

# **Influence of wood construction on the ecosystem and climate change**

Einfluss des Holzbaus auf das Ökosystem und den Klimawandel

L'impact de la construction bois sur l'écosystème et le changement climatique

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# Influence of wood construction on the ecosystem and climate change

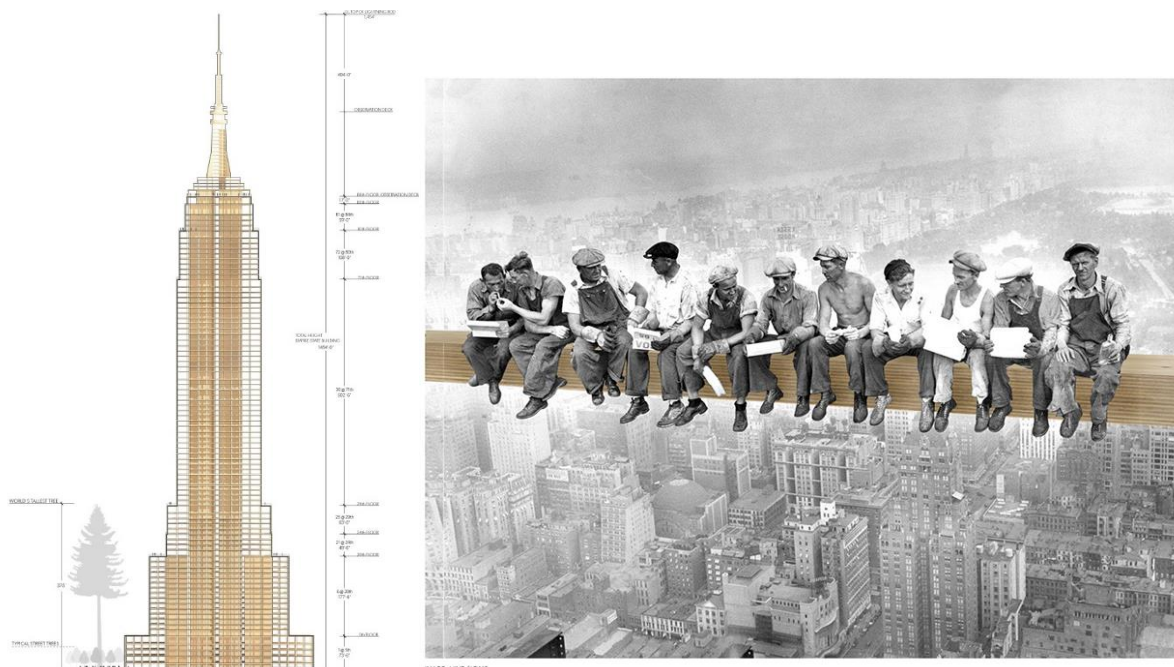
## 1. Systemic change in the way we will build our cities

We stand at the edge of a systemic shift in the way we build and the way we live. As the world searches for ways to address environmental and climate issues, we have come to realize that living more densely is fundamental to the future of mankind and to our relationship with our planet.

For a century and a half steel and concrete have shaped the skylines of the world. They are wonderful materials that allow big buildings, bridges and roads but we now also know that they are hugely energy demanding materials to produce, with significant carbon footprints. Today we understand how dramatically our climate is changing and we know that the future of society will be severely impacted. We also know that as world populations grow and people move at an increasing rate into cities that we will need to continue to build housing and infrastructure to support human existence.

Climate change and the need for more urban housing collide in a crisis that demands building solutions with low energy and low carbon footprints. Wood, unlike steel and concrete, sequesters carbon dioxide, storing it away for the life of the building it is in. As a renewable material, wood offers us a new way to think about our future. To do so it means reinventing wood; making it stronger, more fire safe, more durable and selecting material from sustainably managed forests.

Wood is the only major building material we can build with that is grown by the sun. Its strength to weight is phenomenal and man-made energy is only used to handle it and move it to site. Once cubic meter of wood stores 1 tonne of carbon dioxide. The only way we address anthropogenic climate change is by storing carbon and reducing our emissions. Wood does both.



CHANGING THE PERCEPTION OF WHAT IS POSSIBLE: MGA worked on a study with Metsa Wood and Equilibrium called Plan B: The Empire State of Wood the explored the possibility of recreating the iconic Empire State Building using mass timber.

## 2. The Eiffel Tower Moment

Until the Eiffel Tower was built in 1889, the tallest building on earth was the Great Pyramid in Egypt. The Great Pyramid stood for 5000 years as a monument of outstanding engineering until Gustav Eiffel proposed to shatter all conception of possibility. Five years before the Eiffel tower was built, the first skyscraper was built in Chicago. At 10-storeys in height, the residents of Chicago were afraid to walk beneath its towering mass. Just five years later, the Eiffel tower rose to the equivalent of 89 storeys, reframing what was possible and forever changing skylines around the world.

Tall wood buildings offer a new interpretation of the skyscraper – one that draws on the inviting, elegant qualities of nature and offers greater environmental responsibility and sustainability. Easily replicable and expandable, tall wood building demonstrates the enormous potential of using a fundamental structural material that is renewable and sequesters carbon dioxide.

Countries around the world, including France, are beginning to embrace the next era of architecture. This is the single moment where the world once again shatters its notion of possibility, just as Eiffel did a century and a half ago. This is the single moment where the future of city building begins.

## 3. Why wood?



WOOD IS THE MOST TECHNOLOGICALLY ADVANCED MATERIAL WE CAN BUILD WITH. Significant advancements in engineered wood products have created a new vision for what is possible for safe, tall, urban wood buildings. (T3 Minneapolis, MGA)

Over the last decade a new conversation about sustainable cities and climate change has questioned the methods of the past and through a host of innovators and global voices for change, we have seen a new revolution of tall wood buildings proposed around the world. Advantages of wood design include:

- Lower embodied energy
- Lower operating energy (when appropriately designed)
- Pre-fabricated design, for ease and precision of construction
- Reuse at end of life
- Environmental impact indicators:
  - Carbon sink
  - Reduced GHG emissions
  - Reduced air/water pollution

## 4. Case study: Wood innovation design centre



WIDC: The Wood Innovation and Design Centre in Prince George, BC, Canada is the first, modern all-timber building constructed in North America.

The Wood Innovation and Design Centre in Prince George, BC is a milestone in the story of tall wood. It is the first tall wood building in Canada built beyond current building codes, and for the moment the world's tallest modern all-wood structure, but that record will soon be broken by other mass timber buildings planned for Europe and around the world.

A Detailed Life-Cycle Analysis provides quantifiable data that compares life-cycle stages of conventional steel and concrete towers to tall wood buildings. For example, we completed an LCA comparing WIDC and the same building if it was built in concrete:

- Global Warming Potential - 88% improvement.
- Non-renewable Energy Depletion - 43% improvement.
- Acidification Potential - 47% improvement.
- Human Health Criteria Air Pollutants - 33% improvement.
- Ozone Depletion Potential - 54% improvement.
- Smog Potential - 39% improvement.

## 5. Certified forestry practices + responsible innovation

When we choose wood for building, we also need to ensure the use of wood is truly responsible to the environment. Deforestation is a huge problem and a huge aspect of manmade climate impact. Sourcing wood from responsibly managed forestry is critical. We use third party certification programs managed by environmental, community, industry and aboriginal people groups to ensure that the wood we use carefully considers its footprint on local ecology, habitat and peoples.

Inventive uses of wood to address complex housing needs will demonstrate the beauty and diversity of value-added wood products from our forests. The sustainable growth and increasing resiliency of the our wood manufacturing economies around the world is an important story to tell. As more designers and builders adopt mass timber solutions, we can engage in meaningful and repeatable innovation locally that can change the way we build globally.





WOOD OFFERS US A NEW WAY TO THINK ABOUT THE FUTURE. Pairing the new structural and fire safety qualities of mass timber with a desire for low carbon and renewable materials in buildings has meant a resurgence of the wood industry and a new fascination with the innovation potential of these materials. (Reinventer Paris,