

TIMBER

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The first CLT buildings were constructed in 1993-95 in Germany and Switzerland, and the majority of production remains in Europe. The first U.S. commercial CLT building was completed in 2011 in Whitefish, Mont.

A study by Grand View Research, a market research company in San Francisco, anticipates the global CLT market will be worth more than \$2 billion by 2025, tied to demand for “green” homes.

The U.S. Senate in June added provisions to its version of the 2018 Farm Bill that would establish a federal research program for mass timber. Originally known as the Timber Innovation Act, the bill was sponsored by Sen.

Oregon Sen. Jeff Merkley said he wants to see Oregon become the national leader in mass timber, an industry with “enormous potential.”

“We think about the fact that we build these medium high-rise buildings out of concrete and steel,” Merkley said. “If we can open that market effectively to mass timber, then it could be huge.”

Benefits, skepticism

First, Locke said, there are cost savings on construction and installation with mass timber.

Construction can be completed in roughly half the time as steel and concrete with half as many workers.

Then there is the environmental element. Production of CLT emits 26 percent less greenhouse gases than making steel and 50 percent less than concrete.

CLT was initially developed to create a high-end use for lumber. Locke said it could also provide a market for small-diameter trees and the wildfire fuels building up in western forests.

Others, however, have tempered expectations. According to University of Washington and Washington State University researchers, the predicted



George Plaven/Capital Press

Carbon 12, an eight-story condominium in Portland, is made with mass timber that accounts for 223 metric tons of avoided carbon dioxide emissions, while also storing 577 metric tons of CO2 in the wood itself. That's equivalent to taking 169 cars off the road for one year.

demand for softwood lumber to manufacture CLT panels is still less than 1 percent of the annual Pacific Northwest timber harvest, making it a boutique industry at best.

Doug Heiken, conservation and restoration coordinator for the environmental group Oregon Wild, described CLT as a side product of the timber industry that would not change its overall carbon footprint.

He said there is no guarantee wood for mass timber would come from sustainable forestry practices and not industrial clear-cuts.

“Mass timber isn't really that different from any other timber in that way,” Heiken said.

Building codes

The main limiting factor, Locke said, are international building codes, which are slowly being adapted to catch up to tall wood buildings.

In April, the International Code Council moved to update codes allowing for wood buildings up to 18 stories, although the proposed changes would not be adopted until 2021 at the earliest.

Oregon took the extraordinary step in August of adopting the recommendations under its Statewide Alternate Method — the first state to do so. Locke said mass timber has passed every required test and is proving to be just as safe as

concrete or steel.

Such tests are conducted at the TallWood Design Institute, a collaborative research program of the University of Oregon College of Design and Oregon State University's College of Forestry and College of Engineering.

Iain Macdonald, associate director of the institute, said 20 to 30 professors are working in research and product development, studying fire performance, building physics, environmental impact and economics.

“Urbanization is going to drive a huge demand for housing around the world,” Macdonald said. “Our role is to do applied research on this, to put



Courtesy Shanna Hall Photography.

A closeup view of mass plywood manufactured at Freres Lumber Co. shows the layers of veneer. Mass plywood can be made up to 12 feet wide, 48 feet long and 24 inches thick.

together educational programs for stakeholders like architects, structural engineers and construction companies.”

Macdonald acknowledged fears about mass timber, especially regarding fire safety. Fire tests involve roasting panels in a furnace at 1,832 degrees F. for up to two hours, and Macdonald said the results so far are promising.

While the surface does char, Macdonald said the interior of the panel remains insulated from the heat. He compared it to throwing a whole log onto a campfire, versus small pieces of kindling.

William Silva, preconstruction manager for Swinerton Builders — a Portland company that has experience with the product — said that as product testing and building codes come together fellow builders should get over their fears.

“It's become more than just a progressive concept,” Silva said. “I see a lot of developers looking at this as a value proposition.”

Rural prosperity

Set in the forested canyon near Lyons, Ore., Freres Lumber Co. has pioneered a new form of mass timber to sustain its business and 470 employees.

The company, founded in 1922, debuted its new mass plywood factory in December 2017, a sparkling \$40 million, four-acre facility that manu-

factures panels using veneer lumber up to 12 feet wide, 48 feet long and 24 inches thick.

Tyler Freres, co-owner and vice president of sales, said the company received patents for its mass plywood panels earlier this year. He believes mass plywood is a more efficient product than CLT, using 20 percent less wood while holding up in every facet of construction.

“This is a truly unique facility,” Freres said. “We had to design all the processes ourselves.”

Freres, who lives in nearby Stayton, said the prosperity of local schools and communities is tied to the success of the timber industry. Mass timber can be a lifeline, he said, though it will require a more productive approach to thinning federal forests to boost volume.

In the '70s, Oregon's timber harvest totaled more than 8 million board-feet, according to the state Office of Economic Analysis. Today, the timber harvest has dropped by more than half that amount, and logging on federal lands is down nearly 90 percent.

“It's been an absolute disaster, losing timber,” Freres said.

Freres said mass plywood will be key to supporting his family's business for another 100 years. He said the company receives many inquiries from builders interested in mass plywood.

“The potential is almost limitless,” he said.



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