Overview

This Presentation
1. Why Procurement
2. Current Landscape
3. Key Components
   a. Scope
   b. Disclosure and EPDs
   c. Limits
   d. Incentives
   e. Compliance
4. Development Process and Stakeholders

Policy Introductory Series
1. Introduction to the Embodied Carbon Policy Landscape
2. Climate Action Plans
3. Procurement Policy
4. Building Codes
5. City Zoning and Incentive Programs
6. Reuse and Deconstruction

Thanks to the CLF Regional Hub Policy Leads for feedback and review of this series.
Matching Policy Opportunities with Embodied Carbon Reduction Strategies

<table>
<thead>
<tr>
<th>Optimize Project</th>
<th>Optimize System</th>
<th>Optimize Procurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Build less, reuse more</td>
<td>● Choose low-carbon systems and assemblies</td>
<td>● Select the lowest carbon version of the selected product</td>
</tr>
<tr>
<td>● Design to reduce embodied carbon and increase material/structural efficiency</td>
<td>● Use alternate, low-carbon materials</td>
<td>● Clean manufacturing (efficiency, fuel switching)</td>
</tr>
</tbody>
</table>

**STRATEGIES**

<table>
<thead>
<tr>
<th>TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Design Calculators, Rules of Thumb</td>
</tr>
<tr>
<td>Whole Building Life Cycle Assessment (WBLCA)</td>
</tr>
<tr>
<td>Environmental Product Declaration (EPDs) / EC3 Tool</td>
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**TOOLS**

<table>
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<th>POLICY MEASURES</th>
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<tr>
<td>Reuse &amp; Deconstruction</td>
</tr>
<tr>
<td>Zoning and City Incentive Programs</td>
</tr>
<tr>
<td>Building Codes and Regulations</td>
</tr>
<tr>
<td>Climate Action Plans</td>
</tr>
</tbody>
</table>

**POLICY MEASURES**

<table>
<thead>
<tr>
<th>PROCUREMENT</th>
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<tr>
<td>Procurement (Buy Clean)</td>
</tr>
</tbody>
</table>
Why Procurement Policy?
Low Embodied Carbon Procurement Policy Framework

1. Scope
   - Which Materials?
   - Which Projects?

2. Disclosure
   - EPD
   - Material quantities

3. Standards
   - GWP targets for each material
   - Timeline for lowering targets

4. Incentives
   - Performance Incentives
   - Financial Incentives
   - Education and outreach

5. Compliance
   - Solicitation & Bidding
   - Data collection
   - Timeline

*Can be added in over time*
Why Buy Clean? **Leveraging Public Procurement**

- Procurement policies leverage money that is already being spent (‘Leading by Example’)

- **32% of the embodied carbon of construction** in the United States between 2008-2018 was attributed to public projects

> “In the US, nearly half of all cement and a fifth of steel is purchased with tax dollars” *(Climate Works)*

Why Buy Clean? Targeting Industrial Emissions

- Address hard to abate industrial sector emissions
- Increase supply chain and purchasing transparency
  - Greenhouse gas emissions
  - Working conditions
  - Manufacturing location (state, country, neighborhood)
- Align public procurement with environmental, labor, and equity goals

Global GHG emissions by end use

- Industry 30%
- Residential 11%
- Commercial 7%
- Waste 3%
- Other 14%
- Agriculture 14%
- Land Use Change & Forestry 4%
- Building operations 18%
- Other industry 8%

Data sources: WRI Climate Watch (2016); IEA World Energy Balances (2019).
Why Buy Clean? **Addressing the Carbon Loophole**

- Emissions are often accounted locally, creating a ‘carbon loophole’
- The majority of a product (and companies) embodied carbon footprint is generated in its supply chain, which is often spread across the globe

“For the average company, supply chain emissions are around 11.4 times greater than direct emissions”

*(CDP Supply Chain)*
Current Landscape
Growing Procurement Policy Landscape

- **United States**
  - **State**
    - First policy introduced in CA in 2017
    - Bills introduced in 8 states in 2021, already see continued 2022 momentum
  - **Federal**
    - GSA requirements for concrete/asphalt as of March 2022
    - Federal Buy Clean taskforce launched following EO 14057

- **International**
  - Canadian Greening Government Initiative
  - UN Industrial Deep Decarbonization Initiative working to align global green procurement policy
Tracking the Growing Embodied Carbon Policy Landscape

Current Embodied Carbon Policy

Embodied carbon policies are spreading rapidly across the United States and the world. Click on the map markers below to learn more about existing and proposed policies. For more information about the individual policies, see the links for each policy below the map.

Learn more at the CLF Policy Toolkit:
carbonleadershipforum.org/clf-policy-toolkit

NOTE: Includes all embodied carbon related policies, not just procurement
## 2022 State and Federal Procurement Policy Landscape (as of March 2022)

### PASSED/SIGNED

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Steel, glass, mineral wool</td>
<td>Asphalt, cement, concrete, glass, steel, wood</td>
<td>Concrete, Asphalt, Steel</td>
<td>Concrete</td>
<td>Concrete, Asphalt</td>
<td>TBD</td>
</tr>
</tbody>
</table>

**Includes Buildings:**
- ✓
- ✓
- ✗
- ✓
- ✓
- ✓

**Includes DOT Projects:**
- ✓
- ✓
- ✓
- ✓
- ✓
- TBD

**Requires Disclosure:**
- ✓
- ✓
- ✓
- ✓
- ✓
- TBD

**GWP Standards:**
- Industry Average
- Industry Average
- TBD
- TBD
- ✓
- TBD

**Provides Incentives:**
- ✗
- ✗
- ✓
- TBD
- ✗
- TBD

### LAUNCHED (2022)

<table>
<thead>
<tr>
<th>NY LECLA (2021)</th>
<th>GSA Standards (2022)</th>
<th>E.O. 14057</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete, Asphalt</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

### ONGOING (Introduced in 2021/2)

<table>
<thead>
<tr>
<th>CA (SB 778)</th>
<th>CA AB 1369</th>
<th>MA (H.4182)</th>
<th>NY CFCLA (A09042)</th>
<th>BCBF MN (BE177)</th>
<th>B.C. MD (HB 806)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete (adds to BCCA)</td>
<td>Adds gypsum board, Insulation, Carpet/carpet tiles, and ceiling tiles to BCCA</td>
<td>Steel, flat glass, mineral wool, concrete, cement</td>
<td>Concrete</td>
<td>Steel, concrete, asphalt, PVs, energy storage</td>
<td>Cement, concrete, glass, steel, wood</td>
</tr>
</tbody>
</table>

**Includes Buildings:**
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- ✓
- ✗
- ✓
- ✓
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**Includes DOT Projects:**
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- TBD
- TBD
- ✓
- TBD

**Provides Incentives:**
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- ✓
- ✗
- TBD
- ✓
- ✗
Eligible Materials and Projects

Which **projects** are covered?

Most proposed bills have included **both**:

- Vertical infrastructure (e.g. **buildings**)
- Horizontal infrastructure (e.g. **transportation projects**)
- Some include only 1 of these types

Which **materials** are covered?

- The most frequently included materials are **concrete and steel**, including ready-mixed concrete, structural steel, reinforcing steel
- The following materials are also included, in order of ‘popularity’:
  - Asphalt
  - Engineered wood
  - Glass
  - Insulation
  - Finishes (*CA AB 1369 is first bill to include*)

**REMINDER** A procurement policy refers to spending on materials used in public projects like universities, courthouses, or roads.
Disclosure
Disclosure

Environmental Product Declarations (EPDs)

- EPDs are **third party verified** disclosures of a material’s environmental impacts based on a product LCA (*like a nutrition label on food product*)

- Must follow international LCA/EPD standards (**ISO**) and industry-specific rules (**PCRs**)

- Enable **performance-based criteria** and selection of best possible material between functionally equivalent products.
  - *Ex. Two concretes of the same strength and performance may be compared with EPDs, whereas concrete and wood could not be compared.*

![Environmental Impacts Table]

Additional detail and impacts are reported on page three of this EPD.
Disclosure

EPDs capture a range of practices and facilities

- Good for supporting technology agnostic, performance-based strategies
- Example strategies captured by LCA
  - Plant energy efficiency & Renewable energy use
  - Sustainable ingredient sourcing (recycled content, etc.)
  - Also can track innovative strategies like carbon capture and fuel substitution
- Enables companies to pursue (and communicate) the clean manufacturing solutions that are right for their facilities and products
Disclosure

Environmental Product Declarations (EPDs)

What is the typical environmental impact of a [piece of rebar] made in [North America]?

Industry-Wide (Average) EPD

- Communicate typical manufacturing impacts for a range of products for a group of manufacturers
- Cannot be used to compare products to each other or against a baseline
- Helpful in understanding the typical impact of a product

What is the environmental impact of this [piece of rebar] from this manufacturer?

Product-Specific EPDs

Communicate the impacts of a specific product and manufacturer across multiple facilities
Disclosure

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Industry-Wide (Average) EPD

What is the environmental impact of this [piece of rebar] from this manufacturer?

- Communicate the impacts of a specific product and manufacturer across multiple facilities

Product-Specific EPDs

- Product-specific EPD in which the environmental impacts can be attributed to a single manufacturer and manufacturing facility.

Facility-specific EPDs

- Product-specific EPD in which key upstream (A1) processes are modeled with supply-chain-specific data (plant-specific cement data, etc.)

Supply-chain-specific EPDs

Learn more at: https://carbonleadershipforum.org/epd-requirements-in-procurement-policies/
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Supply-chain specific EPDs

Product-specific EPD in which key upstream (A1) processes are modeled with supply-chain-specific data (plant-specific cement data, etc.)

What is the typical environmental impact of a [piece of rebar] made in [North America]?

What is the environmental impact of this [piece of rebar] from this manufacturer?

Helpful for setting benchmarks/limits, NOT for policy compliance

Learn more at: https://carbonleadershipforum.org/epd-requirements-in-procurement-policies/
Disclosure

Number of EPDs is Growing

Adapted from a graphic from Building Transparency. Data from 2012 – 2018 was sourced from Andersen et al. (2019). Data for 2020-2022 represents number of EPDs in the EC3 Database.
Disclosure

**Beyond GWP**

**Disclosure bills can include other items besides GWP:**
- Labor reporting requirements
- Health impacts
- Grow economic competitiveness

**Example:**
- [Buy Clean Buy Fair WA (HB 1103)](https://leg.wa.gov/billsearch/)
Embodied Carbon Limits and Targets
Standards

Global Warming Potential (GWP) Limits

Sets a maximum allowable GWP value for the embodied carbon intensity (e.g. CO2e per unit) for a project or product.

Lowering Limits Over Time: Option 1

Buy Clean California requires the GWP limits to be set at industry average and updated every 3 years to continue to reflect the industry average.
## Standards

### Case Study: Buy Clean California Act

<table>
<thead>
<tr>
<th>Eligible Material</th>
<th>Subcategory</th>
<th>Limit</th>
<th>Declared Unit</th>
<th>Functional Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structural Steel</strong></td>
<td>Hot-rolled sections</td>
<td>1.01 metric tons CO$_2$-eq</td>
<td>1 metric ton</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Hollow structural sections</td>
<td>1.71 metric tons CO$_2$-eq</td>
<td>1 metric ton</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Plate</td>
<td>1.49 metric tons CO$_2$-eq</td>
<td>1 metric ton</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Concrete Reinforcing Steel</strong></td>
<td>N/A</td>
<td>0.89 metric tons CO$_2$-eq</td>
<td>1 metric ton</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Flat Glass</strong></td>
<td>N/A</td>
<td>1.43 metric tons CO$_2$-eq</td>
<td>1 metric ton</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Mineral Wool Board Insulation</strong></td>
<td>Light-density mineral wool board insulation</td>
<td>3.33 kg CO$_2$-eq</td>
<td>N/A</td>
<td>1 m$^2$ of insulation material with a thickness giving average thermal resistance of RSI = 1 m$^2$K/W and with a building service life of 75 years.</td>
</tr>
<tr>
<td></td>
<td>Heavy-density mineral wool board insulation</td>
<td>8.16 kg CO$_2$-eq</td>
<td>N/A</td>
<td>1 m$^2$ of insulation material with a thickness giving average thermal resistance of RSI = 1 m$^2$K/W and with a building service life of 75 years.</td>
</tr>
</tbody>
</table>

Read more about the limits set by the Buy Clean California Act on the official [DGS website](https://www.dgs.ca.gov) or read the CLF Report [Buy Clean California Limits](https://www.carbonleadershipforum.org/).
Sets an **initial baseline carbon intensity** (e.g. CO2e per unit) that a project or product must reduce from. Baselines may be for a specific year.

**Example:**
The LEEDv4 **Pilot Credit** awards 1-2 points to teams that achieve percentage reductions from the CLF **Material Baselines**.

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**Lowering Limits Over Time: Option 2**

If an initial GWP baseline is set, policies may require percentage reductions by certain dates. This is similar to how companies or governments typically make public commitments to reduce carbon broadly.
CLF Material Baselines

The Carbon Leadership Forum produces an annual publication that includes 3 GWP values for 30 + construction products to provide estimates of the GWP for:

- Achievable (Low)
- Typical (industry average)
- Baseline (high) numbers

Learn more here: https://carbonleadershipforum.org/material-baselines/
Incentives
Incentives

Increasing compliance and innovation

- **Rewarding high performers** rather than punishing worst polluters
  - Performance incentives for achieved reductions (e.g. end of project financial reward to contractor or similar)
    - Setting a ‘low’ or ‘good’ value (rather than only a maximum limit), as proposed in **CLEAN Futures Act** in Congress (2021)
  - Purchasing preference incentives: evaluating suppliers and products on carbon AND cost
    - *Proposed in original NY LECCA (2021); more common in private sector*

- **Financial support for compliance** (tax credits or other rewards for developing EPDs/low carbon products)
  - Examples: **Oregon Concrete EPD Program** run concurrent to Portland Low Carbon Concrete Program requirements; *also included in Buy Clean Oregon passed in 2022; included in Build Back Better Act*

- **Other**
  - Examples: Expedited product evaluation by DOTs for low EC concrete (*proposed in NY Climate Forward Concrete Leadership Act, hasn’t yet passed*)
Incentives
Examples: Tax Credits / Supplier Incentives

**Oregon Concrete EPD program**
- Voluntary incentive program
- Resulted in:
  - Approximately $50,000 of direct reimbursements for the cost of producing concrete EPDs.
  - Publication of over 1500 EPDs across 20 different Oregon concrete plants.
  - Provide [EPD incentive grants](#) to those needing financial assistance.

**NY LECLA** EPD Tax Credit:
- Manufacturers can receive up to $3k in support for EPD analysis (would be valid until 2023)

*Note: Requirement was proposed but not passed. Up to working group whether to include.*

Also included in [Buy Clean Oregon](#) passed in 2022; included in [Build Back Better Act](#)
Incentives

Examples: Purchasing Preferences

**Example 1: Performance discount rate**
Bids are sorted above and below a climate performance threshold. Low-carbon bids receive a discount rate.

- **Bid A**
  - GWP: 250 kg CO$_2$e
- **Bid B**
  - GWP: 200 kg CO$_2$e
- **Bid C**
  - GWP: 300 kg CO$_2$e
- **Bid D**
  - GWP: 350 kg CO$_2$e

<table>
<thead>
<tr>
<th>Bid</th>
<th>GWP (kg CO$_2$e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bid A</td>
<td>250</td>
</tr>
<tr>
<td>Bid B</td>
<td>200</td>
</tr>
<tr>
<td>Bid C</td>
<td>300</td>
</tr>
<tr>
<td>Bid D</td>
<td>350</td>
</tr>
</tbody>
</table>

- 5% discount applied to bids below GWP value.
- No discount over performance threshold.

**Example 2: Sliding discount rate**
Bids are ranked by GWP and a discount rate is applied to the lowest three.

- **Bid A**
  - GWP: 250 kg CO$_2$e
- **Bid B**
  - GWP: 200 kg CO$_2$e
- **Bid C**
  - GWP: 300 kg CO$_2$e
- **Bid D**
  - GWP: 350 kg CO$_2$e

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<td>300</td>
</tr>
<tr>
<td>Bid D</td>
<td>350</td>
</tr>
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</table>

- 5% discount applied to #1
- 3% discount applied to #2
- 2% discount applied to #3
- No discount after 3rd place

Bid incentives proposed in the original NY LECCLA and later versions of CA SB-778, neither fully passed.

*Note: Requires holding bidders to certain level of carbon performance at project completion to ensure reductions are realized post-bid.*
Increasing Policy Compliance

Policies have to balance ambition and feasibility: policies that are difficult to comply with may result in less embodied carbon reductions.

**Examples** of strategies used by government agencies to ease compliance and increase the success of a policy:

- Provide (or partner to provide) free education and training sessions
- Standardized, easy to use reporting interfaces for project teams
- Pilot projects to test requirements
- Model specifications or other documents for use by project teams
- Multi-year timelines for phase-in of requirements
- Policy exceptions and waivers (or ‘hardship clauses’)
- Early adoption incentives

*Learn more about implementation strategies at [https://carbonleadershipforum.org/implementing-buy-clean/](https://carbonleadershipforum.org/implementing-buy-clean/)*
Case Study Portland Low Carbon Concrete Program

Concrete EPD Requirements for City Projects

Product-specific Type III EPD required for all pre-approved concrete mix designs and concrete mixes for projects over 50 yd$^3$

Maximum GWP Limits Published for Concrete

GWP Limits published that concrete used on city projects will be required to meet

Advisory committee, Data collection, and Pilot projects

Between 2020, 2022, the City of Portland met with an advisory committee to develop the GWP limits, collected data on Portland Metro Area projects, and did a pilot project.

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Case Study Buy Clean Buy Fair Reporting Database and Pilot Projects

Who provides the data?
Contractor*

What data must be provided?
Project data
- Basic project characteristics
- Material quantities:
  - Structural concrete
  - Reinforcing steel
  - Structural steel
  - Engineered wood

Product data
- Valid Type III EPD
- Health certifications, if any
- Manufacturer name / location
- Supplier codes of conduct
- Working condition data

How and where is the data submitted?
- Online portal (‘pilot database’)
- Contractor can choose to use EC3 as an alternative method for uploading data automatically

Who reviews submittal?
Agency Project Managers/Teams

*Contractor is ultimately responsible for ensuring that data is collected

*Not yet required, only in pilot phase
Informing Policy Development

Legislators draft policy language (often with help from advocacy organizations)

Legislative process (may take several years before policy gains enough support to pass)

Government agency leads policy development (and/or rulemaking), often including public comment period

Policy passed!

Policy goes into effect. Impacted stakeholders are required to comply per rules established by agency/policy

Examples of advocacy organizations that have supported embodied carbon policy development:

[Logos of various organizations]
Takeaways

Government procurement is an effective tool for reducing embodied carbon on carbon intensive materials, and is an increasingly popular type of policy in the US and around the world.

Scope
- Which Materials?
- Which Projects?

Disclosure
- EPD
- Material quantities

Standards
- GWP targets for each material
- Timeline for lowering targets

Incentives
- Performance Incentives
- Financial Incentives
- Education and outreach

Compliance
- Solicitation & Bidding
- Data collection
- Timeline

Can be added in over time

Start with a few high impact materials where you spend most $$

Require transparency in the form of EPDs

Set targets/limits for materials where data is available

Performance and financial incentives can speed compliance

Phase in requirements and use strategies to increase compliance
Thank you!