

Maintaining Life-Cycle Analysis Data for U.S. Wood Products

Life-cycle assessment research quantifies and characterizes material and energy inputs and material and emission outputs associated with the production of consumer products. The assessment can also be extended past production to the use and final disposal of products in a cradle-to-grave analysis. The Forest Products Laboratory (FPL), in cooperation with the Consortium for Research on Renewable Industrial Materials (CORRIM), has been conducting life-cycle analysis (LCA) research on U.S. wood products used in construction of buildings in the United States for many years. Building designers can use this information to choose structural and nonstructural materials—wood or nonwood—that have the lowest environmental impacts associated with their production and use. Life-cycle information is needed by building designers to guide material choice decisions. It can also be used in support of green certification credits of buildings under standards such as LEED, the National Green Building Standard, the International Green Construction Code, and CalGreen (Bowyer et al. 2012). Wood product producers can present the environmental performance associated with lumber and panel products by publication of environmental product declarations (EPDs) that contain life-cycle environmental impact data for each wood product they produce.

Background

Since 1996, CORRIM and FPL have conducted research including surveys of wood product manufacturers on their material and energy use and emissions to generate life-cycle inventories (LCIs) (raw detailed data) and LCAs (environmental impacts by

aggregate category) for many wood products. Data cover emissions from harvesting, log transport, and tree planting through to manufactured products that are packaged and ready to leave the mill gate. LCIs and LCAs are developed consistent with the International Organization for Standardization guidelines (ISO 14040/14044) and the North American Wood Product product category rule (PCR). LCIs and LCAs have been prepared for many products, including softwood and hardwood lumber, softwood plywood, oriented strandboard, wooden I-Joists, and glulam beams for various regions.

The original inventory data were collected in the early 2000s and were recently updated. However, continual changes in production processes, industry consolidation, and updated methods drive the need for new data development to support updates to the U.S. national and international life-cycle databases, for the development of EPDs, and for building designers to use in high-performance building designs.

Objective

The main objective of this project is to provide up-to-date life-cycle data for production of wood products produced in all major U.S. regions, covering all processes from planting, growth, and harvest to manufacturing and packaging of products ready to leave the mill gate, on a five-year cycle. This project will focus on both major structural wood products previously mentioned and many nonstructural products. These updated wood products LCAs will be used for updating EPDs so that wood product manufacturers can provide scientific documentation of environmental performance of their products.

Approach

Data will be collected in cooperation with wood industry associations from wood manufacturing facilities along with forest harvesting operations, with additional data derived from secondary data sources. LCA results will be produced using SimaPro life-cycle analysis software.

Expected Outcomes

The most recent LCAs for major structural wood products in the United States are in the process of being published. Wood product manufacturers and their corresponding associations will be able to use these data to develop new North American wood product EPDs that document environmental performance to prospective buyers. Building designers will be able to use these data to help them meet environmental performance goals for high-performance buildings.

Timeline

Wood product LCA updates will occur on a five-year cycle to provide current data for EPD updates.

Cooperators

Consortium for Research on Renewable Industrial Materials (CORRIM)

USDA Forest Service, Forest Products Laboratory

Contact Information

Elaine Oneil

Consortium for Research on Renewable Industrial Materials

Seattle, Washington

(206) 543-6859; eonil@uw.edu

Richard Bergman

USDA Forest Service, Forest Products Laboratory

Madison, Wisconsin

(608) 231-9477; rbergman@fs.fed.us

Reference

Bowyer, J.; Howe, J.; Stai, S.; Trusty, W.; Bratkovich, S.; Fernholz, K. 2012. The international green construction code implications for materials selection in commercial construction. Minneapolis, MN: Dovetail Partners, Inc. 16 p. http://www.dovetailinc.org/report_pdfs/2012/dovetailigcc0512.pdf (17 October 2016).