



CANADIAN FOREST SERVICE

# SPOTLIGHT

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## Wood: A Sustainable Alternative in Non-Residential and Multi-Family Building Construction

Wood is a natural resource that can support growing global interest in green building. A renewable, energy-efficient material with a low carbon footprint, it provides builders with an effective, sustainable alternative in mid-rise, high-rise and non-residential construction.

### New Building Systems and Engineered Wood Products

Today, a new generation of building systems and engineered wood products are available in the marketplace for use in residential and commercial construction.

Combining new technologies with innovative engineering and design, they provide construction professionals and designers with safe, cost-effective, carbon-neutral, and sustainable building alternatives. This can help foster greater use of wood in the multi-family and non-residential construction segments.

### Hybrid Structures

Wood is a light construction material that, in many cases, may be added to a steel or concrete building without affecting its overall structural integrity.

A building which combines wood with steel or concrete is known as a hybrid structure. The newly-expanded Complan building in Quebec City is an example of such a structure. It features a one-storey wood addition on top of an existing concrete structure. The first such building in Canada, it received funding under Natural Resources Canada's *Large-Scale Wood Demonstrations Initiative* to showcase the innovative use of wood in commercial and residential applications. In May 2013, the project was the recipient of an award in interior design by the Quebec-based *le Centre d'expertise sur la construction commerciale en bois*.



Complan Building. Photo courtesy of CGBWSTUDIO

### Engineered Wood Products

Wood products that undergo specific manufacturing processes to achieve improved performance properties such as their load-carrying capabilities are known as engineered wood products. Glue-laminated (glulam) timber and cross-laminated timber (CLT) are examples of such products. Their strength and rigidity make them popular in residential and commercial construction in North America and Europe.

Glulam is manufactured by gluing together, under controlled conditions, different pieces of dimension lumber. It offers developers with flexible design options since it can be manufactured in many shapes and sizes. It also meets the fire-resistance requirements of North American building codes for different building types and uses.

Glulam can be used in various building applications including roof systems, complex arches, structural elements, architectural features, and even as floor or ridge beams.



Glulam. Photo Courtesy of FPInnovations

For its part, cross-laminated timber (CLT) is a new panel product made out of layers of timber stacked and glued together using hydraulic or vacuum presses. Like glulam, it provides the construction industry with many advantages when used in light or heavy-frame structures, including a smaller environmental footprint, faster construction at a lower cost, and enhanced strength properties. It also offers a significant market opportunity in the North American non-residential and multi-residential construction market.



Cross-laminated timber panels.

## Sustained Federal Support

Given their significant potential for Canada's forest sector, the Government of Canada has, since 2007, invested more than \$55 million to support these next generation building systems and engineered wood products. This funding, provided under a number of programs delivered by Natural Resources Canada (NRCan), has supported various activities including technical research, pilot scale testing, the development of product standards and amendments to building codes, and wood demonstrations.

These investments include projects that [commercialize](#) Canadian first-in-kind forest products and processes. They include equipment to produce innovative CLT walls which can be used as structural components in buildings and specialty oriented strand board products using unique manufacturing processes.

Together, these investments are helping Canada's forest sector take advantage of emerging market opportunities and diversify the products it sells in the marketplace.