

## CHAPTER 5: POLICY EVALUATION

### 5.1 INTRODUCTION

This chapter presents an analysis of a general Buy Clean policy framework (based on the Buy Clean California Act<sup>1</sup> and HB: 2412 - Creating the Buy Clean Washington Act<sup>2</sup>), outlines a pathway to develop Buy Clean policy and supporting standards, discusses potential impacts of policy implementation, and identifies investments that could help support embodied carbon policy implementation.

### 5.2 BUY CLEAN POLICY FRAMEWORK

This section describes key components underpinning Buy Clean policy, providing a basis to assess policy options, approaches and potential impacts, described in more detail in later parts of this report chapter. The 'Buy Clean' framework is based on 1) the current Buy Clean California Act - signed into law in October 2017, 2) the originally proposed HB: 2412: Creating the Buy Clean Washington Act - introduced to the Washington State legislature in January 2018, and 3) lessons learned from evaluation of global embodied carbon policies (see **Chapter 2: Policy Review**). Key components of Buy Clean policy include:

1. **GOAL:** Policy addresses two goals to reduce the carbon impact of construction:
  - Incentivize disclosure of embodied carbon
  - Set performance targets to measure and reduce embodied carbon
2. **SCOPE:** The scope of policy mandates is limited to:
  - Procurement of construction materials for state-owned facilities and infrastructure
  - Enable product choices within a material type, rather than between material types
  - A selected list of 'eligible materials'
3. **METHOD:** Policy uses life cycle assessment (LCA) to disclose and evaluate embodied carbon.
  - Use of EPDs to evaluate embodied carbon
  - Setting a global warming potential (GWP) performance target based on LCA
  - Demonstrating compliance as part of construction process
  - Establish reporting mechanisms and methods to establish conformance/exemptions.
4. **TIMELINE:** Policy establishes an appropriate timeline to build industry capacity:
  - Voluntary submission of EPDs and/or testing with pilot projects
  - Mandatory submission of EPDs
  - Performance targets established and mandatory
  - Performance targets reviewed and updated as appropriate
5. **IMPLEMENTATION/EVALUATION:** Effective implementation and evaluation should include:
  - Support for local manufacturers to develop EPDs
  - Education and outreach to design, construction and facilities professionals
  - Creation of a centralized database of material quantities, origin and EPD results
  - Regular evaluation of progress connected to global material de-carbonization roadmaps

<sup>1</sup> California Legislative Information, "Buy Clean California Act [3500 - 3505]," 2017, [https://leginfo.ca.gov/faces/codes\\_displayText.xhtml?division=2.&chapter=3.&part=1.&lawCode=PCC&article=5](https://leginfo.ca.gov/faces/codes_displayText.xhtml?division=2.&chapter=3.&part=1.&lawCode=PCC&article=5).

<sup>2</sup> Washington State Legislature, "HB 2412 - 2017-18 Creating the Buy Clean Washington Act," 2018, <https://app.leg.wa.gov/billssummary?BillNumber=2412&Year=2017>.

Based on assessment of selected US-based and global embodied carbon policies, the following guiding principles can inform best practices for policy development and potential implementation. The potential investments listed in Section 5.6 would support broad application of guiding principles, but they are not necessarily contingent on supplemental funding. The guiding principles include:

1. Establish clear and consistent messaging around policy goals and key components; e.g. emphasize that policy aims to compare related material types vs. make comparisons between different material types.
2. Provide opportunities or mechanisms for feedback from stakeholder groups. Consult (and consider input from) industry representatives from both the supply-side (manufacturers) and demand-side (architects, building owners), as well as technical LCA experts in order to reflect material-specific nuances in policy language and/or implementation guidelines.
3. Identify potential resources (e.g. organizations, people, professional reports, etc.) that decision-makers can leverage during policy development, particularly when and where there are technical complexities and issues related to supply chains and environmental LCA reporting.
4. Assess the timeline of potential implementation and pilot projects against the timeline of upcoming large state-funded projects.
5. Where possible, develop policy that encourages innovation and provides benefit to product manufacturers who meet compliance standards.

### 5.3 GENERAL ANALYSIS OF BUY CLEAN CALIFORNIA

The Buy Clean California Act addresses components noted in the Buy Clean Policy Framework (Section 5.2). There is no pre-established roadmap, tested framework or formal evaluation of Buy Clean policy. Case studies from individual construction projects and international policies with similar standards provide lessons learned, but there is no comparable model of US state-level procurement policy that establishes standards for environmental disclosure and performance targets.

California will incrementally introduce Buy Clean standards, starting in January 2019. The research team has gathered information and lessons learned from Buy Clean California policy development and implementation planning, but there are many unknowns that could take several years to understand and evaluate. Based on qualitative evaluation of the Buy Clean California Act, this section provides further analysis of its key components against the policy framework outlined in Section 5.2.

#### GOALS

The original Buy Clean California Act (which informed bill language proposed by Washington) was intentionally simplified and tied to high-level goals, such as reducing global carbon emissions through encouraging low carbon manufacturing practices. Shaped by brief language to define standards, the original bill was moved forward by policymakers and advocates motivated to pass it into law in the near-term legislative cycle. Its simplicity was intended to allow clear and digestible communication of standards, which by nature, are complex and technical, particularly since requirements would apply across product markets with varying supply chains and material-specific nuances.

Succinct bill language helps ensure legislative and other stakeholders (whose endorsement is key to move regulation forward) can understand policy and communicate its broad goals and parameters. Detailed, exacting language can lead to rigid standards unresponsive to continually evolving product markets, whereas broad, simplified language allows potentially flexibility to interpret and adapt guidelines as needed. However, brevity and limited detail – especially related to standards that would require a depth of technical knowledge from affected industry groups – can risk confusion, concern and differing interpretations of requirements, and may not reflect the complexities and variances unique to each product market.

The goals underpinning the Buy Clean California Act are two-pronged: 1) Disclosure: through the EPD requirement, policy aims to accelerate adoption of reporting practices that improve product transparency, and 2) Performance: through the pre-calculated GWP thresholds, policy aims to limit levels of embodied carbon emissions, and thereby, move product suppliers to adopt ‘low carbon’ manufacturing processes (relative to respective product markets).

While the bill itself is not explicit on broader policy vision, content developed by advocates for the bill provides insight. Overall, the Buy Clean policy vision aims to accelerate the reduction of embodied carbon emissions attributed to construction materials through using purchasing power to address the ‘carbon loophole’. Recent press articles<sup>3,4</sup> support other reports<sup>5</sup> that clarify and assess the carbon loophole issue.

## SCOPE

The scope of Buy Clean policy shaped by California enables state government to consider environmental performance of facilities and infrastructure it *owns*, and thereby, directly position state awarding authorities to address embodied carbon attributed to public procurement. In the broad landscape of both public- and private- funded construction projects, the immediate impact that state-level procurement policy would have on transforming industry-wide practice and realizing large emissions savings may be limited, but it could accelerate incremental shifts and provide a roadmap for commercially-focused policies, resulting in cumulative benefits over time.

As described in **Chapter 3: Technical Review**, construction materials result in carbon emissions and other environmental impacts throughout all the main lifecycle stages of a building: (A) production and construction, (B) use, (C) end-of-life, and (D) impacts beyond the system boundary. LCA is typically applied to assess impacts occurring throughout all stages (cradle-to-grave) or occurring during one defined stage (e.g. cradle-to-gate). The scope of Buy Clean policy considers cradle-to-gate impacts, and does not necessarily assess the holistic picture of environmental impacts incurred by a material over its lifecycle phases (e.g. maintenance, repair, replacement, or end-of-life disposal).

The defined scope of Buy Clean does not account for potential emission ‘trade-offs’ of material types. For instance, a material may result in high emissions during manufacturing, but in other life cycle phases, it could contribute to significant emissions savings (e.g. energy efficiency gains and/or

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<sup>3</sup> Brad Plumber, “You’ve Heard of Outsourced Jobs, but Outsourced Pollution? It’s Real, and Tough to Tally Up,” *The New York Times*, September 4, 2018.

<sup>4</sup> Ali Hasanbeigi and Daniel Moran, “The Glaring Loophole in Our Climate Policies,” *The Washington Post*, September 13, 2018.

<sup>5</sup> Daniel Moran, Ali Hasanbeigi, and Cecilia Springer, “The Carbon Loophole in Climate Policy: Quantifying the Embodied Carbon in Traded Products,” 2018, <https://buyclean.org/media/2016/12/The-Carbon-Loophole-in-Climate-Policy-Final.pdf>.

reuse/recycling benefits). Furthermore, the scope does not consider other environmental impact categories (e.g. acidification, eutrophication, ozone depletion, smog formation) beyond GWP used to provide a holistic assessment of lifecycle environmental impacts. For these reasons, it is critical to emphasize that Buy Clean policy is only appropriate to compare materials with nearly identical performance variables and types of life cycle impacts. The policy is not an appropriate mechanism to compare performance between different materials (e.g. steel vs. concrete).

The Buy Clean California Act includes four ‘eligible material’ categories: carbon steel rebar, flat glass, mineral wool board insulation, and structural steel, which were material types policy advocates identified as ‘high impact/trade exposed’. The proposed Buy Clean Washington bill initially included an expanded version of this list, which was refined to limit the eligible categories to structural materials. The focus on structural materials helps address industry concerns that ‘competing’ material types would have similar reporting requirements under Buy Clean regulation, even though the policy does not intend to compare between material categories.

#### **METHOD: MANDATORY ENVIRONMENTAL DISCLOSURE STANDARD – FACILITY-SPECIFIC EPDS**

The Buy Clean California policy requires product manufacturers of each eligible material to report embodied carbon using a facility-specific EPD or ‘similarly robust LCA method.’ Successful bidders would need to submit EPDs before installing products on state-funded projects.

Governments and firms require or publish three common types of EPDs: (1) industry-average (in which the average commonly only represents sample datasets from participating product manufacturers), (2) product-specific (which may be an average of several facilities producing the same product), and (3) facility-specific. EPDs can be third-party verified or ‘self-declared.’

Facility-specific EPDs provide the most direct, detailed and potentially accurate assessment of environmental impacts attributed to a specific product. However, generating facility-specific EPDs is often more resource intensive than publishing other types of EPDs, and some product manufacturers perceive that facility-specific EPDs could be used by competitors to glean propriety information.

The Buy Clean requirement of facility-specific EPDs is not a common specification in other programs or policies with EPD-specific guidelines. For instance, the LEED EPD credit establishes a pathway that allows for the use of industry-average or product-specific EPDs in its credit calculation. While collecting granular data at the facility level could provide a more direct assessment of impacts of a specific product, the additional challenges and barriers to product manufacturers are worth noting, particularly concerning small, local firms with no prior experience or limited budgets to incorporate new reporting practices into current business models.

#### **METHOD: MANDATORY ENVIRONMENTAL PERFORMANCE STANDARD – GWP THRESHOLD**

Buy Clean California intends to establish a pre-calculated GWP threshold (or limit) for each material category to measure and compare environmental performance of eligible materials. GWP is a standardized metric that reports greenhouse gas (GHG) emissions, an environmental impact category specifically targeted by Buy Clean goals. Buy Clean California will require state awarding authorities (beginning in 2021) to assess whether or not embodied carbon emissions fall below the threshold to verify if compliance is met. At this time, the policy would not recognize or attach weighting to varying

levels of performance below or above the limit. This potentially limits opportunity to motivate continual improvement beyond the threshold and thereby, realize significant emissions reductions over time.

California intendeds to establish GWP thresholds for each product category based on average environmental performance calculated by available facility-specific, product-specific and industry-average EPDs. However, since thresholds would only represent a sample of publicly available EPDs from each product market, they may not accurately reflect the true average of market-wide performance, especially in contexts with sparse datasets and/or inconsistent methodologies, tools and sources to generate data. See Section 3.4 of the **Chapter 3: Technical Review** for detailed description on challenges related to setting performance targets for material categories.

The Buy Clean California Act outlines the process to establish GWP thresholds, stating “the department [the Department of General Services (DGS)] shall set the maximum acceptable global warming potential at the industry average of facility-specific global warming potential emissions for that material with a phase-in period of not more than two years. The department shall determine the industry average by consulting recognized databases of environmental product declarations. When determining the industry averages pursuant to this paragraph, the department should include all stages of manufacturing required by the relevant product category rule. However, when setting the initial industry average, the department may exclude emissions that occur during fabrication stages, and make reasonable judgments aligned with the product category rule.”

Subsequently, the state defined a prescriptive method to calculate a baseline based on a weighted calculation of EPDs from single suppliers with single production facilities, single suppliers with multiple production facilities and industry-wide EPDs<sup>6</sup>. However, this approach does not account for two important factors - (1) not all product suppliers will issue EPDs (e.g. there are no EPDs currently available for steel commonly imported to the US West coast), and (2) ideally, performance results should be weighted based on production capacity, and not all facilities produce equal volumes of materials. Additionally, upcoming EPDs (per the new ISO 21930:2017 EPD standards) will require product suppliers to report variability (e.g. standard deviation); however, the current policy method does not anticipate how to integrate new EPD data into evaluation.

#### **METHOD: DEMONSTRATING COMPLIANCE**

State agencies and public entities (e.g. state universities) awarding construction contracts will be required to communicate Buy Clean policy requirements in their bid specifications (i.e. instructions to bidders). Bidders do not need to provide EPDs during the bidding process; the bidder awarded the contract would need to report EPDs provided by product manufacturers before a project team can install eligible materials.

California amended the policy to include options for noncompliance. If the requirements “[are] technically infeasible, would result in a significant increase in the project cost or a significant delay in completion, or would result in only one source or manufacturer being able to provide the type of material needed by the state.”<sup>7</sup>

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<sup>6</sup> [https://www.documents.dgs.ca.gov/pd/engineering/AB%20262/GWP\\_Method\\_Doc.pdf](https://www.documents.dgs.ca.gov/pd/engineering/AB%20262/GWP_Method_Doc.pdf)

<sup>7</sup> California Legislative Information, “Buy Clean California Act [3500 - 3505].”

The language does not specify penalties or recourse if product manufacturers do not meet requirements without providing justification, but it infers that selected product manufacturers would no longer be eligible to provide construction materials, and assuming there is a competitive pool of manufacturers who could meet requirements, the project team would select another option. This uncertainty poses risk to the construction team as they attempt to evaluate project impacts such as: How much will this requirement impact material costs? How will non-compliance justification be established? How much time will the documentation and justification cost?

## TIMELINE

The bill timeline is summarized below:

1. Buy Clean California Act signed into law (October 15, 2017)
2. Amendment passed – updated implementation timeline and added justifiable exemptions (June 27, 2018)
3. Voluntary submission of facility-specific EPDs requested (starting January 1, 2019)
4. Mandatory submission of facility-specific EPDs required (starting January 1, 2020)
5. DGS to establish GWP maximum (by January 1, 2021)
6. Performance reported in EPDs must fall below maximum GWP (starting in July 1, 2021 – applies to contracts ‘entered into’ on or after that date)
7. DGS to submit a report to the CA Legislature (by January 1, 2022)
8. DGS to review GWP maximum and adjust downward as appropriate (by January 1, 2024 and every three years thereafter)

The incremental timeline to implement Buy Clean California presents potential benefits. It could provide additional time for affected product markets to improve understanding of environmental reporting, labels and performance measures, and build capability to access or apply the tools, data and software needed to track and quantify environmental impacts. Furthermore, by including an initial trial phase that encourages voluntary participation, the government positions itself to build internal capability to regulate policy, establish a standard delivery approach, and assess and refine policy details based on lessons learned during the first phase of implementation.

However, time alone may not ensure that affected industry groups become equipped to meet compliance standards in the future. Depending on the context (especially in regions with small businesses), firms may not have the financial ability to access technical and educational resources to build internal capability. In this context, an extended timeline risks delaying the issue of non-compliance. Where possible, government should supplement an incremental timeline with education and training resources for manufacturers. **Chapter 2: Policy Review** provides examples of support programs administered by the USGBC-LA and Oregon DEQ (see **Chapter 2 Section 2.3**).

## IMPLEMENTATION

The California Department of General Services (DGS) implements state regulation. DGS staff developed their expertise in the eligible material categories and evaluated the state of EPDs across affected

product markets. Further, DGS has developed implementation procedures, made publicly available on the department website.<sup>8</sup> As part of this process, DGS has:

1. Hosted a public event (6/26/2018) with stakeholders to share information about implementation including:
  - Proposed language to include in state contract specifications
  - Presentation slides from the stakeholder event with background on LCA/EPDs
  - Proposed methodology for calculating ‘Global Warming Potential Baseline’
  - A summary of calculation data available (as of June 2018)
  - External stakeholder comments and DGS responses
2. Posted resources including:
  - The incentive program administered by the USGBC Los Angeles chapter<sup>9</sup>
  - A list of the accepted PCRs for each eligible material category
  - The EPD program operator responsible for the majority of EPDs (for each material)
3. Hosted a meeting with awarding agencies (9/26/2018) to ‘discuss acceptable documentation for AB 262 compliance, standardized language for requesting EPDs in solicitations, industry compliance concerns and next steps.’<sup>7</sup>

As noted, the bill requires DGS to establish maximum GWP thresholds for eligible material categories and update these values every three years. DGS is also required to assess barriers to implementation and effectiveness of GWP thresholds through a report due six months after legislation becomes mandatory. This timeframe could challenge ability to collect and compile sufficient data to assess the policy, unless DGS establishes a standardized method to collect, compile and evaluate data from participating construction projects.

## 5.4 PATHWAY TO DEVELOPING BUY CLEAN WASHINGTON POLICY

This section presents a step-by-step pathway for Washington State to consider upon developing Buy Clean policy standards. Under each step (where appropriate), the research team presents ‘key considerations’ – strategies or approaches that the state could adopt to potentially mitigate potential risks, impact effectiveness of policy, influence complexity and cost of policy implementation, and/or provide additional flexibility for policy to meet the needs of different industry groups (e.g. complex product markets, small businesses, etc.).

The recommended steps in this Section are as follows:

STEP 0: Evaluate policy context

STEP 1: Establish policy goals

<sup>8</sup> DGS, “Buy Clean California Act (AB 262),” accessed December 30, 2018, <https://www.dgs.ca.gov/pd/Programs/Engineering/AB262.aspx>.

<sup>9</sup> USGBC-LA, “Buy Clean California – USGBC LA,” accessed December 12, 2018, <https://usgbc-la.org/programs/buy-clean-california/>.

**STEP 2: Establish policy scope**

- 2.1 Select eligible materials
- 2.2 Select type of policy standards
- 2.3 Select type of compliance guidelines

**STEP 3: Establish Methods**

- 3.1 Select disclosure method
- 3.2 Select method to report material quantities
- 3.3 Select method to establish performance targets
- 3.4 Select method to assess environmental performance

**STEP 4: Establish Timeline**

- 4.1 Consider construction industry practices
- 4.2 Select time to evaluate embodied carbon (if appropriate)
- 4.3 Select method to update embodied carbon targets (if appropriate)

**STEP 5: Implement and Evaluate****STEP 0. EVALUATE POLICY CONTEXT**

As a starting point, policymakers should assess factors unique to local context and assess state ‘readiness’ to meet policy standards. Key factors to consider include: (1) prevalence of related policies and initiatives targeting the building sector, (2) prevalence and level of environmental reporting practices by product market, (3) availability and quality of EPDs and LCA data sources, (4) availability of accessible, standardized software, tools and methodologies, and (5) availability of government resources to support education, training, and incentive programs to support policy.

**Chapter 3: Technical Review** evaluates the context of embodied carbon reporting for structural materials in Washington State. While many of these recommendations could be generalized for other building materials, care should be taken to evaluate material-specific impacts if Buy Clean policy is developed for materials other than those evaluated in this report.

**STEP 1. ESTABLISH POLICY GOALS**

The Buy Clean Washington Study starts with the presumption that policymakers have established broad goals related to carbon reduction throughout the supply chain of building materials. Governments often consider embodied carbon procurement policies to achieve two high-level goals: (1) Disclosure: To accelerate the adoption of reporting practices that disclose the environmental impacts of construction materials and (2) Performance: To accelerate the reduction of embodied carbon by improving the environmental performance of construction materials.

While both goals are not mutually exclusive (governments often develop standards targeting both goals within a single policy), policymakers may choose to develop policy around a dominant goal based on policy context. For instance, a government body may shape near-term standards around disclosure goals, in order to build industry capability to meet performance goals in the future.

## STEP 2. ESTABLISH POLICY SCOPE

When establishing the scope of Buy Clean policy three aspects are critical to consider, the eligible materials to be eligible for the program, the type of policy (disclosure or performance-based) and the type of compliance (mandatory or voluntary).

### 2.1 SELECT ELEGIBLE MATERIALS

The basis of Buy Clean policy is a pre-determined 'eligible materials' list, which defines specific product categories required to comply with policy standards. The Buy Clean Washington Study assessed material types based on the eligible materials list identified by the Pilot Project (per bill language in ESSB 6095); however, the state could consider adopting other approaches to defining a list of eligible materials:

**Option 1:** Adopt list defined for the Pilot Project, which specifies structural materials for four categories

**Option 2:** Modify selection criteria for the eligible materials list, considering factors such as trade-exposed products, materials that result in the highest emissions during the manufacturing phase

**Option 3:** Do not establish a prescriptive list. Rather, apply Buy Clean requirements to *all* construction products used for public-funded projects.

### 2.2 SELECT TYPE OF POLICY STANDARDS

As identified in description of Step 1: Establishing the policy goals, there are some key aspects to consider when establishing the scope of Buy Clean policies. This section outlines and provides examples against two high-level options for type of standards to develop: 1) disclosure-based and 2) performance-based.

#### **Option 1: Disclosure-based policy**

Under Option 1, Washington State could develop policy with disclosure-based reporting standards in order to improve transparency of environmental impacts across product markets. Standards would require or incentivize product manufacturers selected for state-funded construction projects to publish environmental impacts of 'eligible products'. State awarding authorities would collect environmental impact data from product manufacturers but would not assess or compare performance of products. Therefore, WA State would not penalize or reward product manufacturers for level of reported embodied carbon emissions. This would function similarly to the first stage of the Buy Clean California project before GWP limits are established.

**Example A:** A state government requires manufacturers to publish EPDs for select product categories in order for eligible installation on public-funded projects.

**Example B:** A state government provides its environmental agency supplemental funding to establish a voluntary EPD program for local manufacturers including tools such as LCA/EPD Calculators. Manufacturers apply to participate in the program and receive financial, technical and educational support to generate EPDs.

### **Option 2: Performance-based policy**

Under Option 2, Washington State would develop standards for environmental performance thresholds or targets pre-calculated by the Department of Enterprise Services (DES) for each product category identified as an ‘eligible material’. Standards would incentivize or require manufacturers to meet a level of environmental performance relative to a pre-calculated value that reflects an embodied carbon performance target for each product type. This could function similarly to the final stage of the Buy Clean California project or be applied differently depending on the methods selected in Step 3.

***Example 2A:** a state government pre-calculates mandatory GWP thresholds for each product category defined as ‘eligible’ under policy. Through published facility-specific EPDs, product manufacturers must demonstrate that products fall below the GWP limit before installing materials on public-funded projects.*

***Example 2B:** A federal government implements a national voluntary rating system, providing points and certifications aligned with pre-established targets for global warming potential (GWP). The system awards points proportional to the level of environmental performance demonstrated by product manufacturers. Developers obtain incentives such as certification (e.g. green product label), financial bonuses, additional construction rights (e.g. density bonuses), or technical, education and financial support that helps manufacturers meet targets.*

***Example 2C:** a state government sets performance targets for each product category. Contractors commit to meeting performance targets at bidding with outcomes linked to prescribed bid award criteria such as ‘sustainability points’ or connected to an overall project carbon target that must be met.*

## **2.3 SELECT TYPE OF COMPLIANCE GUIDELINES**

Governments can apply either mandatory (noncompliance is penalized) or voluntary (requirements are optional) compliance guidelines to underpin policy standards. As a general observation, the research team recognizes that providing benefits to product manufacturers for meeting policy standards (vs attaching penalizations or disadvantages to non-compliance) can lower the risk of inadvertent, negatives impact to local businesses.

### **Option 1: Mandatory**

Product manufacturers must comply with standards in order to install construction materials on state-funded projects. Noncompliance would result in a form of penalization determined by WA State – for instance, the state could refuse to permit installation of non-compliant materials on the awarded project, or WA State could require product manufacturers of non-compliant materials to pay a fine or follow additional recourse procedures.

Further, WA State could establish exemption criteria to waive compliance for product manufacturers who meet pre-determined requirements. WA State could adopt similar exemption criteria included in the amended Buy Clean California Act, which states justifiable exemptions could be made if the requirement is found technically infeasible, likely to incur significant cost increases or schedule delays to the project, or where no other manufacturer could provide the type of material needed by the state. Or, WA State could consider other exemption criteria specific to firm-level attributes. For instance, exemptions could be made for

firms that meet WA State definition for small businesses or that meet similar criteria (e.g. operating budget or number of full-time employees).

Instead of waiving compliance completely, WA State could consider providing an alternative pathway to exempt product manufacturers that encourages them to adopt other approaches to improve reporting practices and environmental performance. For example, the pathway could require completion of a regimented curriculum around environmental impact reporting (e.g. EPDs and LCAs), so that at the very least, firms are familiarized with practices and positioned to adopt them in the long-term (see Recommended Investment #4 on page 5-21 for more information on this pathway).

### **Option 2: Voluntary**

In requests for proposals (RFPs) to potential bidders, state awarding authorities would include a request for optional compliance with policy standards. This would allow WA State to formalize a process for collecting environmental impact data that is already available; however, without incentives, it is unlikely that the optional request would result in generation of new environmental impact data or improved performance from product markets not already carrying out reporting practices.

## STEP 3. ESTABLISH METHODS

Establishing the methods for implementing Buy Clean policy is a critical step as it sets forward technical details that can significantly impact the outcomes of the policy.

### **3.1 SELECT DISCLOSURE METHOD**

EPDs are a widely-adopted and well-established standard for reporting environmental impacts/performance. EPDs provide GWP values that directly correlate with the Buy Clean goal to reduce embodied carbon emissions. For several product markets, EPDs may be the preferred and most sensible reporting standard for eligible materials, since they are already prevalent in practice. However, other product markets may carry out alternative product-specific reporting standards responsive to the specific nuances of a material supply chain (e.g. FSC certification for wood products). See **Chapter 3: Technical Review** for more description and analysis of EPD availability and supply chain characteristics of each product category. Options available include:

**Option 1: Standard EPDs.** Market-driven development of third party verified EPDs.

**Option 2: Supported EPD Development.** Support EPD production as outlined in **Chapter 3 Section 3.3**.

**Option 3: Alternate Methods.** Accept alternate reporting methods including but not limited to self-declared EPDs.

### **3.2 SELECT METHOD TO REPORT MATERIAL QUANTITIES**

Collection and analysis of material quantities data in addition to EPDs (note, EPDs only provide values per unit quantity) can be valuable in meeting the goals of Buy Clean policy. This data would help WA State determine if Buy Clean policy resulted in a total embodied carbon reduction over time (i.e. X tons

over Y years). Additionally it enables evaluation based on relative impact of different materials used on a project.

**Option 1: Detailed Reporting.** Report material quantities in a standardized way to facilitate data aggregation and comparison, following the template developed for **Chapter 4: Pilot Study**, which can be found in **Appendix B.2: Structural Material Quantity Reporting Template**.

**Option 2: Simplified Reporting.** Report material quantities in aggregate (e.g. total cubic yards of concrete used not differentiated by mix type used). This might be simpler to implement than Option 1 but would produce significantly less data on material use and selection.

**Option 3: No Reporting.** Do not require reporting of material quantities. This is the easiest to implement.

### 3.3 SELECT METHOD TO ESTABLISH PERFORMANCE TARGETS

If a performance-based policy is selected, this section provides guidance on establishing a methodology to calculate performance targets (GWP values) specific to each product market eligible under Buy Clean. **Chapter 3: Technical Review** outlines critical issues when establishing methods to identify performance targets for embodied carbon. WA State could consider two approaches to establishing performance targets.

**Option 1: Average EPD Method.** Collect available EPDs and calculate benchmarks using methods similar to those described in the California Buy Clean Policy. This method has the advantage of enabling calculations to occur based on prescriptive formula without requiring significant interpretation to implement. Given this method's dependence on published EPDs (generally produced voluntarily) it risks not adequately representing the range and distribution of current practice nor the regionally specific nature of the supply chain that can exist for structural materials.

**Option 2: Benchmark Study Method:** Conduct regionally specific embodied carbon benchmark studies to establish estimates of material embodied carbon representative of the range of materials currently available in Washington State. This method is described in **Chapter 3 Section 3.4**. This method has the advantage of more accurately reflecting current practice and would be more likely to identify meaningful yet achievable performance targets. This method likely requires more investment of State resources to develop the benchmark studies. Prescriptive targets could be set such as embodied carbon within the bottom 80% of current practice in year 1 ratcheting to improved performance in subsequent years.

### 3.4 SELECT METHOD TO ASSESS ENVIRONMENTAL PERFORMANCE

WA State could consider two approaches to assess environmental performance of eligible materials:

**Option 1: Single Threshold:** Establish a single GWP threshold for each structural material type and apply a binary approach to assess environmental performance for compliance standards – does the reported GWP value fall above or below the pre-established threshold? Similar to Buy Clean California, the cut-off is binary, either a product is below the target and thus permitted or above the target and not permitted (unless an exemption is granted). This approach does not

incentivize or reward radically low carbon solutions and may thus have difficulty actually impacting material production markets.

**Option 2: Tiered System:** Establish a tiered system for each structural material type that assesses degree of performance relative to GWP benchmarks. This would position WA State to recognize (and potentially reward) products with the lowest emissions and could motivate product manufacturers to continually improve beyond the GWP threshold. WA State could assess reported GWP values against pre-established performance rates relative to a baseline (e.g. a product's GWP is 30% lower than the baseline) or pre-establish a set of targets that range in ease/difficulty to meet. Products at the high end of tiers (or exceeding targets) could potentially pay a penalty to be considered for purchase. This option has the advantage of enabling easy phase in with achievable targets while incentivizing innovation.

## STEP 4. ESTABLISH TIMELINE

### 4.1 CONSIDER INDUSTRY PRACTICES

When establishing an implementation timeline the following issues should be considered:

1. The extended timeline of construction: it can be years from when a project is initiated until it is bid and then additional years from start to end of construction. Project costs can increase if requirements changes after contracts awarded. Set timeline to give sufficient time for design and construction teams to implement and test methods.
2. How long it takes manufacturers to obtain EPDs: depending on the sophistication of the company or industry this can range from several months to years.
3. Analysis of the effectiveness of policy takes data and time. Providing mechanisms to automatically track and evaluate data will facilitate evaluation and reporting.

### 4.2 SELECT TIME TO EVALUATE EMBODIED CARBON (IF APPROPRIATE)

Select the optimal time to evaluate EPD data. Requiring EPDs and establishing performance thresholds at bidding could potentially influence procurement more than at construction.

**Option 1: At Bid.** If EPDs and embodied carbon performance is integrated into bidding requirements, Buy Clean Policy has the potential to have higher impact on product selection. Using a tiered system as described in Step 3.4 could be used to establish quantitative measures of product sustainability to be evaluated as part of a comprehensive bid package. Final installation of materials could be verified to meet bid statements with financial penalties applied for non-conformance.

**Option 2: At Construction.** When EPDs are evaluated just prior to construction there is risk that the conformance with Buy Clean Policy will be an afterthought and any non-compliance identified as worthy of exemptions. While time of construction is an ideal time to verify the actual materials used, this is a phase of construction where schedule is often the dominant driver of decisions and a difficult time to identify alternate sourcing options.

### 4.3 SELECT METHOD TO UPDATE EMBODIED CARBON TARGETS (IF APPROPRIATE)

**Option 1: Automatic Updates.** Automatic update of performance targets (such as decreasing annually to 50% of a current benchmark by 2040) have the advantage of forcing improved performance targets without continued negotiation. However, automatic updates may not be technologically feasible.

**Option 2: Responding to Material Updates.** If the Average EPD method is used to establish targets (Option 1 of Step 3.3) then the target would be updated to reflect the gradual shift in industry (or perhaps just the average shift in products reporting EPDs). Given that high carbon products will be less likely to report impacts using EPDs, this method risks skewing the estimates to reflect a self-selecting subset of industry.

**Option 3: Material Specific Roadmaps.** Setting achievable performance thresholds and obtaining industry input to establish a roadmap and timeline for improvement will help develop meaningful targets that inspire improvement over time and that are technologically feasible. As noted in **Chapter 3: Technical Review**, many industries already create roadmaps and performance targets for their industry. These could be leveraged to align with Buy Clean policy target timelines.

## STEP 5. IMPLEMENT AND EVALUATE

In order to effectively implement and evaluate Buy Clean policy, staff at divisions such as California’s DGC, Oregon’s DEQ or Washington’s DES need to have unique knowledge and skills and time and resources to support the policy. Section 5.6 outlines a range of potential investments that the state could consider to support the goals of Buy Clean policy.

### 5.5 POTENTIAL OUTCOMES

Since Buy Clean policies are relatively new, predicting outcomes requires qualitative assessment and application of professional judgement. Table 5.1 presents opportunities and potential outcomes related to embodied carbon policy options explored in this chapter, while Table 5.2 presents challenges and respective potential outcomes. These opportunities and challenges could be evaluated and elaborated upon through formal stakeholder engagement.

Table 5.1. Assessment of opportunities and potential outcomes related to embodied carbon policy

OPPORTUNITIES	POTENTIAL OUTCOMES
<p><b>1. The policy can bring attention to established environmental reporting standards and green product labels (e.g. EPDs), and life cycle analysis approaches (WBLCA, LCA)</b></p>	<p>1.1 Increased awareness and knowledge of disclosure standards and life cycle thinking</p>
	<p>1.2 Increased uptake of environmental reporting practices, particularly in product markets with limited prevalence of (or nonexistent) environmental reporting practices</p>
<p><b>2. A disclosure-based policy could lead WA State to establish a system for data collection</b></p>	<p>2.1 WA State can evaluate current availability of (and willingness to provide) environmental impact data and identify (1) product markets where environmental impact data collection and EPD publication is prevalent or mature, (2) product markets with data gaps that could use support to fill and (3) potential opportunities and barriers to EPD collection</p>

OPPORTUNITIES	POTENTIAL OUTCOMES
<b>3. WA State could supplement policy with education and training resources for product manufacturers</b>	3.1 State-funded education and training could build industry capability to adopt environmental reporting practices into standard business processes
<b>4. Product manufacturers could use environmental/green product labels for business purposes</b>	4.1 Product manufacturers would be able to use labels as marketing tools, and for other purposes (e.g. LEED points) which could provide a competitive edge to local firms
	4.2 Carrying out environmental reporting could provide valuable information to guide firm-level investments that reduce energy consumption and achieve cost savings
<b>5. A performance-based policy could position WA State to directly measure and compare environmental performance results, and set a baseline for ‘acceptable’ maximum levels of embodied emissions</b>	5.1 Targets and collected data can be used for comparative assessment, positioning WA State to select best options for embodied carbon reduction
	5.2 WA State can develop performance targets balanced between ambitious and achievable, which could lead businesses to adopt sustainable manufacturing practices that reduce embodied carbon
	5.3 Electricity dependent product manufactures benefiting from Washington State’s low carbon electrical grid would be recognized when competing with products made in regions with higher carbon electrical grids
<b>6. WA State could develop compliance exemptions to mitigate risk and provide flexibility</b>	6.1 Compliance exemptions could avoid delays to project schedules and prevent additional financial costs to project teams
	6.2 Compliance exemptions could mitigate potential consequences to small firms
	6.3 Compliance exemptions could ensure policy is responsive to specific complexities of affected product markets
<b>7. WA State could incentivize voluntary submission of environmental impact data,</b>	7.1 Incentives can further motivate product manufacturers to participate and thereby, spur generation of EPDs

Table 5.2. Assessment of challenges and potential outcomes related to embodied carbon policy

CHALLENGES	POTENTIAL OUTCOMES
<b>1. A disclosure-based policy would not position state officials to assess and compare environmental performance</b>	1.1 Without environmental performance requirements or incentives, product manufacturers may not have an imperative to adopt or improve practices to reduce embodied carbon
<b>2. Environmental reporting could pose additional costs to businesses. Costs may incur from personnel time (internal FTE and/or external consultants), third-party verification, and publication of label. Cost would vary by product market and type of EPD required.</b>	2.1 Additional costs could burden small businesses (or firms with tight operating budgets) with limited flexibility to absorb the added financial burden of environmental reporting
	2.2 Additional costs could result in “unfair” advantage to large businesses with more flexibility and resources (financial, staff, software, technical skills, past experience, etc.) to adopt environmental reporting standards

CHALLENGES	POTENTIAL OUTCOMES
<p><b>3. WA State would need to develop disclosure-based standards that (1) government can feasibly implement, and (2) are responsive to specific variances of supply chains</b></p>	<p>3.1 WA State does not have the staff expertise or time to develop effective policy resulting in failed implementation.</p>
	<p>3.2 WA State develops standardized requirement(s) that may not be realistic or achievable for some product markets, resulting in additional burden to product manufacturers.</p>
	<p>3.3 WA State develops requirements specific to each product market, resulting in additional time, cost and complexity to implement, resulting in additional burden to state officials.</p>
<p><b>4. Establishing a method to shape performance-based targets for each product category would require rigorous data collection and verification, a defined calculation methodology, and government access to vetted software and tools.</b></p>	<p>4.1 WA State may not have (or is unable to procure) the resources needed to pre-calculate measures, including staff time and expertise, technical systems and budget</p>
	<p>4.2 Methods to establish targets are overly simplified resulting in ineffective policies</p>
	<p>4.3 Depending on product market, there may be data limitations due to availability, sample representation, quality and consistency in tools, methods and sources. This could lead to development of unfair or ineffective measures (e.g. the bar is set too high or too low).</p>
<p><b>5. Level of penalization for non-compliance may not strike the right balance (i.e. it's too severe or not severe enough).</b></p>	<p>5.1 'Harsh' penalizations (e.g. disqualifying noncompliant materials) could result in delays to project schedules or incur additional costs to project teams, particularly if the noncompliant material is from a product category with limited competition</p>
	<p>5.2 Product manufacturers could find penalizations too severe and decide to no longer consider state-funded projects as a revenue stream. This could limit competitive procurement options to WA State and result in a missed opportunity – the government-led imperative to improve transparency and reduce environmental impacts is no longer a driver to the product manufacturer who does not pursue state contracts</p>
	<p>5.3 Alternatively, less severe penalizations (e.g. a nominal fee) could undermine effectiveness of policy. Manufacturers may assess that the time, cost and technical resources needed to meet compliance outweigh the cost of non-compliance</p>
<p><b>6. Policymakers would need to avoid developing exemption guidelines that are too broad or too easy to meet.</b></p>	<p>6.1 Compliance criteria could make policy ineffective if it provides too much flexibility in how exemption rules can be interpreted (or it includes too many criterion that most firms could meet)</p>
	<p>6.2 Exempt product manufacturers may not have an imperative to carry out effort aligned with meeting standards. Further, this could disadvantage exempt businesses in the long-term, in a context where standards are mandatory or the 'norm' for commercial projects</p>
<p><b>7. Optional standards could result in lack of participation (i.e. low levels of compliance)</b></p>	<p>7.1 Lack of product manufacturers pursuing compliance standards would not generate new environmental impact data nor support improved environmental performance of products</p>
	<p>7.2 Lack of compliance could send message to industry and other governments that policy is ineffective, and thereby this discourages future effort to build upon policy or replicate elsewhere</p>

## 5.6 POTENTIAL INVESTMENTS

The following section provides investments for Washington State officials to consider to support potential Buy Clean Washington regulation and/or to support goals related to Buy Clean policy. Investments are not contingent on legislators passing a regulatory Buy Clean Washington Act. These investments could support non-regulatory programs or initiatives that accelerate adoption of transparent manufacturing practices and reduction of embodied carbon. They can also mitigate potential risks or negative impacts of any potential Buy Clean regulation.

The investments are based on lessons learned from other governments with established embodied carbon policies (discussed in **Chapter 2: Policy Review**). This section includes descriptive sub-sections on the following recommended investments:

1. Support continual evaluation of Buy Clean policy and Pilots
2. Develop a standardized delivery approach
3. Build internal capability to implement policy
4. Lead ongoing industry engagement and workforce development
5. Use technical infrastructure to support policy
6. Align with existing policies, programs, and initiatives
7. Establish program to manage policy

## 1. SUPPORT CONTINUAL EVALUATION OF BUY CLEAN PILOTS

The Buy Clean Washington Study has been conducted in parallel to (and supports) the Pilot Phase evaluation led by DES. The study identified several research areas that would benefit from extended time and an updated scope of work, described further in Table 5.3.

**Table 5.3. Investment #1: Support continual evaluation of Buy Clean policy.**

RECOMMENDATION	DESCRIPTION
<b>1.1 Extend Pilot project phase</b>	Additional time would enable DES to coordinate with the pilot project managers and research team to share study methods and templates, collect feedback and refine as needed. Further, extension provides more time for pilot projects to apply methods to test ability to meet Buy Clean Pilot requirements.
<b>1.2 Solicit industry feedback</b>	Formalized stakeholder feedback of this Study would be valuable in order to assess the analysis and methods proposed. This could be done via online comment period, establishment of a technical advisory committee and/or public presentations and workshops.
	Key stakeholder groups should include: Product manufacturers, Trade associations, Architecture, engineering, and construction (AEC) representatives, and Academic and nonprofit groups with technical/subject expertise and who have established relationships with industry groups.
<b>1.3 Conduct an economic impact analysis</b>	For quantitative assessment of potential economic impacts, WA State could benefit from conducting an economic analysis (potentially through an environmental policy lens). The economic study could assess several potential impact areas, including local company revenue and profits, employment, and gross regional product (GRP).
<b>1.4 Support ongoing data collection on delivery of Buy Clean California</b>	California will trial Buy Clean policy standards beginning in January 2019 (voluntary EPD collection). Information and lessons learned gathered from public officials and affected industry stakeholders would supplement data collection from the WA Pilot Phase.

Overall, additional time is needed for pilot research teams to trial the methods and templates developed in this study (see **Chapter 4: Pilot Study**). Furthermore, we highly recommend that any additional evaluation should include formal industry consultation.

## 2. DEVELOP A STANDARDIZED DELIVERY APPROACH

Buy Clean policy would require participation of personnel from multiple awarding authorities (state government agencies and public entities, e.g. universities) managing construction contracts. Awarding authorities would need to adapt their department-specific procurement processes to reflect new standards and develop new or update accompanying guidelines (e.g. contracting manuals). State agencies and public entities would need to coordinate early and consistently to align efforts and establish a consistent delivery approach.

Table 5.4 presents recommendations to ensure a standard delivery approach that would avoid duplication of effort, confusion of varying processes, and potential burden to product manufacturers.

**Table 5.4. Investment #2: Develop a standardized delivery approach.**

<b>Recommendation</b>	<b>Description</b>
<b>2.1 Identify funding priorities for policy delivery and assess availability of state resources (financial and staff time)</b>	Assess (1) amount of additional financial resources needed to supplement and deliver policy (and identify funding priorities), and (2) availability of government funding in the near-term and long-term to support policy implementation.  Understanding funding opportunities or barriers could help guide and prioritize investments needed to support policy delivery.
<b>2.2 Establish cross-agency/entity implementation team or workgroup</b>	Formalize a workgroup comprising procurement decision-makers and key personnel representing each awarding authority. DES could convene and coordinate meetings, work activities, etc.
<b>2.3 Develop standardized procedures/processes</b>	State agencies and public entities collaborate to establish standard procedures for managing compliance and develop Buy Clean procurement guidelines with consistent language.
<b>2.4 Establish a phased approach to implementation, starting with a voluntary/trial phase.</b>	Deploy an incremental, extended timeline to test requirements, assess industry readiness to comply, and provide flexibility to refine standards and procedures where appropriate.  This could also provide affected industry groups more time to understand requirements and build capability to meet standards, especially if supplemented by investments under Recommendation #4.
<b>2.5 Design a component of policy implementation that reduces potential burden or disadvantage to product manufacturers</b>	Develop compliance exemption(s) and/or alternative pathway(s) aimed at firms from product markets with limited or no availability of EPDs, and/or state/regional firms considered “small businesses”
<b>2.6 Provide ongoing, publicly accessible communication on policy implementation</b>	Provide communication resources and forums to update industry stakeholder groups and the general public on status of policy implementation. Where possible, use fact-based messaging to demonstrate policy impact.

### 3. BUILD INTERNAL CAPABILITY TO IMPLEMENT POLICY

Environmental performance reporting and pre-calculating measures are practices underpinned by a complex system of overlapping (and sometimes inconsistent) technical standards and guidelines, software and tools, quantitative methodologies, and a myriad of initiatives and research (often spanning international borders). The technical complexity of establishing and regulating embodied carbon standards requires a level of expertise that many government bodies do not have within existing programs. Table 5.5 presents recommendations that would help build internal capability to implement Buy Clean policy.

**Table 5.5. Investment #3: Build internal capability to implement policy.**

RECOMMENDATION	DESCRIPTION
<b>3.1 Provide high-level education and training to current personnel</b>	Identify and/or create educational/training course(s) or other resources focused on green building labels (e.g. EPDs), embodied carbon, building products and related supply chains, and lifecycle analysis.
<b>3.2 Establish and employ new staff positions to fill skill and knowledge gaps</b>	Fund creation of new position(s) to employ staff with appropriate knowledge and skillsets. Ideal candidates could meet most or all of the following selection criteria: <ul style="list-style-type: none"> <li>• Understanding and prior experience working in the building industry</li> <li>• Expertise in lifecycle analysis and environmental product declarations</li> <li>• Higher education degree related to environmental science</li> <li>• Knowledge of environmental policies, particular related to embodied carbon or materials management</li> <li>• Demonstrable aptitude in verbal and written communications</li> <li>• Experience engaging multiple external stakeholder groups</li> </ul>
<b>3.3 Establish a panel of on-call consultants qualified to provide technical services</b>	Establish a formal list of qualified firms and professionals that could provide technical, administrative and training support to government personnel and industry stakeholders as needed. Recommended expertise areas include: <ul style="list-style-type: none"> <li>• Tool/software development and management (particularly tools related to product environmental impact metrics)</li> <li>• Green building labels (e.g. EPDs)</li> <li>• Developing and delivering professional educational/training curriculum</li> <li>• Engagement with industry and product market stakeholders</li> <li>• Quality assurance</li> <li>• Program design (and policy mechanisms) related to building materials</li> <li>• Technical knowledge of embodied carbon, building materials and supply chains, lifecycle analysis</li> </ul>

#### 4. LEAD ONGOING INDUSTRY ENGAGEMENT AND WORKFORCE DEVELOPMENT

Table 5.6 presents the recommendations to help the building industry and workforce engage in Buy Clean practices. This involves engaging building industry and product market stakeholders through communication forums, education and training, and incentives; increasing industry awareness and valuation of environmental reporting and performance; and engaging with external consultants to provide technical assistance and develop tools to support compliance.

**Table 5.6. Investment #4: Lead ongoing industry engagement and workforce development.**

RECOMENDATION	DESCRIPTION
<b>4.1 Facilitate ongoing stakeholder engagement</b>	<p>Stakeholder engagement needs facilitation to occur throughout the policy development process. Develop and execute a plan for stakeholder engagement, identifying key groups and mechanisms for engagement. See Recommendation 1.2 in Table 5.3.</p> <p>Examples of potential mechanisms for engagement:</p> <ul style="list-style-type: none"> <li>• Workshop or focus group sessions (by invitation)</li> <li>• Public informational sessions</li> <li>• Dedicated website to post documentation and updates, and to provide a channel for written feedback</li> <li>• Educational communication materials, e.g. brochures, fact sheets, online videos</li> </ul>
<b>4.2 Provide incentives</b>	<p>Invest in state-led, or identify/invest in externally managed incentives, at least in the initial phases of policy implementation. Incentives could include:</p> <ul style="list-style-type: none"> <li>• Awarding points or credits that could lead to certification or an environmental marketing claim</li> <li>• Financial incentives to support manufacturers collect and report environmental performance data</li> <li>• Reimbursements for educational or technical support</li> <li>• Cash bonuses for compliance</li> <li>• Additional construction rights (e.g. density bonuses)</li> </ul>
<b>4.3 Provide professional education and training opportunities</b>	<p>Provide education and training to build knowledge around green building labels (EPDs) and underpinning systems (LCA methodology, software, data), and improve awareness of environmental impacts attributed to construction materials.</p> <p>Further, identify established education and training courses or work to develop and deliver educational program specific to Buy Clean policy. Leverage courses that offer continuing education credits or certifications recognized by industry associations.</p>
<b>4.4 Online educational resources/directory</b>	<p>Sponsor or host an open-source resource library that includes case studies (success stories), news, reports, policies (model templates), brochures, videos, briefs, RFQ announcements.</p>

## 5. SUPPORT TECHNICAL INFRASTRUCTURE

Governments often invest in databases, software/tools and standardized methodology that aligns with policy standards and supports implementation. Such technical resources help government agencies manage information and streamline reporting processes. Multiple technical investments can be aligned to provide a standardized system for ensuring compliance. Technical resources also help build industry capability to report environmental impacts, and where policy establishes performance targets, government can use data and tools to calculate values that accurately reflect baseline performance of product markets. Further, as discussed in **Chapter 3: Technical Review**, robust technical infrastructure is needed in order to improve the quality, availability, usability, and comparability of reported EPDs.

Table 5.7 presents recommendations to support technical infrastructure.

**Table 5.7. Investment #5: Support technical infrastructure.**

RECOMMENDATION	DESCRIPTION
<b>5.1 Support development of a North American LCI database that integrates EPD results</b>	<p>WA State partners with others (government, NGOs and industry) to co-sponsor and provide leadership to advance emerging data initiatives such as:</p> <ul style="list-style-type: none"> <li>• National or regional Life Cycle Inventory data centers as outlined in Appendices C.2 and C.3. These initiatives are critical to enabling comparable LCAs and EPDs.</li> <li>• An open access EPD database, the Embodied Carbon in Construction Calculator (EC3). The EC3 tool is hosted at the University of Washington’s Carbon Leadership Forum and could provide a mechanism to find and report EPDs for Buy Clean Policy</li> </ul>
<b>5.2 Commission embodied carbon benchmark studies specific to Washington State</b>	<p>As outlined in <b>Chapter 3: Technical Review</b>, commissioning material and regionally specific embodied carbon benchmark studies would provide valuable insights into current industry averages and variability in Washington State. Note that for each material category, a different organization(s) has established expertise and have already created the LCA models that would streamline the creation of these studies.</p>
<b>5.3 Identify LCA software and tools that could be used to create WA specific EPD calculators</b>	<p>LCA consultants have developed customized EPD/LCI software and tools for different industries that could be customized for Washington-based product manufacturers.</p> <p>Further, modeling software could be integrated with the benchmark studies and database (recommendations 5.1 &amp; 5.2) to support comparisons and decision-making.</p>
<b>5.4 Develop a standard manual that provides guidance on technical infrastructure</b>	<p>WA State develops formal documentation that includes step-by-step guidance on database, methodologies, and general requirements and processes related to Buy Clean policy.</p>

6. ALIGN WITH EXISTING POLICIES, PROGRAMS AND INITIATIVES

There are several programs and initiatives with similar goals and standards that product manufacturers and other industry groups are already familiar with or follow. **Chapter 2: Policy Review** outlines a suite of aligned activities Table 5.8 presents this recommendation in detail.

Table 5.8. Investment #6: Align with existing policies, programs, and initiatives.

RECOMMENDATION	DESCRIPTION
<p><b>6.1 Partner with green building rating programs (national or local chapters)</b></p>	<p>Recommend WA state work with NGOs to align new policy standards with existing programs (see <b>Chapter 2: Policy Review</b>) such as:</p> <ul style="list-style-type: none"> <li>• LEED EPD credits</li> <li>• LEED pilot credits possible through demonstrating compliance with WA State policy.</li> <li>• ILFI Zero Carbon Certification.</li> <li>• ILFI Living Building Challenge Material Petal.</li> <li>• Architecture 2030’s Carbon Smart Material Palette and the 2030 Challenge for Products.</li> </ul>
<p><b>6.2 Lead or participate in a collaborative regional work group focused on embodied carbon policy</b></p>	<p>WA state could lead or support (through direct funding or participation) regional policy collaboration with government, industry, NGO stakeholders across region (e.g. California, Idaho, Oregon, Washington, British Columbia).</p> <p>Public officials, industry leaders and researchers across states/provinces and cities in the region are pursuing or evaluating policies with similar goals and standards around embodied carbon, but there is no formal structure or mechanism to bring stakeholders together to share updates, exchange lessons learned, and identify barriers and opportunities to implementation.</p>

## 7. ESTABLISH PROGRAM TO MANAGE POLICY

Each recommended investment above has greater potential for effectiveness and impact when complimented by other investments, especially if brought together under a single, harmonious system. Dependent on funding availability, WA State could establish and fund an ongoing program or public agency to develop and introduce multiple investments that address all of the recommended areas. The most effective example the project team identified was the system that is in place in France that connects between advancing the quality of data, promoting the generation of EPDs, testing tools and implementation pathways and developing reporting mechanisms including building rating systems rewarding low carbon building options.

Table 5.9 outlines recommended services that such a program could provide.

**Table 5.9. Investment #7: Establish program to manage policy.**

RECOMMENDATION	DESCRIPTION
<b>7.1 Professional education and training</b>	Administer a structured education and training program that includes online and in-person sessions
<b>7.2 Online portal of collated, open-source resources</b>	Manage a web-based, searchable platform that provides access to open-source resources provided by external organizations (e.g. recorded webinars, professional reports, research studies, technical guidance, etc.)
<b>7.3 Establish and manage stakeholder work group(s)</b>	Bring together organizations and professionals with similar work objectives to: <ul style="list-style-type: none"> <li>• Understand landscape of local industry and product markets</li> <li>• Identify barriers and opportunities facing industry groups</li> <li>• Formulate a consensus-based roadmap for continual improvement</li> </ul>
<b>7.4 Policy design and planning</b>	Lead implementation planning and delivery for potential Buy Clean policy. Over time, translate lessons learned from Buy Clean policy into best practices and delivery models for other governments and organizations to apply (e.g. cities, counties and companies)
<b>7.5 Provide incentives and research grants</b>	<ul style="list-style-type: none"> <li>• Provide financial support and incentives to local product manufacturers to meet compliance standards</li> <li>• Administer research grants to nonprofits and small businesses to support projects that result in case studies, generation of more data, understanding effective practices and approaches at facility-level</li> </ul>
<b>7.6 Formalize technical infrastructure and manage systems (e.g. database, software/tools)</b>	Bring together technical resources under a shared, open-source platform with accompanying guidelines, methodologies, etc. Lead ongoing maintenance and refinement of technical systems.
<b>7.7 Evaluate policy outcomes</b>	Establish performance indicators for policy and evaluate progress on a systematic, consistent basis. Develop a process to analyze and reflect evaluation in continual updates to policy.

## 5.7 POTENTIAL COST IMPACTS

This section presents four policy scenarios that could lead to cost impacts to product suppliers and WA State Government. It identifies key dependencies that could impact cost amount.

Table 5.10. Cost assessment and dependencies.

Scenario 1: Environmental reporting standards are implemented.		
	Cost Assessment	Dependencies
Product Suppliers	EPD development costs range from \$5,000 for materials with established datasets, tools and technical infrastructure to over \$50,000 for materials with complex manufacturing processes and/or data and technical resources. Costs may incur from personnel time (internal FTE and/or external consultants), third-party verification, and publication of label.	<ul style="list-style-type: none"> <li>Type of EPD and material categories.</li> <li>Reporting method (e.g. simplified vs detailed) to collect required structural material data.</li> <li>Organization size, e.g. those with high net income and large staff size may easily absorb costs.</li> <li>Organization past experience/capability.</li> <li>Time, i.e. how long it takes manufacturers to obtain EPDs.</li> <li>State supplemental investments to support compliance, e.g. financial incentives or technical education.</li> </ul>
State Gov.	Costs to state government would depend on whether it uses existing resources to implement new policy or if it provides supplemental funding.	<ul style="list-style-type: none"> <li>Budget availability/amount.</li> <li>Current state agency personnel expertise/capability.</li> <li>If (and by what degree) state adapts procurement systems and processes.</li> <li>Types of investments made.</li> </ul>
<b>Cost Mitigation</b> <ol style="list-style-type: none"> <li>Promote benefits of using EPDs to support long-term revenue growth. EPDs can be used to:                             <ul style="list-style-type: none"> <li>Provide verified results to support green marketing claims.</li> <li>Provide competitive advantage with clients/markets focused on environmental sustainability.</li> <li>Communicate with clients and investors.</li> <li>Inform business changes to improve operational efficiency and reduce energy costs.</li> </ul> </li> <li>Support development of EPD datasets and industry resources.</li> <li>Partner with industry associations to procure externally provided financial, technical and educational incentives.</li> <li>Set compliance exemption criteria for local small businesses.</li> </ol>		
Scenario 2: Environmental performance standards are implemented.		
	Cost Assessment	Dependencies
Product Suppliers	Similar to disclosure standards, cost of meeting performance targets could incur from staff time, reporting, verification, etc. Standards could require some firms to change or adopt new manufacturing practices to improve performance.	<ul style="list-style-type: none"> <li>Rigor of standards (i.e. targets are simple or difficult to meet).</li> <li>Availability of WA funding/incentives.</li> <li>Organization experience/ability.</li> <li>Prevalence/sophistication of firm’s low carbon manufacturing practices.</li> </ul>
State Gov.	WA State would need to develop disclosure-based standards that it can feasibly implement, and that are responsive to specific variances of supply chains. Costs could incur to the state due to data collection and verification, defining a calculation methodology, and getting access to vetted software.	<ul style="list-style-type: none"> <li>State resources to pre-calculate and implement targets. Includes personnel time and expertise, technical systems, budget.</li> <li>Availability of regional, product-specific data to calculate measures.</li> <li>Method used to establish and assess targets.</li> </ul>
<b>Cost Mitigation</b> <ol style="list-style-type: none"> <li>Set achievable targets.</li> <li>Consider product specific performance criteria to develop targets.</li> <li>Invest in technical resources (e.g. state/regional-specific EPD calculator, material-specific benchmark studies).</li> </ol>		

Scenario 3: Noncompliance guidelines include penalties.		
<b>Product Suppliers</b>	<p><b>Cost Assessment</b></p> <p>State could refuse permit installation of non-compliant materials or require product manufacturers of non-compliant materials to pay a fine or follow additional recourse procedures.</p>	<p><b>Dependencies</b></p> <ul style="list-style-type: none"> <li>• Type of compliance penalties.</li> <li>• Exemption criteria.</li> </ul>
<b>State Government</b>	<p>Costs depend on type of penalties and potential impacts to project schedules. Noncompliance fees could generate modest revenue for state. ‘Harsh’ penalizations (e.g. noncompliant product supplier no longer permitted to install materials) could result in delays to project schedules and incur additional construction costs to state and their design and construction teams.</p>	<ul style="list-style-type: none"> <li>• Type of compliance penalties.</li> <li>• Exemption criteria.</li> <li>• Impacts to project schedules.</li> <li>• Competition in product markets.</li> </ul>
<p><b>Cost Mitigation</b></p> <ol style="list-style-type: none"> <li>1. Consider incentivizing compliance over penalizing noncompliance.</li> <li>2. Establish exemption criteria to waive compliance, e.g. requirements likely to incur significant cost increases or project delays.</li> </ol>		
Scenario 4: Implementation timeline and delivery.		
<b>Product Suppliers</b> <b>Project Teams</b>	<p><b>Cost Assessment</b></p> <p>The extended timeline of construction: it can be years from when a project is initiated until it is bid and then additional years from start to end of construction. Project costs can increase if requirements change after contracts awarded.</p>	<p><b>Dependencies</b></p> <ul style="list-style-type: none"> <li>• Project delivery model.</li> <li>• Project schedules.</li> </ul>
<b>State Gov.</b>	<p>Buy Clean policy would affect multiple awarding authorities managing construction contracts. Awarding authorities would need to adapt their department-specific procurement processes to reflect new standards.</p>	<ul style="list-style-type: none"> <li>• Level of coordination effort needed between awarding authorities.</li> <li>• Approach to updating procurement processes and guidelines.</li> </ul>
<p><b>Cost Mitigation</b></p> <ol style="list-style-type: none"> <li>1. Set timeline to give sufficient time for design and construction teams to implement and test methods.</li> <li>2. State agencies and public entities coordinate early and consistently to align efforts and establish a consistent delivery approach.</li> <li>3. Use model specification template as an attachment to existing construction contracting manuals and standard specs to decrease time and effort of updating existing guidelines to reflect new policy requirements.</li> <li>4. Create and maintain an EPD database and reporting method.</li> </ol>		