Carbon Leadership Forum

Regional Hub Policy Series

Embodied Carbon & Procurement Policy

Overview

This Presentation

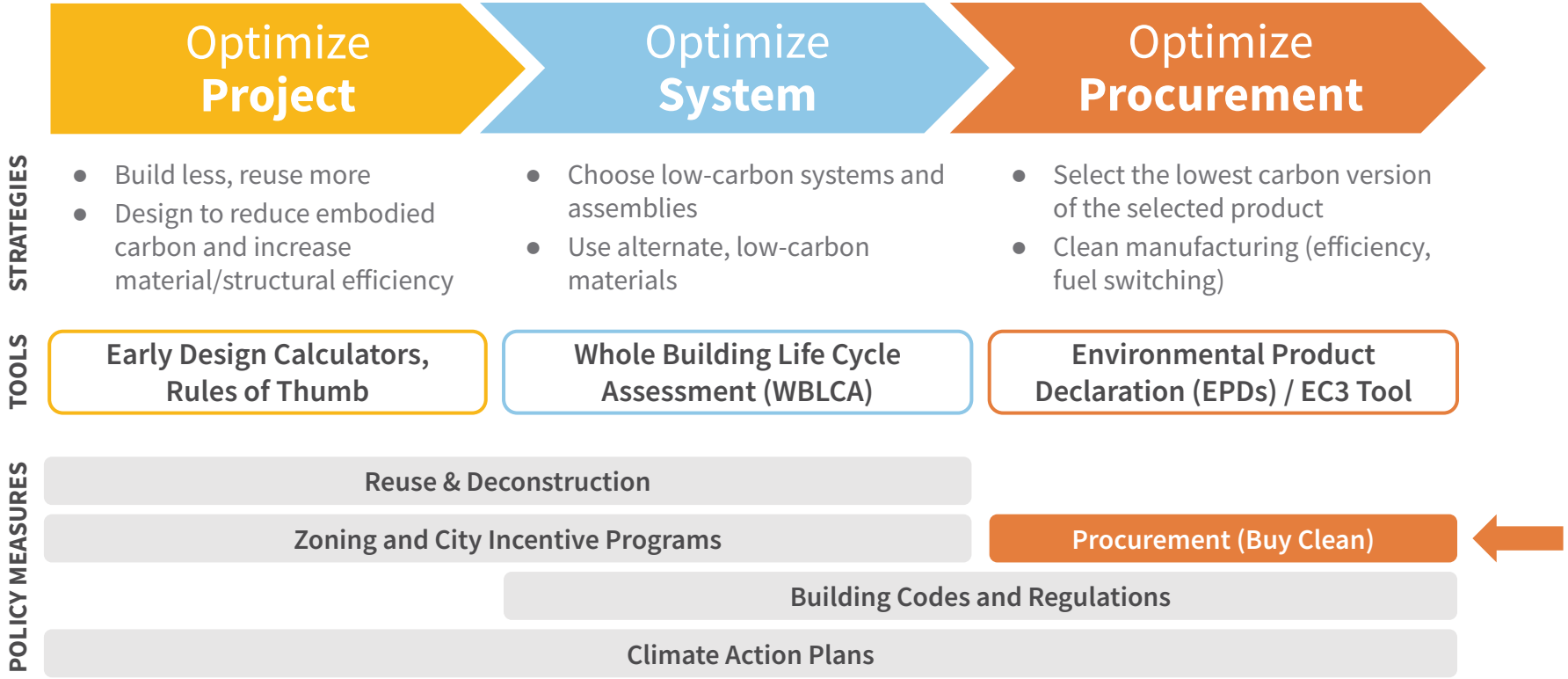
1. Why Procurement
2. Current Landscape
3. Key Components
   a. Scope
   b. Disclosure and EPDs
   c. Limits
   d. Incentives
   e. Compliance
4. Development Process and Stakeholders

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



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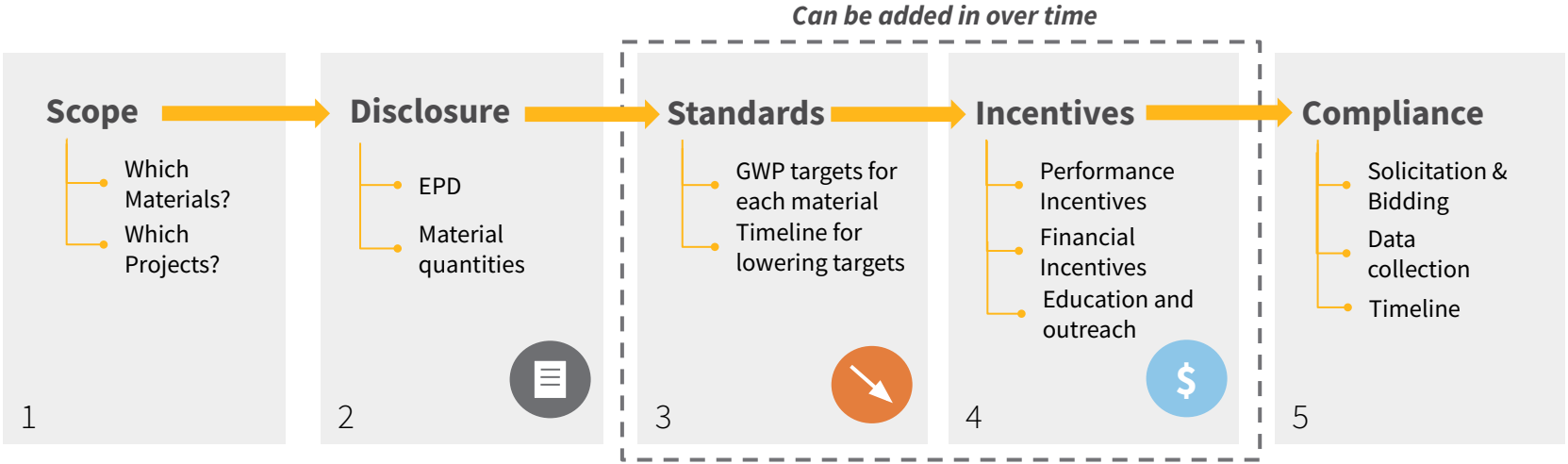
Why Procurement Policy?

Low Embodied Carbon Procurement Policy Framework

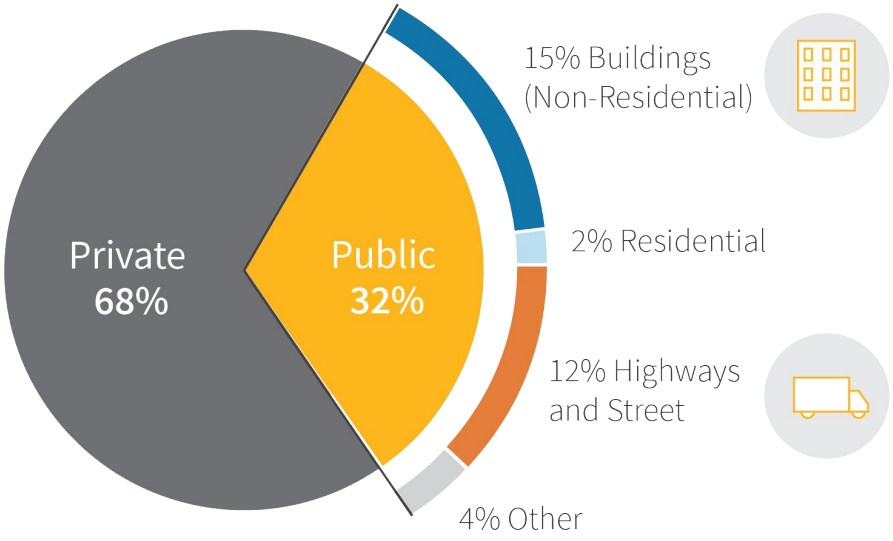


Why Buy Clean? Leveraging Public Procurement

- 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)

climateworks FOUNDATION

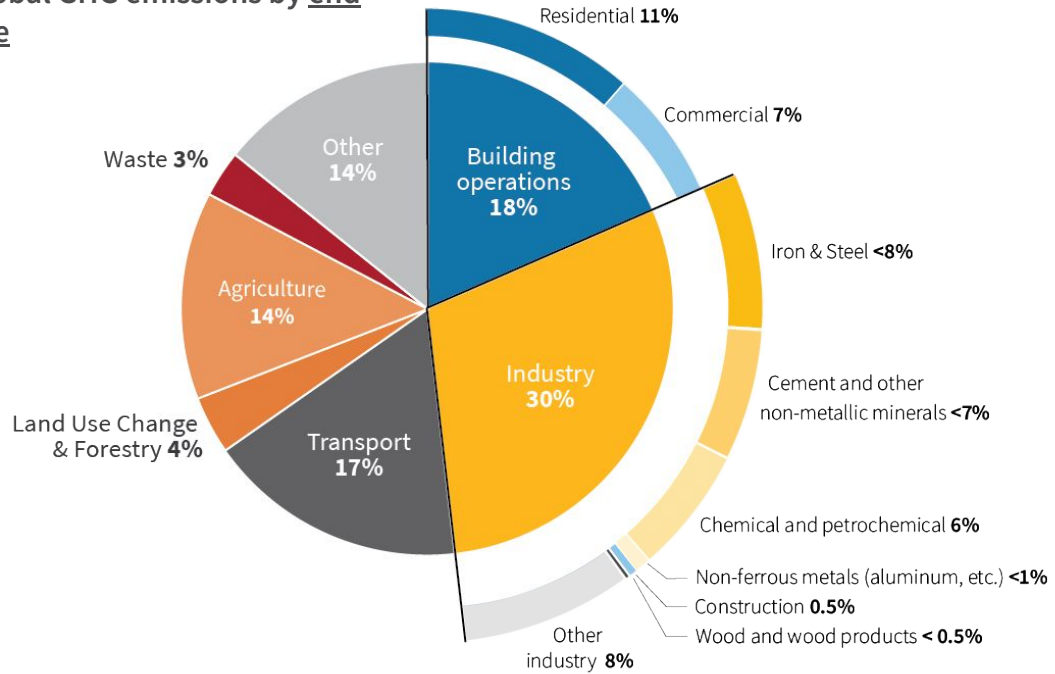


Relative contributions of the global warming potential of US construction for private and public projects). Data sources: US Census Bureau ("Annual Value of Construction Spending Put in Place" for 2008 - 2018); US EPA Office of Research and Development (USEEIO v1.1 data).

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



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

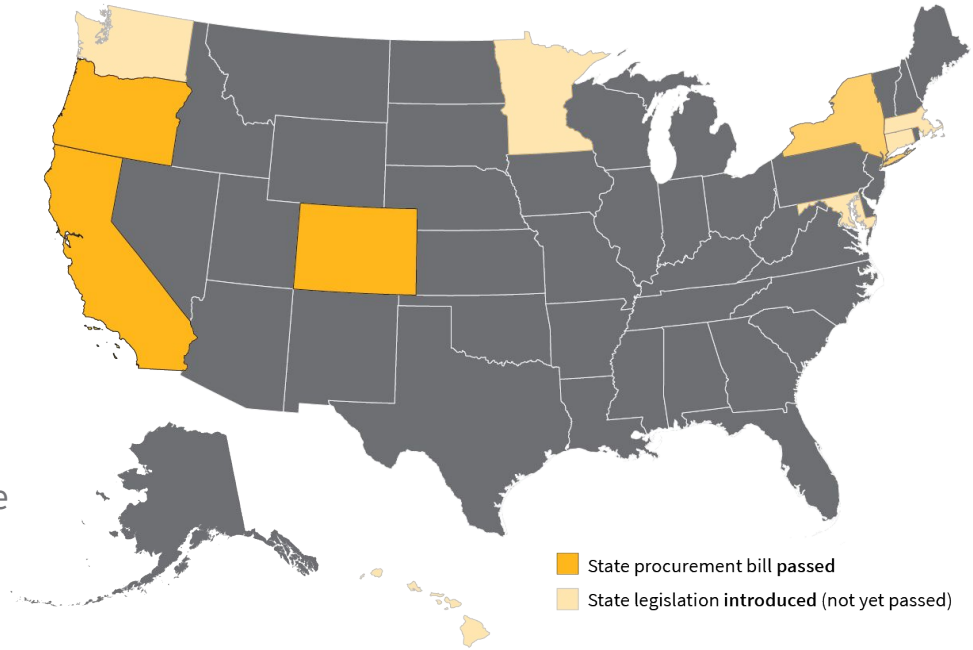
“For the average company, supply chain emissions are around 11.4 times greater than direct emissions” (CDP Supply Chain)

Data Source: 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

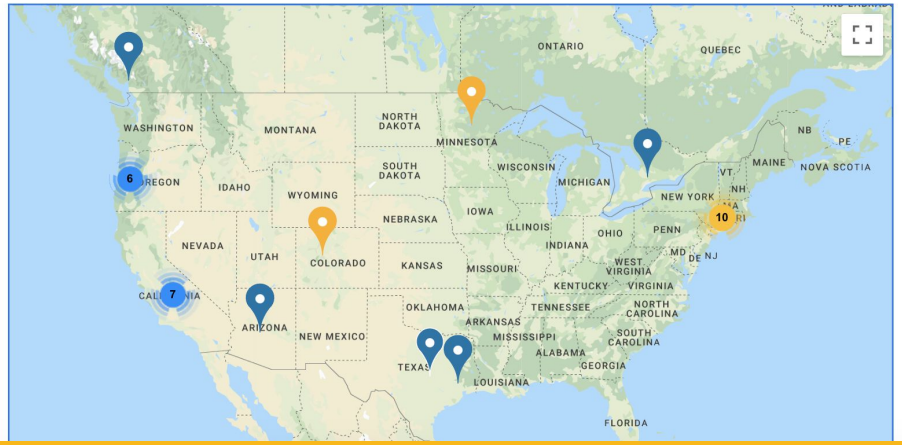


Tracking the Growing Embodied Carbon Policy Landscape

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.

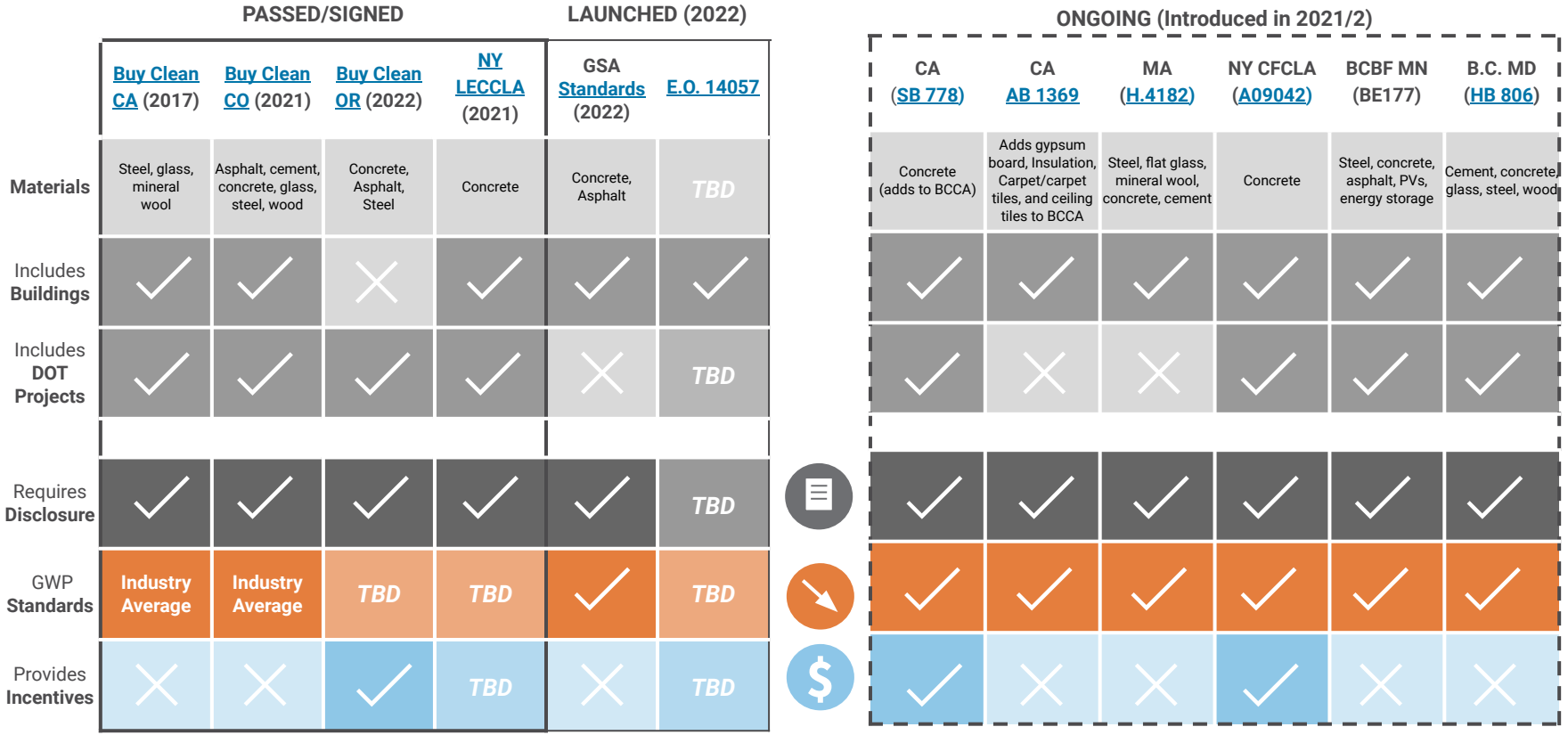
National Policy State or Provincial Policy Local Policy



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)*



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Scope

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

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

Which **materials** are covered?

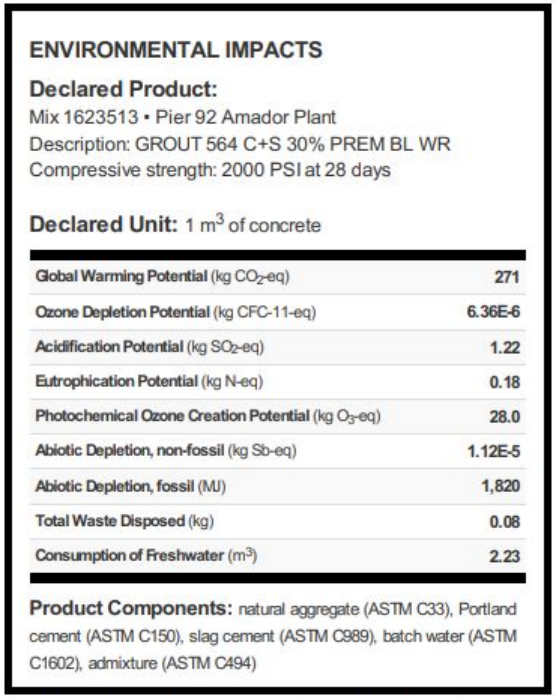
- The most frequently included materials are **concrete and steel,** including ready-mixed concrete, structural steel, reinforcing steel
- The following materials are also included, in order of 'popularity':
  - Asphalt
  - Engineered wood
  - Glass
  - Insulation
  - Finishes *(CA AB 1369 is first bill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

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

Declared Product:
Mix 1623513 • Pier 92 Amador Plant
Description: GROUT 564 C+S 30% PREM BL WR
Compressive strength: 2000 PSI at 28 days

Declared Unit: 1 m^3 of concrete

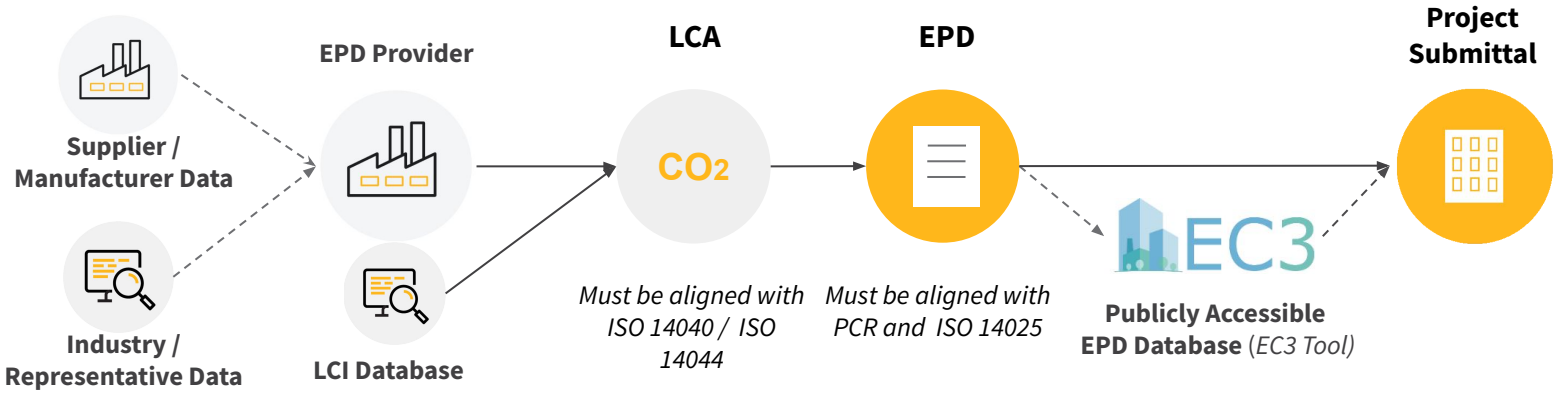
Global Warming Potential (kg CO_2-eq)	271
Ozone Depletion Potential (kg CFC-11-eq)	6.36E-6
Acidification Potential (kg SO_2-eq)	1.22
Eutrophication Potential (kg N-eq)	0.18
Photochemical Ozone Creation Potential (kg O_3-eq)	28.0
Abiotic Depletion, non-fossil (kg Sb-eq)	1.12E-5
Abiotic Depletion, fossil (MJ)	1,820
Total Waste Disposed (kg)	0.08
Consumption of Freshwater (m^3)	2.23

Product Components: natural aggregate (ASTM C33), Portland cement (ASTM C150), slag cement (ASTM C989), batch water (ASTM C1602), admixture (ASTM C494)

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

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



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

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Facility-specific EPDs

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

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.)*

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

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Helpful for setting benchmarks/limits, NOT for policy compliance

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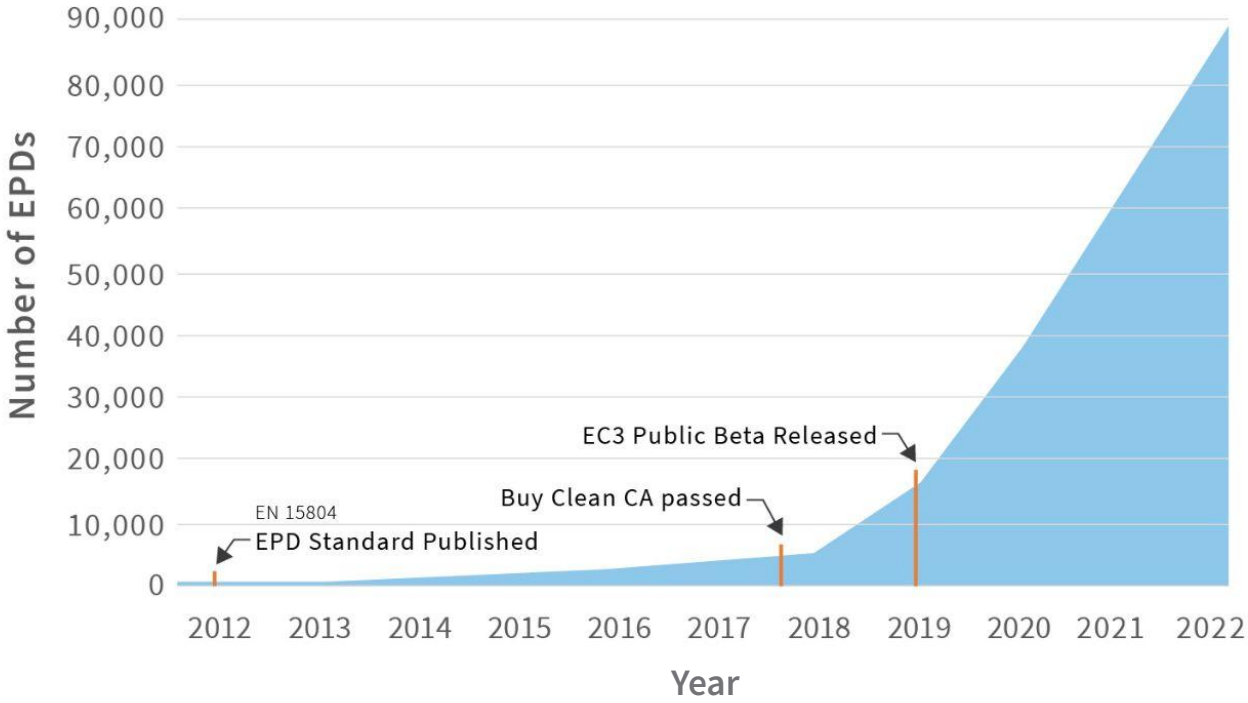
Number of EPDs is Growing



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.

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)

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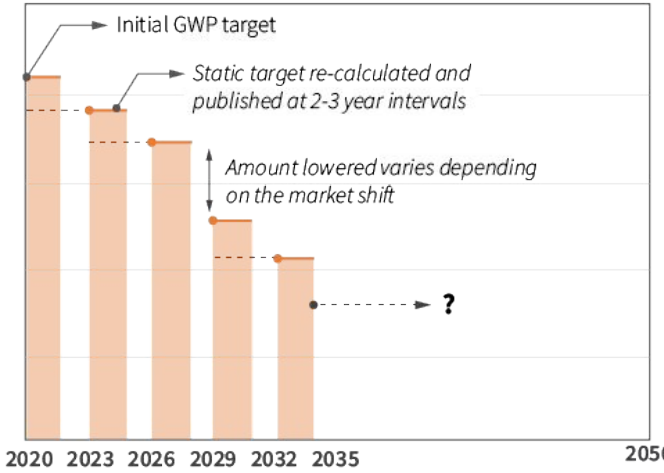
Embodied Carbon Limits and Targets

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.



Case Study: Buy Clean California Act

Eligible Material	Subcategory	Limit	Declared Unit	Functional Unit
Structural Steel	Hot-rolled sections	1.01 metric tons CO_2-eq	1 metric ton	N/A
	Hollow structural sections	1.71 metric tons CO_2-eq	1 metric ton	N/A
	Plate	1.49 metric tons CO_2-eq	1 metric ton	N/A
Concrete Reinforcing Steel	N/A	0.89 metric tons CO_2-eq	1 metric ton	N/A
Flat Glass	N/A	1.43 metric tons CO_2-eq	1 metric ton	N/A
Mineral Wool Board Insulation	Light-density mineral wool board insulation	3.33 kg CO_2-eq	N/A	1 m_2 of insulation material with a thickness giving average thermal resistance of RSI = 1 m_2K/W and with a building service life of 75 years.
	Heavy-density mineral wool board insulation	8.16 kg CO_2-eq	N/A	1 m_2 of insulation material with a thickness giving average thermal resistance of RSI = 1 m_2K/W and with a building service life of 75 years.

Read more about the limits set by the Buy Clean California on the **official DGS website** or read the CLF Report ***Buy Clean California Limits***.

Standards

Reduction Targets from a Baseline

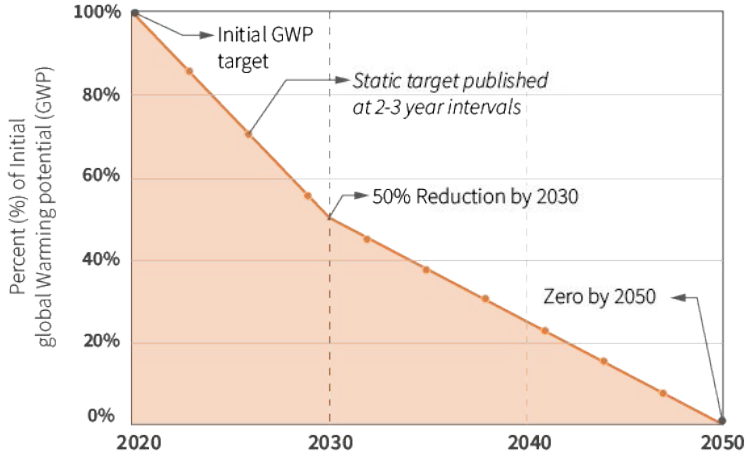
Sets an **initial baseline carbon intensity** (e.g. CO2e per unit) that a project or product must reduce from. Baselines may be for a specific year.

Example:

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

Lowering Limits Over Time: Option 2

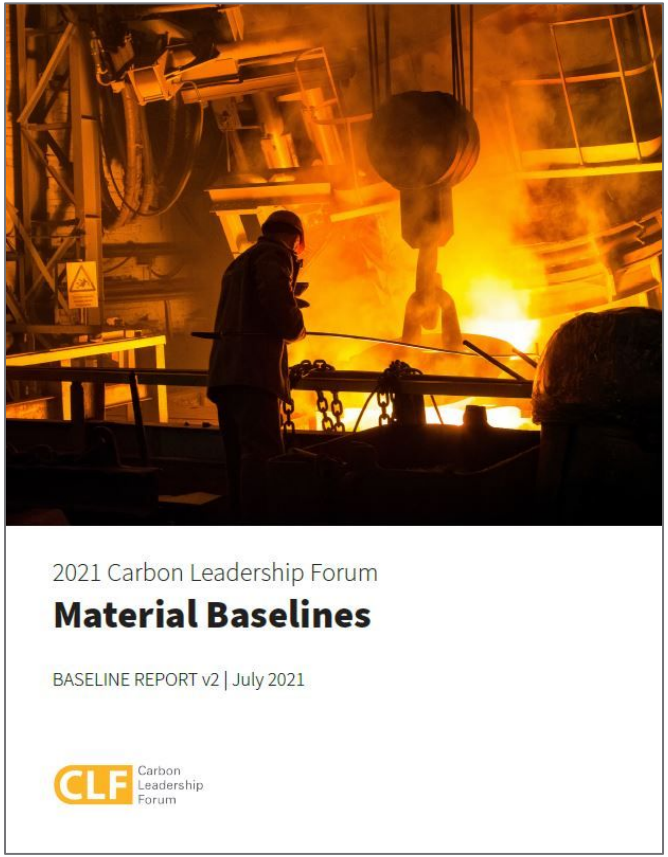
If an initial GWP baseline is set, policies may require percentage reductions by certain dates. This is similar to how companies or governments typically make public commitments to reduce carbon broadly.



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/

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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 LECCLA (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)*

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.

Also included in Buy Clean Oregon passed in 2022; included in Build Back Better Act

NY LECCLA EPD Tax Credit:

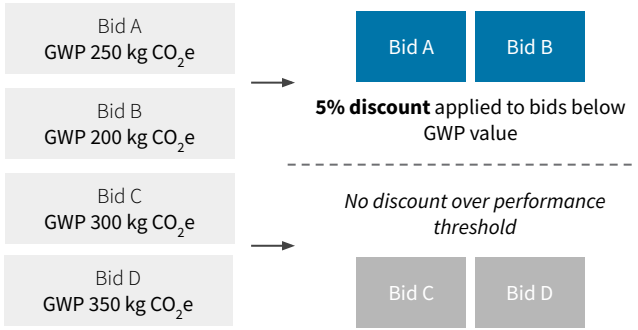
- Manufacturers can receive up to $3k in support for EPD analysis *(would be valid until 2023)*

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

Examples: Purchasing Preferences

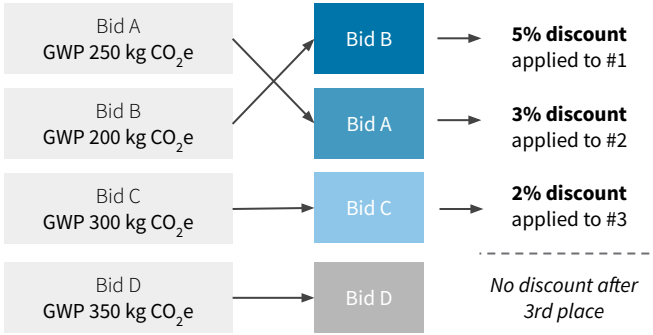
Example 1: Performance discount rate

Bids are sorted above and below a climate performance threshold. Low-carbon bids receive a discount rate



Example 2: Sliding discount rate

Bids are ranked by GWP and a discount rate is applied to the lowest three.



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.*

Compliance

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/***

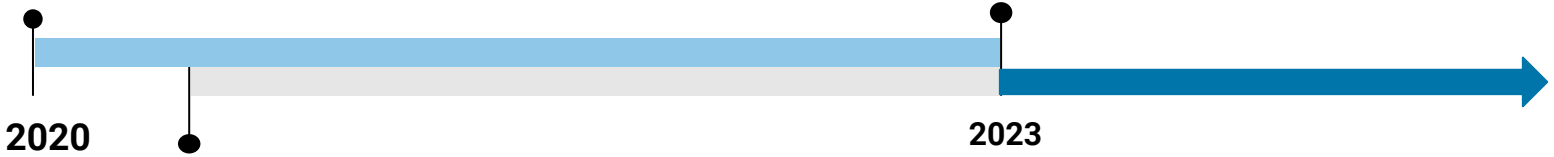
Case Study Portland Low Carbon Concrete Program

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

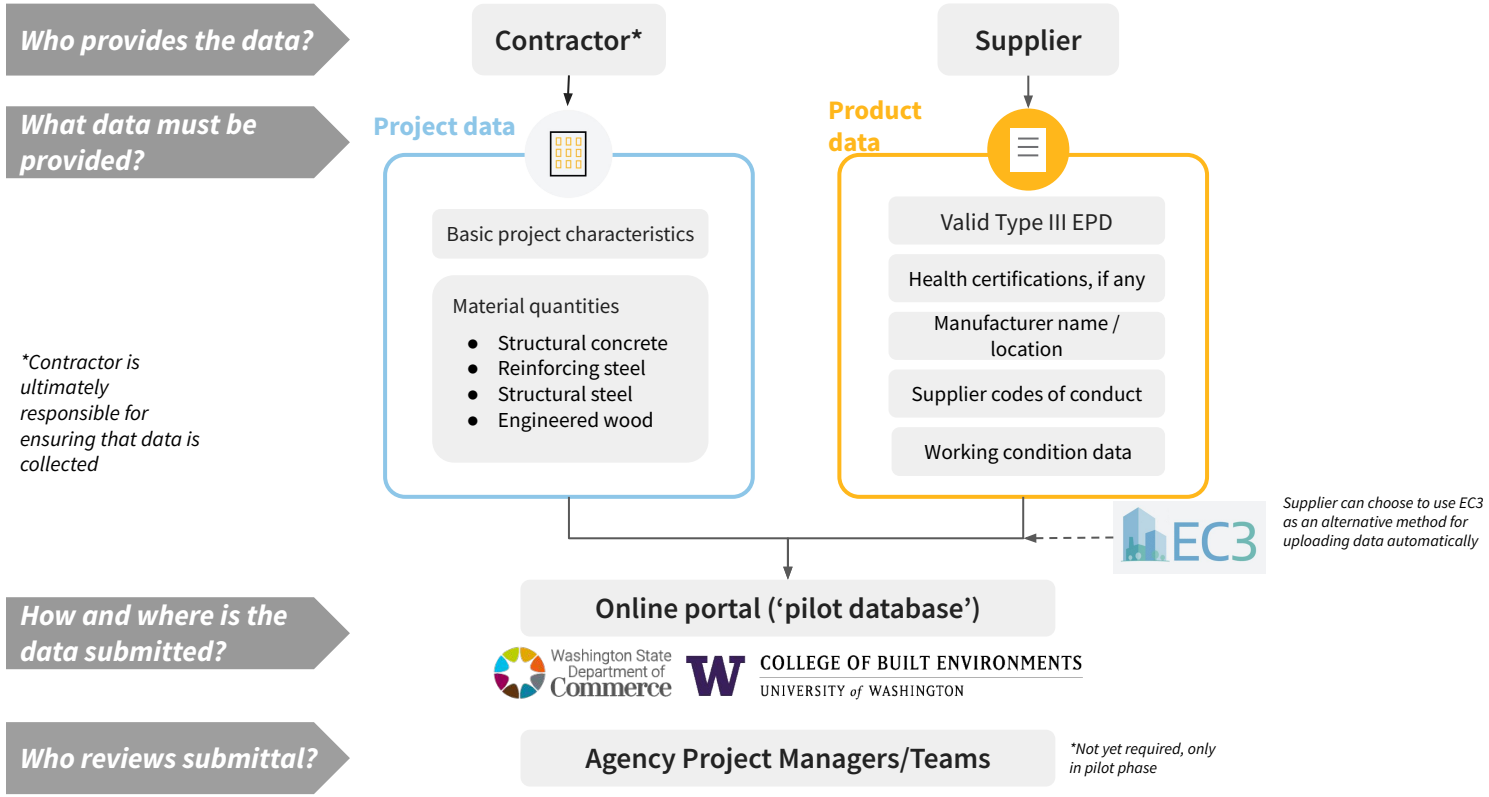
GWP Limits published that concrete used on city projects will be required to meet



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 projects

Case Study Buy Clean Buy Fair Reporting Database and Pilot Projects



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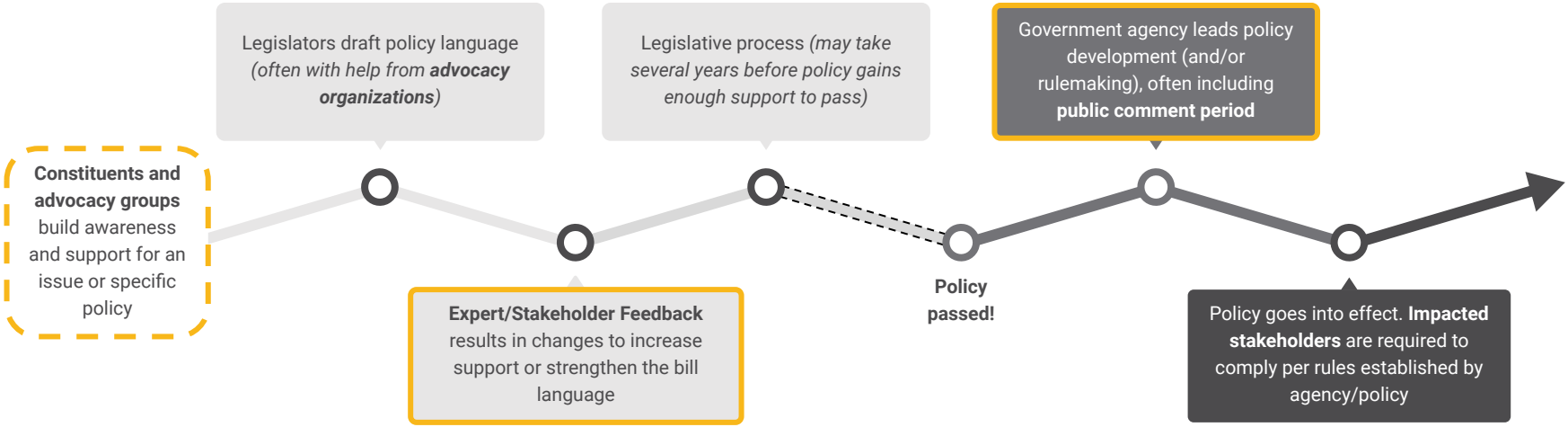
Development Process and Stakeholders

Informing Policy Development

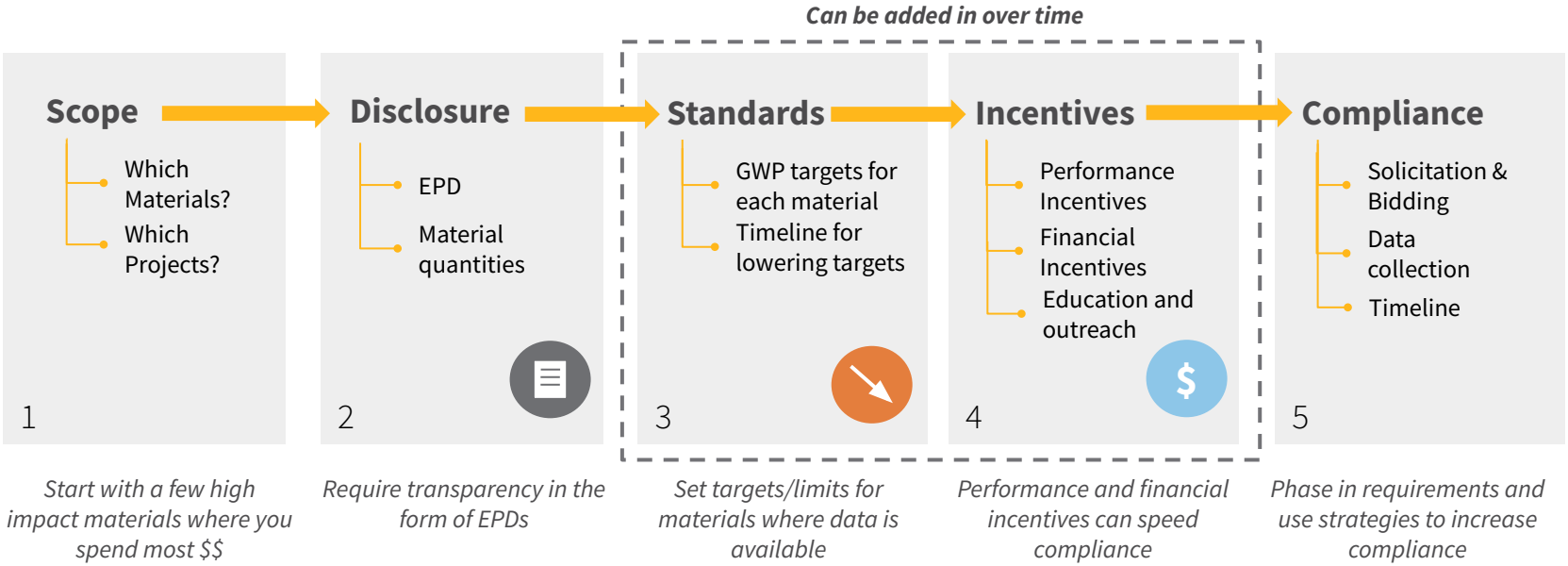


***Examples** of advocacy organizations that have supported embodied carbon policy development:*

BLUEGREEN ALLIANCE · NRDC NATURAL RESOURCES DEFENSE COUNCIL · AIA · OPENAIR · CLEAN ENERGY CANADA

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.



Thank you!