Timber construction could revolutionise skyscraper typology, says Dr Philip Oldfield, Senior Lecturer in the Faculty of the Built Environment, University of New South Wales.

Dr Oldfield will be appearing at the inaugural Australian Smart Skyscrapers Summit in Melbourne to discuss opportunities for rethinking Australian tall building design inspired by climate, culture and context. His presentation will explore opportunities for reinvention in tall towers, looking at how they can play a more generous role in future cities as well as accommodate innovative new functions and provide places of community and recreation in the sky. Dr Oldfield will also feature on a panel discussion regarding Regulations Impacting Height Limits for High Rise Buildings.

While there are many new developments and innovations in the high-rise construction arena, Dr Oldfield is most intrigued by the timber as a building material.

“For me the most exciting development is the growth of timber as a potential structural material in tall buildings.”

Australia is already home to some impressive timber structures, including the Forte Apartments in Melbourne which held the title of the world’s tallest timber building before the recent construction of an 18-storey timber tower in Vancouver by Acton Ostry Architects.

The 18-story Brock Commons Student Residence at the University of British Columbia is, at 53 meters tall, the tallest mass wood hybrid building in the world. The $51.5 million project boasts costs that are comparable to concrete and steel structures.

The wood hybrid structure rose at a rate of two floors per week. The design also incorporates prefabricated materials with a prefabricated steel beam, Cross Laminated Timber (CLT) slab panels, steel connectors and façade elements. From an environmental perspective, the project demonstrates the benefits of timber construction in the construction of smart, green buildings. The development is estimated to have a carbon benefit of 2,563 tonnes through the use of carbon-trapping wood construction.

“The big advantage is that timber has a far lower embodied carbon than steel or concrete,” says Dr Oldfield.

Increased use of timber results in a reduced reliance on steel and concrete, which require large amounts of energy to be transformed into useable materials.

However, cautions Dr Oldfield, as timber construction soars in popularity, becoming more widespread in Australia, it is imperative to ensure that forestry can handle increased demand.

“In terms of sustainability, using timber is only useful if for every tree you fell, you replace that with a similar tree. A future of timber towers requires us to be planting these trees now.”

Dr Oldfield’s research suggests that 33% of a modern office tower’s carbon footprint is embodied in its materials. While skyscraper design has long focused on optimising operating energy performance, they have neglected the energy costs associated with construction materials.

“We need to focus more attention on reducing embodied carbon through dematerialising the structure and using low-carbon materials,” says Dr Oldfield.

Beyond the obvious environmental advantages of timber, the material also presents additional benefits in terms of design and liveability.

“Timber can bring a warmth and natural quality to interiors so often lacking in high-rise,” says Dr Oldfield.

Other notable timber constructions in Australia include Melbourne’s Library at the Dock in the Docklands, constructed primarily from Cross Laminated
Timber. The project won the Sustainability Award at the 2014 Australian Timber Design Awards.

Melbourne will also see the construction of an 8-storey CLT building with the proposed development at 105 Punt Road promising to deliver a smart, sustainable structure with a carbon sequestration system. As well as using innovative CLT technology, the building places priority on shared communal spaces and environmental features such as solar panels and recycled rain water.

With plans for timber towers of up to 35-storeys in the pipeline around the world, timber construction is certainly on the rise, rivalling traditional building materials with its undeniable array of substantial benefits.

Timber design and production specialist Associate Prof. Gregory Nolan is Director at the Centre for Sustainable Architecture with Wood School of Architecture and Design, University of Tasmania. Prof Nolan will appear at the Australian Smart Skyscrapers Summit to discuss opportunities for timber construction systems in high-rise buildings, profiling the increased use of prefabricated timber structures in major building projects.

The Australian Smart Skyscraper Summit will be held on the 28-29th March 2017 at the Melbourne Convention and Exhibition Centre.

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