Embodied Carbon Intergovernmental Coordinating Council

Public Hearing #1

Meeting Guidelines

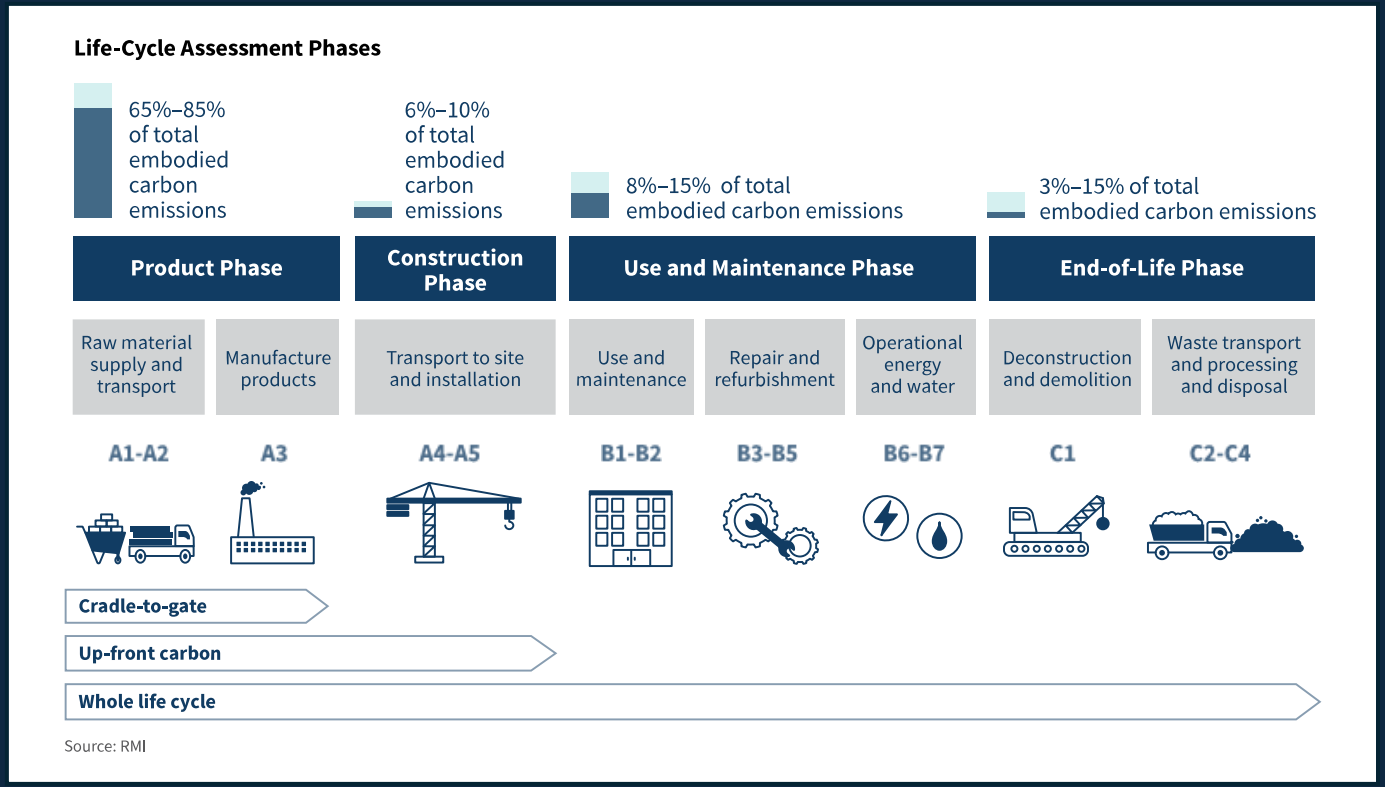
- This is a hybrid meeting and **will be recorded**
- The goal of this hearing is to gather information to help guide the Council's work and recommendations
- In order to maximize time available for those who wish to speak, Council members will not be able to respond to questions posed by public hearing participants

Agenda

- What is Embodied Carbon?
- Overview of the Council Members & Charge
- Open Comment

What is Embodied Carbon?

Embodied Carbon refers to the greenhouse gas (GHG) emissions generated by the manufacturing, transportation, installation, maintenance, and disposal of a product



source: Rocky Mountain Institute, "Embodied Carbon 101: Building Materials" 2023

Council Members

Co-Chairs

- Melissa Hoffer, Massachusetts Climate Chief, Office of Climate Innovation and Resilience
- Adam Baacke, Commissioner of the Division of Capital Asset Management and Maintenance (DCAMM)

Members

- Colton Andrews, President of Western MA Building Trades Unions, representing the building trades
- Senator Michael Barrett, Senate Chair of the Joint Committee on Telecommunications, Utilities and Energy
- Nicole Bilbo, Representing the Secretary of the Executive Office of Transportation
- Luciana Burdi, Representing the CEO of the Massachusetts Port Authority
- Wayne Capolupo, Representing the Massachusetts Senate Minority Leader Bruce Tarr
- Beverly Craig, Representing the CEO of the Massachusetts Clean Energy Center (MassCEC)
- Katherine Eshel, Representing the General Manager of the Massachusetts Bay Transportation Authority (MBTA)
- Professor John Fernández, licensed architect and professor of building technology, MIT
- Mark Fine, Representing the Secretary of the Executive Office of Administration and Finance
- Eric Friedman, Representing the Secretary of the Executive Office of Energy and Environmental Affairs
- Michael Gryniuk, structural engineer and Principal at Cora Structural
- David Hart, Representing the House Chair of the House Chair of the Joint Committee on Telecommunications, Utilities and Energy, Representative Mark Cusack
- Sarah Kalish, Representing the Secretary of the Executive Office of Economic Development
- Patrick Kenny, Representing the Chair of the Board of Building Regulations and Standards
- Caroline Murray, Regional Sustainability Manager and Project Executive at Turner Construction
- Jenny Raitt, Executive Director of the Northern Middlesex Council of Governments
- Amy Stitley, Representing the Secretary of the Executive Office of Housing and Livable Communities
- John Tzimorangas, Representing House Minority Leader Representative Bradley Jones, Jr.

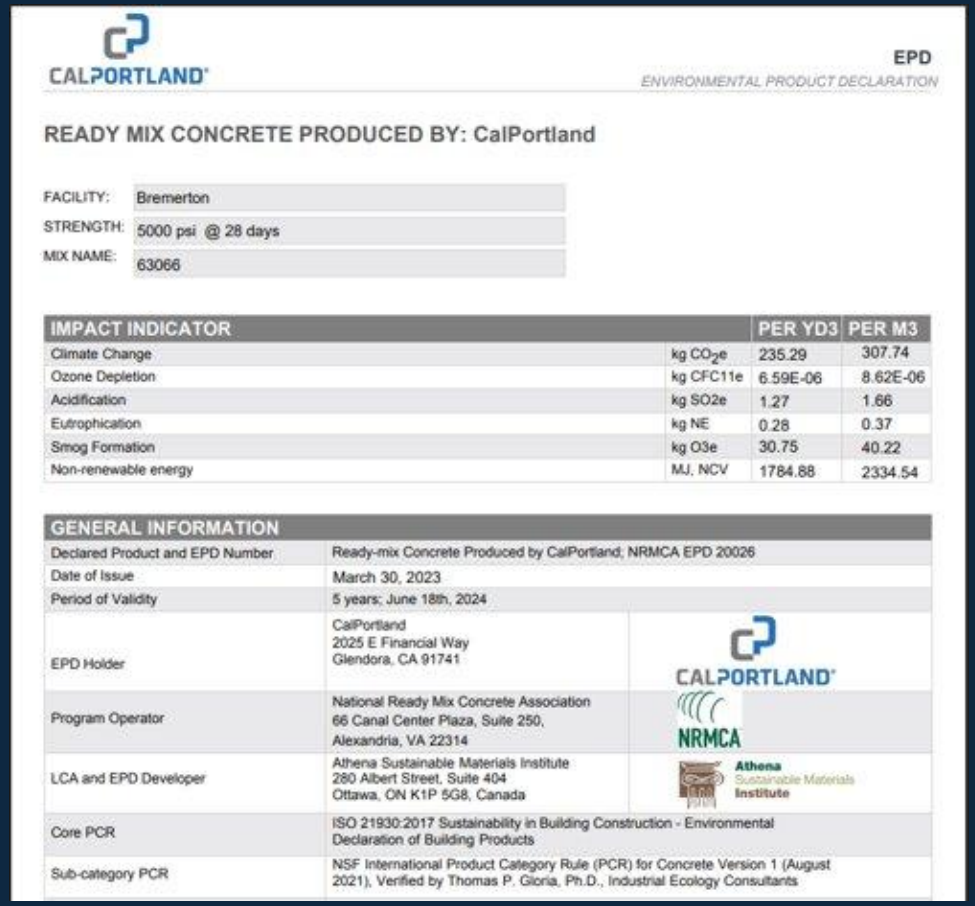
Council Tasks and Deadlines (1/4)

Per S.L. c. 239, §§ 4B-4F

Establish an **embodied carbon reduction plan**, which shall be completed on or before ***January 1st, 2026***, and shall include:

1. With respect to state-led building and transportation projects, **recommendations for encouraging, and where appropriate, requiring:**
    a. Environmental Product Declarations (EPDs)
    b. Use of low embodied carbon materials, with particular attention to **cement and concrete mixtures, steel, glass, asphalt and asphalt mixtures and wood**

Environmental Product Declarations (EPDs)



CALPORTLAND

EPD

ENVIRONMENTAL PRODUCT DECLARATION

READY MIX CONCRETE PRODUCED BY: CalPortland

FACILITY:	Bremerton
STRENGTH:	5000 psi @ 28 days
MIX NAME:	63066

IMPACT INDICATOR		PER YD3	PER M3
Climate Change	kg CO_2e	235.29	307.74
Ozone Depletion	kg CFC11e	6.59E-06	8.62E-06
Acidification	kg SO2e	1.27	1.66
Eutrophication	kg NE	0.28	0.37
Smog Formation	kg O3e	30.75	40.22
Non-renewable energy	MJ, NCV	1784.88	2334.54

GENERAL INFORMATION	
Declared Product and EPD Number	Ready-mix Concrete Produced by CalPortland; NRMCA EPD 20026
Date of Issue	March 30, 2023
Period of Validity	5 years; June 18th, 2024
EPD Holder	CalPortland 2025 E Financial Way Glendora, CA 91741
Program Operator	National Ready Mix Concrete Association 66 Canal Center Plaza, Suite 250, Alexandria, VA 22314
LCA and EPD Developer	Athena Sustainable Materials Institute 280 Albert Street, Suite 404 Ottawa, ON K1P 5G8, Canada
Core PCR	ISO 21930:2017 Sustainability in Building Construction - Environmental Declaration of Building Products
Sub-category PCR	NSF International Product Category Rule (PCR) for Concrete Version 1 (August 2021), Verified by Thomas P. Gloria, Ph.D., Industrial Ecology Consultants

- “nutrition labels” for building products
- independently verified documents
- report the environmental data from a life-cycle assessment (LCA), including global warming potential (GWP)

Council Tasks and Deadlines (2/4)

Per S.L. c. 239, §§ 4B-4F

2. **Review progress in research** and development of low-embodied carbon technologies and materials

3. Make recommendations for **establishing maximum global warming potential (GWP) values** for products likely to be used in state-led building and transportation projects
    a. EPDs in state government contracting and procurement
    b. Low-embodied carbon materials

Global Warming Potential (GWP)

- Measures how much energy the emission of 1 ton of a gas will absorb over a given period of time (usually 100 years), relative to the emission of 1 ton of carbon dioxide (CO2)
- Typical unit of measurement for Embodied Carbon, expressed in CO2 equivalents (CO2e)
- The larger the GWP, the greater warming effect

		Global warming potential over integration time horizon		
Gas	Lifetime, years	20 years	100 years	500 years
CO_2	~100	1	1	1
CH_4	10	62	25	8
N_2O	120	290	320	180
CFC-12	102	7900	8500	4200
HCFC-123	1.4	300	93	29
SF_6	3200	16500	24900	36500

source: Jacob, Daniel J. Introduction to Atmospheric Chemistry. Princeton University Press, 1999

Council Tasks and Deadlines (3/4)

Per S.L. c. 239, §§ 4B-4F

4. Develop **recommended procedures** for the use of:
    a. EPDs in state government contracting and procurement
    b. Low-embodied carbon materials

5. **Examine current laws**, regulations, policies and guidelines that affect the use of EPDs and low embodied carbon materials

6. Consider interactions between embodied carbon and operational carbon, to ensure a reduction on both fronts

Council Tasks and Deadlines (4/4)

Per S.L. c. 239, §§ 4B-4F

The council **shall also consider:**

1. Approaches to integrate the reduction of embodied carbon into the state building code

2. Best practices to incentivize and enhance the reuse of building materials and decrease building demolition

Avenues for implementation

- Administrative changes to construction materials specifications published by state agencies (MassDOT and DCAMM)
- Legislation
- Building & energy code changes
- Goals & targets established by policy

Open Comment

(questions for facilitation start in following slide)

Speakers May Wish to Consider:

- **EPD requirements for state projects:** What obstacles to implementation do you foresee within your industry or organization? And what opportunities?
- What is the current **availability of EPDs** in your industry?
- **Setting GWP limits:** what thresholds make sense? Timeline for implementation?
- **Vertical vs. Horizontal Construction:** What differences are important for the council to note?
- **Deconstruction & Reuse:** How can the Council best incentivize increase deconstruction & reuse? What are challenges and opportunities?
- **Building Codes:** What should the Council consider when thinking about integrating Embodied Carbon into building codes?
- What is a realistic **timeline for pilot projects and implementation** for these measures?
- What else?

If you have additional question comments, please send them to:

Climate.Office@mass.gov

Thank you!