

Knowledge Infrastructure/The Critical Path to Advance Embodied Carbon Building Codes: American Council for an Energy-Efficient Economy Paper



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The American Council for an Energy-Efficient Economy (“ACEEE”) published a December 2021 paper titled: *Knowledge Infrastructure: The Critical Path to Advance Embodied Carbon Building Codes (“Paper”)*

The *Paper* is authored by:

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The *Paper* states it provides:

- A comprehensive review of the current state of knowledge of embodied carbon in buildings
- Knowledge gaps in regards to embodied carbon in buildings
- A basis for governments, academia, industry, and other stakeholders to develop standards/codes to decarbonize buildings (while also driving decarbonization in manufacturing)

The *Paper* opines that the construction industry accounts for:

- Five percent of global energy use
- Ten percent of global greenhouse gas (GHG emissions)

This is deemed to be due to the manufacture of building construction material (i.e., steel, cement, and glass). These materials are believed to be a primary source of such emissions.

The *Paper* states that advancements in building energy codes have stimulated changes in building design and operation. However, it opines that, in contrast, strategies to reduce embodied carbon in the remaining life-cycle stages of a building are less defined and studied.

Key findings of the *Paper* include:

- International standards to guide the development of methodologies to assess embodied carbon in the built environment are well-established, but such standards focus on principles and frameworks.
- Implementation guides for buildings in North America are needed for issues such as how to choose system boundaries and utilization of multiple methods to overcome the challenge of upstream data complexity.
- Existing data are primarily at the material level and focus on the manufacturing process.
- Data collection and reporting guidelines are needed for supply-chain-specific and facility-specific data to enable more accurate counting and fair comparisons.
- A number of tools are available to facilitate embodied carbon analysis.
- The underlying databases of such tools could lead to discrepancies in results.
- Guidelines for data standardization and transparency are needed.
- The largest knowledge gap concerning embodied carbon in the United States in buildings exists at the whole-building level.
- The trade-offs between operational carbon (from building energy use) and embodied carbon should be considered in whole-building embodied carbon evaluations.
- The absence of information on product durability may introduce conflicts between resilience and embodied carbon.
- Development of guidelines and standards on whole-life embodied carbon data collection and reporting requires participation from manufacturers, construction companies, and building owners.
- Developing/enhancing the capability to collect or report data should be considered when demanding additional data from such stakeholders.
- Developing business cases for manufacturers and integrating building decarbonization with industrial decarbonization are essential steps to build the knowledge infrastructure needed to reduce embodied carbon in buildings.

A copy of the *Paper* can be downloaded [here](#).