
**SENATE COMMITTEE ON ENERGY, UTILITIES AND
COMMUNICATIONS**
Senator Ben Hueso, Chair
2021 - 2022 Regular

Bill No: AB 2446 **Hearing Date:** 6/15/2022
Author: Holden
Version: 4/7/2022 Amended
Urgency: No **Fiscal:** Yes
Consultant: Sarah Smith

SUBJECT: Embodied carbon emissions: construction materials

DIGEST: This bill requires the California Energy Commission (CEC) to develop a framework for measuring and reducing carbon emissions associated with new building construction.

ANALYSIS:

Existing law:

- 1) Requires the CEC to establish building design and construction standards that increase the efficiency in the use of energy and water for new residential and new nonresidential buildings. The CEC must periodically update the standards. Six months after the CEC certifies an energy conservation manual, cities, counties, and state agencies are prohibited from issuing a building permit for a building that does not comply with the current standards created by the CEC. The CEC must demonstrate that any water efficiency standards are necessary to save energy. (Public Resources Code §25402(a)(1))
- 2) Requires the CEC's building efficiency standards to be cost-effective when taken in their entirety and amortized over the economic life of the structure compared with historic practice. When determining cost-effectiveness, the CEC must consider the value of the water or energy saved, impact on product efficacy for the consumer, and the life-cycle cost of complying with the standard. The CEC must consider other relevant factors, including, but not limited to the standards' cost on house costs, the total statewide costs and benefits of the standard over its lifetime, economic impacts on California businesses, and alternative approaches and their associated costs. (Public Resources Code §25402(b)(3))
- 3) Requires the CEC to publish by January 1, 2017, a study on low-income Californians' barriers to energy efficiency and weatherization investments and

make recommendations on how to address these barriers. (Public Resources Code §25327)

- 4) Requires the CEC to assess and report by January 1, 2021, on California's potential to reduce greenhouse gas (GHG) emissions in the state's residential and commercial building stock by at least 40 percent below 1990 levels by January 1, 2030. Existing law requires this report to include specified assessments, including an assessment of potential ratepayer impacts and challenges associated with reducing GHG emissions from certain housing sectors. (Public Resources Code §25403)
- 5) Requires the California Air Resources Board (CARB) to develop by July 1, 2023, a comprehensive strategy for the state's cement sector to achieve net-zero GHG emissions no later than December 31, 2045. (Health and Safety Code §38561.2)

This bill:

- 1) Requires the CEC to develop a framework for measuring and reducing the carbon intensity of new building construction.
- 2) Requires the CEC to design the framework to achieve an 80 percent net reduction in the carbon intensity of construction and materials used in new construction by 2045, as compared to 2020 levels. This bill also requires the CEC to adopt an interim goal of reducing the carbon intensity of construction 20 percent below 2020 levels by 2030 and 40 percent below 2020 levels by 2035.
- 3) Requires the CEC's framework to include specified life cycle analyses to determine the carbon intensity of residential and non-residential building construction.
- 4) Authorizes the CEC to include a tracking and reporting mechanism in the framework and charge a fee for the CEC's costs to administer the reporting mechanism. This bill also allows the CEC to create a system of credits that private entities can trade.
- 5) Requires the CEC to prioritize actions that leverage applicable state and federal incentives and evaluate measures to support market demand and financial incentives to encourage the production and use of materials used in construction-related projects with low GHG intensity. Specifically, this bill requires the CEC to consider measures to expedite the adoption for use in

projects undertaken by state agencies and measures to provide incentives for research and development of technologies to reduce emissions related to building construction.

Background

Embodied carbon differs from building emissions arising end uses in buildings.

This bill requires the CEC to develop a framework for measuring and reducing emissions associated with the construction of buildings. The carbon intensity of building construction is included in a building's embodied carbon footprint.

Embodied carbon generally refers to the emissions footprint associated with the processing, manufacturing, transporting, and installation of building materials.

While buildings' embodied carbon includes waste associated with construction, embodied carbon does not include the emissions associated with appliances used by building occupants. Data from the 2021 edition of CARB's Greenhouse Gas Inventory indicates that the commercial and residential building sectors were responsible for approximately 10.5 percent of the state's total emissions.

However, the vast majority of these emissions are associated with appliance end uses in buildings. Emissions associated with the electric demands from buildings are included in power sector emissions.

Bill expands CEC's building decarbonization responsibilities. This bill requires the CEC to develop a framework for reducing embodied carbon associated with buildings; however, the CEC's building code authority only extends to standards that promote the conservation of energy and water associated with buildings and appliances. Title 20 of the California Code of Regulations includes the CEC's appliance standards and Title 24 includes the CEC's Building Energy Efficiency Standards. Prior legislation (AB 3232, Friedman, 2018) required the CEC to assess the potential for reducing GHG emissions from the state's residential and commercial building stock by at least 40 percent below 1990 levels by January 1, 2030. However, the CEC's decarbonization assessment pursuant to AB 3232 focused on reducing emissions from building end uses and decarbonization of the energy sector. This bill requires the CEC to develop a framework for reducing embodied carbon, which does not include appliance end uses or emissions from the power sector. While this bill does not expand the CEC's rulemaking powers to create building standards for lower carbon building materials, it extends the CEC's building decarbonization responsibilities beyond assessments directly related to the CEC's existing rulemaking authority.

Bill sets targets for reducing embodied emissions, but baselines are unclear. This bill requires the CEC to set a goal of achieving an 80 percent net reduction in the carbon intensity of construction and materials used in new construction by 2045

when compared to 2020 levels. This bill also requires the CEC to set specified interim goals for carbon intensity reduction by 2030 and 2035 based on 2020 levels. However, the carbon intensity of buildings constructed in 2020 is unclear. Emissions from the sourcing, manufacturing, and transportation of building materials may be attributed to accounted emissions from the commercial and industrial sources in 2020.

Bill appears to authorize the creation of a market for embodied carbon credits.

This bill authorizes the CEC to include a tracking and reporting mechanism in the embodied carbon reduction framework. This bill allows the CEC to charge a fee for the CEC's costs to administer the reporting mechanism. This bill also allows the CEC to create a system of credits that private entities can trade. While this bill enables the CEC to include a market for trading credits in the embodied carbon reduction framework, this bill does not specify which entities are eligible to earn credits, how credits are earned, or requirements for counting, valuing or trading credits. As a result, it is unclear whether the credits would conflict with existing credit markets, including the Cap and Trade credit market administered by CARB. A number of building material manufacturing facilities may be covered entities under Cap and Trade rules. For example, glass, iron and steel, and cement production facilities that generate at least 25,000 metric tons of carbon dioxide equivalent emissions are covered entities under the existing Cap and Trade program.

Need for Amendments. As currently drafted, this bill requires the CEC to develop a method for measuring emissions associated with building material production and transportation; however, these are mobile and stationary emissions sources already monitored by CARB. Additionally, this bill authorizes the CEC to include a market for trading credits in the embodied carbon reduction framework developed under this bill; however, it is not clear how this credit market would function or how this credit market would impact the existing Cap and Trade market. *As a result, the author and committee may wish to amend this bill to shift the CEC's duties to develop of a framework for embodied emissions under this bill to CARB and delete references to the creation of a new market for credits.*

Prior/Related Legislation

SB 1297 (Cortese, 2022) would require the CEC to consider embodied carbon and carbon sequestration in buildings in the 2023 integrated energy policy report. The bill would also require CARB to develop an accounting methodology to quantify embodied carbon and carbon sequestration in building materials. The bill is currently pending in the Assembly.

SB 596 (Becker, Chapter 246, Statutes of 2021) required CARB to develop a comprehensive strategy for the state's cement sector to achieve net-zero GHG emissions no later than December 31, 2045.

AB 3232 (Friedman, Chapter 373, Statutes of 2018) required the CEC to assess the potential for reducing GHG emissions from the state's residential and commercial building stock by at least 40 percent below 1990 levels by January 1, 2030.

FISCAL EFFECT: Appropriation: No Fiscal Com.: Yes Local: No

SUPPORT:

American Institute of Architects California

APA

Arup

Bamcore, LLC

Blue Planet Systems

Burdge Architects

Buro Happold Consulting Engineers

CarbonCure Technologies

DuPont Shelter Solutions

Glotman Simpson

Grimshaw Architects

Hawley Peterson Snyder Architects

hb+a Architects

Holmes

Housing Innovation Alliance

IMEG Corp.

Independent Energy Producers Association

KPFF

MariSol Malibu

Mighty Buildings

Natural Resources Defense Council

One Way Ventures

OpenAir

Poirier + Associates Architects

Siegel & Strain Architects

StopWaste

The Climate Reality Project, San Fernando Valley

U.S. Green Building Council

U.S. Green Building Council-Los Angeles

WAP Sustainability

ZGF

OPPOSITION:

Association of California Construction Managers

ARGUMENTS IN SUPPORT: According to the author:

It is no surprise that housing is an issue in California, and it is our duty as the state to provide solutions to guide key sectors to becoming more sustainable. My hope is to work together across sectors to reach our carbon emission goals and to secure better practices for the people and the planet.

ARGUMENTS IN OPPOSITION: The Association of California Construction Managers (ACCM) is opposed to this bill unless it is amended to limit this bill's requirements to a study on whether existing building materials could accomplish this bill's goals and construction cost increases that would result from requiring lower embodied carbon construction materials. In opposition ACCM states:

Construction costs have escalated significantly during the past 18 months. There is every expectation that this cost escalation will continue for the next 18 months. Already school districts are reducing the number of public works projects they are planning because they do not have the financial resources to complete those projects. ACCM is concerned that requiring the building materials changes that would occur from the bill's implementation would result in such significant cost escalation that even fewer school district public works projects would be initiated.

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