

## KEYNOTE INTERVIEW

# Mass timber to drive mass benefits



*As the use of mass timber in construction increases around the world, Nuveen's **Gwen Busby** says investors are recognizing the climate benefits of sustainable timberland*

In many parts of the world, wood was the go-to material for housebuilding for thousands of years, until it was supplanted by concrete and steel in the 20th century. Now, however, wood is making a comeback in the construction sector, with mass timber an increasingly popular alternative to more carbon-intensive materials.

Gwen Busby, head of research and strategy at Nuveen Natural Capital, tells us that the growing market for mass timber has the potential to significantly increase demand for timber. The climate benefits of mass timber, she says, is a major factor in drawing climate-conscious investors toward

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including sustainably managed timberland in their portfolios.

**Q How is demand for timber as a construction material affecting investor interest in timberland assets?**

Using wood in place of conventional building materials has huge climate mitigation potential, which investors can help to unlock by allocating to sustainable timberland. Partly because of that, we're seeing investors with

climate or portfolio decarbonization targets increasingly recognize that timberland investments can provide added value for their portfolio.

The opportunity for timberland investors reflects the increasing significance of climate, carbon and sustainability as value drivers in timberland markets. Timberland funds are well-positioned to benefit from rising investor interest – but they need to have certified sustainable forest management practices, rigorous ESG frameworks and favorable logistics for transporting timber to manufacturing and end-use building markets.

A key trend is the increasing

## Analysis

popularity of mass timber as a low-carbon and cost-effective alternative building material. The expanding market for mass timber construction in multifamily and office mid-rise and high-rise, as well as in industrial building sectors, has the potential to materially increase demand for timber.

### **Q What exactly is mass timber? How can it be used?**

Mass timber is a category of engineered wood product that is designed for structural applications. It's created by compressing multiple solid wood panels together and the result is a wood product with exceptional strength and stability. Advances in mass timber technology have paved the way for constructing many types of buildings using wood. Multifamily housing and office buildings are particularly well-suited to mass timber systems because of the potential for standardization and modular construction.

In the industrial sector, mass timber systems are also well-suited to tilt-up wall construction methods, where cross-laminated timber panels are used in place of concrete panels. The trees used to make these products naturally absorb and store carbon. So, as the world looks to reduce emissions, mass timber is gaining attention as a climate friendly alternative to more carbon intensive materials like steel and concrete.

### **Q Will demand for mass timber continue to increase?**

Today, mass timber currently still makes up a relatively small share of global wood consumption. But it represents one of the fastest growing markets for timber. We're seeing demand being driven from three areas.

Firstly, in the building sector, we're seeing increased adoption of timber due to its potential to reduce emissions though replacing higher-emissions concrete and steel materials. There has been a greater emphasis on embodied



### **Q What is needed to ensure that the carbon benefits of mass timber are adequately measured and certified?**

We need a rigorous methodology for quantification. There needs to be standardized metrics, measurement and verification to make sure that the carbon benefits are credible. This could be enabled through independent carbon crediting system like Verra, in alignment with green building certification systems such as LEED, BREEAM and ILFI Zero Carbon.

carbon, which is the greenhouse gas emissions associated with construction activity and building materials.

To date, most of the emissions focus has been on reducing operating emissions because of its greater relative share of total emissions – about 27 percent – compared to building materials and construction, which account for 13 percent, according to Architecture 2030. As emissions reduction targets become more stringent and buildings become more energy efficient, however, the embodied carbon will assume greater importance.

Secondly, we're seeing additional demand from the commercial real estate industry, which has historically focused on measuring, managing and reducing operational carbon. There is growing consensus around the need to tackle embodied emissions as the

building stock expands to accommodate a growing population. Achieving the vision of reducing embodied carbon has become more plausible with the development of new tools such as life-cycle analysis, which measures a building's embodied carbon.

Additionally, green building certifications have adopted the use of these tools, plus some net-zero certifications like ILFI Zero Carbon have set embodied carbon reduction targets. As institutional investors and asset managers adopt net-zero strategies that consider embodied carbon, the need to quantify and strive to reduce carbon emissions in the construction materials will increase.

And the third factor is that constraints in the building sector are also making mass timber systems an increasingly attractive alternative to traditional steel and concrete systems.

The scarcity of skilled labor is impacting all US building sectors. The sector continues to face challenges in meeting both building timelines and budgeted costs. And with about 41 percent of the current US construction workforce expected to retire by 2031, these challenges are likely to intensify.

Alternatives like wood-based modular construction have the potential to accelerate project timelines and reduce costs. Research from McKinsey suggests that modular construction can improve time to completion by up to 50 percent and produce a cost saving of up to 20 percent. These purely economic advantages make mass timber cost competitive with concrete and steel systems, especially in high-cost labor markets.

### Q How can you quantify the sustainability benefits from using mass timber?

Whereas traditional building materials like concrete and steel emit CO<sub>2</sub> when produced, trees used to make mass timber products naturally absorb and store carbon as they grow. Increasing the amount of wood used in buildings, as a substitute for these more carbon intensive materials, has the potential to significantly reduce emissions from the building sector, which currently accounts for about 40 percent of global greenhouse gas emissions annually.

To put a number on the potential climate benefits from building with wood, we can look at a life-cycle analysis that quantifies and compares embodied carbon in two or more functionally equivalent buildings, one made of mass timber and the other made of steel and concrete. A key result is that as wood material volume increases, the global warming potential of a building decreases. This is due to both avoided emissions linked to concrete and steel, as well as greater carbon storage in the wood itself.

We reviewed two LCAs completed by Wood Works, which revealed that in an office and multifamily building, the reduction in global warming potential

ranged from 70-80 percent for mass timber systems compared to equivalent concrete and steel buildings.

### Q How can the use of mass timber generate carbon credits?

The global voluntary carbon credit markets currently offer ways to value carbon stored in forests – and those mechanisms are now expanding to include mass timber. The first mass timber construction methodology is coming soon – that will provide a mechanism for verifying carbon stored in wood buildings and generating credits for the global voluntary market.

Mass timber actually complements sustainable forestry, because well-managed forests sequester carbon while the trees are growing, and then mass timber provides a way of storing carbon in the built environment. And carbon storage in buildings can essentially be permanent. Unlike carbon stored in forests, where there is a risk that carbon could be released through things like wildfires, illegal logging or disease outbreaks, risks to long-term carbon storage in buildings are relatively limited.

On top of this, rising demand for mass timber made with wood from sustainably managed forests will incentivize more sustainable timber production. This will eventually mean more mass timber for more carbon storage in wood buildings. So, there can be a virtuous cycle where carbon is being

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transferred from forests to the built environment.

### Q What are the main challenges in growing the market for mass timber?

Mass timber technology has been around for over 30 years. It was first used in the construction industry in Switzerland and Germany in the mid-1990s. To this day, Europe is still the world’s main producer and consumer of cross-laminated timber, which is one of the most common types of mass timber.

In the 2010s, we began seeing mass timber construction in North America. Now, consumption is expected to increase more than five times its current rate by 2027. But while demand is strong, there’s not a lot of integration across the US value chain – that’s something that could pose a challenge for development in the region. For example, a wood building in California might use cross-laminated timber sourced from Oregon and glulam sourced from Europe, and then the modular manufacturing and assembly might take place in Texas.

If you look at the success of the European model, it suggests there may be efficiency gains from consolidation. So, by evaluating more advanced European producers and their integrated systems, the US market could reduce costs and become more efficient. Also, cutting down on transportation distances will reduce the global warming potential of a building and in turn help maximize the climate benefits from wood-based construction.

On the other hand, North America is the fastest growing market for mass timber – and it’s well-positioned for continued growth. The growth of the market in the United States is enabled by a uniform manufacturing standard and model code – this is where the US has an advantage over Europe, because a lack of uniform standards may constrain growth there. ■

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