

The Climate Economy: TallWood Design Institute director on how mass timber is taking root in Oregon

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Mass timber has carried a burden in Oregon since the middle of the last decade, when it began to be promoted as a sustainable building-material alternative to steel and concrete and their hefty greenhouse-gas emissions footprints, and as a catalyst to revive the long-suffering forest economy.

So how has it done? Very well, according to Iain Macdonald. He's director of the TallWood Design Institute, a University of Oregon-Oregon State University collaboration focused on advancing mass timber products such as cross-laminated timber (CLT), mass plywood panels (MPP) and glue-laminated timber (glulam).

In testimony to a Congressional committee in July 2021, Macdonald described the sector's rapid growth, noting that in 2013, there were only a handful of mass timber projects started, while in 2020 there were more than 100. We caught up with Macdonald recently for an update on progress and to get a better read on what mass timber means for Oregon. The conversation was edited for brevity and clarity.

What's the current state of mass timber? Pandemic and inflation-related economic fluctuations aside, mass timber continues to drive upward in popularity. There's interest all around the country now. And a few years ago, there were firms from British Columbia coming down to Oregon to do design and engineering and help with construction, because there wasn't much local capacity. But now we're seeing Oregon firms fanning out across the U.S., doing projects all over the place. Timberlab, for instance, assisted on the 25-story Ascent mass timber tower in Milwaukee, Wisconsin (the world's tallest hybrid mass timber structure).

So mass timber means more than DR Johnson and its CLT products and Freres Engineered Wood with its MPP products? Yes, if you think about the supply chain, it goes beyond a couple of companies that make panels in the region. Swinerton, the 17th largest general contractor in the United States, was focused on building out their mass timber expertise here in Portland and spun out Timberlab. Then they made the decision to go into fabrication because they saw there were



IAIN MACDONALD, DIRECTOR OF THE TALLWOOD DESIGN INSTITUTE, AT THE CANYONS, A PORTLAND APARTMENT BUILDING DESIGNED AND BUILT BY PATH ARCHITECTURE/KAISER GROUP.

PHOTO: SAM GEHRKE

bottlenecks in the supply chain around the supply of glulam, the column and beam-type products. There's another company, Sauter Timber, that has set up shop in Estacada. They don't make panels. They take blank panels and then do all the CNC fabrication on that.

Is sustainability the biggest factor in the growing demand?

I think it has been the primary driver. There's a lot of mass timber happening with technology firms, especially in the Bay Area, who are interested in lowering their carbon footprints — in their office buildings, data centers, all kinds of different typologies.... That area is just exploding in demand for mass timber, and as a result I think the supply chain is going to continue to grow in Oregon because of our proximity.

Mass timber beats steel and concrete from a climate perspective by capturing carbon when a tree grows, and by preserving that carbon in structures. But there are emissions associated with its production, correct? It's not a zero-carbon material, but generally it is going to be more beneficial to the environment than not using it. And there are co-benefits.

What are some of those? We're part of the Oregon Mass Timber Coalition that is a finalist in a (federal) Build Back Better Regional Challenge with a project that centers around using mass timber to design and construct modular housing to tackle the housing affordability problem. So that's one cool benefit. But another major thrust of that project is various activities to use restoration fiber, which is when you go into a forest and instead of clear cutting, you sustainably thin the forest. This means better forest health, less insect infestation, things like that, and it reduces the risk of wildfires. So you have to think holistically about the use of material.

Freres said it sees availability of fiber as an issue — Oregon wants to build up a mass timber sector, but for manufacturers it's hard to count on supply of the raw material because the national forests are largely off-limits. Do you agree? We did a supply chain analysis a couple of years ago and found that two big factors inhibiting growth in Oregon were concerns over fiber supply and workforce availability. The state has had discussions with companies considering inward investment in Oregon and they've voiced those concerns.

Workforce availability is a concern for everyone now, but can the fiber supply issue be overcome? One of the things that we propose in our coalition is to do sustainable-harvest pilot projects in the national forest, possibly in the north Willamette Valley. If we can demonstrate a collaborative process

with relevant stakeholders, then maybe we can change perceptions and allay fears. The other opportunity is to go to species that aren't utilized for mass timber. They may not be as strong and stiff as Doug fir, so wouldn't be appropriate for 20-story buildings, but they could be appropriate for things like modular housing of two or three stories.

WHAT IS MASS TIMBER?

Mass timber comprises various forms of engineered wood products that are made by fastening pieces of wood together to create strong panels and beams that can replace concrete and steel in ever-taller buildings. Here are three common types produced in Oregon that are often used in mass timber projects.

Cross-laminated timber (CLT): Perhaps the most well-known mass timber product, CLT panels are made from layering sawn boards in alternating directions and bonding them together with a structural adhesive. It's often used for walls, floors and roofs.

Mass plywood panels (MPP): It's been described as plywood on steroids. Like plywood, MPP combines wood veneers. Like CLT, panels are used in floors, roof and walls, and can be engineered for beams and columns.

Glue-laminated timber (glulam): Glulam is an older technology in which the layers of wood are oriented in the same direction. This makes it a good for use for columns and beams.