

Title: **Is All-Timber Superior for Building Tall?**

Author: Rainer Strauch, Managing Director, CREE GmbH

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# Debating Tall

## Is All-Timber Superior for Building Tall?

In recent years, interest in timber as a primary construction material for tall buildings has accelerated, and the list of completed projects has grown ever longer, and higher. Most “tall timber” buildings employ some combination of timber, steel and concrete for their primary structure, but a significant number of projects, and many more credible proposals, also use engineered mass timber for their primary load-bearing material. CTBUH asked advocates of both approaches, “Is all-timber superior for building tall?”

### ✓ YES

#### Kevin Flanagan

Founder, Kevin P. Flanagan Architects/  
Masterplanners

The argument for timber can be sustained by the numbers: If timber creates one unit of carbon dioxide in production, hybrid concrete/steel creates nearly 4,000 units, with concomitant energy use. Concrete and steel represent 11 percent of global carbon emissions, a figure that is climbing with our population, and comprise some 20 percent of the world’s landfills.

Hybrid timber construction has been part of a needed incremental change, incorporating timber into our concrete and steel construction methods. But the old ways are unsustainable. Engineered mass timber, a 21st-century material derived from sustainable forestry, came to market in 2005, and by 2015, new building codes began to be acknowledged and adopted. This is a nascent technology using a natural, cellular material that holds great promise for healthier habitats; one that welcomes back nature to our urban lives. Timber naturally cleans the air for us and sequesters carbon dioxide, as one half of its weight is carbon. It is the only existing building material that can lead the construction industry to a Paris Accord-compliant, net-zero economy.

For high-rise construction—in this context, anything above 10 to 15 stories, the adoption of engineered, laminated, and cross-laminated timber (CLT) construction has been delayed through use of the nomenclature “hybrid” timber; as this is a term not as yet strictly defined. Buildings touting “sustainable, green” credentials at times use only 5 percent timber and 95

percent concrete and steel by weight. “Hybrid” as a term can foster dubious claims of ecological and urban well-being benefits. Timber in that context is simply a decorative marketing tool that appeases planners and less-adventurous contractors, who are much more knowledgeable about concrete.

A “5 percent solution” in this case is a kind of “spoof,” to quote historian Kenneth Clarke. To quote futurist Arthur C. Clarke, it has not nearly the level of “magic” we need now. Embracing new technology brings benefits of new jobs and greater prosperity. We should, as an industry and as a society, strive to research a solution that makes 100 percent use of cleaner, lighter, more sustainable materials, such as engineered mass timber.

### ✗ NO

#### Rainer Strauch

Managing Director, CTO, CREE GmbH

To be clear right from the start: I very much appreciate all-timber buildings. They absolutely deserve their position in modern architecture, and certainly can contribute a lot to the sustainably built environment we desire.

However, “looking good and feeling right” is not enough to change conservative notions of proper construction materials and methods. In order to do better with the industry as a whole, we need to think about how to penetrate the market in large quantities, suggesting timber construction to every “standard” concrete/steel client, for every “standard” large or tall building project. Architectural icons gain attraction, but “standard” buildings represent the vast

majority in terms of numbers, thus can deliver by far the most positive environmental impact.

For the above reason, I would like to make the case for all kinds of timber-composite or—as CREE Buildings calls them—“timber hybrid” construction systems and technologies. Without that smart and material-minimizing mix of timber with concrete/steel, many current buildings would have never seen any timber used at all. For example, the Eunoia Junior College, Singapore’s first high-rise college, or the staggering 74,000 square-meter Siemens Campus Module 2, would have just been built in concrete/steel. Now they feature the uncompromised beauty of exposed structural wood.

Timber-composite’s advantages include better physical performance in terms of vibration, deflection, sound insulation, fire resistance and compartmentalization, weather and water protection during construction and operations, and many more benefits, as compared to all-timber construction.

All this comes with minimized material input, which also secures cost competitiveness, if not cost parity, against concrete/steel composite construction (as proven by some of our recent projects). Which takes us back to the above-mentioned market penetration factor, that is never going to happen without clear economic benefits. Increasing numbers of experts, and clients as well, follow that ideal combination, utilizing the benefits of timber and concrete/steel alike. And this is where we see “building tall” heading, featuring any conceivable form of structural timber composite/hybrid. ■

