



Canadian Wood Council
Conseil canadien du bois

Mass Timber Industry Roundtable

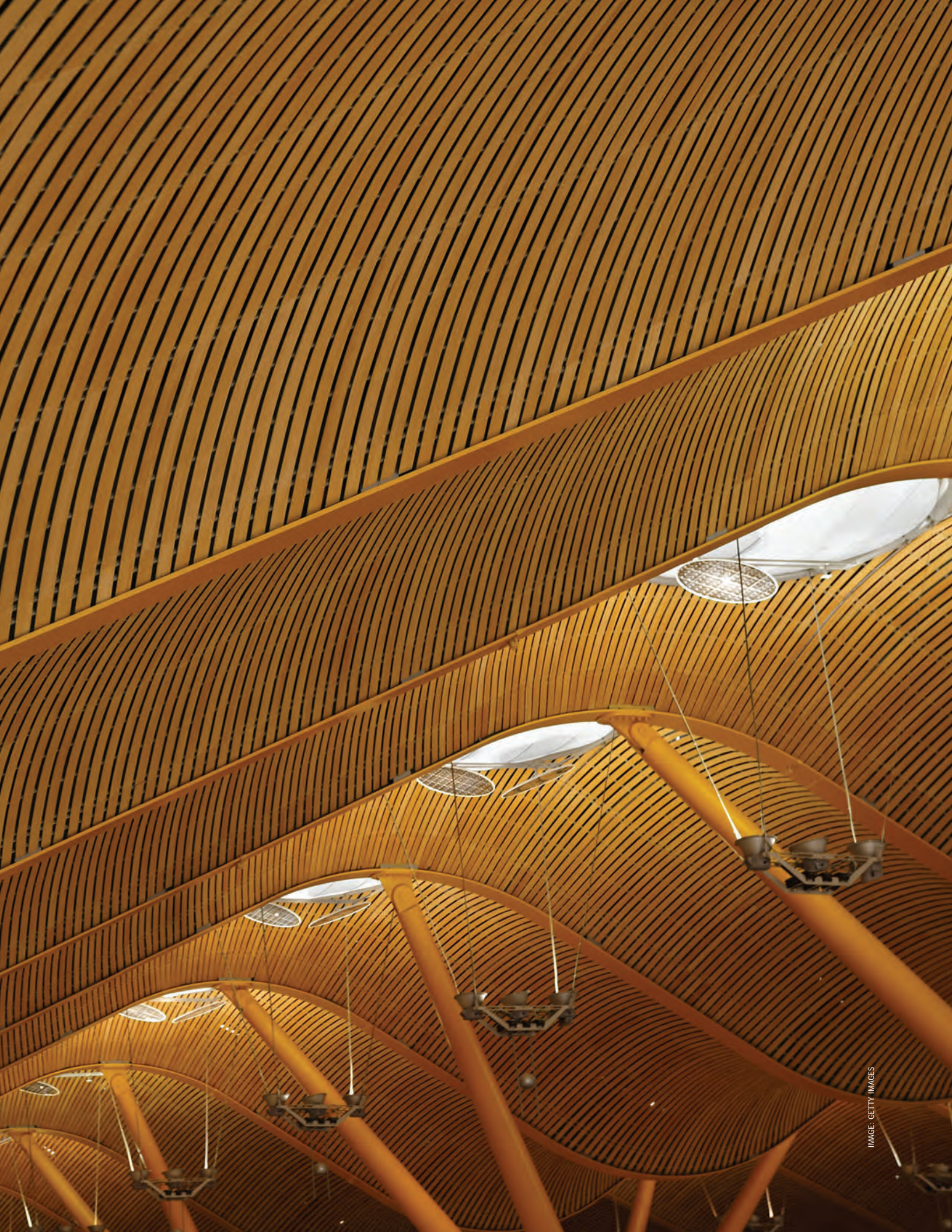
MARKET REPORT

Session 1 | Toronto, Ontario



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Introduction

by **Andrew Bowerbank**, Vice President,
Market Development, Canadian Wood Council

Interest in Mass Timber has grown exponentially over the past few years. More projects than ever before are under design and development across Canada, and our CWC Wood *WORKS!* Program is exceeding project influence targets set for 2021/22. Multiple factors have contributed to this growing interest; from life-cycle carbon accounting, to sustainable resource management, to advancements in manufacturing, to health and wellness, and more. We are now in a position where the adoption of mass timber systems across the industrial/commercial/institutional (ICI) building sector is about to go mainstream.

The wood products industry is well prepared to drive this transition. Along this journey we will need to build greater market awareness, provide on-going education and training, ensure competitive pricing, support advancements in manufacturing and scalability, to name just a few. But more importantly, from a CWC perspective, we need to be prepared to respond to competitive interests that do not align with the wood industry and keep control of misinformation designed to undermine our efforts and objectives. In the world of social media, it's not easy managing disruptive commentaries led by competing interest groups. We need to ensure our voice is heard, push back on those that spread misinformation, and engage with industry leaders from across sectors to ensure they have the tools and resources needed to make informed decisions — this needs to be a key responsibility for the Canadian Wood Council in coming years.

Mass Timber has quickly become an international movement. Canada has an opportunity now to establish a global leadership position and drive new economic opportunities. We will only achieve this objective if the resources required to drive results can be secured. Money will always be a needed resource to fund activities, but it is also the professional connections and strategic planning that is required to ensure our efforts are shared and adopted across the marketplace. The Mass Timber Industry Roundtable (MTIR) was launched by the CWC in 2021 with this specific objective – to provide the industry leadership required to push market interest in mass timber buildings from trend to mainstream.

We have brought together a diverse group of thought leaders from across the building design and construction sectors to discuss the opportunities and barriers. This report highlights the discussions and perspectives that transpired at our first in-person session of the Mass Timber Industry Roundtable. If anyone was reserved in the notion that mass timber was set to go mainstream, this session put those reservations to rest. The session took place in Toronto on Nov 30th 2021, between the two peaks of the Delta and Omicron Covid-19 variants. Invitations went out to an industry that was both nervous about venturing out at this challenging time, and excited about the opportunity to connect in person again. The result? A completely packed room of professionals ready to roll up their sleeves and contribute to the latest trend in building design. If the energy in the room on that day is any indication, Canada will soon witness a disruptive mainstream event in the built environment. ■





Background

Founded in 1959, the Canadian Wood Council (CWC) is Canada's unifying voice for the wood products industry. As a national federation of associations, our 14 members represent hundreds of manufacturers across the country.

For more than 60 years, we have supported our members by accelerating market demand for wood products and championed responsible leadership through excellence in codes, standards, and regulations. We also deliver technical knowledge for the construction sector through our market leading Wood *WORKS!* program.

Wood *WORKS!* is a national program by the CWC advocating for the adoption of wood in the building and construction sector. With the goal of transforming markets and promoting holistic built environments, this industry-led initiative enables innovative systems integration, strategic market outreach, and supports the sector through training, best practices, research, networking and direct technical support.

As social and economic values evolve to prioritize sustainability and climate action, the CWC and its member associations are in a position to demonstrate responsible and resilient resource management.

Wood is the only renewable material in the construction sector.

Recognizing this distinction, we are proud to be the unifying and national voice for wood products in Canada and understand that we have a duty to work with our partners to protect our Boreal Forests, while continuing to deliver quality and essential products. At CWC, we are committed to supporting regenerative forestry practices and dedicated to reducing our emissions output through investigative supply chain management.

Populations will continue to grow and urban centres will expand; to ensure responsible growth, we will implement strategies and best practices that support the next chapter of this enduring industry.

Empowered by government and industry collaboration, we will take decisive sustainability action through the lifecycle analysis of our supply chains, maintain our precious ecosystems and natural carbon sinks through thoughtful extraction, and strive for innovative solutions through technology integration and holistic policy development.

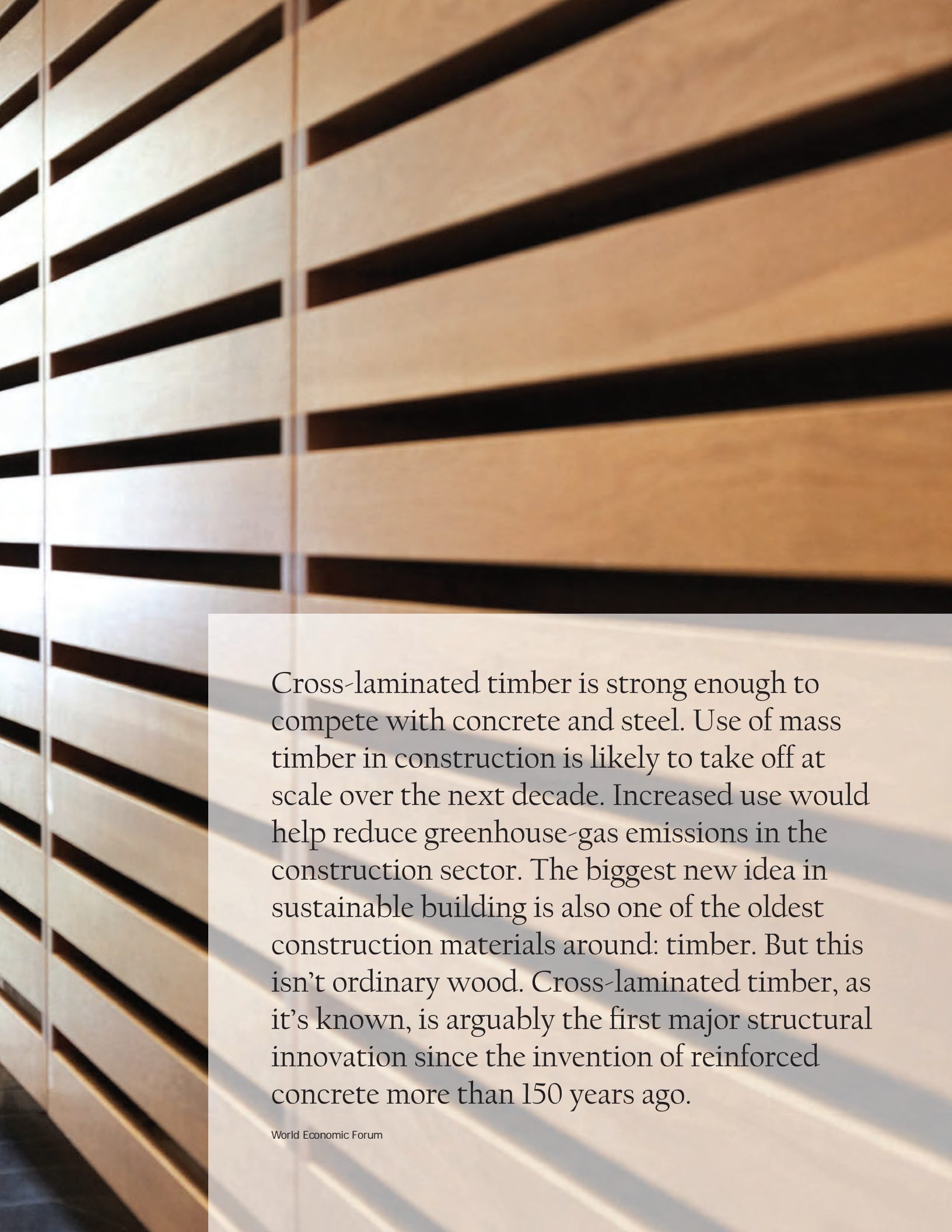
Sustainability is not a market trend. At CWC, we believe sustainability must be ingrained in everything we do. It is our obligation and privilege to provide responsible leadership to our sector and we welcome the changes and opportunities that lie before us. ■



Canadian Wood Council
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Cross-laminated timber is strong enough to compete with concrete and steel. Use of mass timber in construction is likely to take off at scale over the next decade. Increased use would help reduce greenhouse-gas emissions in the construction sector. The biggest new idea in sustainable building is also one of the oldest construction materials around: timber. But this isn't ordinary wood. Cross-laminated timber, as it's known, is arguably the first major structural innovation since the invention of reinforced concrete more than 150 years ago.

Current State of the Market

From Forest to Mill

As champions of sustainable forest management, Canada is in a position to solidify our global leadership in the bioeconomy and forest sector by advancing mass timber adoption. Mass timber is revolutionizing the building industry as a renewable, nature-based construction material. According to Natural Resources Canada (NRCan), "As high-value wood products, mass timber can play an instrumental role in the circular economy by providing a renewable source of building materials and contributing to a lower carbon footprint for the construction sector."

From Mill to Structure

According to NRCan's report, The State of Mass Timber in Canada 2021, nearly 500 completed or under-construction mass timber projects have been accounted for between the years of 2007-2019, representing more than 16 million square feet of gross floor area across Canada. Currently, there are 21 domestic mass timber manufacturing facilities. The majority of Canada's production facilities reside in British Columbia with a total of nine facilities, followed by five in Quebec, four in Ontario, two in Alberta and one in Manitoba. This number is on the rise, and we are seeing new integrated business models in timber manufacturing. One such example can be found in Alberta, where there is a combined primary and secondary manufacturing venture: Northlands Forest Products acquired Western Archrib in 2021. Howie Ewashko, co-owner of Northland Forest Products and Western Archrib, stated, "As a steward of Alberta's forests, we look forward to being able to follow the journey from seed, to forest, to these beautiful stunning structures. We're proud to work in and be stewards of Alberta forests, and are excited to be part of an integrated business that better connects people to nature."

Perceived Challenges

While there is evidence, research, and case studies that demonstrates comparable, and in some cases, superior

CASE STUDY

The Canadian Wood Council, in partnership with federal and provincial governments and industry organizations are conducting a series of five fire tests to demonstrate the fire performance and benefits of using mass timber for tall and large buildings.

Did you know?

Canada has 28% of the world's boreal zone, totaling 552 million hectares?

(Source: National Resources Canada)

safety and performance standards of mass timber construction in relation to conventional materials such as steel and concrete, misconception is still circulating. The most common assumptions are related to fire, wind, and earthquake resistance, as well as construction site management. It should be noted that more research and development is needed in the areas of moisture and water damage, as well as repair and rehabilitation processes of mass timber.

Market Drivers

Although presented as a new trend in the ICI sector in recent years, timber construction has been a staple building component for centuries, sharing the structural stage with stone, iron, and masonry. It wasn't until the latter half of the 19th century when advances in manufacturing gave way for inexpensive, mass-produced steel and concrete, altering the way buildings have been designed. As a result, steel and concrete became synonymous with the urban environment, creating the proverbial "concrete jungle." In fact, mass timber has been used in construction for more than 25 years, beginning with its adoption in Europe in the early 1990s. Timber is experiencing a revival for several reasons:

- > Advancements in technology
- > Changes in building codes
- > Potential for lower construction costs
- > Speed of construction
- > Sustainable product lifecycle
- > Stimulates the national economy
- > Meets safety and performance standards
- > Durability and longevity
- > Health and wellness benefits
- > Aesthetically pleasing
- > Supports local supply-chains ■

Intent of the Mass Timber Industry Roundtable

The Mass Timber Industry Roundtable is a private sector forum launched to help expand the market, build greater awareness, and develop new strategic opportunities for ICI and Multi-Unit Residential projects, as well as innovative applications across our infrastructure. Founded by the CWC, the Roundtable brings together a select group of industry leaders twice a year to address our most pressing challenges and increase awareness across the marketplace. When market interest in mass timber grows, the industry as a whole will benefit.

Through the Canadian Wood Council's Wood *WORKS!* Program, our technical experts, will continue to address

market issues and barriers, influence project development and recommend ideas that have the potential to drive innovation. We will also review strategies for industry-wide economic stimulus, and opportunities to showcase successes.

The findings of this report will support the development of content and direction for subsequent Mass Timber Industry Roundtables, to be hosted bi-annually in select cities across the Country. Each Roundtable is intended to build on previous sessions with a goal to establish a long-term market shift to mainstream adoption of wood products in the ICI building sector. ■





Roundtable Overview

On November 30, 2021, more than 80 executives from Canada's building and construction industry gathered in Toronto for a full day of discussions on how to accelerate the adoption of mass timber in our built environment. Each participant at the Roundtable was thoughtfully identified and invited based on their experience and leadership with mass timber across the supply chain, specifically, material manufacturing, architecture, engineering, sustainability, property management, building operations, communications and marketing, financing, education, and more. Each table had dedicated notetakers to capture discussions and provide detailed content to support the development of this report. In the pages that follow, summaries of the day's activities, and the key takeaways that emerged are presented; thus, it is important to recognize that this report should not be interpreted as meeting minutes. For those interested in viewing all table notes, they are available upon request.

The CWC hosted the industry event at the Delta Hotel in Toronto. The Roundtable commenced with a keynote presentation, followed by table discussions, a six-person panel session, and programming. To ensure a holistic approach and interdisciplinary insight, 11 tables were specifically curated, each focusing on a different topic and complemented with assigned participants based on their unique expertise and experiences. The tables were designed to engage participants by posing a series of prepared questions in relation to their table topic and in response to the guest speakers.

A primary objective was to provide a collaborative and open space to share lessons learned, voice perspectives on the opportunities and the barriers before us, and work to create an industry led response strategy to the adoption of mass timber construction. ■

ROUNDTABLE TOPICS

TABLE 1: Marketing & Communications

TABLE 2: Finances & Investments

TABLE 3: Technology Innovation

TABLE 4: Materials & Manufacturing

TABLE 5: Project Influence

TABLE 6: Cross Sector Collaboration

TABLE 7: Business Planning & Sector Growth

TABLE 8: Education & Training

TABLE 9: Building Construction & Operations

TABLE 10: Green Buildings & Sustainable Development

TABLE 11: Design Excellence

“Mass timber is likely to take off at scale over the next decade”

—CAITLIN CLARKE, SENIOR CONSERVATION FELLOW, SUPPLY CHAINS AT THE NATURE CONSERVANCY

(Source: World Economic Forum)

TABLE 1:

Marketing & Communications

Prompting the Discussion:

1. Which sectors or audiences should the timber industry be targeting? And why?
2. Are current communication methods effective considering that mass timber is still in the early stages of adoption?
3. What strategies can be adopted to build enthusiasm around mass timber? How do we collectively get wood in the mainstream media?

Industry Insight:

Targeted Audiences

Mass timber is primarily applied in structural systems; therefore, the design community – specifically, architects and engineers – have naturally become knowledgeable and experienced with mass timber in comparison to other actors in the building and construction supply chain. Participants identified that marketing and communication efforts should now shift to the following audiences and sectors:

- > Codes Officials
- > Building Owners
- > The General Public
- > The Next Generation of Leaders
- > Real Estate Sector

Strategic Media

Advancements in our communication strategies, in a large part due to evolving digital assets, demands an evolution in how we tell and disseminate the story of mass timber. It was identified that the timber industry should increase its communications from purely educational content via websites and technical sessions to promotional content through a wider breadth of mediums, including: TV Commercials; YouTube Ads; social media platforms targeting younger audiences such as Instagram. In addition to an evolved digital strategy, participants strongly agreed that in person site tours would be an effective approach for the promotion of mass timber, specifically because mass timber provides a sensory experience that cannot always be translated online i.e., how does the wood smell? How does it make you feel? What are acoustics like? Is it visually pleasing?

Mainstream Content

When discussing the benefits of mass timber, participants immediately identified with its inherent sustainability properties and alignment with biophilic principals. There

“The biggest challenge now is changing social perceptions of mass timber, so the industry has a green light to step up development.”

—VINCENT MARTINEZ, PRESIDENT OF ARCHITECTURE 2030

(Source: World Economic Forum)



was also recognition that the timber industry is domestic and offers great economic opportunity for the Canadian economy. Participants suggested that content regarding mass timber should focus on three primary topics: 1) Health & Wellness 2) Sustainability 3) Local Economic Development. Participants believe that these three topics offer interdisciplinary and collaborative opportunities that resonate across all sectors and easily garner earned media.

TABLE 2:

Finances & Investments

Prompting the Discussion:

1. What strategies, research, or resources are needed to engage and entice investors?
2. How can environmental, social, and governance (ESG) metrics better integrate mass timber opportunities as a key part of project financial plans?
3. Does the speed of construction and earlier occupancy factor in to cost considerations for developers?

Industry Insight:

Quantify the “Soft” Benefits

Participants recognize that there are indirect or soft benefits with the application of mass timber, specifically based on its integral role in achieving biophilic design. Biophilia has been shown to impact illness and absenteeism, staff retention, job performance, healing rates, classroom learning rates, retail sales, violence statistics and more. The soft benefits of mass timber are currently not quantified and often not considered in relation to larger project objectives, nor are they accounted for in project financing or return on investment. Participants suggest the timber industry lead studies that quantify these benefits and tangibly show how mass timber provides a greater return over the project's lifecycle.

Lifecycle Cost Analysis

As an engineering economic evaluation tool, lifecycle cost analysis (LCCA) is useful for comparing competing material alternatives. To understand the true cost of mass timber, it was suggested by participants that lifecycle cost analysis be used to quantify the economic benefits attributed to mass timber, namely: lowered resource input and output in the manufacturing process, the use of local supply chains, shortened construction schedules, fewer onsite workers, and more.

LIFECYCLE COST ANALYSIS (LCCA): is a method for assessing the total cost of a project, product, or process over its lifetime. Thus, LLCA accounts for all cost considerations, including: capital investment, purchase, installation, as well as future costs related to energy, operations, maintenance, repair, financing and disposal costs.

Did you know?

10% of employee absences can be attributed to architecture with no connection to nature.

(Source: Terrapin Bright Green)

The Carbon Tax and ESG Investment

The timber industry is well positioned to benefit from the national and international implementation of the carbon tax and corporate adoption of ESG investment analysis. Timber is recognized as a low-carbon alternative to other construction materials; participants strongly believe the industry should capitalize on this understanding and use these financial mechanisms for the promotion and adoption of mass timber buildings at the beginning stages of project development.



TABLE 3:

Technology Innovation

Prompting the Discussion:

- 1. What are some key technology enablers that may be vital for mass timber adoption?
- 2. What are the opportunities for mass timber in the commercial retrofit market?
- 3. Is mass timber considered innovative? Does innovation come from the product? Or its delivery method?

Industry Insight:

Building Information Modeling (BIM)

Participants expressed that the timber industry should leverage the innovation of 3D engineering software to support the adoption of mass timber. Building Information Modeling (BIM) has specifically been identified as an opportunity for the industry. Through BIM, asset owners have an opportunity to: better understand and visualize how mass timber can be incorporated in their building at the design stage; mitigate risk; reduce cost; improve onsite collaboration and communication; improve scheduling and sequencing; and increase productivity through prefabrication.

Reimagining Application

Beyond interior design applications (flooring, molding, wall treatments, staircases), most projects that incorporate wood in commercial applications primarily use it for structural purposes in place of steel or concrete beams. In recent years, we are witnessing two new applications for wood: 1) exterior wood cladding and 2) renovation and expansion for existing buildings. Participants expressed their interest in using wood through these two new applications and are open to other forms of wood and mass timber adoption.

Off-site Construction

Mass timber is well positioned to use offsite construction systems, specifically prefabrication and modular systems. If mass timber production can align itself with the innovations of offsite construction, the benefits for mass timber will reach beyond its inherent sustainability properties and become synonymous with superior quality control, shorter construction schedules, increased safety, cost efficiency, and flexibility. It is suggested that using offsite construction methods for timber construction should be adopted consistently as part of a systems approach. According to Natural Resources Canada, while most mass timber projects benefit from the efficiencies of prefabrication, "Modular projects are not common in Canada because it is a relatively new method of assembly. However, British Columbia is looking at many affordable housing projects that use modular design as an option."

CASE STUDY

CLIENT: GRAHAM Group
ARCHITECT & PHOTOS: Studio RHE
CUSTOMER: Resolution Property
MANUFACTURER: binderholz group



The Gramophone Works is one of the largest of its kind in Europe. The building was renovated and extended by three storeys in timber frame construction. A total of 1,160 m³ of CLT BBS and 1,350 m² of 3-ply solid wood panels were used.

TABLE 4:

Materials & Manufacturing

Prompting the Discussion:

1. How can manufacturing play a role in mitigating perceived risks about mass timber?
2. How can we improve mass timber manufacturing?
3. What are the challenges with using mass timber as an alternative material in construction?

INTEGRATED DESIGN PROCESS (IDP):

an interdisciplinary design approach with the emphasis on collaboration. All the stakeholders involved in the project meet during the design of the plans and specifications to develop optimum solutions for each discipline. This is a comprehensive process that concentrates as much on design, construction and operation as on the occupancy of the building.

Industry Insight:

Product Procurement

When choosing to build with mass timber products, it is suggested that product procurement happen as soon as possible to mitigate long lead times, and manage

construction schedules and expectations. This can be achieved by integrating the desired timber manufacturer at the beginning of the design process, ideally through an integrated design process.

Standardization

A significant concern that has been identified by participants is the lack of standardization in the industry. Standardization is key to ensuring consistency, which would lead to greater confidence in the use of mass timber. In particular, the industry should develop standards related to products and processes, enabling predictability across the country. Specific examples of standardization include:

- > Product thickness
- > Dimension tolerances
- > Straightness
- > Squareness
- > Lamination joints
- > Fasteners
- > Performance criteria

More Competition and Manufacturing

Currently, there are 21 production facilities across Canada. Participants suggested that more competition is required amongst the supply chain in order to lower costs and address long lead times. Increasing manufacturers across the country was identified as a priority.



TABLE 5:

Project Influence

Prompting the Discussion:

1. Is perception still a big hurdle? Concrete and steel are still referred to as traditional construction, why is that, when we have been building with timber so much longer? How do we change the perception?
2. Will mass timber remain just a niche market or is there potential to grow the industry?
3. How can we convince investors, developers, builders, etc. (who have significant capital and risk in a project) to break from what they know, and embrace the new technologies, materials, and processes surrounding mass timber?

Industry Insight:

One Size Does Not Fit All

While there is enthusiasm to promote the blanket adoption of mass timber across Canada in buildings and infrastructure assets, participants acknowledged that mass timber is not favourable for every region or project. It was suggested that greater market penetration can be achieved with a more focused strategy for application. The industry should identify target regions based on advantageous conditions, such as the institutional building market, population density, and local bylaws and regulations. Additionally, mass timber should be integrated into projects that have limited probability of design restrictions or obstacles. Specifically, the industry should be focusing on mass timber applications that introduce hybrid-material applications, and in low and midrise commercial building spaces.

Research & Development

Since mass timber is a newer construction material, there are many perceived risks that need to be addressed and managed, particularly as it relates to water and fire resistance, performance under seismic stress, and costs related to repair and rehabilitation. In order to mitigate these risks, participants are urging the timber industry to conduct more research and testing in collaboration with other sectors. Until then, it is suggested that the results of existing tests and studies be shared with any owner who is considering mass timber adoption.

Establish A Clear ROI

In order to effectively promote mass timber, the asset owner must have a clear understanding of the return-on-investment opportunities, and project expectations should be managed. Participants expressed that understanding an owner's motivations will assist in communicating the return, which could be any of the following:

- > Higher rent premiums and resale value for sustainable buildings
- > Increased competitiveness as sustainable building activities continue to grow across the globe, with dramatic increases expected in the future
- > Supports existing government targets and frameworks related to resource use and climate change mitigation
- > Supports green public procurement
- > Marketing advantages for low-carbon material integration
- > Supports benchmarking related to green building assessments
- > Shorter construction schedules and project cost savings



IMAGE: KORB & ASSOCIATES, NEW LAND ENTERPRISES

CASE STUDY:

THE ASCENT, MILWAUKEE, WISCONSIN

Developers of the Ascent, said, "Mass timber construction requires 90% less construction traffic, 75% fewer workers on-site, and is 25% faster than traditional construction. All of these reductions factor into reduced emissions associated with the construction process."

(Source: American Wood Council)

TABLE 6:

Cross Sector Collaboration

Prompting the Discussion:

1. What messaging will resonate across sectors to encourage the adoption of mass timber?
2. How can we effectively engage multiple sectors?
3. How can this story be better told across sectors that are not directly engaged with the design and construction sectors?

Industry Insight:

Carbon Is King

Recognizing that emissions are emerging as a mainstream metric across sectors, it would be advantageous to introduce a new strategy for mass timber construction through the lens of carbon reduction potential. Carbon has become a currency in its own right; this is reflected in the growing interest in ESG investing and analysis, carbon trading and carbon taxes. It was identified that mass timber adoption would benefit with the strong correlation to emission reductions.

CASE STUDY: GREEN BUILDING MOVEMENT

The Green Building Councils in Canada and the U.S. drove a movement in North America for the adoption of high-performance/green buildings through several very effective campaigns targeted across multiple sectors. The green building movement grew in popularity and prominence thanks in part to these campaigns but also through a number of strategic collaborations and partnerships.

- > Collaborations were formed with architectural associations and academic institutions for LEED training to be accepted in course curriculum and as a mechanism for on-going accreditation.
- > There was a concerted focus on municipal leadership as they worked together to have LEED adopted as a requirement in local procurement processes.
- > Partnerships were formed with well-respected agencies and NGOs including the United Nations Sustainable Building and Climate Initiative, the Urban Land Institute, The Clinton Climate Initiative and more.
- > The infamous GreenBuild conference and trade show grew into a North America-wide sensation with attendance annually exceeding 30,000 delegates. This was an unprecedented accomplishment for an environmentally focused event.

Did you know?

Replacing steel with mass timber, globally, would reduce carbon dioxide emissions by between 15% and 20%.

(Source: American Association for the Advancement of Science)

Collaborating With Associations

Non-government organizations or industry associations exist across every sector. An association's primary responsibilities are to establish best practices, educate, provide market leadership, identify future trends, and lead technical standards for which the industry adheres. Associations aim to add value to their programs, grow their membership, and maintain participation value for existing members. Introducing mass timber to complimentary associations as a means to connect with a new sector would allow the timber industry greater market penetration and exposure for their member companies. By targeting associations, collaborative opportunities can be created to efficiently and effectively engage leadership across the built environment for transformative impact.

Building Our Shared Environment

With greater interest and awareness on health and wellbeing in our society, studies are highlighting the impact that our physical spaces have on our quality of life. Awareness of cross-sector subject matter, like mental health and sustainability, are an opportunity for the timber industry. Timber's inherent sustainability and wellness qualities can be leveraged to highlight that how we build and what we build impacts everyone and should be an interdisciplinary discussion. Participants are encouraging the timber industry to reimagine the role of our built environment across sectors, and leverage timber's biophilic and resilient properties to start the conversation.

TABLE 7:

Business Planning & Sector Growth

Prompting the Discussion:

1. What areas of focus should the industry prioritize to manage perceived risks associated to mass timber?
2. Is the timber industry doing enough to acquire government support and resources? What should be considered?
3. What strategies can be used to increase the general public's perceived value of mass timber buildings?

Industry Insight:

Managing Risk

Mass timber products are considered fairly new and with that comes unknowns and perceived risks. To mitigate these risks, participants have suggested that the industry focus on:

- > Stabilizing supply
- > Standardizing products
- > Harmonizing codes from province to province

Stronger Lobbying Efforts

Whether it be agriculture, mining, or oil and gas, Canada's resource sectors have traditionally turned to the practice of lobbying to articulate their interests to local, provincial, and federal governments to influence public policy. While lobbying efforts do exist in the timber industry, participants expressed that stronger lobbying strategies are needed to compete with other construction materials, namely steel and concrete.

Partnerships Across the Industry

While several associations, think tanks, and advocacy groups exist across the timber industry, participants expressed that greater effort is needed to collaboratively develop and support public facing marketing campaigns, specifically targeting the general public. Mainstream adoption of mass timber will accelerate with greater demand; this demand will come from occupants, across the residential or commercial building sectors.

The production of construction materials such as steel, cement and glass accounts for 10% of global energy-related CO₂ emissions, according to a United Nations report. By contrast, cross-laminated timber and other engineered wood products can benefit the climate in three ways: trees capture and store carbon as they grow; long-lived wood products lock in carbon; and these products can be used instead of high-impact materials like concrete in many cases.

—THE WORLD ECONOMIC FORUM

TABLE 8:

Education & Training

Prompting the Discussion

1. Explore the opportunities for higher education in support of the trend towards mass timber construction.
2. Where are the gaps in current education and training?
3. How can the industry effectively reach across sectors for mass education?

Industry Insight:

Tailored Training

Understanding that all actors in the building and construction supply chain have specific technical knowledge based on their specialization, it was identified that education and training curriculum must be created to meet the needs of specific disciplines. Therefore, the industry should develop targeted, hands-on workshops and sessions for each actor in the supply chain, reflecting how mass timber specifically impacts their field of expertise.

Material Development

A majority of professionals across the architectural, engineering, and construction sectors have not yet had an opportunity to directly work with mass timber. This lack of exposure and hands-on experience leaves many with basic inquiries and questions. Participants determined that the development of simplified documents are essential for increasing awareness, and encouraging greater interest in building with mass timber. More specifically, it would be to the industry's benefit to create and circulate the following:

- > Frequently Asked Questions (FAQ) sheets
- > Checklists
- > Lessons Learned reports
- > Case Studies
- > Product Cut Sheets

Partnering with Academic Institutions

Education in the fields of design and construction is primarily delivered through post-secondary institutions; therefore, it was suggested by participants that the timber industry increase partnership opportunities with academic institutions across the country to update curriculum for engineering, architecture, mechanical and electrical, sustainability, project management, building sciences, and more. By working directly with the academic sector, the timber industry will have an opportunity to provide accurate and priority expertise, ensuring a strong and educated workforce over the coming generations.

HAVE YOU HEARD OF CWC'S WOODSMART PROGRAM?

This program is leading the effort to expand wood design and construction education in Canadian colleges and universities. Our approach is to provide support, and resources, for educators and encourage students to study wood design and construction. Our goal is for future architects, engineers, and building professionals to enter the workforce with the required skillsets to plan, design, fabricate, and assemble advanced wood structures. Encouraging these future practitioners, and builders, will increase the use of wood in our built environment and in turn help to mitigate climate change, while strengthening the shift to more industrialized construction processes



TABLE 9:

Building Construction & Operations

Prompting the Discussion

1. How do we change the procurement model to adopt IPD processes? What other factors/options should be considered at procurement stage?
2. What are the current limitations preventing mass timber adoption in the construction process?
3. Which actors in the construction and operations supply chain need to be prioritized? Why?

Industry Insight:

Building a Timber Workforce & Training the Trades

While every actor across the construction supply chain will require training to successfully adopt and implement mass timber, it was identified by participants that training the trades and building a dedicated timber workforce is a primary priority. New training programs will need to mimic existing program frameworks conducted through trades

associations to meet third-party validation standards, such as the Red Seal designation. This is important to maintain standardization and to ensure workers are equipped to support any project across the country, guaranteeing that “out of province” workers are reliable and confident with any mass timber project. Through a verified trades training program, the industry can begin to develop a dedicated timber workforce.

A New Construction Culture

Currently, construction and procurement processes favour a culture driven by lowest price bids and speed of delivery. This culture has not been designed to account for our changing and expanding priorities towards quality, sustainability, wellness, technology adoption, and digitalization. Participants agreed that we must evolve our traditional construction and procurement methods from “lowest cost” to “greatest value,” building in resiliency to new technologies, processes, and materials, such as mass timber.

Adopting the IPD Process

Since many are relatively inexperienced with mass timber design and construction, it was suggested that the integrated project delivery (IPD) process may be the most advantageous to manage risks and expectations. In particular, integrating manufacturers early on in the design process, as well as sharing profit and risk was appealing to the majority of participants.

UP FOR DEBATE

During the Roundtable, not all participants agreed in using the IPD process. This seems to be reflective of a larger debate that is happening in the market.



TABLE 10:

Green Buildings & Sustainability Development

Prompting the Discussion

1. What is mass timber's role in green buildings and sustainable development? How should that be communicated?
2. What mechanisms or policies are required in aiding in the full realization of mass timber's potential being fully implemented?
3. Wood is the only renewable material in the construction sector — Period. How can this fact be used to influence/support the wood product's sustainability story? How can the story of embodied carbon and carbon sequestration be better represented?

Industry Insight:

Lifecycle Assessment

Canadian markets are emphasizing sustainability, resiliency, and resource efficiency in business development, procurement models, policies, and standards. Lifecycle assessment (LCA) and environmental product declarations (EPD) are becoming preferred tools for the measurement and standardization of materials and processes in the building and construction industry. Industry players will soon be legally required to report on energy, water and emissions in the coming years, as carbon pricing and offset strategies become enforced. To support the adoption of mass timber, participants suggested the industry embrace and disclose lifecycle assessment data for mass timber products in an effort to support a transparent emissions profile across the supply chain and voluntarily implement environmental product declarations for mass timber products.

CASE STUDY: ONTARIO REPORTING OF ENERGY & WATER USE REGULATION

Under Ontario's Reporting of Energy Consumption and Water Use regulation, large building owners need to report their building's energy and water use once a year to the Ministry of Energy on:

- > July 1, 2019 for buildings 100,000 square feet and larger
- > July 1, 2023 for buildings 50,000 square feet and larger

“One of the greatest benefits of building with mass timber is wood's ability to sequester CO₂. In addition to storing carbon, wood products are associated with low levels of carbon emissions during manufacturing, thus reducing the overall carbon footprint of a building's construction.”

—NATURAL RESOURCES CANADA

Holistic Design

It was identified by roundtable participants that, in an effort to promote mainstream adoption of mass timber, passionate proponents have misguidedly focused on its full-scale adoption, rather than its strategic incorporation in support of sustainable project objectives. In other words, participants identified that mass timber should be viewed as one tool in the greater objective for low-carbon, sustainable development — as opposed to a blanket, siloed solution. Thus, adoption would be successful if there was a focus on holistic design principals, pairing or integrating mass timber with other sustainable systems, including renewable energy, in the achievement of a project's zero emissions targets.

Renewable Product

Timber is the only renewable product in construction. This fact is often overlooked or unacknowledged. Participants suggested that there should be a greater emphasis on timber's natural sustainable properties and potential for infinite supply, unlike other construction materials that require intensive processing and are finite by nature.

TABLE 11:

Design Excellence

Prompting the Discussion

- 1. From exploring organic form, to integrating hybrid material and systems, to exploring the limits of size, scale and space, discuss where you feel Canadian design can go with mass timber.
- 2. Through design, how can we promote the adoption of mass timber?
- 3. How does design play a role in how we experience and use buildings?

Industry Insight:

Biophilic Design

The built environment defines the spaces where we live, work, and play; its composition undeniably impacts our physical and mental wellbeing. With a growing awareness and appreciation for health and wellness in the building and construction industry, biophilic design has become an emerging trend. Mass timber innately supports biophilic design principals and directly connects occupants with the natural environment through the sensory experiences of wood. By positioning mass timber as a key design element in achieving biophilic design, Roundtable participants strongly believe that it will increase adoption.

BIOPHILIC DESIGN

A concept used within the building industry to increase occupant connectivity to the natural environment through the use of direct nature, indirect nature, and space and place conditions.

Biomimicry

Biology offers lessons in efficient resource stewardship and circular economic principals. Designers are now adapting nature’s lessons or mimicking natural systems through the development of new materials, products and architecture. Coupled with an increased demand for sustainable and experiential built spaces, biomimicry across the design community is on the rise. Wood, specifically mass timber, has a role to play in designing these unique forms and functional spaces. Participants suggested mass timber would be particularly impactful in demonstration projects using biomimicry.

Visibility through Scale

To promote mass timber amongst the general public and the design community alike, participants believe it should be applied and encouraged at a district scale rather than its application on standalone buildings, which is what we are currently experiencing. By focusing on community wide application, it is suggested that there would be greater visibility and interest, leading to increased mass adoption.



IMAGE GETTY IMAGES

Did you know?

According to the Forest Products Association of Canada, Canada has the most certified sustainable forests in the world. We have more than 164 million hectares certified.



IMAGE: GETTY IMAGES

Summary Thoughts

Through the process of synthesizing discussions and presentations conducted at the 1st Mass Timber Industry Roundtable, it can be concluded that mainstream adoption of mass timber can be achieved over the coming years if the industry:

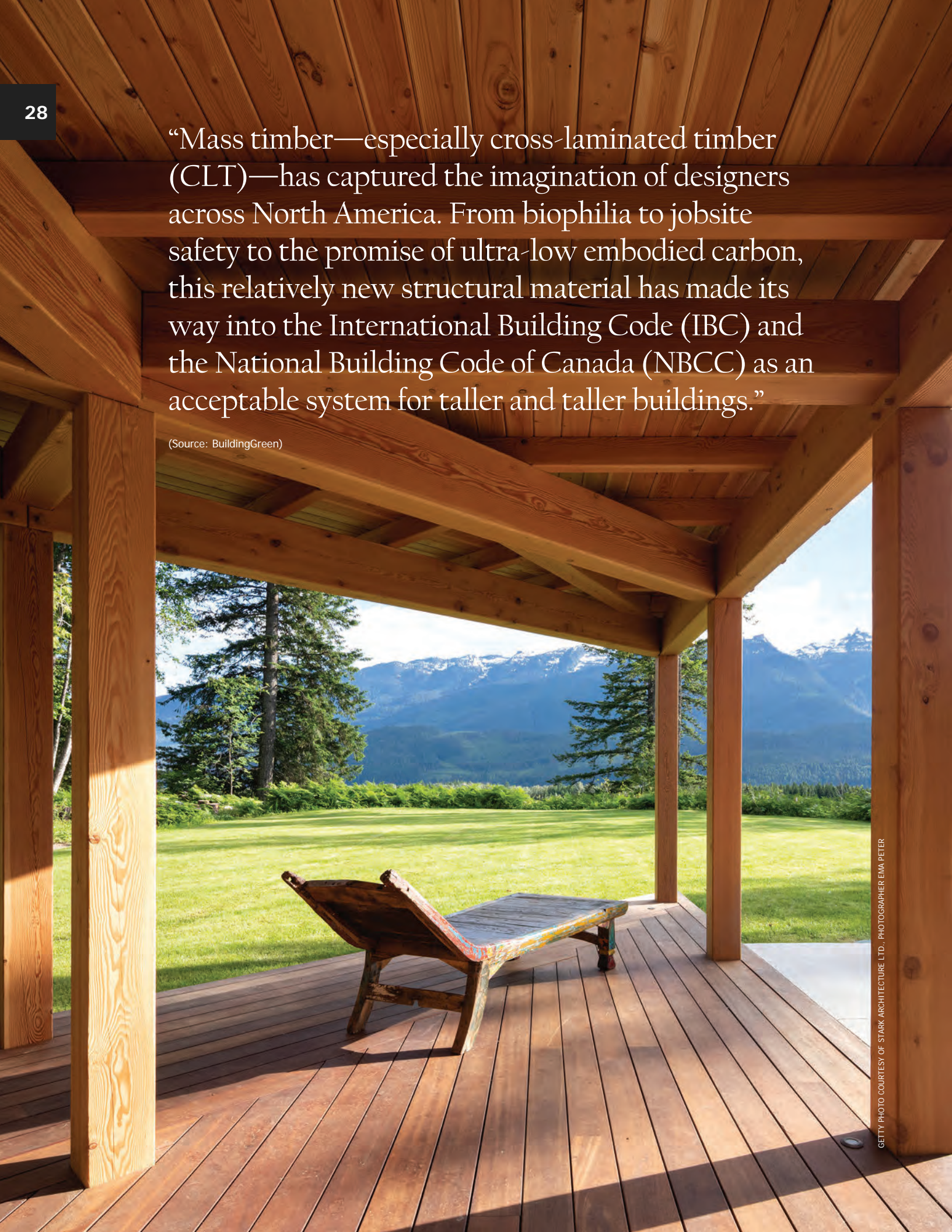
- > Prioritizes marketing and engagement efforts with building owners and occupants through mainstream and relevant communications channels
- > Capitalizes on emissions-based financial frameworks and lifecycle cost analysis
- > Leverages offsite construction systems for manufacturing and the IPD process for implementation
- > Standardizes products and builds upon existing manufacturing infrastructure
- > Establishes a clear strategy for returns on investment to benefit developers and building owners
- > Educates the trades through 3rd party verified programming and in partnership with academic institutions to build a dedicated timber workforce
- > Curates and disseminates clear and unified messaging in collaboration with industry allies
- > Selectively and strategically focus on hybrid building systems and low to midrise commercial buildings
- > Strengthens lobbying efforts
- > Highlights sustainability and wellness attributes
- > Advances research and development
- > Collaborates with associations across sectors
- > Scales adoption through community wide applications



PHOTO COURTESY OF STARK ARCHITECTURE LTD., PHOTOGRAPHER EIMA PETER

“Mass timber—especially cross-laminated timber (CLT)—has captured the imagination of designers across North America. From biophilia to jobsite safety to the promise of ultra-low embodied carbon, this relatively new structural material has made its way into the International Building Code (IBC) and the National Building Code of Canada (NBCC) as an acceptable system for taller and taller buildings.”

(Source: BuildingGreen)



A Path Foreword

The Canadian Wood Council is committed to supporting the needs of our member companies, promoting the benefits of wood products across the industrial/commercial/institutional buildings sector, and developing the tools and resources needed to grow the emerging mass timber industry across the country. The following is a short list of initiatives we are bringing to the market over the coming months as we strive to meet our objectives.

STA Assure

In February of 2021, The CWC hosted a meeting with the Structural Timber Association (STA). STA is the UK's leading organisation representing the structural timber sector and associated supply chain companies. The meeting was held to discuss STA's advocacy and programming as it relates to insurance rates, safety, and quality for timber buildings, in particular, their STA Assure and Site Safe Programs. Through these discussions, it was determined that CWC and STA had natural synergies and that partnership or collaboration on specific initiatives would be beneficial. CWC is actively reviewing STA's successful programs with the intention of introducing them to the Canadian market.

Mass Timber Demonstration Fire Test Project (MTDFTP)

Developers and architects in Canada are continuing to push the envelope with respect to the use of mass timber in tall building designs. In doing so, there is a strong interest in mass timber elements to be exposed rather than protected with gypsum board and hidden. The technical basis to justify such designs from available laboratory fire testing data may not be sufficient to convince regulatory authorities that these building designs meet the safety and property protection objectives needed to obtain building permit approval. The overarching objective of the Mass Timber Demonstration Fire Test Project (MTDFTP) is to support the approval of tall and large mass timber buildings in Canada and encourage the construction of buildings that include



mass timber. In January 2021, a partnership was formed to undertake the Mass Timber Demonstration Fire Test Project, which currently involves the following organizations:

- > Canadian Wood Council (CWC)
- > Natural Resources Canada (NRCan)
- > National Research Council of Canada (NRC)
- > Government of Ontario – Northern Development, Mines, Natural Resources and Forestry (NDMNRF)
- > Government of Alberta – Agriculture, Forestry and Rural Economic Development (AFRED)
- > Government of British Columbia – Forestry Innovation Investment (FII)
- > Government of Quebec – Ministère des Forêts, de la Faune et des Parcs (MFFP)
- > FPIInnovations (FPI)
- > BC Office of Mass Timber Implementation
- > GHL Consultants Ltd. (Vancouver)
- > CHM Fire Consultants Ltd. (Ottawa)
- > ISL Engineering and Land Services Ltd.

The project plan includes pilot-scale demonstration burns (Richmond, BC) and full-scale fire tests (Ottawa, ON) with the intent to highlight the performance of mass timber products and to inform stakeholders as to the performance of mass timber products, systems and structures, and to capture data and results to advance market acceptance of mass timber products in tall wood buildings and support future performance-based codes.

Low-Rise Commercial Construction in Wood — A Guide for Architects and Engineers

By far, the largest opportunity available to the wood industry is the Low-Rise market segment. In 2020, in Canada alone, more than 50 million square feet of buildings three storeys or less were constructed. Almost 75% of this market segment, largely dominated by the steel industry, is made of these three main usages: offices, diverse retail

spaces, and warehouses/light industrial buildings. To achieve CWC's goal of developing new wood solutions for low-rise commercial buildings, three regional workshops regrouping experts from the construction and design industry were held in early 2019 to research and develop new viable and sound wood systems. The structural systems developed in the regional workshops were further refined by a national working group and four professional firms were recently published in a new document: *Low-Rise Commercial Construction in Wood — A Guide for Architects and Engineers*. This 11"x17" high-quality color guide includes the six design templates that were developed along with informative appendices on fire performance, control of noise, building enclosure and moisture management considerations, and carbon calculations. A soft launch took place in the fall of 2021 and a more comprehensive promotion plan is under development. We are grateful to NRCAN for supporting such a project.

Mid-Rise guide

The Mid-Rise project and guide were conceived to provide a snapshot into opportunities that have been created by Canadian Code Provisions progressing over the last 12 years, allowing taller and larger wood buildings.

The foundation came from the Wood *WORKS!* program hosting regional focus groups during 2019, made up of key industry stakeholders that included the design and development community, municipal officials, and the supply chain. From the focus-group conversations and the research gathered and analyzed, it was evident that each of our provinces was at varying degrees of adoption, understanding and application for wood buildings. The opportunities that are available for wood use in mid-rise developments are varied and many, and the illustrations and information contained inside this guide, will continue to inspire, and inform the design and construction industry about missing middle possibilities for wood buildings.

The flow of the sections is laid out to mirror basic project planning steps that are undertaken by design teams — typically led by an architectural team. Understanding what is allowed by code, creates the conversation around ideas for buildings and potential project opportunities. Site location, local planning and zoning regulations, and a business case that makes it achievable, are stages a design team navigates early with a client. Many factors drive the business case. Goals set early for greener and environmentally sustainable development, applications of sustainable materials having significantly lower embodied carbon, can be incorporated into design principles. Schedule often drives design and project efficiency, creating consideration into using prefabricated and modular wood structural systems.

The guide is illustrated to be relevant to all design and building professionals involved in building our future environments, including architects, engineers, the

development community, material suppliers, manufacturers, building inspectors, municipal officials and planners, project managers, contractors, innovators, and the general public at large.

Climate change response and emissions reduction strategy (Radicle)

The CWC has engaged a respected environmental commodities company out of Alberta called Radicle to develop a roadmap for climate leadership and build a comprehensive emissions strategy and net-zero framework. Radicle has become a trusted advisor to governments, corporations, and small and medium sized businesses in Canada; they bring decades of experience in carbon markets, carbon strategy and greenhouse gas (GHG) management for businesses.

Radicle will work closely with CWC staff, in an iterative process, to engage with key stakeholders about the benefit of using wood to mitigate climate change. Together, we will develop a plan for a multiyear program and ensure a pathway aligns with emission reduction opportunities for CWC and our member companies.

The CWC's Big Data Management Master Plan

Canadian Wood Council, through the Wood *WORKS!* Program have been working closely with public sector funders for over a decade. The work completed because of these partnerships has resulted in an impressive group of wood demonstration projects and program initiatives that are helping to transform the wood products industry. As digital technology continues to advance at the rapid pace we are experiencing, it will be important to establish the tools and digital resources required to effectively collect information and share the results with the greater marketplace.

To meet market growth objectives, share project success, and educate the market on what is possible, the CWC has recommended the creation of a new digital platform, database, and project directory that goes far beyond what is in place today. To fully engage the market, a new generation of interactive analytics and business intelligence tools will need to be developed that have national scale and scope.

A robust system, platform, directory of this nature must have the adaptive resources to ensure long-term relevance to the market and grow to meet demand. There is also potential for Canada's leadership in mass timber and wood construction to take a more dominant role in international efforts. The project outlined here will stand as Canada's voice in the growing global mass timber market. Together, NRCAN, our regional funding partners, and the CWC have the knowledge and leadership required to design, develop, manage, and maintain a new interactive tool that will stand as the national hub for excellence in wood building design and development. ■

“As our economy bounces back from the COVID-19 crisis, we want to do everything we can to support forest workers. By focusing on mass timber, we have an opportunity to transition the forestry sector to high-value over high-volume production. This will mean opportunities for local workers, strong partnerships with First Nations and greater economic opportunity while making a significant contribution to advancing CleanBC.”

—JOHN HORGAN, BC PREMIER

(Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development)

GLOSSARY OF TERMS

Building Information Modeling (BIM): A 3D modeling software specifically meant to aid in the design and construction of buildings. Architects, contractors and engineers use the software to visualize, design and coordinate the construction of a building end to end. BIM software is similar to computer aided design (CAD) and technically falls under the CAD umbrella, but the difference is that all the tools are for designing a building using both 2D and 3D modeling tools, allowing for the creation of construction documents and visualizations.

Biophilia: The innate human instinct to connect with nature and other living beings.

Biophilic Design: A concept used within the building industry to increase occupant connectivity to the natural environment through the use of direct nature, indirect nature, and space and place conditions.

Biomimicry: In architecture and manufacturing biomimicry means designing buildings and products to mimic or co-opt naturally occurring processes.

Environmental Product Declarations (EPD): A document that transparently communicates the environmental performance or impact of any product or material over its lifetime.

Integrated Design Process (IDP): An interdisciplinary design approach with the emphasis on collaboration. All the stakeholders involved in the project met during the design of the plans and specifications to develop optimum solutions for each discipline. This is a comprehensive process that concentrates as much on design, construction and operation as on the occupancy of the building.

Integrated Project Delivery (IPD): An approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and construction.

Lifecycle Assessment (LCA): A methodology for assessing environmental impacts associated with all the stages of the lifecycle of a commercial product, process, or service.

Lifecycle Cost Analysis (LCCA): A method for assessing the total cost of a project, product, or process over its lifetime. Thus, LCCA accounts for all cost considerations, including: capital investment, purchase, installation, as well as future costs related to energy, operations, maintenance, repair, financing and disposal costs.

Mass Timber: Engineered wood products made of large, solid wood panels, columns, or beams for use as load-bearing wall, floor, and roof assemblies. It is typically formed and engineered for high strength through lamination, fasteners, or structural adhesives.

Offsite Construction: According to the National Institute of Building Sciences (NIBS), offsite construction involves planning, designing, fabrication, and assembly of a building at a location other than the actual area for rapid assembly at the site. Unlike traditional construction, offsite construction is less time consuming, sustainable, safe, cost efficient, and flexible. Structures are manufactured in a controlled environment and are transported to the actual site, allowing for increased quality control, which is not possible in case of on-site or traditional construction. Prefabrication and modular construction are systems under offsite construction. It is suggested that using offsite construction methods for timber construction should be adopted consistently as part of a systems approach.



Acknowledgments

As the Canadian Wood Council's Senior Manager of Marketing & Communications, I am thrilled to present the Mass Timber Industry Roundtable and this accompanying Market Report.

The Canadian Wood Council has proudly supported the wood industry since 1959 and is well positioned to promote mass timber on behalf of our 14 members and the greater low carbon construction industry.

For years, the CWC has been recognized for developing quality and trusted technical and educational content and events, in support of market growth and knowledge sharing.

This event was thoughtfully designed to stand out from our standard initiatives, marking our intention to further our collaborative efforts across the building and construction sectors. Through the conversations, lessons, and perspectives shared at the Mass Timber Industry Roundtable, the CWC is in a better position to inform the greater industry on relevant and needed education, programming, and campaigns.

We are looking forward to hosting the bi-annual Mass Timber Industry Roundtable for the next 3 years and hope to see you at the next event!



Barbara Murray,
Senior Manager Marketing & Communications
Canadian Wood Council



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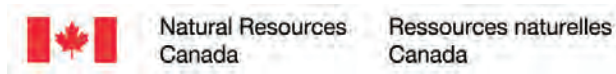


Roundtable Photographer

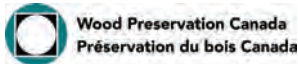
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MARKET REPORT 2022
