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Skills needs for mass timber production and adoption in British Columbia

Summary for policymakers

PLACE Centre
Smart Prosperity Institute

Future Skills Centre
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The Smart Prosperity Institute is Canada's largest policy think tank and global research network focused on the environment and the economy. Based at the University of Ottawa, we deliver world-class research and work with public and private partners to advance practical policies and market solutions for a stronger, cleaner economy.

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The Future Skills Centre (FSC) is a forward-thinking centre for research and collaboration dedicated to driving innovation in skills development so that everyone in Canada can be prepared for the future of work. We partner with policymakers, researchers, practitioners, employers and labour, and post-secondary institutions to solve pressing labour market challenges and ensure that everyone can benefit from relevant lifelong learning opportunities. We are founded by a consortium whose members are Toronto Metropolitan University, Blueprint, and The Conference Board of Canada, and are funded by the Government of Canada's Future Skills Program.

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Skills needs for mass timber production and adoption in British Columbia

Stakeholders across British Columbia (BC) are exploring the potential of mass timber, an engineered wood product used as a building material, as a source of economic growth, employment, and investment in an industry which has seen a recent decline. Proponents claim that mass timber solutions may provide opportunities to contribute to the decarbonization of buildings, speed up the construction of new housing, and create jobs in the province's forestry, manufacturing, design, and construction sectors.[1]

These solutions are already being developed by eight mass timber manufacturing facilities in the province today, contributing to many of the 352 mass timber projects that have been built (or are under construction) within the province as of 2023.[2] Building off this momentum, the BC government projects the potential for ten new mass timber facilities in the province by 2035, creating an estimated 2,350–4,230 new jobs in forestry, manufacturing, technology and engineering, and design.[3] However, there is a great deal more research and examination needed to fully understand what mass timber will mean for BC, including analysis of the skills and jobs involved in the production, how this will incorporate with sustainability, climate, and biodiversity objectives as well as Indigenous ownership and reconciliation, and if it will actually lead to opportunities for skilled labour across BC.

This report focuses on one aspect of this discussion, namely, what are the skills changes needed for mass timber production and adoption in BC across the supply chain. Skills research helps understand changes in relative importance of occupations across the mass timber supply chain and the knowledge and abilities that are required by workers in these occupations.

Smart Prosperity Institute uses a combination of a place-based approach, literature reviews, stakeholder interviews, workshops and quantitative data analysis to map the skills gaps and their relative importance for each occupation across the mass timber supply chain in BC.

Developing the skills ecosystem for mass timber can generate employment for rural and resource communities seeking new economic opportunities. The decline in the forestry sector has adversely impacted many communities and the mass timber sector is currently receiving extensive attention as a solution to this decline. While there are a number of uncertainties around different aspects of the production and adoption of mass timber products in BC, such as access to sufficient fibre supplies, a lack of required transportation infrastructure, and unclear market demand for mass timber products, a key step is to understand how this emerging technology will change the skills needs of existing industries and how prepared workers are today to fill roles that may emerge in the coming years. This is not the only step needed to grow this sector, and while it is important to note that recent studies find that emissions from wood harvests are grossly underestimated,[4] understanding how to develop the skills ecosystem around mass timber is still a necessary step as the province considers how to support this potential opportunity.

Given the focus and attention by the BC government on mass timber, as seen in their *Mass Timber Action Plan*, the Smart Prosperity Institute (SPI) has explored the skills ecosystem required for this technology.[5] This brief, summarizing the output

of two research reports from the Smart Prosperity Institute (SPI) on skills and labour needs for BC's growing mass timber industry, captures the ideas, analysis, and recommendations put forward to examine the skills-related challenges and opportunities emerging around mass timber, as the provinces considers its approach to this sector.

This brief summarizes the research conducted for two reports published by SPI detailing skills and labour needs and challenges in BC's growing mass timber supply chain: *Framing BC's low-carbon future: Identifying the skills and workforce needs of British Columbia's growing mass timber sector*, and *Making mass timber in Northern BC: An evaluation of readiness of workers and policies for producing more mass timber products in Northeastern British Columbia*. Research for these reports was collected through a combination of surveys, interviews, and informal discussions with stakeholders across BC's mass timber sector and was supplemented by a literature review and quantitative analysis about future skills and knowledge needs for workers. Additionally, a virtual workshop bringing together mass timber stakeholders in BC, with a specific focus on Northern BC, was hosted to support discussions about the particular challenges the sector faced in each region. For more insights about the methodologies used to generate these findings, please refer to the appendices in *Framing BC's low-carbon future*.

Abbreviations

3D	Three-dimensional
BC	British Columbia
BCIT	British Columbia Institute of Technology
BIM	Building information modelling
CAD	Computer-aided design
CLT	Cross-laminated timber
DfMA	Design for Manufacturing and Assembly
GLULAM	Glue-laminated timber
NLC	Northern Lights College
SME	Small and medium-sized enterprise
SPI	Smart Prosperity Institute
UNBC	University of Northern British Columbia

How does mass timber differ from other available technologies?

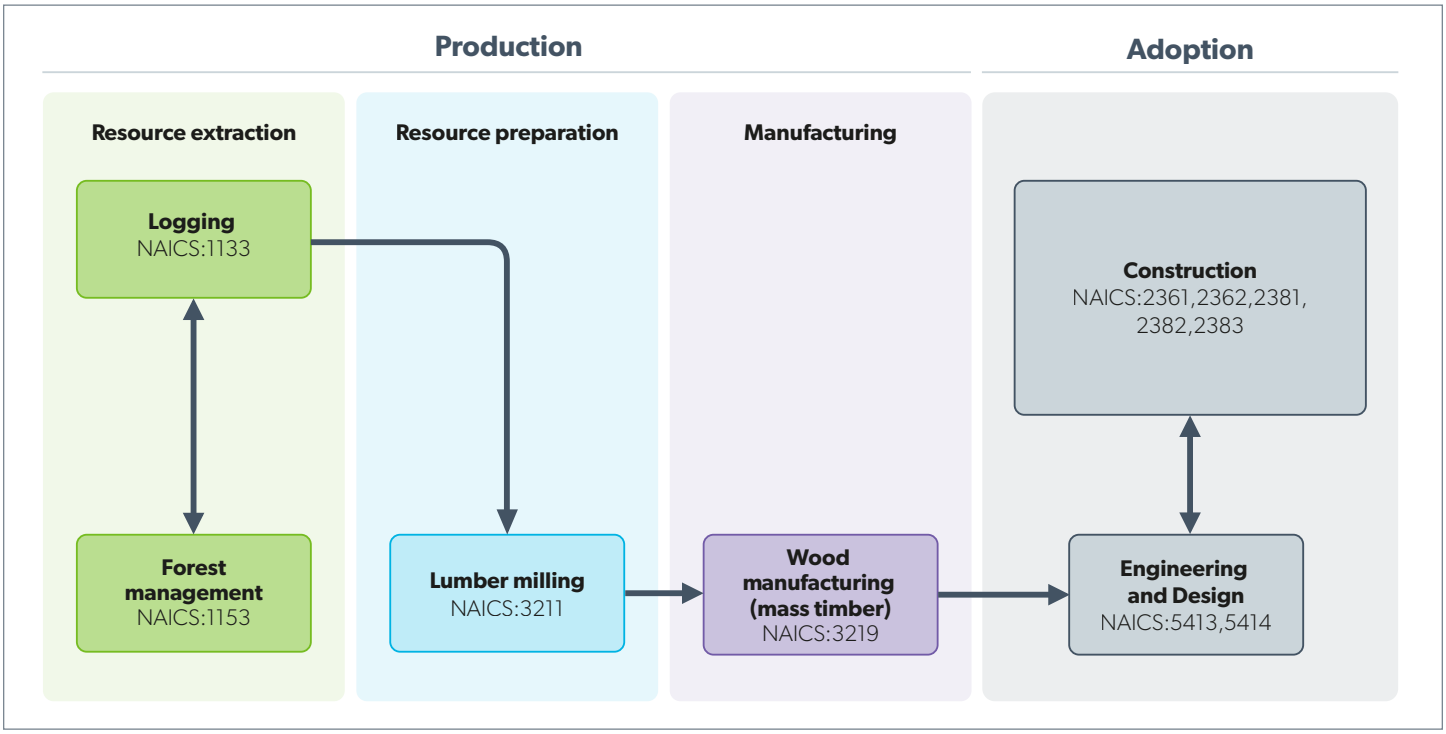
Skills and labour requirements for producing and adopting mass timber are based on the differences in technological requirements between mass timber and readily available alternatives, like steel and concrete. Mass timber products are "engineered wood products," which are comprised of thick, compressed layers of wood. Products include cross-laminated timber (CLT), glue-laminated timber (GLULAM), nail-laminated timber, and dowel-laminated timber. Many mass timber products are designed to be load-bearing, and their technical use ranges from individual homes to 18-storey commercial or residential buildings (the current height granted by the 2021 International Building Code).[6] Mass timber panels (the end-products developed through the manufacturing process) are manufactured off-site and then brought onto a construction site for assembly. Fabrication shops produce these panels to exact specifications, typically using digital tools such as robotic and computer numerical controlled machines. Computer numerical controlled machines also allow for pre-cutting openings, such as windows, staircases, and utilities. Most exterior and interior finishes can also be installed off-site, meaning that all mass timber components arrive at the construction site pre-built and may require only minor adjustments. On-site, the different elements are hoisted into place and connected with fastening systems such as bolts, screws, and nails, allowing for a fast and quiet construction process with only minimal disruption to the local area.[7] This production process stands in contrast with steel and concrete framed structures, which require more on-site construction beyond assembly and follow more conventional construction practices. Figure 1 below details the sectors impacted by mass timber in the production and installation process.

The three most produced products in Canada are GLULAM (with 13 production facilities), CLT (with eight production facilities), and laminated veneer lumber (with seven production facilities). Based on completed projects and manufacturing capacities, BC is currently leading in both the production and adoption of mass timber in Canada.[8]

How will this potential shift impact the skills workers need to work in these impacted sectors?

It is important to emphasize that the industries relevant to mass timber's supply chain will experience different impacts depending on the degree of production and/or adoption within the province. For these mass timber products, production refers to manufacturing panels, which involves forestry, transportation, and manufacturing, while adoption refers to using panels in buildings, which involves manufacturing, design, and construction. For example, in scenarios with high production volumes but low adoption in BC, we can expect substantial workforce impacts in resource extraction, resource preparation, and manufacturing, but limited impacts in construction and design. These scenarios will also require more conservation workers to ensure environmental and sylvicultural outcomes are consistent with broader sustainability and biodiversity objectives. Similarly, scenarios with high adoption but low production volumes in BC would see the majority of workforce impacts concentrated in the construction and design sectors, with a limited need for labour or skills changes in more upstream industries.

Figure 1. Overview of mass timber supply chain in British Columbia



If both production and adoption grow alongside each other, certain occupations within each supply chain segment will likely see increases in demand, especially those in manufacturing and machine operations. Jobs like woodworking machine operators, wood product processors, manufacturing managers, mechanical engineers, carpenters, and construction labourers will be impacted by the growth of this opportunity. Within the context of this shift, research identified that most of the roles that will be created as the industry changes already exist today. The workers involved in production and adoption will, therefore, need to upskill to add new skills or knowledge areas to their existing knowledge bases or potentially reskill from one occupation into another. Table 1 below summarizes some emerging skills needs and shows where the shifts will be most impactful within these sectors.

Table 1: Summary of occupations impacted by the growth of mass timber throughout the supply chain[9]

Occupation	Tasks traditionally performed	Change due to greater uptake of mass timber	The geographical region of employment
Lumber graders and other wood processing inspectors and graders	Inspect wood products and classify according to industry specifications	New industry classification for mass timber products, specific focus on the moisture content of wood	Mainland/Southwest (36.4%), Cariboo (19.2%, Thompson-Okanagan (15.7%)
Other wood processing machine operators	Run drying kilns to reduce wood moisture	Increase amount or intensity of the drying cycles to reduce wood moisture	Mainland/Southwest (33.9%), Thompson-Okanagan (27.1%), Cariboo (16.8%)
Woodworking machine operators	Use CNC machines to produce furniture, use glueing machines to join pieces of wood	More extensive use of digital tools, produce precise building components	Mainland/Southwest (48.8%), Thompson-Okanagan (16.5%), Vancouver Island/Coast (11.0%)
Other wood processing machine operators	Glue layers of wood to produce veneer and plywood	Produce stronger, thicker layers of wood using adhesive	Mainland/Southwest (33.9%), Thompson-Okanagan (27.1%), Cariboo (16.8%)
Supervisors, wood product processing	Supervise and manage workflow	Align work schedule with construction, increased knowledge of construction and design processes	Mainland/Southwest (26.6%), Cariboo (26.0%), Thompson-Okanagan (13.0%)
Manufacturing managers	Plan plant activities to meet production targets, plan resource use	Increased communication with external stakeholders (i.e., designers, construction managers, etc.), plan resource use under a 'just-in-time' approach	Mainland/Southwest (69.0%), Thompson-Okanagan (12.4%), Vancouver Island/Coast (10.9%)
Architects	Prepare building design, prepare building plans	Engage with manufacturers and construction professionals, prepare building design according to wood's structural properties	Mainland/Southwest (84.04%), Vancouver Island/Coast (10.7%), Thompson-Okanagan (4.2%)
Mechanical engineers	Design building heating and cooling systems	Engage with manufacturers and construction professionals, design mechanical systems according to the thermal properties of wood	Mainland/Southwest (75.6%), Vancouver Island/Coast (11.4%), Thompson-Okanagan (6.0%)
Electrical and electronic engineers	Design building electrical and power systems	Engage with manufacturers and construction professionals, design electrical systems according to the properties of wood	Mainland/Southwest (82.6%), Vancouver Island/Coast (8.7%), Thompson-Okanagan (5.4%)
Construction managers	Plan construction projects according to building design, oversee construction activities	Involved in the design stages, use of building information modelling (BIM), coordinate with designers and manufacturers	Mainland/Southwest (66.6%), Vancouver Island/Coast (13.6%), Thompson-Okanagan (11.9%)
Carpenters	Form building foundation, install floor beams, walls, and roofs	Provide inputs in the design process, assemble building components on site, increased precision in work, knowledge about wood and connectors	Mainland/Southwest (52.6%), Vancouver Island/Coast (21.2%), Thompson-Okanagan (13.5%)
Construction trade helpers and labourers	Load and unload construction material, support tradespersons and heavy equipment operators, mix various materials	Support moisture management, manage construction site for on-site assembly	Mainland/Southwest (62.0%), Vancouver Island/Coast (14.5%), Thompson-Okanagan (12.8%)

Occupation	Tasks traditionally performed	Change due to greater uptake of mass timber	The geographical region of employment
Plumbers	Install, maintain, and repair plumbing systems	Involved in design, coordination with engineers and manufacturers, precision in working with finished products	Mainland/Southwest (66.1%), Vancouver Island/Coast (14.8%), Thompson-Okanagan (10.6%),
Electricians	Install, maintain, and repair electrical and power systems	Involved in design, coordination with engineers and manufacturers, precision in working with finished products	Mainland/Southwest (60.1%), Vancouver Island/Coast (17.3%), Thompson-Okanagan (13.2%)
Heating, refrigeration and air conditioning mechanics	Install, maintain, and repair heating and cooling systems	Involved in design, coordination with engineers and manufacturers, precision in working with finished products	Mainland/Southwest (61.5%), Thompson-Okanagan (17.3%), Vancouver Island/Coast (13.8%)

What will be required of the workforce to learn these new skills?

As workers, employers, and employment stakeholders consider what is needed to help workers learn new skills, a few key points will be important to remember:

Stakeholders expect mass timber to grow, but there is uncertainty around the growth trajectory.

Overall, stakeholders we engaged with through this research expressed great confidence that mass timber will experience further growth. However, there is uncertainty around the growth trajectory. A majority of survey respondents (57%) believe that mass timber will experience slow but steady growth in BC. The remaining (43%) believe that mass timber will quickly overcome the challenges limiting its growth, such as building codes restricting its usage and uncertainty from financiers (including banks and insurance companies, who often see mass timber projects as being riskier than traditional alternatives). It is also important to remember that unchecked growth with mass timber as a building material may adversely affect forests ecology and biodiversity, and that the climate benefits of mass timber are still uncertain. Therefore, any growth of mass timber must be carefully balanced with a greater understanding of its impact on BC's climate and sustainability objectives.

Opportunities exist for upskilling workers from other industries so that they become more acquainted with the properties of advanced wood manufacturing.

For example, while workers from other industries (such as metal or plastic processing) can operate computer numerical controlled machines to produce prefabricated structures with precision dimensions, they lack experience working with wood (or engineered wood) as a production material. They also lack knowledge of construction and wood adhesion. This example of specialized knowledge requirements illustrates a clear need to upskill workers to become more acquainted with the properties of wood before mass timber manufacturers can employ individuals in similar roles from other sectors.

Non-technical skills will be key, as mass timber solutions involve a high degree of coordination and collaboration on designs between different sectors.

Non-technical skills will be the most in-demand across all industries specific to the mass timber value chains, indicating a greater need for communication, coordination, and collaboration within sectors responsible for designing, manufacturing, and assembling panels. This will require roles in sectors that previously did not communicate regularly, such as manufacturing, design, and construction, to develop a stronger understanding of each other's tasks and requirements and collaborate on project designs. One panel-manufacturer noted that hiring manufacturing managers with experience in construction was a genuine asset for their company, as these individuals already had the required experience and knowledge for the job.

Stakeholders identified that the majority of occupations discussed in this report would not need to fully retrain to work with mass timber. Rather, they would need to upskill, and the skills gaps can be plugged in a relatively small amount of time.

For trained engineers, stakeholders estimated that around 60 hours of additional training was required to learn the necessary knowledge to work with mass timber products. As such, stakeholders have noted that they prefer shorter, more targeted programs to support this upskilling, such as the University of British Columbia's regularly held Design for Manufacturing and Assembly (DfMA) workshop.

How well prepared are regions in BC to develop the mass timber skills ecosystem?

One critical aspect of supporting a potential mass timber sector in Northern BC is ensuring that a robust skills ecosystem (a network of stakeholders and institutions, including post-secondary institutions, employers, coordinating bodies, learners, and governments, all working on skills and labour challenges in a given region or sector) exists to support the development of the skilled and capable workforce needed. While it is worth reiterating that a lack of skilled workers is far from the only relevant factor impeding future growth in the sector (current market demand, fibre supply challenges, infrastructure gaps, sustainability and other barriers will also need to be addressed), it is indisputably important.

For rural and resource communities that were adversely affected by the downturn of the primary forestry sector, mass timber could represent an opportunity to attract investment and create jobs.[10] Yet capturing these potential benefits is not a simple task; doing so will require reducing the uncertainties stakeholders currently face, developing a strong foundation of talent (and investor interest) upon which prosperity can be built and solving the underlying environmental and sustainability challenges. When mass timber has become an established economic opportunity in other regions across the globe, the emergence of a skills ecosystem will play a critical role in supporting this shift.

One region with particular interest in addressing these uncertainties is Northern BC. Currently, Golden, BC, represents the most northern area where a mass timber manufacturing facility is located in the province. The centralization of forestry operations, decline in fibre supply, and increase in global competition seen since the 1990s have had particularly negative impacts on smaller resource-dependent communities in Northern BC, especially those with a high reliance on the forestry sector and low levels of economic diversification.[11] In 2023 alone, over 600 jobs have been lost as a result of closures in Prince George, Chetwynd, and Houston, BC.[12] Northern BC communities such as Prince George, Mackenzie, Chetwynd, Fort Nelson, and Quesnel, BC, have accordingly expressed interest in establishing a foothold in the sector. While there are no established mass timber facilities in Northeastern BC yet, the region has already completed a number of major mass timber building and construction projects, such as the Prince George Airport Extension,[13] the Quesnel Junior School,[14] and the Upper Skeena Recreation Centre in Hazelton.[15]

To better understand the preparedness of Northern BC communities to support potential growth in the mass timber sector, this project reviewed the existing skills ecosystem in this region. The following details how prepared each stakeholder category is in Northern BC and what steps need to be taken to align the current skills ecosystem with international leaders in the DACH region (a leading wood manufacturing cluster in Germany, Austria, and Switzerland).

How ready are post-secondary institutions to provide training in Northern BC?

- Providers of both short-term options (such as micro-credentials, one-off seminars, and online resources) and long-term options (such as post-secondary education programs and apprenticeship programs) are well-positioned to offer programming aligned with the needs of mass timber technologies.
- Post-secondary institutions, including the College of New Caledonia, Northern Lights College (NLC), University of Northern British Columbia (UNBC) and British Columbia Institute of Technology (BCIT), already offer programs relevant to occupations that will be created through the mass timber supply chain and are developing new ones to fill gaps (such as a mass timber development micro-credential at UNBC). Existing post-secondary institutions also have strong relationships with global leaders in the mass timber space, including those in the DACH region.
- The region needs more programs aimed at teaching general wood skills as well as forest conservation skills, which have been essential in establishing mass timber industries in the DACH region. This would ensure graduates learn about a wider variety of advanced and engineered wood products and techniques, including 3D modelling, computer-aided design (CAD), building information modelling (BIM), and the use of computer numerical controlled machines, as examples. Employers stressed that this broad range of skills made graduates more attractive to hire. Creating this programming might involve revitalizing a local wood technology program, an idea previously floated by the College of New Caledonia, NLC, and UNBC (but that had been suspended due to a lack of interest).

How well-positioned are employers to hire, and to offer training and supports?

- Mass timber is still an emerging technology without extensive employment opportunities, as there are zero mass timber manufacturers currently operating in Northern BC. There are some employers in advanced wood processing and engineered wood manufacturing more broadly, but none have yet begun manufacturing mass timber technologies. Newer employers and businesses who enter into the sector will need to address both the availability of workers and the sustainability of their operations.
- Existing employers who have expressed a general interest in mass timber, including some sawmills, have noted they have yet to invest due to concerns such as a lack of knowledge around product standards needed to meet future building code requirements and uncertainty around effectively marketing mass timber products. For new companies interested in entering the market, other issues, such as uncertainty around market demand, a lack of infrastructure, and difficulties securing the needed fibre supply, have all been cited as barriers to investment.

- In the DACH region, most of the well-established mass timber manufacturers started as small family-run small and medium-sized enterprises (SMEs), such as sawmills, and gradually diversified into a variety of advanced wood products, including mass timber.[16] Any potential expansion of mass timber manufacturing employers in Northern BC should be mindful of how sustainable growth has been carried out in other cases, such as the DACH region.

What coordinating bodies exist, and what role can they play?

- Coordinating bodies are groups that exist to improve the flow of information between stakeholders (by sharing job postings, connecting employers with prospective candidates, teaching students about careers, etc.). They include employment agencies, career counsellors, industry associations, and local networks (such as the Forestry Initiatives Program in Quesnel, BC).
- Stakeholders currently feel the network of coordination bodies that exists today is doing a good job of supporting the forestry sector and the emerging mass timber opportunity. However, given the absence of a major employer, they cannot play their full role in connecting employment opportunities in mass timber with prospective workers.

Are policymakers creating the right programs and supports to train and upskill workers?

- There are a range of available programs and policies that focus on skills training relevant to Northern BC (including many focused on the needs of small, rural, or remote communities). Still, the majority of supports are aimed at individual programs and learners and are targeted towards shorter-term education programs. Few are focused on mass timber.
- There is a missing layer of policies and programs that aim to set a common vision and drive coordination and collaboration within the forestry and value-added manufacturing sector. These are critical for ensuring stakeholders' actions are aligned and that priorities for growing the sector (instead of supporting only individual learners, employers, or programs) can be advanced. Within the DACH region, Germany's *Charter for Wood 2.0* is cited as a leading example of this type of policy which seeks to increase sustainable forestry and use wood products to mitigate climate change through targeted policy recommendations and measurement targets, all of which could be replicated for Northern BC or the province at large. [17]

What should be prioritized to improve the skills ecosystem for mass timber in Northern BC?

Priority #1: Ensure training programs are available for all industries and occupations within the supply chain, distinguishing between production and adoption

Throughout the supply chain, there is a need to ensure training programs are available for workers seeking to work on mass timber projects. Policymakers need to ensure training is available for all sectors involved in the production and adoption of mass timber as well as in forest conservation. This means designing training programs that tackle the major challenges experienced by each set of workers:

- Focus on upskilling workers in production in regions where investments in mass timber facilities are anticipated within BC, recognizing that investments in skills training need to follow investments in production facilities or buildings.
- Ensure all occupations involved in the adoption side receive greater training in communication, collaboration, and coordination between industries and technical disciplines. These include occupations such as architects, manufacturing managers, construction site managers, and plumbers, all of whom will need to understand each other's technical terminology to be able to work swiftly on a project.
- Create opportunities for workers to reskill in occupations where the primary change is not about the need to collaborate across sectors, but related to changes in the technology/technologies used. These include occupations such as manufacturing engineers, mechanical/electrical engineers, and carpenters.

Priority #2: Ensure training programs focus on upskilling for gaps, and focus on wood skills more broadly (not just mass timber)

Ensuring training programs focus on upskilling for gaps (i.e., they should be short, targeted, and low-cost) rather than fully retraining has a greater chance of supporting upskilling. These programs should also teach general wood skills rather than focusing on mass timber specifically.

- Stakeholders have suggested that their preferred mode of learning mass timber-related skills would be short, targeted training programs or industry roundtables. These training programs could be focused on software skills (e.g., Revit), manufacturing and design skills (e.g., DfMA, BIM, and CAD), as well as artificial intelligence and robotics skills, as stakeholders indicated that these programs would be ideally suited to teaching the digital skill sets required on the job.

- Within the DACH region, focusing on wood skills was foundational for launching a mass timber ecosystem. A broader, more generalized wood-focused curriculum produced graduates that can occupy a variety of positions and occupations along the supply chain of mass timber and other wood products, equipping them all with digital skills, such as 3D modelling, CAD, BIM, and the use of computer numerical controlled machines, as well as high levels of practical work experience.

Priority #3: Focus on improving the affordability and accessibility of all educational offerings

- The BC and federal governments provide funding for various upskilling and reskilling initiatives, including certain micro-credentials, but full degrees at both universities and colleges remain expensive for many Northern BC learners. For example, the mass timber micro-credential at BCIT, which receives funding from the federal government, has experienced high demand that exceeds the funding available for students, potentially meaning that not everyone who requires support will be able to access it. Opportunities should be explored that could improve the affordability of specific educations and ideally provide an incentive for graduates to stay within the region. One example could be a tuition rebate program, such as the Saskatchewan Graduate Retention Program.[18]
- There are currently a multitude of relevant courses, programs, micro-credentials, and diplomas available to interested learners and companies in the wood manufacturing and mass timber space, and in-person and virtual offerings are rapidly expanding. Yet, learners do not have a central location to see all the available programs and face an added barrier in understanding what programs will best suit their desired career trajectories. A central platform detailing all educational offerings, similar to the Swiss Timber Construction Association's list,[19] should be created for BC.

Priority #4: Address other barriers, with a focus on aligning anticipated economic opportunities with sustainability

- There are other challenges that communities in BC have identified in the context of mass timber. Some of these include a lack of employers in Northern BC, access to high-quality fibre and a lack of transportation infrastructure. As communities think through solutions for these, it will be critical to ensure that climate, biodiversity and sustainability challenges are adequately addressed.
- The issue of attracting new employers to Northern BC will need to balance the skills needs and business case of the proposed new investment with an understanding of the local environmental context. New mass timber manufacturers, advanced wood processing facilities, and engineered wood manufacturers need to understand and work within the sustainability context of their communities and ecosystems. Ensuring the sustainability of the sector will also have labour implications for the types of workers needed for biodiversity and sustainability work and the need to develop new skills for those occupations, all of which can help to grow these Northern BC communities alongside mass timber.
- There are significant transportation infrastructure needs for workers and communities engaged in mass timber across BC, but these needs must be evaluated with a sustainability lens. While transportation costs in the north of BC are some of the highest in the province and the lack of sufficient railway transit has reduced investment in locations like Fort St. John, these cannot be isolated decisions or ones made from a purely economic perspective. Beyond transportation, wider and more equal access to high-quality fibre internet services would be a strong positive for businesses and workers alike in remote and northern communities where mass timber is located.

Conclusion

Of the issues relevant to the emerging mass timber industry in British Columbia, the lack of a robust skills ecosystem is a major concern. While many stakeholders in the mass timber space, including in manufacturing and construction, perceive it as a relatively niche opportunity in its early stages, there is consensus that it will grow from today's levels. Regions that could benefit most should take steps to invest in skills development to improve the capacities and knowledge in their workforces and create more growth opportunities. Stakeholders in communities like Prince George, Mackenzie, Chetwynd, Fort Nelson, and Quesnel, BC, can begin to advance these priorities today to be prepared for the changes to come, informed by the analysis conducted for our reports. Mass timber, if aligned with sustainability and climate goals, may become a promising opportunity and ensure that economic benefits accrue to regions that may not have otherwise benefitted from investments in clean innovation and growth. Addressing the skills and labour challenges laid out in this report series will be a necessary step in the process of fully understanding the impact of what mass timber production means for BC and especially Northern BC.

For additional details and discussion on any of the ideas, analyses, or recommendations presented in this summary for policymakers, please read SPI's two reports *Framing BC's low-carbon future: Identifying the skills and workforce needs of British Columbia's growing mass timber sector*, and *Making mass timber in Northern BC: An evaluation of readiness of workers and policies for producing more mass timber products in Northeastern British Columbia*.

Endnotes

1 Government of British Columbia. (2022). *BC's Mass Timber Action Plan*. https://www2.gov.bc.ca/assets/gov/business/construction-industry/bc_masstimber_action_plan_2022.pdf

2 Natural Resources Canada. (2021). *The State of Mass Timber in Canada* [ArcGIS Dashboard]. Government of Canada. Retrieved May 23, 2023, from https://nrcan-rncan.maps.arcgis.com/apps/dashboards/041e338d2a4d4b3a82ff2c238a9f0f93

3 Office of Mass Timber Implementation. (2023). *Mass Timber.* Government of British Columbia. Retrieved March 4, 2023, from https://www2.gov.bc.ca/gov/content/industry/construction-industry/mass-timber

4 Peng, L., Searchinger, T. D., Zionts, J., & Waite, R. (2023). The carbon costs of global wood harvests. *Nature, 620*(7972), 110–115. https://doi.org/10.1038/s41586-023-06187-1

5 Government of British Columbia. (2022). *BC's Mass Timber Action Plan*. https://www2.gov.bc.ca/assets/gov/business/construction-industry/bc_masstimber_action_plan_2022.pdf

6 naturally:wood. (n.d.). *Mass timber and taller wood construction*. Retrieved May 23, 2023, from https://www.naturallywood.com/topics/mass-timber/; Government of British Columbia. (2022, April 7). Government of British Columbia. (2022). *BC's Mass Timber Action Plan.* https://www2.gov.bc.ca/assets/gov/business/construction-industry/bc_masstimber_action_plan_2022.pdf

7 Karacabeyli, E., Douglas, B. (Eds.). (2013). *CLT handbook: Cross-laminated timber (U.S. edition).* FPInnovations. https://cdn2.hubspot.net/hubfs/5577290/PDFs/CLT%20Handbook/CLT_USA-Complete-document-Think_Wood.pdf

8 Natural Resources Canada. (2021). The State of Mass Timber in Canada [ArcGIS Dashboard]. Government of Canada. Retrieved May 23, 2023, from https://nrcan-rncan.maps.arcgis.com/apps/dashboards/041e338d2a4d4b3a82ff2c238a9f0f93

9 Table is author's own analysis, as seen in *Framing BC's low-carbon future.*

10 BC Forestry Workers. (2023). *A Better Future for B.C. Forestry: A Sector Strategy for Sustainable, Value-Added Forest Industries*. https://bcforestryworkers.ca/wp-content/uploads/2024/03/A_better_future_for_BC_forestry-1.pdf

11 Markey, S., Pierce, J.T., Vodden, K., & Roseland, M. (2005). *Second Growth: Community Economic Development in Rural British Columbia*. UBC Press.

12 Kurjata, A. (2023, April 6). *Hundreds lose jobs as northern B.C. mill closures come into effect.* CBC News. https://www.cbc.ca/news/canada/british-columbia/canfor-job-losses-1.6803157

13 naturally:wood. (n.d.). *Prince George Airport Expansion.* Retrieved September 15, 2023, from https://www.naturallywood.com/project/prince-george-airport-expansion/

14 naturally:wood. (n.d.). *Prince George Airport Expansion.* Retrieved September 15, 2023, from https://www.naturallywood.com/project/prince-george-airport-expansion/

15 naturally:wood. (n.d.). *Upper Skeena Recreation Centre.* Retrieved September 15, 2023, from https://www.naturallywood.com/project/upper-skeena-recreation-centre

16 Timber-Online.net. (n.d.). *The biggest CLT producers in Central Europe: Update 2021/2022.* https://www.timber-online.net/content/holz/holzkurier/en/blog/biggest-clt-producers.html

17 Federal Ministry of Food and Agriculture. (2021). *Mitigating climate change. Creating value. Utilising resources efficiently. Charter for Wood 2.0.* https://www.bmel.de/SharedDocs/Downloads/EN/_Forests/charter-for-wood-2.pdf?__blob=publicationFile&v=7

18 Government of Saskatchewan. (n.d.). *Graduate Retention Program*. Retrieved October 2, 2023, from https://www.saskatchewan.ca/residents/education-and-learning/graduate-retention-program

19 Holzbau Schweiz. (n.d.). *Branchenverband Schweizer Holzbaubetriebe*. Retrieved October 27, 2023, from https://www.holzbau-schweiz.ch/de/

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