



# Recommendations for Washington State Embodied Carbon Code Language

*A study commissioned by the State of Washington 68th  
Legislature for potential adoption by code council*

**Meghan Lewis**

Program Director, Carbon Leadership Forum

# Embodied Carbon Study

Study commissioned by the Washington State 68th Legislature in 2024. Effective March 29, 2024, the state building code council is required to conduct a study, submitted in a report to the appropriate committees of the legislature by December 1, 2024, that includes:

- (i) A review of the language addressing embodied carbon used in the building codes of other jurisdictions, including but not limited to the California Green Building Standards Code and the Vancouver Building By-law; and
- (ii) The development of recommendations for language addressing embodied carbon for potential adoption by the council.
  - (b) The study must consider subject areas including, but not limited to, the applicability to buildings greater than 50,000 square feet; multiple compliance pathways phased in over time; including whole building life cycle assessments; reuse of existing buildings; and compliance with material carbon caps.
  - (c) In conducting the study, the council must provide opportunities for comment from design, construction, and building industry stakeholders.

## Study Authors



The Carbon Leadership Forum is a nonprofit dedicated to accelerating the transformation of the building sector to radically reduce the greenhouse gas emissions attributed to materials (also known as embodied carbon) used in buildings and infrastructure. We research, educate, and foster cross-collaboration to bring the embodied carbon of buildings and infrastructure down to zero.



RMI is an independent nonprofit, founded in 1982 as Rocky Mountain Institute, that transforms global energy systems through market-driven solutions to align with a 1.5°C future and secure a clean, prosperous, zero-carbon future for all. We work in the world's most critical geographies and engage businesses, policymakers, communities, and NGOs to identify and scale energy system interventions that will cut climate pollution at least 50 percent by 2030.



New Buildings Institute (NBI) is a nonprofit organization that has been working throughout its 26-year history to advance best practices, building and energy codes, and policies through market leadership, research and technical advocacy for a built environment that is better for people, communities, and the planet. NBI's mission focuses on reducing energy costs, cutting emissions that fuel climate change, and delivering on improved health, safety, and resiliency for everyone.

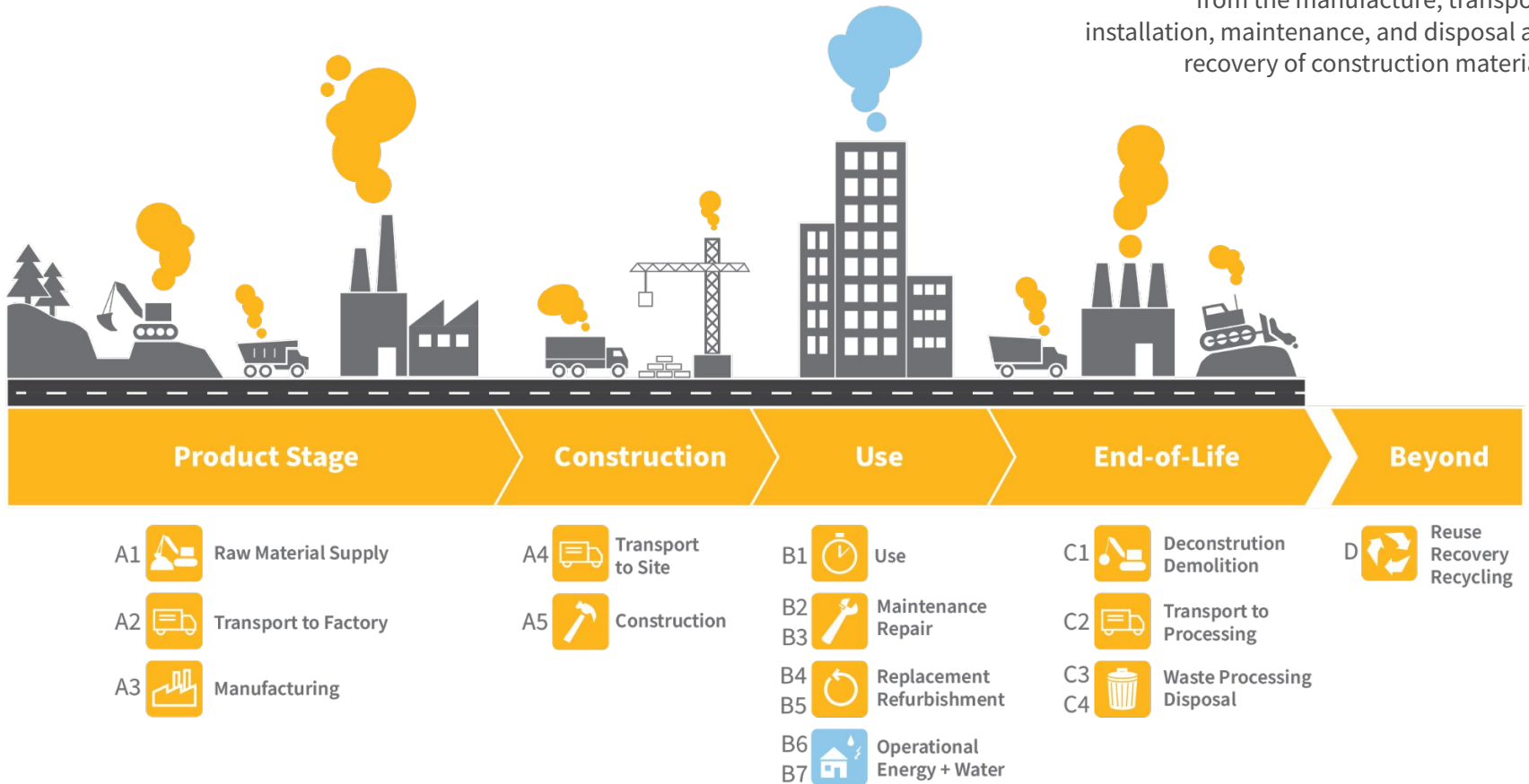


The Life Cycle Lab at University of Washington's College of Built Environments leads research to advance life cycle assessment data, methods and approaches to enable optimization of materials, buildings and infrastructure. Our work is structured to inform impactful policies and practices that support global decarbonization efforts. We envision a transformed, decarbonized building industry – better buildings for a better planet.

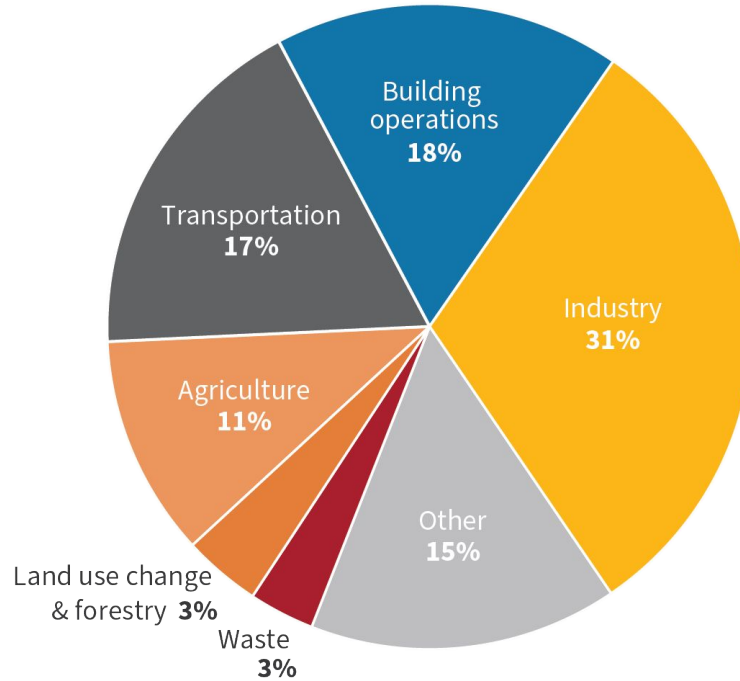
*And a huge thank you to **Architecture 2030** for project management support throughout this project.*

# What is Embodied Carbon?

Greenhouse gas (GHG) emissions generated from the manufacture, transport, installation, maintenance, and disposal and recovery of construction materials



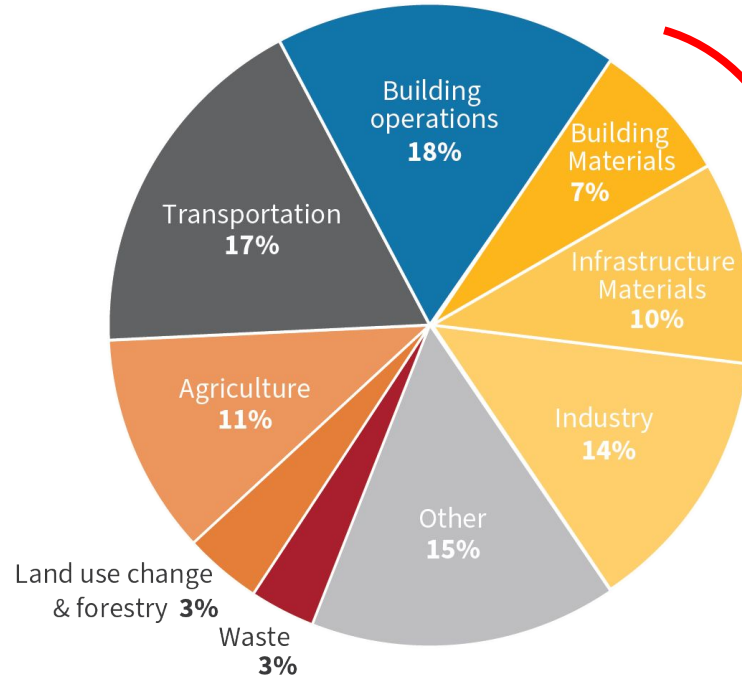
## Why does embodied carbon matter?



### Global greenhouse gas emissions by end use and sub-sector (2019)

Data sources: [World Greenhouse Gas Emissions: 2019](#), World Resources Institute (WRI), 2022, IEA World Energy Balances (2019); analysis by CLF.

# Why does embodied carbon matter?

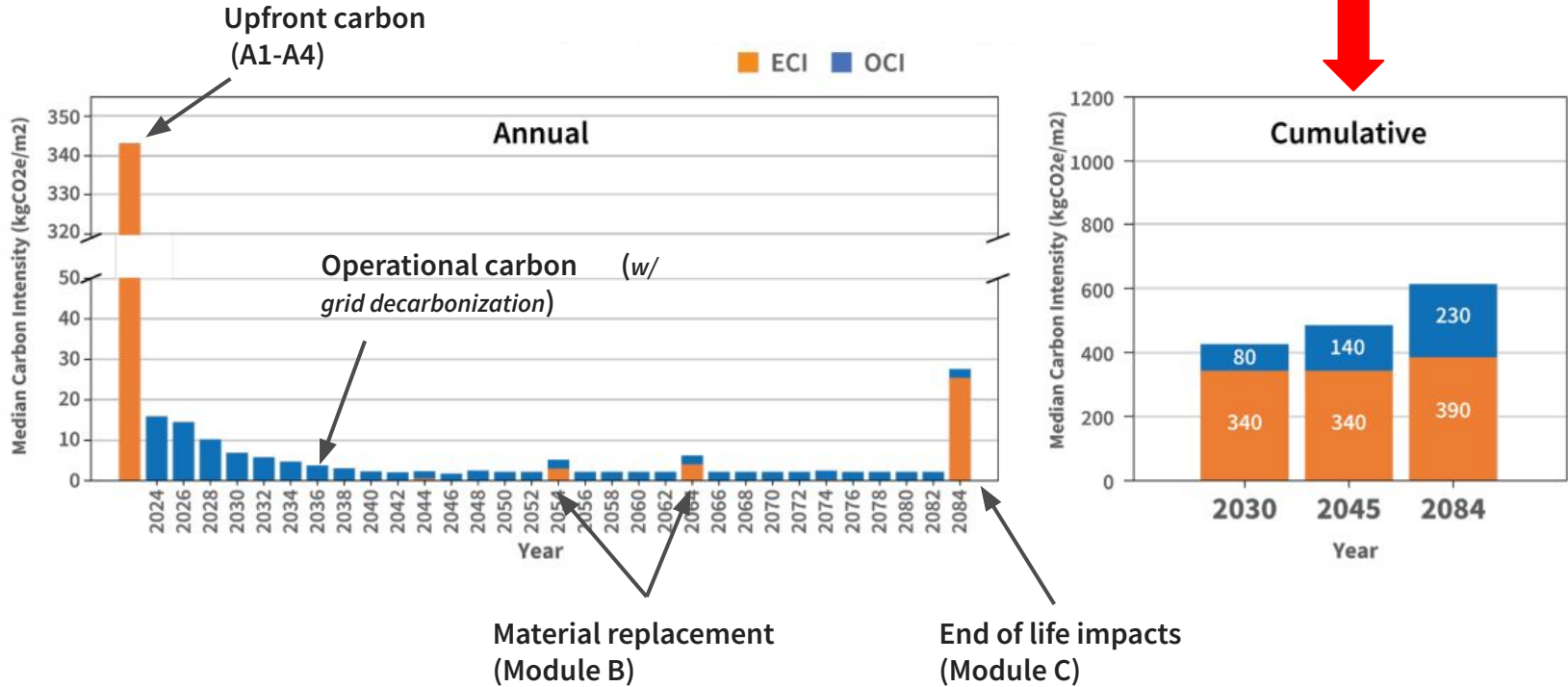


Embodied carbon is **17%** of global emissions

## Global greenhouse gas emissions by end use and sub-sector (2019)

Data sources: [World Greenhouse Gas Emissions: 2019](#), World Resources Institute (WRI), 2022, IEA World Energy Balances (2019); analysis by CLF.

# Embodied carbon at the building scale



*Example from analysis of 30 buildings in the State of California.*  
 Benke et al. (2024). *The California Carbon Report: Six Key Takeaways for Policymakers*. Carbon Leadership Forum, University of Washington. Seattle, WA. <http://hdl.handle.net/1773/51415>

# Embodied carbon is connected to labor, pollution, climate justice, and public health



Source: Carbon Leadership Forum (2024)  
[Embodied Carbon 101](#)



# Washington State Embodied Carbon Actions and Mandates



- **RCW 70A.45.020**
- **Buy Clean Buy Fair Washington Act** (and previous pilot study and reporting database development)
  - Participation in the Federal-State Buy Clean Partnership hosted by the U.S. Climate Alliance
  - Washington state was awarded \$3.5M EPD Technical Assistance grants from the EPA in collaboration with Oregon and the International Code Council
- Action plans and state strategy:
  - Washington State 2021 Energy Strategy
  - Inslee's Executive Order 20-01
  - Pacific Coast Collaborative Low Carbon Construction Taskforce and Action Plan
- Examples of city and county policies and programs:
  - City of Seattle Green Building incentive Programs
  - Kirkland High Performance Green Buildings Embodied Carbon Criteria
  - King County Strategic Climate Action Plan
  - King County was awarded Climate Pollution Reduction Grants (CPRG) funding, including embodied carbon

# Outline of the study

- Introduction
- **Measuring and reducing embodied carbon emissions**
  - Existing Washington State policies relevant to embodied carbon emissions
- **Washington State Code Considerations**
  - Options for placement of new embodied carbon provisions in code

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- **Potential language for addressing embodied carbon in Washington State Code**
  - Compliance with Material Carbon Caps
  - Whole building life cycle assessments and building-level requirements
  - Reuse of existing buildings
  - Additional pathways
  - Multiple Compliance Pathways and Phasing

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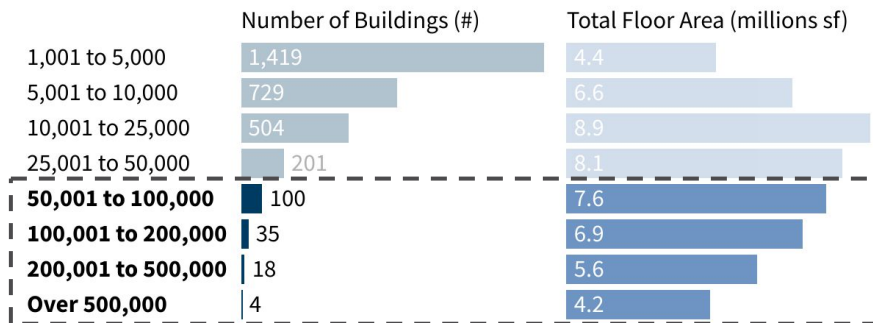
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- **Implementation Considerations**
  - Estimating the number of new buildings and total floor area affected by measures
  - Analysis of emissions and economic impact for Washington
  - Training, reporting, education, and enforcement mechanisms

# Estimating the number of new buildings and total floor area affected by measures

## Based on an analysis of U.S. Census Bureau data

### Commercial

■ Number of Buildings (#) ■ Total Floor Area (millions sf)

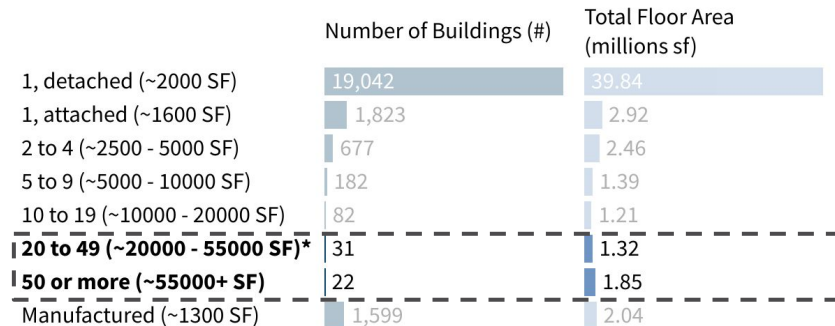


Source: RMI Analysis, data from the US Energy Information Administration (EIA) Annual Energy Outlook 2023 projections and EIA Commercial Building Energy Consumption Survey 2019 data.

= Roughly 5% of newly constructed buildings

### Residential

■ Number of Buildings (#) ■ Total Floor Area (millions sf)

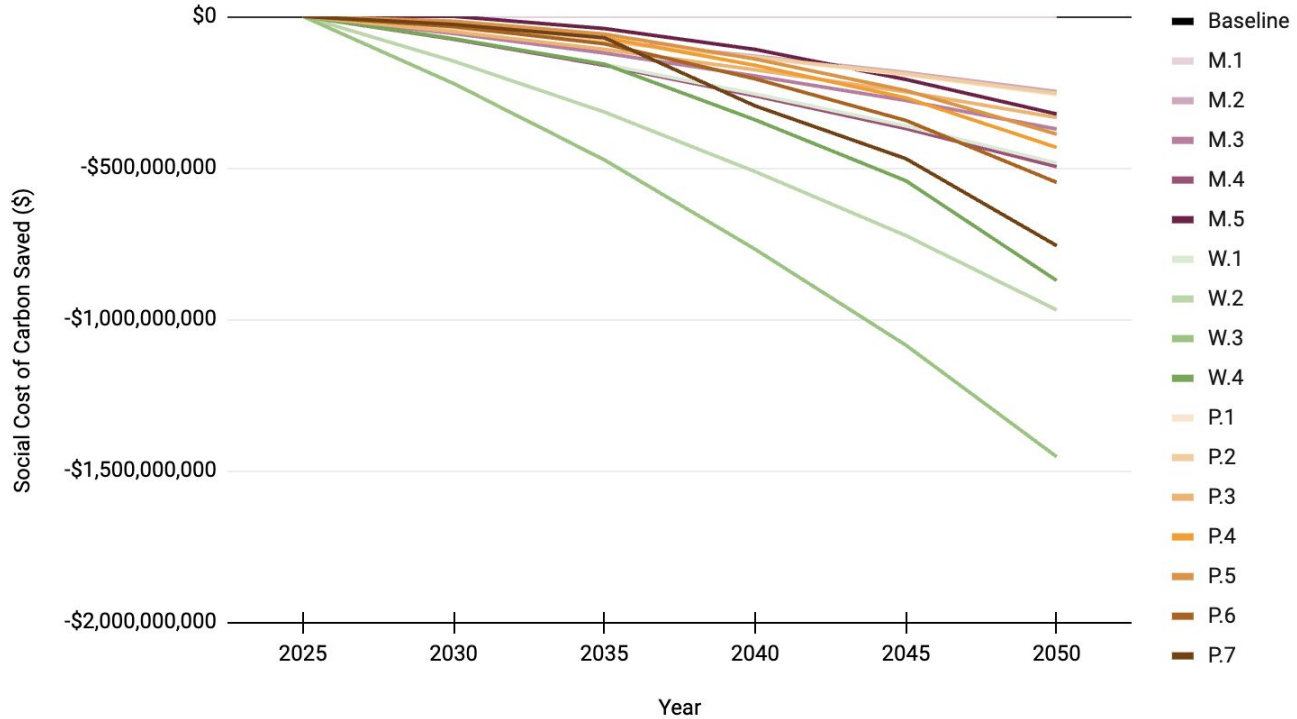


Source: RMI Analysis, using data from the US Energy Information Administration (EIA) Annual Energy Outlook 2023 projections and the American Housing Survey 2023 data

= Roughly 0.1% of newly constructed buildings

# Economic and emissions reductions benefits

## Cumulative Social Cost of Carbon Saved Over Time



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- **Recommended Language for Washington State Code Council**
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- **Appendix A: Feedback from design, construction, and building industry stakeholders**

# Thank you