



Buy Clean Buy Fair Washington Pilot Study



The Buy Clean Buy Fair (BCBF) Washington Project was a pilot study commissioned by the Washington State Legislature in 2021. This project was funded by two budget provisos that required the University of Washington (UW) College of Built Environments' Carbon Leadership Forum (CLF) to develop a reporting database to collect environmental and labor information from State construction projects and conduct a case study using pilot projects.

What is “Buy Clean Buy Fair”?

“Buy Clean” is a policy approach that incorporates low-carbon purchasing requirements into government procurement of construction materials. Procurement policies such as Buy Clean are becoming increasingly common in the US as more climate policies are being introduced at the state and federal levels to reduce greenhouse gas emissions. The “Buy Fair” component of “Buy Clean and Buy Fair” includes additional requirements for reporting on working conditions in order to promote high labor standards in manufacturing. By coupling Buy Clean requirements with Buy Fair requirements, state governments (and other entities) can decrease greenhouse gas emissions while also supporting good working conditions at manufacturing facilities.

Embodied carbon and the public sector

“Embodied carbon” refers to the greenhouse gas emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building materials. Embodied carbon is a significant percentage of global emissions and requires urgent action to mitigate it. Between 2008-2018, the public sector was responsible for 32% of the embodied carbon of construction in the United States[1], which suggests that Buy Clean-type policies such as the one being piloted in this project have a significant potential to reduce embodied carbon on a global scale.

[1] US Census Bureau *Annual Value of Construction Spending Put in Place for 2008-2018*; US EPA (USEEIO v1.1)

Pilot study overview

The requirements of this pilot study were outlined by two budget provisos from the State of Washington. These budget provisos were based on [HB 1103, *Improving environmental and social outcomes with the production of building materials*](#), which was a Buy Clean Buy Fair bill proposed in the 2021 Washington State Legislature but did not pass into law. HB 1103 was developed with input from many stakeholders from a variety of industries.

The first proviso was from the [2021-23 Operating Budget](#) (ESSB 5092, Section 128 (68)) and the second proviso was from the [2021-23 Capital Budget](#) (SHB 1080, Section 1050). Collectively, these provisos directed the UW College of Built Environments—essentially the CLF—to work with the Washington State Department of Commerce (collectively referred to as “the research team”) to accomplish the following two tasks:

1. Develop a reporting database, and
2. Conduct a case study on up to ten pilot projects (including two specific projects at the University of Washington), asking the project teams to collect the requested data and EPDs, and report back on any challenges faced and lessons learned.

This pilot study started in June 2021 and ended in October 2022.

Reporting requirements

Under the requirements of this pilot study, the contractor was responsible for reporting following information for at least 90 percent of the cost of each covered product used in a project:

- a. Product quantity;
- b. Current Environmental Product Declaration;
- c. Health certifications, if any, completed for the product;
- d. Manufacturer name and location, including state or province and country;
- e. Measures taken, if any, to promote the International Labor Organization's four fundamental principles and rights at work within the manufacturer supply chain;
- f. Names and locations, including state or province and country, of the actual production facilities; and
- g. Working condition information for the actual production facilities for all employees

The covered products were:

- Structural concrete
- Reinforcing steel
- Structural steel
- Engineered wood

Ultimately, the contractor was responsible for working with suppliers to collect all of this information and submitting it to the database before the end of the pilot study. The contractor was not responsible for verifying the data collected from the supplier.

Figure 1 summarizes the data reporting requirements in this pilot study, which are divided into parts that the contractor was responsible for (“Project data” on the left) and parts that the product supplier or manufacturer was responsible for (“Product data” on the right).

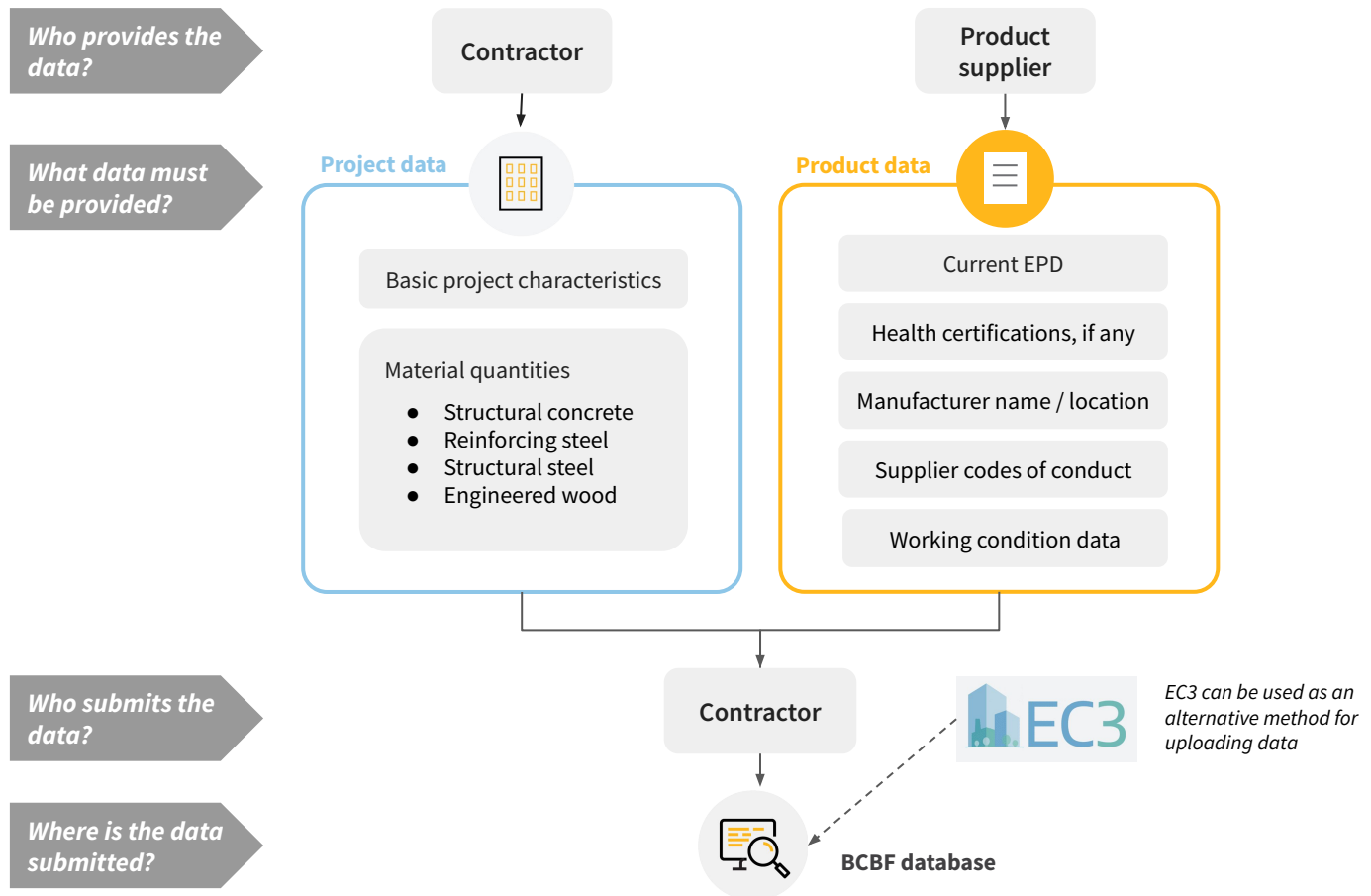


Figure 1. Overview of BCBF data collection requirements.

Database development

To develop the reporting database, the research team first proposed a data reporting structure that would cover all of the reporting requirements and include some additional useful project information. The research team then presented the data reporting structure (in the form of Excel spreadsheets) to stakeholders and used their feedback to improve the data reporting structure. Then, the research team used UW’s public procurement process to hire a database developer, Meserow Design, to create the prototype database. Meserow also connected the BCBF database with the EC3 tool,¹ brainstormed future database needs, and transferred the database and accompanying documentation to the Department of Commerce at the end of the pilot study.

¹ EC3 (Embodied Carbon in Construction Calculator) is a cloud-based database of digitized EPDs maintained by [Building Transparency](#).

Meserow Design came into this project with experience developing software in the ever-evolving area of green building construction, and brought an approach to the software that significantly informed the database structure and user interface design. The database was designed as a configurable survey so that questions could be added, deleted, or modified by administrators as the difficult task of encouraging analyzable submissions becomes clearer during the evolution of the database.

Figure 2 shows a screenshot from the Contractor data submittal workflow of the reporting database. The top area of the screenshot shows the sequence of pages that the Contractor must fill out (“1 Contractor, 2 Project, 3 Building...”).

The screenshot displays a web-based form titled "BUY CLEAN BUY FAIR" with a navigation bar at the top containing steps 1 through 9: 1 CONTRACTOR, 2 PROJECT, 3 BUILDING (highlighted), 4 MATERIALS, 5 CONCRETE, 6 STEEL, 7 WOOD, 8 OTHER, and 9 COMPLETE. The main form is divided into three sections:

- BUILDING BASIC INFO (Required):** Includes fields for Building Use Type(s) (Education, Office), Construction Type (Type III), Building Height Above Grade (feet), Number of Stories Above Grade, and Number of Stories Below Grade. Each field has a comments box.
- GROSS FLOOR AREA (Required):** Includes fields for New Construction, Existing, and Renovation, each with a "Percent" input and a comments box. A note states "All values below must add to 100%".
- STRUCTURAL DESIGN:** Includes fields for Seismic Design Category (B), Primary Type of Lateral Force-Resisting System (Steel: Braced frames), Primary Type of Foundation System (Deep foundation < 50 ft (15m)), Primary Horizontal Gravity System (Concrete: Non-PT framing), Primary Vertical Gravity System (Steel: Columns), and Typical Live Floor Load (psf). Each field has a comments box.

Figure 2. Screenshot of the BCBF user interface where the user enters information about the building project.

Case study of pilot projects

For the pilot project case studies, the research team met with eight potential pilot project teams and ended up with five pilot project teams who committed to participating in the pilot study. These pilot projects are listed in Table 1 and depicted in Figure 3.

The research team sent the data reporting templates to the project teams and communicated with the teams throughout the study. At the end of the study, the research team asked the pilot project teams to submit the data reporting spreadsheets and supply chain-specific EPDs for their project.

The submission of the pilot project materials was somewhat incomplete. Almost none of the submitted EPDs were supply chain-specific, meaning that they did not have the necessary level of data specificity to be supply chain-specific. Material quantities were not always submitted in full, either because the project had not completed construction or because the contractor or manufacturer did not respond to the data request.

The research team met with each of the pilot project teams at the end of the pilot study to understand what challenges they ran into, learn about how these challenges could have been addressed/prevented, and discuss what the State could do to help contractors adapt to a future BCBF program. This feedback was funneled into the recommendations to the State, which are presented on the next page.



UW Interdisciplinary Engineering Building
([image source](#))



UW Milgard Hall
([image source](#))



Shoreline Community College Allied Health, Science, and Manufacturing Replacement
([image source](#))



WWU Sciences Building Addition
([image source](#))



WSDOT Olympic Region Maintenance and Administration Facility (ORMAF) ([image source](#))

Figure 3. Renderings of pilot projects.

Table 1. Pilot project information.

Project owner	Project name	Construction schedule	Covered products
University of Washington	Interdisciplinary Engineering Building (IEB) at UW Seattle	May 2021 - May 2024 (anticipated)	Concrete, rebar, structural steel
University of Washington	Milgard Hall at UW Tacoma	Summer 2021 - October 2022	Concrete, rebar, structural steel, mass timber
Washington State Department of Transportation (WSDOT)	Olympic Region Maintenance Administration Facility (ORMAF) - Fuel Island	March 2021 - July 2022	Concrete, rebar, structural steel
Shoreline Community College	Shoreline Community College - Allied Health, Science, and Manufacturing Replacement	July 2021 - January 2024	Concrete, rebar, structural steel
Western Washington University	Western Washington University - Sciences building addition and renovation	May 2020 - Dec 2021	Concrete, rebar, structural steel

Recommendations to the State

Program administration

The following are recommendations to the Washington State government for administering a potential future BCBF program based on lessons learned from the pilot project experience:

- **Provide model specifications** so that owners can use a reliable and consistent set of contract requirements and instructions about the reporting requirements. As contractors see these specifications in different projects, they will become familiar with the requirements more quickly.
 - The model specifications should **include a recommended timeline** for when the contractors should start reaching out to suppliers and initiating the EPD requisition process. For example, project teams should involve/inform suppliers as soon as possible about the reporting requirements, during pre-construction or design development.
- **Provide financial assistance** for EPD creation. This could include complementary funding for LCA consultants to develop streamlined EPD tools and 3rd party verification processes. There can be a high upfront cost to set up a manufacturing plant to produce its first EPD. Although EPDs can be costly, they are a necessary step for enacting effective embodied carbon reduction, and a program like BCBF can help make them more widespread in the industry.
- **Provide educational resources** for how to navigate the BCBF requirements, including how to use reporting databases, how to understand EPDs, and how to identify the appropriate EPDs within the EC3 tool and/or directly from suppliers.
- **Provide a list of pre-qualified consultants** who can create EPDs. This would help Contractors and Suppliers quickly identify qualified consultants to help them create EPDs.
- **Have a dedicated staff person** for the BCBF Program to help answer questions.
- **Work with industry groups to conduct outreach** to help educate contractors and owners on what they should know about the reporting program. For

example, owners should include the BCBF reporting requirements in the bid documents so that contractors can prepare and protect themselves from unexpected costs.

Database

With regards to the database, the research team and Meserow had a number of ideas for how to make the database and application more durable, robust, supportable, and able to scale and evolve with the changing needs of collecting and analyzing sustainable construction and labor data. These ideas include expanding the administration dashboard, pursuing deeper integration with the EC3 tool, and enabling additional analytical tools. The full list of ideas are contained in the Final Report, which can be found on the [BCBF project website](#).

Reporting requirements

Even though the research team did not specifically request feedback about the reporting requirements, some stakeholders and pilot projects offered feedback on certain reporting requirements. Specifically:

- The wood fiber sourcing requirements should conform to ASTM D7612: *Standard Practice for Categorizing Wood and Wood-Based Products According to Their Fiber Sources*
- Allow those with supply chains entirely in North America to opt-out of the Code of Conduct section due to local and national labor laws.
- Labor data is difficult to collect, especially if the manufacturing facilities are located outside of the U.S. These requirements should be optional based on availability.

Finally, given that no pilot projects produced supply chain-specific EPDs for the pilot study, the research team is curious if this requirement would become more feasible if required by state policy. Perhaps during early-stage implementation of a BCBF reporting program, program managers could allow flexibility to use manufacturer-specific EPDs if supply chain-specific data is unavailable. This could give the industry time to develop the data needed for supply chain-specific EPDs, and may bolster confidence and build experience for project teams that are required to report data under a BCBF program.

Summary of pilot study activities

Figure 4 summarizes the work activities that were undertaken for this pilot study. Note that in this figure, the work activities are ordered in an idealized sequence based on lessons learned in retrospect. Notably, selecting a database developer through a Request for Proposals (RFP) process took significantly longer than expected, so it would have been better to start this process as early as possible.

There were two main streams of work:

1. the pilot projects (color-coded blue); and
2. the database development (color-coded yellow).

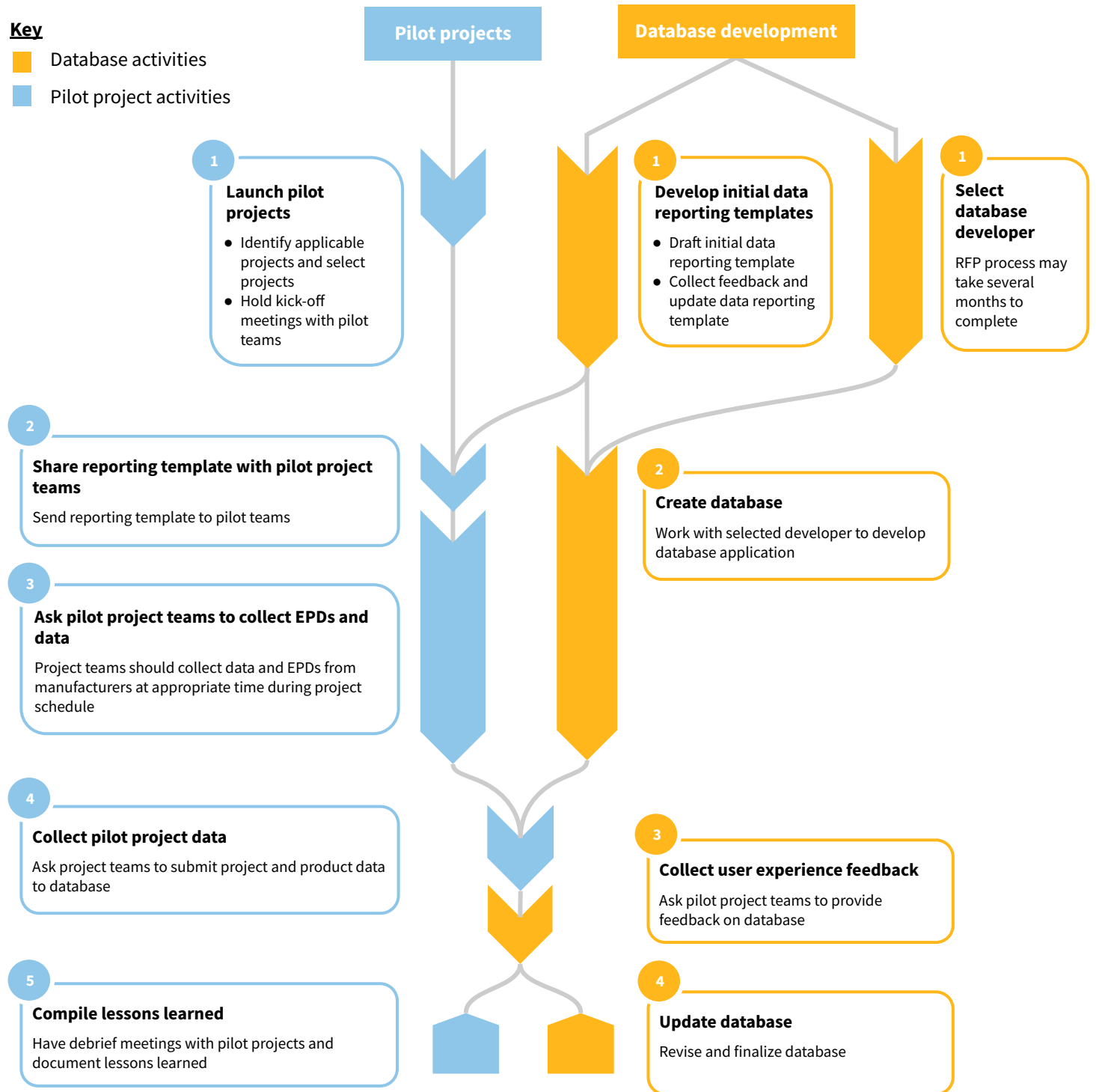


Figure 4. Sequence of work activities for pilot study (sequence is idealized based on lessons learned in retrospect).

Conclusions

Addressing the impacts of climate change requires a comprehensive and ongoing commitment to decreasing greenhouse gas emissions. Programs like BCBF are important to help states reach their energy targets, execute climate action plans, reduce embodied carbon, grow economic competitiveness, and support good working conditions.

This BCBF Pilot Study provided the opportunity to explore the process of setting up and running a BCBF reporting program, including creating the first-ever database in Washington State (and possibly in the country) to collect user-supplied data for a Buy Clean-type program. There were many lessons learned about how to support contractors and facilitate the reporting process to maximize the chances of successful reporting.

Other states or jurisdictions can use the insights gained from this study to establish their own Buy Clean-type reporting programs. Should a future BCBF bill pass, the Washington State Department of Commerce intends to incorporate recommendations from this pilot study and develop a BCBF program that:

- encourages broader adoption of EPDs;
- supports project teams with reporting requirements;
- tracks procurement data for concrete, wood, and steel used in State building projects; and
- convenes stakeholders to explore opportunities to strengthen market demand and supply of low-carbon building materials.

Authors

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Acknowledgments

Many additional individuals contributed to this pilot study. Their names can be found on the [BCBF project website](#).

Image credits

The banner photo on the first page is from [Pexels.com](#).

The images for the pilot projects on page 4 are linked as follows: [UW Interdisciplinary Engineering Building](#), [Shoreline Community College HSMACC](#), [WSDOT ORMAF](#), [UW Milgard Hall](#), [WWU Sciences Building Addition](#).

 Read the [full report](#) for this pilot study.

 Learn more about Buy Clean and other embodied carbon policies in the [CLF Embodied Carbon Policy toolkit](#).

- The Carbon Leadership Forum is accelerating the transformation of the building sector to radically reduce the embodied carbon in building materials and construction through collective action.
- We pioneer research, create resources, foster cross-collaboration, and incubate member-led initiatives to bring embodied carbon emissions of buildings down to zero.
- We are architects, engineers, contractors, material suppliers, building owners and policymakers who care about the future and are taking bold steps to decarbonize the built environment, with a keen focus on eliminating embodied carbon from buildings and infrastructure.



Research



Resources



Initiatives



Network