# Adding Environmental Impacts into the Procurement of Building Products

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## A New Perspective on Procurement

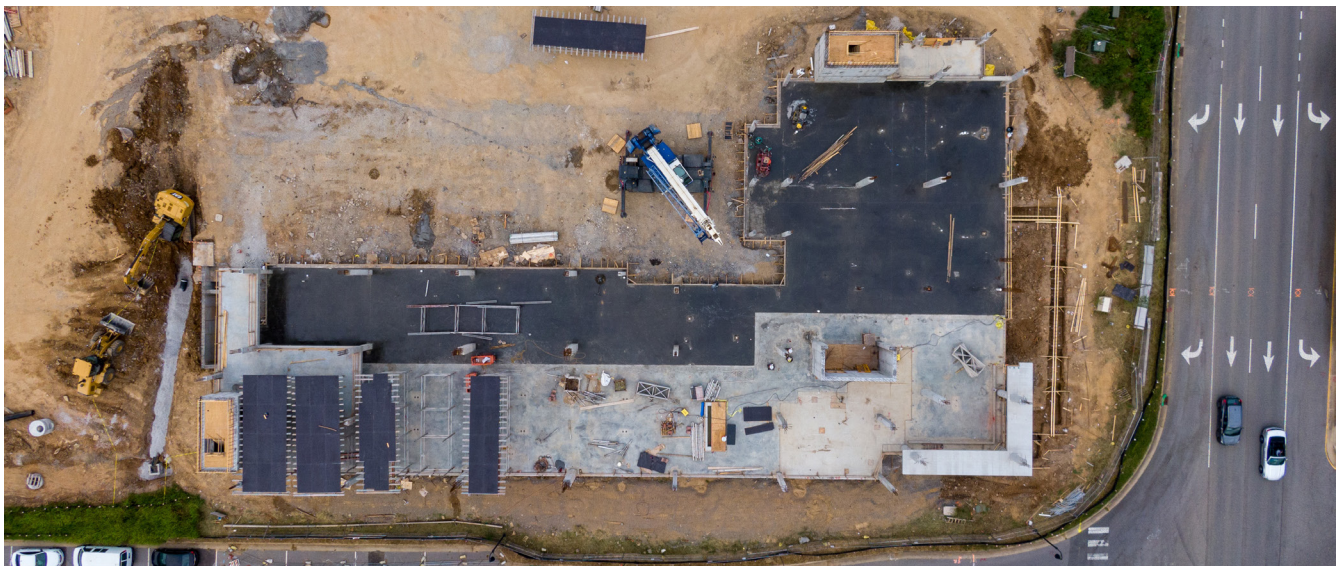
Every year, the U.S. produces around 370 million cubic yards of concrete to construct a variety of essential projects—from roads, to bridges, to buildings. Over the next 50 years, it will consume even more.

California, which has the most construction of any state, has recently implemented The Buy Clean California Act with the intent of minimizing the environmental impacts of construction materials.

The act leverages procurement policies, which in this case refer to the process of construction material acquisition for state projects. It stipulates that products within a few material categories considered for state construction projects must have environmental product declarations (EPDs) that disclose the impacts associated with their production. Only products from vendors

### Key Takeaways:

- EPDs, the current standard for disclosing product impacts, lack the comparability for states to select the most sustainable concrete mixes for their projects.
- Several strategies could make EPDs comparable or even unnecessary for concrete procurement.
- These changes could allow states to more easily meet performance and environmental targets while enabling vendors to compete to produce lower-impact concrete mixtures.
- Even if these changes are made, states may need to provide the incentives and subsidies to accelerate the innovation and procurement of lower-impact concrete mixtures.





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whose EPDs fall below certain environmental impact thresholds can be considered for selection on construction projects. This process of selecting vendors to supply products for projects is known as a vendor decision.

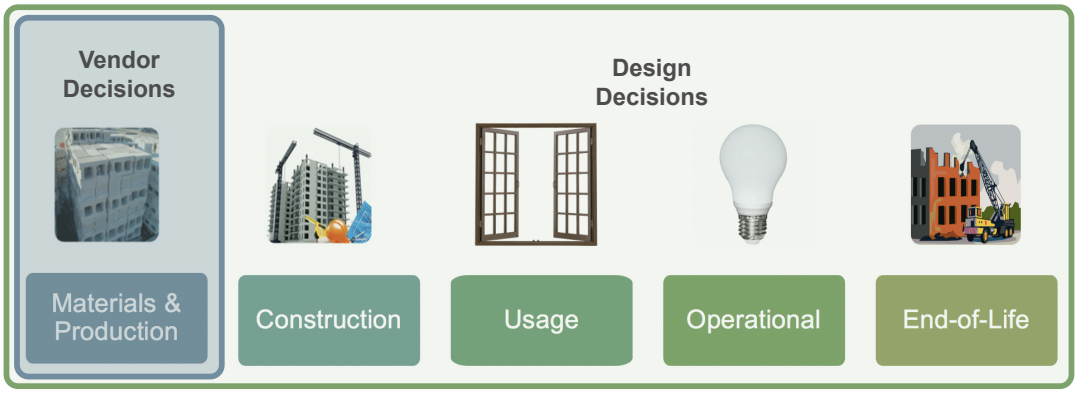
While California may be the first state to incorporate EPDs into vendor decisions, it will unlikely be the last. Other states such as Washington, Oregon, New York, New Jersey, and Minnesota have all begun to consider changing their procurement policies to favor lower-impact products during vendor decisions for state construction projects.

However, the implementation of these procurement policies has proven difficult due to challenges in measuring and communicating material impacts, performance, and cost. This summary will examine some of these current barriers and provide guidance on how to streamline vendor decisions with a specific focus on concrete.

## Vendor Decisions in Detail

The selection of which materials are used in buildings occurs during the design process, which is not typically controlled during the procurement process. To make the most sustainable design decisions, whole building life cycle assessments (LCAs) that include impacts from materials production, construction, operation, and end-of-life should be used by architects and engineers.

Vendor decisions occur during the construction process after the design is complete and involve the selection of a company to provide a product during construction. EPDs have the potential to help procurers make vendor decisions by allowing them to compare the production impacts of construction products by specific vendors. It's important to note the distinction between EPDs and LCAs. While the former influence vendor decisions, the latter influ-




| | Materials & Production | Construction | Usage | Operational | End-of-Life |
|---|---|---|---|---|---|
| Building Product EPD | ✓ | | | | |
| Whole Building LCA | ✓ | ✓ | ✓ | ✓ | ✓ |

**Figure 2.** A table showing the different phases of a project's life cycle. Whole building LCAs help determine design decisions, which can consider all phases of a project's life cycle. EPDs are used only when making vendor decisions and measure just the initial impacts of a building product.

## Strategies to Improve Concrete Procurement


ence design decisions. Though opportunities exist to streamline LCAs and design decisions, this summary specifically addresses the challenges associated with vendor decisions and EPDs.

## Reconsidering EPDs

EPDs have become the primary tool to inform sustainable vendor decisions. However, in their current form they are not appropriate for comparisons, and, if certain advancements are made, may not be necessary at all.

The main issue with EPDs in their current form is their lack of comparability. Currently, manufacturers calculate their EPDs according to a standard known as a product category rule (PCR). Yet, manufacturers often use different data or assumptions when conducting their EPDs, even while following the same PCR. As a result, procurers should not compare EPDs to identify the lowest impact products when they make vendor decisions. This also poses a challenge for product manufacturers. Without a way to effectively compare the impacts of their products, they can't compete to produce lower-impact materials.

A solution to the variations and uncertainty associated with EPDs is for all manufacturers to employ a single calculator that quantifies their products' impacts in a standardized fashion. This calculator would ensure that environmental impact calculations are based on the same background data and assumptions. Nearly all EPDs are currently generated using a calculator, any one of which could be used in a procurement system. The key is to agree on a calculator and then use it as the basis for comparisons. This calculator could also be used to generate EPDs, but that would be a byproduct of the calculator and not the basis for the reporting.

Yet, even if such a calculator was implemented, procurers might still struggle to compare products that meet the same performance requirements. In the case of concrete, EPDs usually only list one performance metric: 28-day strength. Since concrete mixes are created to

meet numerous performance metrics—such as stiffness, density, and constructability—it is inappropriate to compare them purely based on 28-day strength. To address this gap, EPDs could be expanded to include more performance information, or mixtures could only be compared that have been demonstrated to meet specific project requirements.

One way to transition towards this model would be to change how concrete mixes are specified. Today, most manufacturers abide by prescriptive specifications, which dictate the constituents for concrete mixes. However, if prescriptive specifications were replaced with performance-based specifications, which specify performance targets and not constituents, it would be easier for procurers to compare mixtures that meet the same performance requirements. This could also incentivize innovation by giving manufacturers more flexibility to develop lower-impact products.

If adopted, performance-based specifications and a consistent impact calculator could streamline the vendor decision process without relying on EPDs. Procurers could more easily find materials that meet the performance and environmental targets of their projects while manufacturers could compete to offer procurers the lowest impact concrete mixes.

## Incentives for Sustainability

Even if performance-based specifications and a consistent impact calculator were implemented, costs may persist as a barrier to the procurement of the lowest impact materials.

Traditionally, agencies have based their vendor decisions on lowest cost. Adding environmental impact targets can therefore make those decisions more fraught: What if the lowest impact product also possesses the highest cost?

A common solution is to set an environmental impact threshold for products; the lowest cost vendor whose product is below the threshold is chosen. Selecting the thresholds can be difficult because they need to be based on functionally equivalent product categories, which can be challenging for concrete mixtures, as noted above. Some states have taken more nuanced approaches. The proposal in New York state, for instance, allows the selection of concrete with up to a 15% higher cost if that concrete utilizes captured carbon.

Costs also pose challenges outside of the vendor selection process. Since conducting EPDs or any other impact assessment remain expensive for some companies, they can increase costs for manufacturers. Furthermore, very low-carbon concrete mixes will cost more than conventional mixes.

Overcoming these two barriers may require the involvement of governments. Just as with electric vehicles, solar panels, and other low-carbon technologies, government incentives could provide opportunities to spur innovation and lower costs associated with low-carbon building products.

### Related Links:

- CSHub Embodied Carbon Research
- CSHub Building LCA Research
- CSHub Pavement LCA Research

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