



ALBERTA INNOVATES

AGRICULTURE AND ENVIRONMENT

BIOINDUSTRIAL AND CIRCULAR INNOVATION

BIOINDUSTRIAL MATERIALS

FUNDING
DETAILS

Next Generation Wood Construction

The wood products industry in Alberta generated approximately \$4 billion in revenue in 2019. The growing interest in using engineered wood products for tall and large buildings presents significant economic growth opportunities. However, challenges such as design methodology gaps, performance data shortages, the need for advanced construction engineering tools, environmental impact quantification, and a lack of qualified professionals must be addressed. This multidisciplinary research program, led by the University of Alberta, involves over 50 HQP, 34 faculty members from 14 universities, and 20 professionals from government and industry. The research program aims to develop new knowledge and technologies to enhance structural safety, fire safety, energy efficiency, sustainability and construction process of timber structures.



RECIPIENT:

Dr. Ying Hei Chui
University of
Alberta



TOTAL BUDGET:

\$6,650,000.00



PROJECT DATES:

March 2022-
September 2027



PARTNERS:

NSERC, NRCan, Alberta
Innovates, AB WoodWORKS,
BC-FII, MFFP, NDMNRF,
NLGA, Nordic Structures,
Western Archrib, Element 5,
FPInnovations, NRC



AI FUNDING:

\$250,000



PROJECT TRL:

Start: 6
End: 8

Theme	Theme Leaders	Sub-projects / HQPs
Theme 1 – Structural and Serviceability Performance	Dr. Tony Yang & Dr. Marjan Popovski	18 / 19
Theme 2 – Fire Safety	Dr. Beth Weckman & Dr. Christian Dagenais	10/13
Theme 3 – Building Envelope and Energy Performance	Dr. Hua Ge & Dr. Jieying Wang	9/12
Theme 4 – Sustainable Construction Technologies & Practices	Dr. Pierre Blanchet, Dr. Ben Amor, & Sylvain Gagnon	10/13

APPLICATION

The ongoing project aims to advance the use of engineered wood products in tall and large buildings, focusing on structural and fire safety, energy efficiency, and sustainability. It seeks to address gaps in design methodologies, integrate new construction tools, and evaluate the environmental impacts of wood construction. By tackling these challenges, the project is set to drive growth in Alberta's wood products industry and contribute to reducing greenhouse gas (GHG) emissions in the construction sector.

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PROJECT GOALS

The project is dedicated to advancing use of engineered wood products in high-rise buildings. Our goals are to:

- **Improve Design Standards:** Address critical gaps in building codes related to structural integrity, fire safety, energy performance, sustainability and durability.
- **Shift Code Approach:** Provide technical data to transition Canadian building codes from prescriptive to performance-based design, incorporating resiliency and adaptability.
- **Enhance Building Performance:** Develop methods to improve building envelope performance, targeting net-zero energy readiness and climate adaptability.
- **Innovate Construction Technologies:** Create efficient off-site construction technologies that meet structural, fire, and energy performance requirements while minimizing carbon footprints.
- **Assess Other Benefits:** Quantify the socio-economic and environmental benefits of engineered wood products throughout their life cycle, from supply chain to long-term use.
- **Train HQP:** Build innovation capacity by training highly qualified personnel (HQP) to support the wood industry.

BENEFITS TO ALBERTA

The ongoing project promises substantial benefits for Alberta. By addressing critical gaps in design standards and building codes, this research will enhance the structural safety and performance of engineered wood products in mid-rise and tall buildings. This advancement will foster economic growth in Alberta's wood industry, creating new opportunities beyond the traditional low-rise residential market. Additionally, increased use of wood in construction will contribute to reducing GHG emissions, supporting Alberta's environmental goals. The project will also train highly qualified personnel (HQPs), bringing skilled engineers to Alberta and enhancing the region's expertise in innovative wood construction. The project's recent conference and newsletters have fostered knowledge sharing and collaboration, further strengthening Alberta's leadership in the field.



**5 journal & 14
conference
Publications**



**60 Students
Trained**



2 Project Jobs



25-30 Future Jobs

CURRENT STATUS

May 2025 – In progress

The Next Generation Wood Construction project is progressing steadily across all research themes. Key advancements include seismic resilience frameworks, fire performance modeling, mass timber envelope validation, and sustainable construction strategies. Dissemination activities have been strong, with 2 major conferences, annual theme workshops, 21 monthly seminars, 9 board meetings with industry partners, 3 semi-annual newsletters.

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