



Embodied Energy Task Group

Green Building Advisory Group

June 11, 2020



Disclaimer

These notes represent the deliberations of a task group to an independent advisory committee, and as such, may not be consistent with current GSA or other Federal agency policy. Mention of any product, service or program herein does not constitute endorsement.

Embodied Energy Task Group Mission Statement

The Embodied Energy Task Group (EETG) is set up within the General Services Administration Green Building Advisory Council (GSA GBAC) to study the Federal energy, pollution, and cost savings that may be achieved by reducing the energy and carbon embodied in building construction.

Assuming the potential savings are significant, the EETG will produce relevant and readily adoptable procurement recommendations for the GSA to encourage the adoption of low embodied energy and carbon materials.

Task Group Participants

**Victor Olgyay
(Co-Chair)**

**Brendan Owens
(Co-Chair)**

Jed Ela

Michael Bloom

Jane Rohde

Kate Simonen

Frances Yang

Dirk Kestner

Erin McDade

Matt Junglcaus

Alison Kinn

Bruce King

Stacy Smedley

Jennifer Frey

Kent Peterson

Heather Goetsch

Lance Davis

Alex Rogers

Theresa Blaine

Jenna Hamilton

Mark Thimons

Josh Kneifel

Don Horn

Kevin Carbonnier

Walter Tersch

Saif Sadeq

Steve Bruno

Clay Nesler

Elizabeth Beardsley

Audrey Rempher

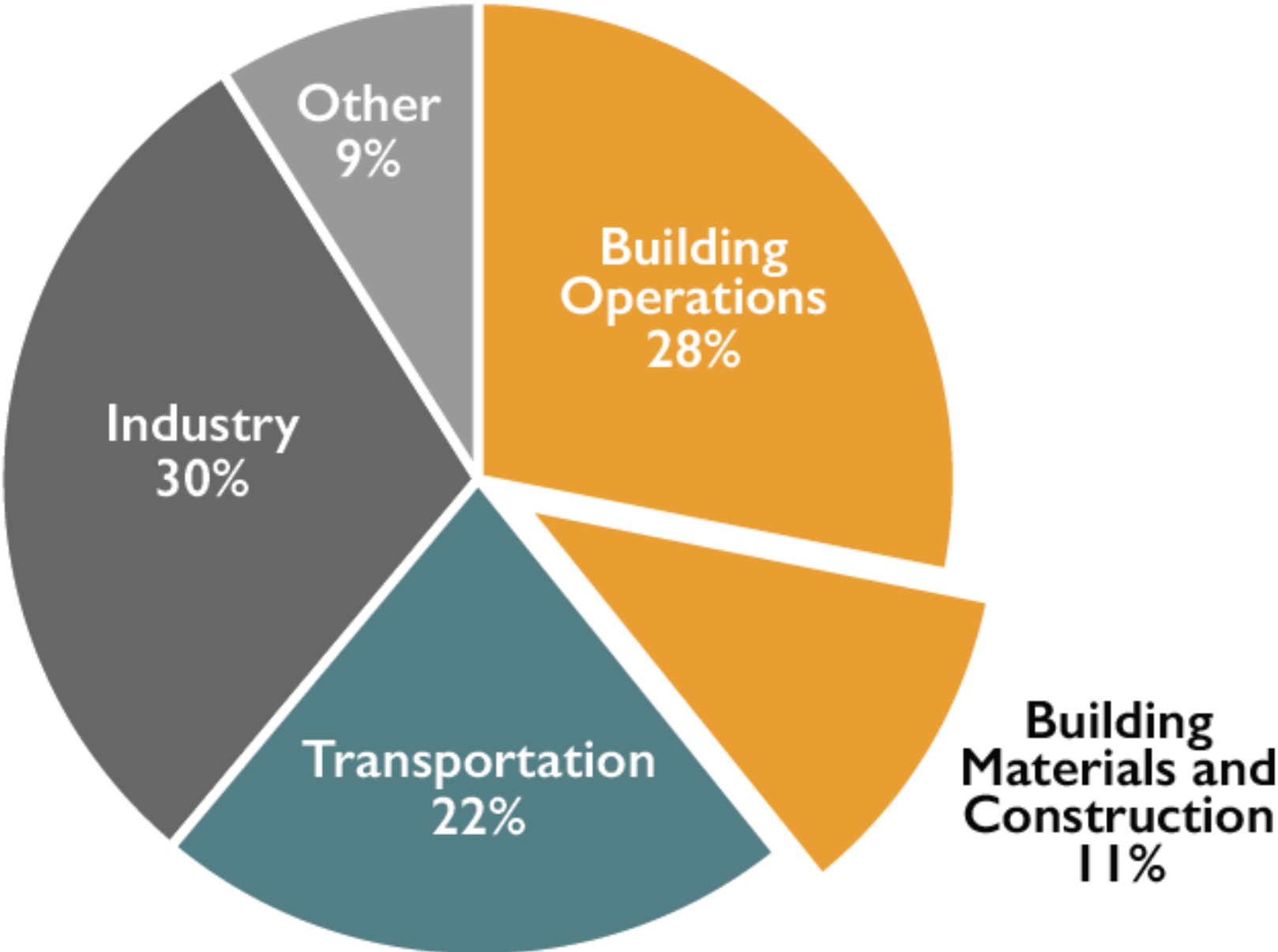
Dorothy Robyn

Rebecca Stevens

Questions for the GBAC

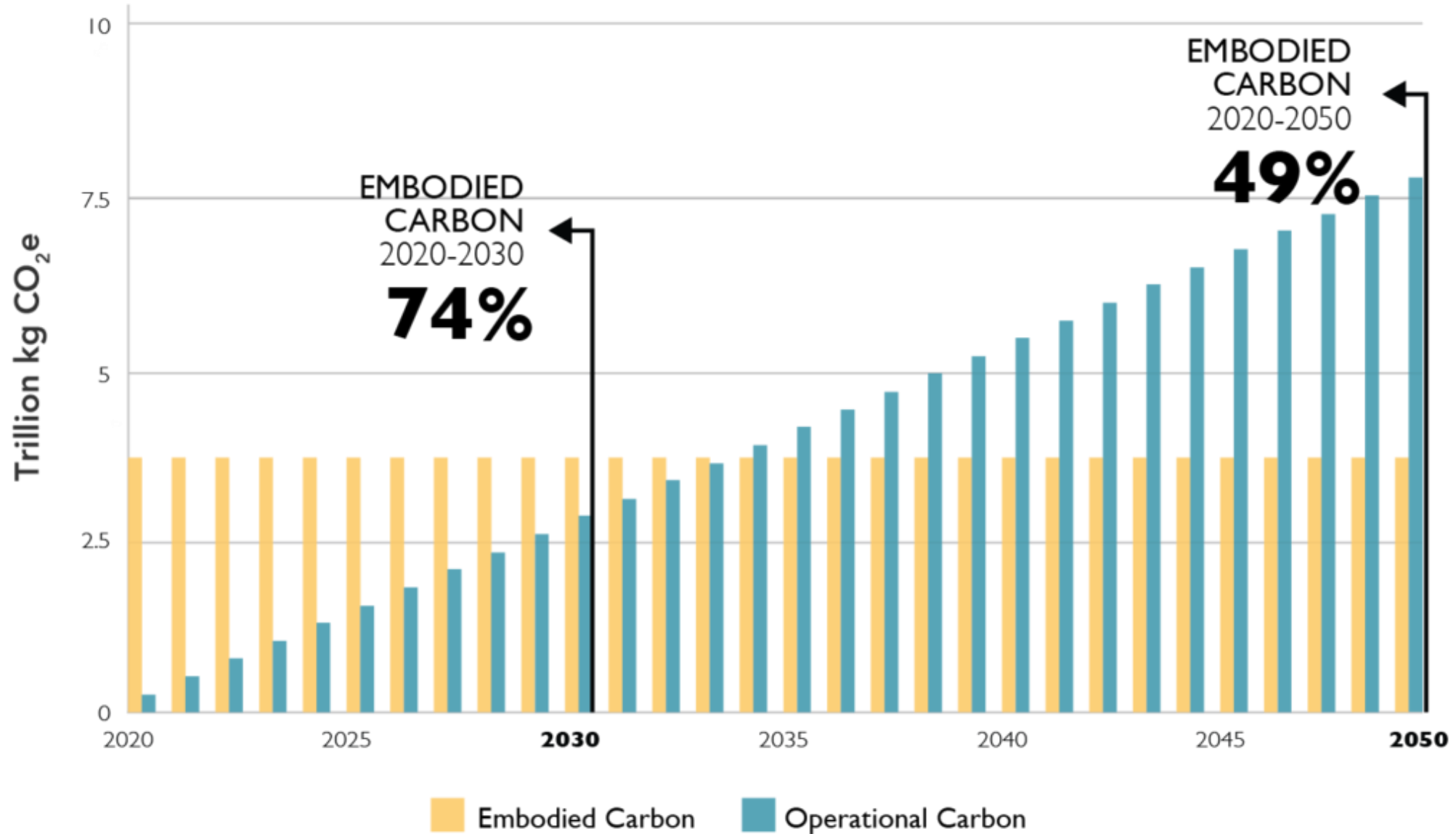
- How can we make these guidelines most relevant and effective?
- Suggestions for additional resources we might reference?
- Other existing policy vehicles we should be examining?
- Thoughts on the application of the guidelines?

Global CO₂ Emissions by Sector



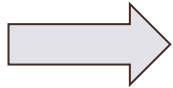
Total Carbon Emissions of Global New Construction from 2020-2050

Business as Usual Projection



Task Group Approach

1. Value of Embodied Energy /Carbon
 - What is the value of this opportunity?
2. How to access value for GSA
 - Recommended approach to guidelines
3. Low EE/EC Procurement guidelines
 - Draft procurement guidelines
4. GSA Advice letter



Lloyd D. George Courthouse

Work Done to Date (Presentations)

- **Time Value of Carbon** (*Erin McDade, Architecture 2030*)
- **GSA Project Completions 2009-2019** (*Walter Tersch, GSA*)
- **Understanding Carbon** (*Stacy Smedley, Skanska & Building Transparency*)
- **Business Case for Reducing Carbon** (*Monika Henn, Urban Land Institute*)
- **Low Carbon Concrete** (*Bruce King, Ecological Building Network*)
- **Sustainable Purchasing Implementation** (*Rebecca Stevens, GSA*)
- **EPA Tools for Assessing Environmental Impact** (*Alison Kinn, EPA*)
- **Building Materials, Embodied Carbon and California's Buy Clean Policy** (*Kate Simonen, University of Washington & Carbon Leadership Forum*)
- **Reducing Embodied Environmental Impacts of Buildings: Policy Options and Technical Infrastructure** (*Jennifer O'Connor, Athena Institute*)
- **Embodied Carbon in LEED v4.1** (*Brendan Owens, USGBC*)



Deliverable #1: Preliminary Assessment

What is the value to the GSA (and ultimately, to the taxpayer) of considering the energy used during the manufacture, transportation, and installation of materials used in the construction and renovation of the GSA's buildings?

This was assessed in three steps:

1. Assess the total annual construction rates of the GSA as a whole
2. Estimate reasonable reductions that could be assumed from this baseline, and
3. Calculate the value of those savings from a variety of perspectives, including energy cost, carbon, public health, and climate mitigation

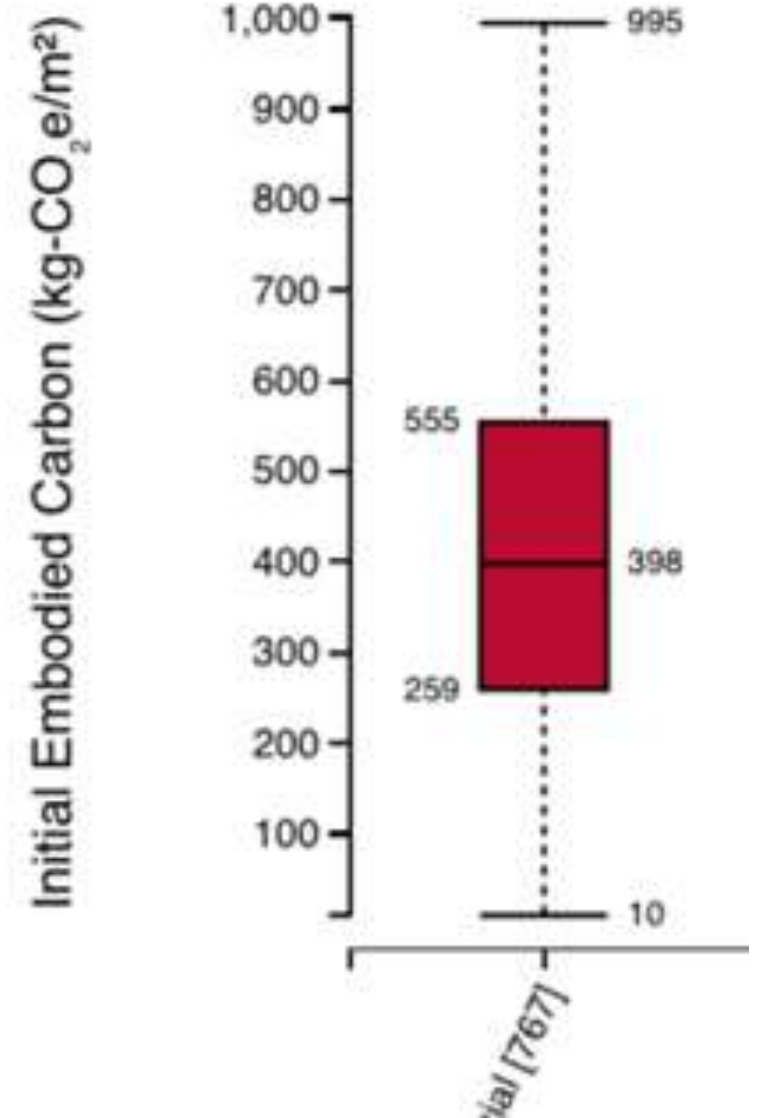
1: Assessing GSA's annual construction rates

We looked at 487 GSA projects completed between 2009 and 2019, affecting over 253 million gross square feet, with a total value of \$11.3 billion. 67% of these projects affected office buildings, including combination office/courthouses. ***On average, per year, there were 44 projects completed, affecting 23M GSF, with a value of \$1.03B.***



2: Estimate anticipated reduction from baseline

- 633 million kg-CO₂e potential annual savings
- Roughly 633,000 metric tons CO₂e/year - the equivalent of 72,000 homes annual energy usage
- Accepted practice assumes that a 30% reduction from baseline can be typically achieved with zero to marginal cost increase



3. Benefits from reducing embodied carbon

- Reduction of supply chain energy costs
 - Estimated as \$13 million per year
- Reduced cost from more material-efficient designs
- Ease of regulatory compliance
- Reduction in air pollution
 - Estimated as to \$12 million per year
- Mitigating climate change-related costs

Deliverable # 2:

Recommended approach to guidelines

Initial TG agreements:

- Criteria for GSA adoption of low EC procurement guidelines
- Approaches to process
- Material Categories – primary content of guidelines

Recommended approach to guidelines

Criteria for adoption of guidelines

- Easy to rapidly adopt
- Effective in securing significant value for the GSA and public (low cost, better performance)
- “Automaticity” — Incorporating continued improvement, without revising policy, e.g. by reference to baselines (like Energy Star) or external policy (e.g. USGBC/LEED) (maybe)
- Non- controversial, non-partisan
- Easy, simple, understandable
- Compatible with existing Federal /GSA / Industry systems
- Ease of implementation as criteria

Approaches to process

Tentative adoption of a “Dual Approach”, based on size of project,

- Very small projects may be exempt
- Medium projects “interior fit outs” for example, would require EPD for most materials
- Large projects “New construction and major renovation” would require a whole building LCA.

Material Categories – primary content of guidelines

General List to include the following:

- Concrete
- Aluminum
- Steel
- Wood
- Thermal and moisture control
- Glass
- Gypsum Board
- Ceiling Panels
- Flooring
- Stone and masonry

Guiding idea:

“Don’t define the product list too tightly; let the project requirements / design team dictate the materials to be evaluated”



Next steps:

- Complete Recommended approach to guidelines
 - (June 16th)
- Produce draft guidelines
 - (June 17th - July 15th)
- Draft Assessment Letter / Completion of Task Group
 - (August 25th)

Questions for the GBAC

- Can we make these guidelines most relevant and effective?
- Suggestions for additional resources we might reference?
- Other existing policy vehicles we should be examining?
- Thoughts on the application of the guidelines?



Thank You

Embodied Energy Task Group