

The US Wood Products Industry: Facilitating the Post-COVID Recovery

Introduction

Chair Spanberger, Ranking Member LaMalfa, and Members of the Committee, thank you for the opportunity to testify today. My name is Iain Macdonald and I serve as the Director of the TallWood Design Institute (TDI), a unique collaboration between the Colleges of Forestry and Engineering at Oregon State University and the College of Design at University of Oregon.

TDI carries out applied research, works in partnership with industry on product development and testing, and offers education and outreach to current and future designers, builders and manufacturers. Our mission is to conduct the science that can open up viable new applications for the use of wood in the built environment and to disseminate the results of that work efficiently to stakeholders in the public and private sectors. The data we generate is used to validate designs for innovative new buildings, evolve building codes, increase the knowledge of design and construction practitioners, and help U.S. manufacturers develop and launch new products and compete effectively in domestic and export markets. Our work focuses heavily on a new breed of engineered wood products collectively known as mass timber, which can make use of small-diameter logs that can be sourced from sustainably managed forests and forest restoration projects, and contribute to the reduction of greenhouse gases and wildfire risk.

The US Wood Products Sector and COVID Impacts

The forestry and wood products sector is a major contributor of employment and GDP to the national economy. Overall, forest products comprised about 1.5% of the total U.S. economy in 2018, supported almost 3 million jobs, and represented about 5% of the entire manufacturing output of the country. The sector is particularly important to the hundreds of rural communities in which processing facilities are located, from the Pacific Northwest to the Southeast. Importantly, the forest sector in the US is one of the only significant economic sectors with net negative carbon emissions, making wood products the most climate-sensitive structural building material available today.

During the COVID-19 pandemic, most forestry and wood product manufacturing businesses stayed open as essential services, but there were still significant impacts to this sector. The need to implement safety and social distancing protocols in plants resulted in temporary shutdowns and lower concentrations of staff in certain spaces, both of which decreased productivity. Delivery logjams further constrained supply. Lumber producers anticipated reduced housing demand in the early days of the pandemic and decreased production levels accordingly. Broadly, the industry has faced these lumber supply constraints while also experiencing high demand for lumber for remodeling and renovation work, which has caused a record spike in prices.

Outside of the supply of lumber for single-family homes, the mass timber product industry experienced reduced demand when some commercial office and hotel projects that would have used mass timber were put on hold or cancelled altogether. Additionally, uncertainty around the extent to which remote employees will return to offices continues to impact the commercial construction sector. In the pulp and paper sector there were some mill closures due to a lack of

demand for high-quality paper for events, programs, etc. And, critically, the logging industry lost approximately \$1B of revenue.

Wood as a Tool to Sustainably Rebuild our Infrastructure and Economy

Wood is the only major building material that can be renewed and regrown. The capacity to process this basic material into engineered products with reliable and predictable strength and performance attributes has undergone a renaissance of late. A family of relatively new engineered products, known as mass timber, is facilitating a sea change in sustainable construction around the world. The characteristics of these products allow wood, which has typically been restricted to single-family homes and low- and mid-rise multifamily dwellings, to be used in buildings that are larger and taller than ever before.

Wood fell out of favor as a building material in office, institutional and commercial buildings around 100 years ago, as concrete and steel became dominant. At the time there were justifiable concerns about wood use in these types of structures, relating to fire, structural strength and seismic resilience. Today this landscape is radically different. Mass timber products are precision-engineered and robotically-fabricated to offer specific strength and stiffness characteristics, depending on where they are needed in a building and what loads they must bear. Modern fire suppression and alarm systems have greatly improved fire safety, and mass timber beams, columns and panels are supplied in large cross-sections, meaning that the face of the wood element will char at a slow, predictable rate, while insulating the core structure and preserving its load-carrying capacity. All of this has been empirically validated through applied research at our major universities and institutes, due in large part to investments made to and through the USDA Forest Service, Forest Products Lab, and Agricultural Research Service.

As a result of this work, we are continually pushing the boundaries of what is possible with wood. In 2015, with support from researchers at OSU, Oregon was the first state to start producing cross-laminated-timber panels certified for use in buildings. This product can be fabricated in large dimensions up to 12 feet by 60 feet for wall and floor applications, and is a game-changer in terms of construction speed and efficiency. As a result, Oregon became home to many of the nation's earliest mass timber buildings. A vibrant cohort of pioneering architects, engineers and construction firms have emerged in the state, with expertise that is now in demand across the country. In Milwaukee, Wisconsin, a 25-story mass timber apartment building named Ascent will shortly become the tallest wood building in the world, at 284 feet, with the timber engineering, fabrication and installation performed by a company in Portland, Oregon.

In the last five years, the rate of adoption of mass timber in the United States has been dramatic. In 2013, there were less than five construction projects started. In 2020 more than 100 projects commenced, and as of June 2021, 1,169 mass timber buildings had been constructed or were in design, with projects in all 50 states. Manufacturing capacity has expanded in lockstep, from just one U.S. production facility in 2015 to nine today¹. These are now bringing high-value jobs back to rural communities, from Colville, Washington to Dothan, Alabama.

This progress is impressive for a new-to-the-US construction technology, but mass timber buildings still represent a tiny fraction of U.S. real estate that is built each year. There are currently just over five million square feet of mass timber buildings in the nation, but in 2019 there was 93 billion

square feet of commercial building space". The U.S. has the capacity and know-how to significantly ramp up the number of mass timber structures, and there are compelling reasons for doing so.

The manufacturing processes for timber products have a significantly lower carbon footprint than those for concrete and steel. Furthermore, the carbon naturally sequestered in wood is stored within the building for its lifetime, and the wood components have the potential to be recycled and given a second life afterward. The lighter strength-to-weight ratio also means that less concrete is needed in the foundations. All these things are important, given that the general scientific consensus is that the warming effects of CO2 emissions will be irreversible unless we can achieve significant reductions by 2030.

Currently 40% of U.S. greenhouse gas emissions are derived from the construction and operation of buildings. Efforts to improve the thermal insulation of windows, doors and walls to reduce the energy consumed for heating and cooling are laudable, but these alone will be insufficient to achieve reduction targets. Mass timber building can further advance efforts to achieve measurable new gains in the sector and nation's carbon reduction efforts. As soon as we construct a mass timber building we immediately avoid emissions. For example, District Office, a 6-story office building in Portland, avoided 750 tons of carbon emissions by using timber instead of concrete, the equivalent of taking 570 cars off the road for a year. The amount of timber used to build it took Oregon's forests just 21 minutes to grow.

Research is Driving the Expanded Use of Sustainable Wood Products

Research and development are driving innovation and adoption of mass timber products and modern wood construction. The work that is ongoing at TDI and other institutions aims eliminate a number of key barriers to wood use, as well as learning more about how we can enhance technical, sustainability and cost performance. We already know that mass timber buildings, when designed correctly, can deliver fire and seismic safety on par with any concrete or steel structure. However, further research is critical to help our industry drive down the cost of doing that, while at the same time optimizing fiber use and allowing mass timber to be implemented on a broad scale.

At TDI, we are putting data into the public domain on fire, seismic, structural and acoustic performance of tall wood buildings, so that more architects and engineers have the tools and confidence they need to effectively design them and contractors have the know-how to build them. And the research goes beyond the wood itself. We are testing different kinds of connectors and assemblies to find out which ones offer the best combinations of cost-efficiency, strength, fire resistance, moisture protection and acoustic separation. We are working on termite-resistant CLT for Hawaii and the southern states, and energy-efficient structural panelized systems for use in Alaska. Along the way we are even learning important things about the psychological and physiological benefits of wood in our indoor environments, which have important ramifications for wellness and disease control.

All of this work involves a high degree of collaboration, both across university research institutions and between the public and private sector. Early next year, ten universities, twenty companies and the USDA Forest Products Lab will be working together to test a 10-story mass timber building on the shake table at UC San Diego. The test will yield a treasure trove of new information about the behavior of these buildings in earthquakes, enabling us to further optimize their performance.

The USDA Agricultural Research Service, the Forest Products Lab and the US Forest Service have been invaluable partners for our own research at TDI. Since 2015 their support has enabled our affiliated researchers to launch more than 50 research projects and acquire state-of-the-art technical equipment that is helping us train our manufacturers in critical new skills like computer-aided design and fabrication. The leadership and financial contributions of these agencies have been matched 200% by state and private-sector support, and industry has worked hand in hand with our researchers to identify the applied research projects that can generate tangible market impacts in a three-to-five-year timeframe. This year we launched the REACTS Consortium for Research on Engineering, Architecture and Construction of Timber Structures. The organization consists of pioneering firms in those industry sectors who are partnering with us and pooling cash contributions and technical expertise to jointly drive the innovation agenda. Notably, work at OSU funded by the Economic Development Administration directly resulted in the launch of a first-in-the-world mass timber product – the Mass Plywood Panel – by Oregon’s Freres Lumber Company, and their investment in a \$40M greenfield manufacturing facility.

Mass timber innovations can play a positive role in our nation’s rebuilding in other ways too. TDI is working hard to evaluate the viability of using under-utilized species in these products, and research is underway already to test the strength properties of ponderosa pine, white fir and Alaskan spruce for use in CLT. Each year sees our forestlands and the communities in proximity to them increasingly threatened by wildfire. By selectively thinning these overstocked forests and using the restoration fiber in our buildings we can simultaneously reduce fire risk, improve the safety of humans and property, and support high-value jobs in rural communities as well as design and construction jobs in urban centers.

Two innovative projects in Oregon seek to embrace opportunities for developing wood products made with under-utilized species while at the same time tackling the housing affordability crisis that plagues many of our major cities. Their aim is to design kit-of-parts housing systems using domestic mass timber that can be prefabricated in a factory and deployed in high volume and at low unit cost to communities in need – whether these are urban centers addressing homelessness, rural communities ravaged by fire or other natural disasters, or working families caught in the ‘missing middle’ who cannot afford to move from rental housing into their own homes. The projects exploit the rapid assembly advantages of mass timber and utilize design principles that enable disassembly and reuse at end of life, helping to further extend the sustainability of these structures. What has been particularly invigorating about these projects is the momentum and determination of all involved to make a lasting impact on these challenges – from federal agencies like FEMA and EDA to Oregon state agencies and private firms.

Key Roles that Government can Play

The research funding and scientific leadership provided through the USDA Agricultural Research Service and the Wood Innovations Program has been pivotal in advancing the science around mass timber buildings, and TDI is grateful to the Subcommittee for its work in supporting these key agencies and their research programs. Continuing and expanding the support available for this critical applied research work will enable the innovative collaborations between research institutions, federal and state agencies and the private sector to make even greater impacts.

Support for workforce training and development will also be critical for the growth of the mass timber supply chain in the U.S. When firms move up the value chain from commodity products such as lumber to custom products such as mass timber, they pivot from a focus on producing products of low complexity and low variation in high volumes to a business model in which each component is designed for a specific place in a specific building. This typically means that those firms must train or hire for new digital skills such as 3D computer-aided-design and computer-controlled fabrication. The good news is that these digitally-oriented jobs are more likely to be appealing to young people than traditional physical work, provided that training is available. TDI is rolling out a certificate program on these topics for industry learners. However, it will be important to implement strategies to introduce these new careers to young people and encourage them to take them up, in particular among demographics that have not traditionally been associated with the forest industry.

And, regarding the Subcommittee's current efforts to consider priority needs for modern infrastructure investment, the INVEST in America Act includes some key investments in rail infrastructure that would help to address critical lumber supply chain constraints. For example, in Oregon, TDI completed a supply chain analysis last year that revealed existing rail infrastructure is serving as an impediment to growth, due to loading constraints on some bridges.

Lastly, I would like to encourage the Subcommittee to consider opportunities for incentivizing federal, state and municipal levels of government to accelerate adoption of green construction with the use of domestically-produced low carbon building materials. By stimulating domestic demand for products like mass timber, we can divert logs from offshore export to domestic processing, grow our manufacturing base and maximize the socio-economic benefits provided by each tree harvested. This is the best way to ensure that forests remain as forests.

In closing, thank you for the opportunity to testify today. I welcome the opportunity to answer any questions.

ⁱ 2021 International Mass Timber Report, Forest Business Network

ⁱⁱ US Energy Information Administration: Annual Energy Outlook 2020

Iain Sutherland Macdonald

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OVERVIEW

- Diverse portfolio of national and international experience in industry capacity-building, marketing, training and development, applied research management and economic development
- Multifaceted understanding of North America's mass timber sector
- Innovator with a track record of creative solutions in economic development, skills development and applied research
- Effective team leader, communicator and collaborator, experienced in successfully managing diverse teams of employees, contractors and partners across organizational and cultural boundaries

PROFESSIONAL HISTORY

Director, TallWood Design Institute (TDI), Corvallis, Portland and Eugene, OR (2016 to present)

I currently manage a unique interdisciplinary institute involving the Colleges of Forestry and Engineering at Oregon State University and the College of Design at the University of Oregon. TDI exists to foster and facilitate innovation in wood-based construction through applied research carried out in direct partnership with industry stakeholders throughout the mass timber supply chain. TDI also offers Masters courses, non-credit certificate programs and professional development opportunities in many forms to architects, structural engineers, manufacturers, construction professionals and building code officials. Our role provides economic development leadership to the State of Oregon and plays a prominent role in national R&D efforts. As founding Director, my role has involved onboarding and training a diverse technical and outreach team, bringing a \$12M technical lab onstream, developing academic and professional relationships throughout the US and internationally, jump-starting a diverse outreach program, and securing significant political support, grants and other financial contributions.

Principal, Making Waves Consulting (2001 to present)

I have provided a wide range of consulting services to industry, the public sector and NGOs, including: conducting peer reviews of mass timber designs; authoring proposals for major government grants; evaluating the adaptive capacity of communities to respond to climate change in Jamaica and Lesotho; creating climate change training and development programs, and; conducting train-the-trainer activities.

Managing Director, Centre for Advanced Wood Processing, University of British Columbia, Vancouver BC (2007-2016)

As Director of Canada's National Centre for Advanced Wood Processing, I led training and development activities that involved technical staff, researchers, external consultants and academics across the world. I managed a state-of-the-art laboratory facility that provided training, product development and prototyping services to manufacturers. We created and ran a diverse range of training, outreach and technical support activities. I provided administrative, financial, strategic and operational leadership to Centre staff and oversaw the planning and marketing of applied R&D and technical assistance services to the private sector.

Associate Director, Centre for Advanced Wood Processing, University of British Columbia, Vancouver BC (2001-2007)

Developed and delivered major training programs for wood products manufacturers, coordinated international skills training projects and managed a network of external relationships with educational institutions, industry associations and stakeholders throughout Canada and internationally.

Events Manager, Centre for Advanced Wood Processing, University of British Columbia, Vancouver BC (1999-2001)

Planned and marketed training programs, technical forums and international conferences for wood industry audiences throughout Canada and the USA. Negotiated sponsorship agreements and supplier contracts, recruited content experts, supervised and evaluated staff.

Director of Export Sales, Merit Kitchens, Vancouver BC (1996-1998)

Developed and serviced export sales accounts in Asia, conducted sales and marketing activities in Japan and other overseas markets. Designed and monitored promotional campaigns, created advertising copy and communications collateral. Conducted market research and competitor analyses, led new product development efforts for specific offshore end users and managed after-sales service functions.

Outbound Department, Japan Travel Bureau International, Vancouver BC (1995-1996)

Coordinated and marketed wholesale and retail sales of customised tours to Japan with a focus on group and corporate travel. Managed high-volume corporate accounts.

Co-Director, Aida Residential English Seminar, Okayama, Japan (1993 and 1994)

Planned and managed annual seven-day residential language seminar. Created innovative educational content, designed event program, hired, supervised and evaluated teaching staff.

Lecturer, English Faculty, Sanyo University, Okayama, Japan (1992-1994)

Devised and delivered international education program with focus on communicative skills. Created original curriculum and oral evaluation system, advised Japanese faculty on college program development.

English Language Consultant, Okayama, Japan (1992 -1993)

Established and ran language instruction company while pursuing own Japanese language studies. Created and utilized original instructional materials.

President, Association of the Japan Exchange and Teaching Program, Okayama Chapter (1991-1992)

Worked with education officials and foreign instructors to maximize effectiveness of JET Program in Okayama region, Japan. Organized and chaired educator meetings, edited newsletter and provided support services and professional development opportunities for foreign instructors. Planned and conducted onboarding seminars for new instructors, served as official Okayama representative at national conferences.

English Teacher, Japan Exchange and Teaching (JET) Program, Okayama, Japan. (1990-1992)

Conducted English communication classes, assisted in development of classroom-based and electronic curriculum, acted as teaching consultant. Established annual residential English immersion program.

ADDITIONAL PROFESSIONAL ACTIVITIES

Innovation and Entrepreneurship Fellow, Oregon State University (2017 – present)

Chair, Oregon Mass Timber Industry Supply Chain Analysis Project, Portland, Oregon (2020)

Conference Chair, Oregon Mass Timber Industry Summit, Salem, Oregon (2019)

Conference Steering Committee, Industrialized Wood-based Construction Conference, Boston, MA (2018)

Conference Steering Committee, International Mass Timber Conference, Portland, Oregon (2016, 2017)

Member, International Programs Advisory Committee, College of Forestry, Oregon State University (2018 – present)

Director and Past Chair, Human Resources Sector Council for the Advanced Wood Products Manufacturing Industries (WMC) (board member 2007- 2017 Chair 2014-2016)

Chair, Faculty of Forestry Learning Technologies Committee, University of British Columbia (2005 – 2009)

Member and Chair, Programme Advisory Committee, Bachelor of Technology in Manufacturing Programme, British Columbia Institute of Technology (2004 – 2009)

Business Development Consultant, Nipponart.com (2002)

Freelance Translator – General and Technical Translation Services, Torikoshi & Macdonald (1997-1998)

SELECTED PROJECTS

Seedlings to Shelters (2021)

TDI team lead on multi-organization project to produce high-volume affordable modular timber housing utilizing West Coast restoration fiber.

REACTS Consortium for Research on Engineering, Architecture and Construction of Timber Structures (2020-present)

Set up a first-of-its-kind industry consortium to fund, plan and drive innovation in timber construction, involving 17 leading architecture, engineering and construction firms from North America and Europe.

Oregon Mass Timber Supply Chain Analysis (2020)

Carried out a detailed analysis of Oregon's supply chain to identify growth opportunities and constraints and inform future state policy decisions and actions.

Certificate Program in Mass Timber Manufacturing and Construction, Oregon State University (2018-present)

Creating a flexible blended learning program for workforce development covering digital design and fabrication, quality assurance, and mass timber construction.

Climate Change Action Training in Jamaica (2013 and 2015)

Undertook consultative needs analysis process and created training packages on climate change adaptation and mitigation for Jamaican communities and students. Led training-of-trainers workshops (Funding: US Agency for International Development).

Wood Products Processing Industry Capacity-Building in South Africa (2004-2010)

Managed a \$2M Canadian International Development Agency-funded project to develop new workforce training capacity for university, polytechnic and industry training institutions in South Africa. Coordinated Canadian and South African teams, managed finances, operations, monitoring and reporting. Developed a suite of e-learning and classroom courses for B.Sc. degree and industry training use, contributed to National Diploma curriculum, provided faculty member training, leveraged funding from public sector and other agencies, negotiated exchange agreements, created recruiting and marketing strategies, trained recruitment officers. Led outreach activities in Ghana, Morocco and Kenya to develop delivery partners throughout Africa.

National Management Skills Training Program for Canada's Wood Products Manufacturing Industry (2008-9)

Led a multi-institutional project team to develop a modular e-learning/mobile learning program and a factory-floor cross-training program to train entrepreneurs and management-track employees (Funding: Human Resources & Social Development Canada).

Industrial Design Education for the South African Furniture Industry (2007-10)

Coordinated industry-driven project to create Diploma program in industrial design and training of in-country instructors in partnership with Emily Carr University, Canada (Funding: Forest Industries Education & Training Authority, South Africa).

SELECTED CONFERENCE PRESENTATIONS

The Evolving North America Mass Timber Sector. Keynote address, Forest Products Society 2020 Annual Conference, Online (2020)

Mass Timber Design and Construction: What we're Learning from Research. American Institute of Architects Annual Conference, Las Vegas, NV (2019)

From Gastown to Stumptown: Rise of the Pacific Northwest as North America's Mass Timber Hub. International Mass Timber Conference, Portland, OR (2019)

Wood Construction: The Role of Research and Education in Overcoming Barriers to Growth. Keynote address, UN Economic Commission for Europe/FAO Annual Conference on Forestry and Forest Products, Vancouver, British Columbia (2018)

Addressing Evolving Skills for Industrialized Construction. Industrialized Wood-based Construction Conference, Boston, MA (2018)

From Fiber to Buildings: Understanding the Design and Performance of Mass Timber Structures. CONSTRUCT 2018, Long Beach, CA (2018)

Building Bigger, Taller and Smarter with Wood. Leadership Forum, International Woodworking Fair, Atlanta, GA (2018)

Mass Timber Construction in the USA: Lessons from Recent Research. Building Innovation 2018 – Sustain, Strengthen, Secure, National Institute of Building Sciences Annual Conference, Washington DC (2018)

Building Bigger, Taller and Smarter with Wood. Keynote Address, UN Economic Commission for Europe/FAO Annual Conference on Forestry and Forest Products, Warsaw, Poland (2017)

Earthquake-Resilient Mass Timber Construction. Keynote Address, Expo Edifica 2017, Santiago, Chile (2017)

The Role of Universities in Supporting Mass Timber Market Development. Oregon Mass Timber Summit, Portland, Oregon (2017)

Canada's Forest Industry. Testimony to the Standing Committee on Natural Resources, House of Commons, 41st Parliament of Canada (2015)

Integrating Traditional and Technology-based Approaches to Training in the Workplace: the Current State of Play in North America. 10th International Conference on Technology, Knowledge & Society, Madrid, Spain (2014)

Marketing Using the Internet and Social Media. Presentations for industry at various conferences, Toronto, Vancouver, Victoria and Kamloops (2011-12)

Evaluating the Viability of Mobile Learning to Enhance Management Training. MLearnCon, San Diego (2010)

Using Mobile Internet Technology to Support and Deliver Lifelong Learning. 9th UBC Learning Conference, Vancouver, Canada (2009)

Mobile Learning for Management and Technical Education. Pacific Northwest Wireless Summit, Vancouver, Canada (2009)

Using E-learning to integrate Professional and Undergraduate Learning: Creating Pedagogical and Operational Synergies Online. International Conference on Learning, University of Illinois, Chicago (2008)

Tailoring Training Delivery to Manufacturers' Needs. Recruiting, Training and Retaining the Right Employees Conference, Toronto, Canada (2007)

E-Learning as a Corporate Training Tool: Pedagogical Approaches and Learner Support. e-Learning Africa Conference, Nairobi, Kenya, (2007)

Strengthening the Forestry and Wood Products Manufacturing Sector through E-learning: a Case Study of International Cooperation in Industry-Focused Education. e-Learning Africa Conference 2006, Addis Ababa, Ethiopia, (2006)

Implementing a Mixed-Mode Course in Advanced Manufacturing Education: Challenges, Benefits and Lessons Learned. E-Strategy Conference, University of British Columbia, Vancouver, Canada (2005)

Lifelong Learning in the Advanced Wood Processing Industry. Human Resources in the Advanced Wood Products Sector – Issues and Possible Solutions Conference, Kitchener, Canada (2003)

SELECTED PUBLICATIONS

Macdonald, I. (2016). Integrating Traditional and Technology-based Approaches to Training in the Workplace: The Current State of Play in North America. *Journal of Technologies in Society, Volume 12, Issue 1, February 2016, pp.13-24.*

Macdonald, I. & Chiu, J. (2011). Evaluating the Viability of Mobile Learning to Enhance Management Training. *Canadian Journal of Learning & Technology, 37 (1).*

Macdonald, I. & Evans, P.D. (2010). Integrating and Enhancing Professional and Undergraduate Education using Blended Learning. In J. Westover (Ed.), *Training the Next Generation of Knowledge Workers: Effective Secondary Education and Workplace Learning Practices to Drive Enhanced Workforce Competitive Advantage in a Global Economy.* (253-267). Common Ground Publishing, Victoria, Australia.

Macdonald, I., Bullen, M. & Kozak, R. (2010). Learner Support Requirements for Online Workplace Training in the South African Furniture Industry. *Journal of Asynchronous Learning Networks 14, (3).*

Evans, P., Macdonald, I., Rypstra, T., Mortimer, J. and Wessels, B.(2010). South Africa's wood processing industry education strategy: a north south partnership to develop a globally competitive workforce for the 21st century. *International Wood Products Journal 1 (1).*

Macdonald, I. & Evans, P.D. (2008). Integrating Professional and Undergraduate Education using Blended Learning: Creating Pedagogical and Operational Synergies Online. *International Journal of Learning 15 (8), 85-94.*

Macdonald, I., Bullen, M. & Kozak, R. (2007). Identifying Effective Pedagogical Approaches for Online Workplace Training: A Case Study of the South African Wood Products Manufacturing Sector. *International Review of Research in Open and Distance Learning 8 (3).*

Various articles on training and development, Crosscut Magazine (2001 – 2004).

Cohen, D. & Macdonald, I. (2001). Trends and Changes in Japanese Building Regulations, *CMHC, Ottawa.*

Cohen, D., Macdonald, I. & Kozak, R. (2001). The Japanese Distribution System for Finished Building Products: In Transition. *Forest Renewal BC, Victoria, BC.*

EDUCATION

- **Master of Science**, (Focus area: technologies to support professional and workforce training)
University of British Columbia, 2006
- **Certificate in Internet Marketing**, University of British Columbia, 2001
- **Diploma of Marketing Research Society of Great Britain**, 1990
- **Bachelor of Arts with Honours, Marketing**, University of Stirling, Scotland, 1990

OTHER PROFESSIONAL DEVELOPMENT

- **University of British Columbia** –various professional development workshops: SEO, Social Media Marketing; Advanced HTML Concepts & Practices; Introduction to Facilitative Leadership; Project Management, and others (1999 – 2011)
- **Member, Toastmasters International** (2002-2004)
- **Member, International Internet Marketing Association** (2001-2003 and 2011-2013)
- **Centre for Teaching and Academic Growth, UBC**: various seminars on instructional design, improving face to face learning with technology, learning management systems, online tools and instructional methods (2002-2005)
- **Japanese Business Letter Writing course**, Simon Fraser University (1996)
- **International Japanese Proficiency Examinations**, advanced levels (1991 & 1993)

LANGUAGES

- **English, Japanese** - fluent
- **German** - basic

**Committee on Agriculture
U.S. House of Representatives
Information Required From Nongovernmental Witnesses**

House rules require nongovernmental witnesses to provide their resume or biographical sketch prior to testifying. If you do not have a resume or biographical sketch available, please complete this form.

1. **Name:** Iain Macdonald _____
2. **Organization you represent:** TallWood Design Institute, Oregon State University _____
3. **Please list any occupational, employment, or work-related experience you have which add to your qualification to provide testimony before the Committee:** _____
I am the Director of the TallWood Design Institute at Oregon State University and was previously Managing Director of the Centre for Advanced Wood Processing in BC, Canada. I have also chaired the Wood Manufacturing Council in Canada and have worked in roles in or supporting the wood products manufacturing industry for 25 years.

4. **Please list any special training, education, or professional experience you have which add to your qualifications to provide testimony before the Committee:** _____
Aside from the abovementioned experience I hold an Honors degree in Marketing and a Master of Science degree in workforce skills development using technology-based learning
5. **If you are appearing on behalf of an organization, please list the capacity in which you are representing that organization, including any offices or elected positions you hold:**
I am appearing as a representative of the TallWood Design Institute, a department within the College of Forestry at Oregon State University _____

PLEASE ATTACH THIS FORM OR YOUR BIOGRAPHY TO EACH COPY OF TESTIMONY.

Truth in Testimony Disclosure Form

In accordance with Rule XI, clause 2(g)(5)* of the *Rules of the House of Representatives*, witnesses are asked to disclose the following information. Please complete this form electronically by filling in the provided blanks.

Committee: Agriculture

Subcommittee: Conservation and Forestry

Hearing Date: 07/21/2021

Hearing Title :

The U.S. Wood Products Industry: Facilitating the Post COVID-19 Recovery

Witness Name: Iain Macdonald

Position/Title: Director

Witness Type: ☐ Governmental ☒ Non-governmental

Are you representing yourself or an organization? ☐ Self ☒ Organization

If you are representing an organization, please list what entity or entities you are representing:

TallWood Design Institute, Oregon State University

FOR WITNESSES APPEARING IN A NON-GOVERNMENTAL CAPACITY

Please complete the following fields. If necessary, attach additional sheet(s) to provide more information.

Are you a fiduciary—including, but not limited to, a director, officer, advisor, or resident agent—of any organization or entity that has an interest in the subject matter of the hearing? If so, please list the name of the organization(s) or entities.

No

Please list any federal grants or contracts (including subgrants or subcontracts) related to the hearing's subject matter that you, the organization(s) you represent, or entities for which you serve as a fiduciary have received in the past thirty-six months from the date of the hearing. Include the source and amount of each grant or contract.

Oregon Forest Resources Institute – US Forest Service (Prime): Forging Links Between Land and People (\$176,000)
US Endowment for Forest and Communities, Inc. – US Forest Service (Prime): Mass Timber on a New Stage: Oregon State University Arts and Education Complex (\$100,000)
US Forest Service: Industry-Responsive Technical Testing for Mass Timber Products and Buildings (\$250,000)

Please list any contracts, grants, or payments originating with a foreign government and related to the hearing's subject that you, the organization(s) you represent, or entities for which you serve as a fiduciary have received in the past thirty-six months from the date of the hearing. Include the amount and country of origin of each contract or payment.

None

Please complete the following fields. If necessary, attach additional sheet(s) to provide more information.

- ☒ I have attached a written statement of proposed testimony.
- ☒ I have attached my curriculum vitae or biography.

* Rule XI, clause 2(g)(5), of the U.S. House of Representatives provides:

(5)(A) Each committee shall, to the greatest extent practicable, require witnesses who appear before it to submit in advance written statements of proposed testimony and to limit their initial presentations to the committee to brief summaries thereof.

(B) In the case of a witness appearing in a non-governmental capacity, a written statement of proposed testimony shall include— (i) a curriculum vitae; (ii) a disclosure of any Federal grants or contracts, or contracts, grants, or payments originating with a foreign government, received during the past 36 months by the witness or by an entity represented by the witness and related to the subject matter of the hearing; and (iii) a disclosure of whether the witness is a fiduciary (including, but not limited to, a director, officer, advisor, or resident agent) of any organization or entity that has an interest in the subject matter of the hearing.

(C) The disclosure referred to in subdivision (B)(iii) shall include— (i) the amount and source of each Federal grant (or subgrant thereof) or contract (or subcontract thereof) related to the subject matter of the hearing; and (ii) the amount and country of origin of any payment or contract related to the subject matter of the hearing originating with a foreign government.

(D) Such statements, with appropriate redactions to protect the privacy or security of the witness, shall be made publicly available in electronic form 24 hours before the witness appears to the extent practicable, but not later than one day after the witness appears.