improvements to consider.

I. Baseline Approach



CARB Embodied Carbon in Buildings Workshop 2, Slide 23, March 2025

For the calculation of a baseline, we agree with the staff recommendation to include stages A1-B5 in the lifecycle scope. As staff identify, much of the data currently used to assess the embodied emissions of construction materials is in the A1-A3 stages. For some materials, like timber or recycled concrete, A4 transport emissions can significantly influence whether a material is a low carbon option *when used on a specific project*. For example, recycled concrete is a material that can be used as an alternative to aggregate in new concrete mixes. However, due to its bulk and weight, it can quickly become a higher emission input if trucked more than a short distance from its

source. Therefore, recycled concrete is most carbon beneficial if it can be reused onsite. A simple A1-A3 emissions boundary would not take this into account. Factoring the A4 emissions may show that local materials are a better choice, even if they have higher A1-A3 emissions. Similarly, timber products, while sequestering carbon, may be purchased from one side of the US and trucked to the other, which can eclipse the carbon capture benefits of this biogenic material.

Including Stages B1-B5: We agree with the inclusion of stages B1-B5, accounting for the use, maintenance, repair, replacement, and refurbishment of a building. These activities occur over the life of the building and should be included as part of the calculation because they are critical to its ability to stay in service. Similar to LEED v5, the Institute for Sustainable Infrastructure's Envision Guidance,¹ in its CR1.1 Reduce Net Embodied Carbon category, requires emissions reductions to the total embodied carbon, which covers A1-B5.

Excluding B6: Excluding operational energy from the baseline calculation is a valid approach if the goal of the baseline is to focus on calculating the additional emissions from a building, beyond those already tracked and reported. As California has a robust set of protocols for measuring and reporting energy use in a building, excluding the emissions from the energy used to operate a building is sufficient for establishing a baseline for tracking embodied emission reduction progress. However, if CARB wishes to eventually be able to compare emissions reductions from building materials to emissions reductions from energy savings, especially for assessing where the most cost-effective reductions may occur, information on B6 will also be needed.

Excluding the C stage: For creating a baseline, we believe that A1-B5 is sufficient, as less information is known on end-of-life scenarios included in module C. However, we do recognize that for some materials, module C may largely impact their perceived emissions profile. For example, if timber products used in a building are burned at their end-of-life, their carbon capture benefits are not fully realized. We recommend CARB conduct additional analysis to identify which products have significant C stage impacts and how those could be most effectively addressed in the future.

Including Module D (reuse and circularity): The CARB proposal does not currently include the newly added Module D. This is an optional new module for circularity and material reuse, which is often referred to as "Cradle-to-cradle." As the implementors of one of the first embodied carbon reduction laws in the country, CARB has a unique opportunity for a transition to a circular economy in the U.S. To this end, NRDC recommends releasing guidance in the reporting requirements for life cycle module D. Denmark, Finland, and the European Union have begun rolling out mandatory requirements for lifecycle module D reporting. London and Vancouver are two municipalities that have also adopted requirements for module D.

• European Union – The Energy Performance of Buildings Directive (EPBD) was amended to include life cycle reporting and the development of GWP limits for all new buildings.² The directive requires accordance with EN 15978 which includes life cycle module D.

¹ <u>https://sustainableinfrastructure.org/wp-content/uploads/EnvisionV3.9.7.2018.pdf</u>

² https://eur-lex.europa.eu/eli/dir/2024/1275/oj

- Denmark- Bygningsreglementet 18 (BR18) is a building regulation requiring GWP limits for new buildings. To comply, an initial LCA and a final LCA must be submitted. The D1 module is reported separately in the LCA and is not absorbed into the value for compliance.³
- Finland The Finland Construction Act establishes reporting requirements and GWP limits for new buildings. Lifecycle module D is referred to as a "carbon handprint" and must be reported in the building's final inspection.⁴ The Finnish government provides GWP values for a variety of material types that would fall under this category.⁵

Comparing CARB's proposal to other standards and programs: In its September 2024 publication "Project LCA Requirements: Recommendations for Alignment" ⁶ Appendix A, the ECHO team shows a comparison of the different calculation approaches and requirements for lifecycle stage reporting. While the ECHO team strongly recommends including a cradle-to-grave assessment, stages A-C, a review of the existing standards and initiatives shows that almost all require A1-A5, some include B1-B5, and very few include B6-B7 (operational energy and water use). Similar to B1-B5, some approaches include C1-C4, either as optional or required.



ECHO Project Life Cycle Assessment Requirements, Appendix A, page 28, September 2024

³ <u>https://www.bygningsreglementet.dk/historisk/version-14/tekniske-bestemmelser/11/brv/version-2-bygningers-klimapaavirkning/kap-1_2/</u>

⁴ https://www.finlex.fi/fi/lainsaadanto/saadoskokoelma/2024/1027#OT3_OT0

⁵ https://co2data.fi/rakentaminen/reports/Carbon%20handprint%20R01.00.pdf

⁶https://static1.squarespace.com/static/65302e85ede46f4cf2b0d174/t/67913dfa6a485343747eefc2/17375 71837083/Project%2BLCA%2BRequirements%2BECHO%2BRecommendations%2Bfor%2BAlignment_2025 0117.pdf

II. Reporting Approach

Annual revenue thresholds for manufacturers to be considered for exemption

The goal of the reporting is to clarify the origin of the major emission sources. As such, the adopted approach should strike a balance between capturing the majority of emissions, without causing an undue reporting burden. NRDC proposes CARB explore providing longer runways for manufacturers adopting reporting regulations for unique cases where smaller manufacturers may not be able to comply in time. This extension should not be used widely and should have specific indicators to identify extraordinary need.

In the public comments for the September 2024 workshop on Building Embodied Carbon, there were eight industry stakeholders who commented on EPDs or LCAs at large. Out of these eight comments, only one industry stakeholder raised concern over their ability to produce an LCA compared to larger companies. None of the industry stakeholders identified the cost of producing an EPD as a barrier to complying with the new law. However, this point was raised by the California Buildings Commission, referring to financial figures from CALCIMA on the cost of new EPDs for material manufacturers. The Commission noted that "should a manufacturer need to generate a new factory or product specific Type III EPDs to comply it has been estimated, based on information provided by the California Construction and Industrial Materials Association (CALCIMA), to cost material manufactures approximately \$10,000 with an estimated \$2,000 annually for recertification."

The cost of EPDs has been decreasing and is contingent on the number of facilities equipped with the appropriate staffing and resources to produce EPDs, it is likely that number is now lower. Some EPD publishers now confirm that the cost may be as low as \$3,000-\$5,000 per concrete plant. Given the reduced price point, we believe that most concrete plants with sizable revenue in California, should be able to produce EPDs. For manufacturers of other materials, like glass and steel, few EPDs exist, and the price points for being able to develop EPDs for their products may be higher. As such, some manufacturers may need more time to comply with reporting regulations.

NRDC proposes referencing other California regulations that successfully use annual revenue as an indicator for providing exemptions. A potential benefit of using an annual revenue threshold is that it is a straightforward proxy to identify which manufacturers are likely to have the resources to comply with EPD reporting. However, annual revenue might not be an accurate reflection of what share of the manufacturer's products are going to California buildings versus other projects that do not have to comply with this regulation, such as concrete producers that supply both buildings and infrastructure projects. If smaller producers have the majority of their products fall under compliance with AB 2446/AB 43, it might be a more appropriate option to provide additional time to comply rather than a full exemption. Therefore, it seems an approach that looks at both the revenue and the share of products used in buildings could be best.

Data reporting regulation concepts

WBLCA: Staff propose that projects with more than 30 residential units or 100,000 square feet of non-residential building space report the results of a whole building lifecycle assessment (WBLCA). Staff further propose using cradle-to-gate, modules A-C for reporting, with a consistent reference study period of 60 years. NRDC agrees with this approach for applicability to larger residential and non-residential buildings and agrees that reporting modules A-C will yield the best information available. NRDC recommends also providing for an option to report module D, for building reuse, where applicable.

NRDC also recommends looking to the Canadian governments work on whole building LCA and calculation approaches. These include:

- National Research Council Canada: National guidelines for WBCLA (2022): Proposes a methodology and instruction for WBLCA practitioners to support standardization of WBLCA practice, provide a framework for WBLCA performance benchmarks, improve harmonization across different WBLCA software tools, and support WBLCA compliance schemes in policy and green building programs.
- National Research Council Canada: National WBLCA Practitioner's Guide (2024): Provides practical guidance to project teams on how to assess and demonstrate embodied carbon reductions for new construction and renovation designs. It was created to enable consistency in the methodologies, boundaries, and assumptions (including for setting baselines) used in WBLCAs for buildings for compliance with Canadian certification programs and jurisdictional requirements.
- <u>Canada Green Building Council (CAGBC)'s Zero Carbon Building Design Standard[™] v4: A</u> certification based on final design that helps ensure projects are designed to optimize reductions in both operational and embodied carbon.
- <u>City of Vancouver Embodied Carbon Guidelines v1.0 (2023)</u>: Provides technical guidance on modeling embodied carbon emissions and demonstrating compliance with City of Vancouver's Building Bylaw which requires designers in the city to calculate, limit, and reduce embodied carbon emissions in buildings (non-single family and low rise).

Delegation of reporting responsibility

NRDC recommends aligning with existing embodied carbon policies by delegating reporting responsibility to the general contractor, rather than the property owner. Deciding who completes the reporting could be left at the discretion of the general contractor, and tied to construction permits. NRDC supports ensuring the parties that are the most knowledgeable about what is being installed onsite are the entities reporting. If an agency is verifying quantities or materials used, it might be practical for the agency to be the party responsible for reporting. This is the case with New York State which requires the contractor to enter information on the project into the EC3 Database for material quantity and link to an EPD, if one exists. NRDC recognizes that the New York State guidance is for public projects, whereas the CARB reporting will be for public and private. For this reason, it seems the contractor or entity pulling the construction permit might be the best entity to report.

Below are a few required reporting parties from various state policies that designate the contractor as the party responsible:

- Buy Clean California The contractor is the party responsible.⁷
- Colorado Buy Clean The general contractor submits EPDs.⁸
- New York State Executive Order 22 The state contract manager or contractor. "Affected Entities, or their contractors, are recommended to enter their project data in EC3 or equivalent software with a database of acceptable EPDs.⁹ Internal presentations to the NYGreen Council provide additional information on how this can be done, though it is up to the individual agencies to determine which approach fits best with their existing project reporting and existing systems.
- City of Vancouver Embodied Carbon Guidelines v1.0 (2023) (Vancouver EC Guidelines) requires designers in the city to calculate, limit, and reduce embodied carbon emissions in buildings (non single family and low rise).

Considerations for residential and non-residential projects

Smaller multifamily residential and commercial projects will likely have a harder time complying with reporting requirements. We recommend a pared-down LCA approach for smaller projects that allows for more of a checklist or prescriptive approach, rather than running a full LCA. While a whole building LCA is the gold standard for calculating embodied carbon, the models that currently exist are complex, and require experience to run. This may prove burdensome on small projects, where material quantities are not as significant. The Carbon Leadership Forum is currently working on a report that outlines a more prescriptive approach for smaller customers. NRDC recommends consulting with the Carbon Leadership Forum on the report and its recommendations.

III. Additional comments

Triangulation: NRDC is concerned about triangulation between the approach for setting the baseline and calculating embodied carbon for the purpose of reporting emissions reductions at an individual project level. We recommend that CARB strive for consistency among the models, including collecting data on the same number of modules, and with the same high-level assumptions where the data exists. Being consistent is essential to avoid adding additional uncertainty to the savings values.

⁷ <u>https://www.dgs.ca.gov/RESD/Resources/Page-Content/Real-Estate-Services-Division-Resources-List-Folder/Buy-Clean-California-Act-BCCA-Requirements</u>

⁸ https://osa.colorado.gov/energy-environment/buy-clean-colorado-act/buy-clean-colorado-act-policy

⁹ <u>https://ogs.ny.gov/system/files/documents/2025/01/1.-eo22-guidance-on-embodied-carbon_jan-2025_0.pdf</u>

Flexibility: In developing these reporting requirements, CARB will be the first entity in the U.S. to publish reporting requirements for both public and private projects in the construction sector. As the 5th largest economy in the world, this represents a large number of projects annually. As more data is collected, staff may recognize that certain reporting elements are not needed, or that others should be added. As this new initiative evolves, it is essential to build in a process for updating the requirements and changing reporting guidance as needed. We think this is especially likely to be the case for the entity responsible for reporting emissions reductions, and the vintage and resolution of data required.

IV. Conclusion

We look forward to CARB's continued leadership and working with stakeholders to materialize the state's embodied carbon strategy.

Sincerely,

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