BC Value-added Wood Products: Labour Market Information Report

Submitted by BC Wood

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Overview

The value-added wood sector is a significant and vibrant industry in British Columbia. While the consequences of the global financial recession were severe, the last five years (2012-2017) have seen annual sales growth of 10%. This rate is more than twice that of total manufacturing sales in BC over the same period[1]. The value-added wood sector is now responsible for 10% of total manufacturing sales in the province and 69% of employers surveyed for this project expect their revenues to grow at a rate of 5% or more over the next five years.

In spite of this success, and in some cases because of it, the sector is experiencing a variety of labour market challenges. In order to better understand and address these challenges, BC Wood led a project in 2017 to engage industry stakeholders in a conversation around labour market issues, funded through the Canada-British Columbia Labour Market Development Agreement's Sector Labour Market Partnerships Program (SLMP).

The SLMP program provides funding to organizations within an economic sector, region, or population to develop projects that help respond to workforce challenges[2].

BC Value-added Wood Products: Sector Engagement Report, was completed in July 2017 and identified initial workforce concerns facing the province's value-added sector over the next five years.

This report, BC Value-added Wood Products: Labour Market Information Report, presents the findings from the labour market information research. It clarifies, deepens and expands on the issues identified in the t engagement project, and develops a fact-based set of opportunities for action.

Subsequent phases may be undertaken dependent on the findings of this report and based on further discussions with the project advisory group.

[1] Sales fell from just over $4 billion in 2007 to $2.76 billion in 2009. Over the years 2012 -2017, inflation adjusted manufacturing sales in value-added wood have grown from $3.1 billion to $5.1 billion. Source: Statistics Canada. Table 16-10-0048-01 Manufacturing sales by industry and province, monthly

[2] https://www.workbc.ca/Employer-Resources/Funding-and-Programs/Sector-Labour-Market-Partnerships.aspx

Executive Summary

The research conducted for this report points to a number of labour market challenges facing the value-added wood industry today. The details of these results are explored in greater detail below.

A variety of quantitative and qualitative research methods were conducted for this report. These include an employer survey, roundtable sessions and interviews; subject matter expert interviews; a literature review; and statistical analyses. This research builds on the the sector engagement project and reinforces its three key findings: a shortage of qualified workers; difficulty attracting new entrants; and a lack of effective and accessible training. A fourth theme was also identified: the need for innovation.

Four opportunities for action are recommended to address these challenges and opportunities: 1) raise awareness of the sector, 2) improve attraction of qualified labour, 3) improve retention of workers, and 4) strengthen training opportunities. The work presented here provides a starting point for reconvening the advisory group to discuss options for Phase 3, the strategy development phase of the Sector LMP Program.

Some data limitations should be noted. Despite extensive efforts to reach as many respondents as possible, employer survey response rates were lower than desired[3]. Additionally, sector-specific occupational data from secondary sources are limited in scope and not perfectly aligned to the sector. Despite these obstacles, consistent findings did emerge, laying a solid foundation for moving forward with phase 3 pending stakeholders' support.

Key Findings: Themes

1. Shortage of Qualified Workers

Findings from the employer survey, roundtable discussions, and interviews confirmed that shortages identified in the sector engagement project[4] are having real business impacts. More than half of the employers that took part in these efforts said they have had to raise wages or add benefits to attract or retain employees, a third had to turn away work, and nearly a quarter curtailed operation.

As shown in Table 1, there are currently close to 1,500 vacancies in the sector, half of which are for production workers. Annual openings going forward are estimated to be between 265 and 520, depending on sales growth and changes in labour productivity.

The largest employee group in the sector is production workers followed by skilled trades workers. For the remaining positions, skilled trades workers account for the most shortages. This is followed by, in order of the number of vacancies, machine operator, manager/supervisor, designer, finisher, salesperson, technologist, and estimator.

The most commonly cited reason for shortages in the employer survey (70% of employers) was that young people are no longer interested in doing the type of work required. This reason was followed by workers leaving for other industries (38%) and workers retiring (34%).

[3] 87 employers responded to the employer survey. An employee survey was also designed, but too few employees responded to include results in the report.

[4] Shortages were identified for the following positions: production worker/labourer, skilled trades workers, machine operator, manager/supervisor, designer, finisher, salesperson, technologist, and estimator.

2. Difficulty attracting new entrants

Several factors were identified that are impeding the sector's ability to attract new entrants. These include demographic changes such as a shrinking share of people aged 15 to 29 in the workforce as well as a number of industry-specific factors.

A consistent theme that arose through the research is that potential new entrants may not be aware of available career opportunities, viewing the value-added wood sector as an industry with a limited future. According to employer interviews, secondary schools and post-secondary institutions lack initiatives to raise awareness about the sector, and there is less exposure to woodworking in high school than there once was. Employers also reported that the pace, noise, and physical challenges of working in the sector may not appeal to a generation with changing workplace expectations.

Additionally, sectors such as forestry, construction, and oil and gas, were reported to attract potential value-added wood applicants by offering higher wages, while service sectors pay less but provide work that is not as demanding.

3. A lack of effective and accessible training

Among employers surveyed, the most common type of training available to their workers is informal coaching and mentoring. Some also offer apprenticeships for employees and in-house workshops. Whether training is offered varies by company size: 90% of firms with six or more employees offer some form of training compared with only half of businesses with five or fewer employees.

Employers generally have a negative perception of institutional training options. Only one quarter of those interviewed rate existing training as excellent or very good when it comes to availability, accessibility, and affordability of programs. When asked in roundtables, not all employers were aware of existing options.

Employers were nearly unanimous in roundtables and interviews about the need for skill-specific training in the industry. Because of the diversity of occupations that are experiencing shortages, an appropriate training strategy will likely consist of multiple approaches, in order to take into consideration the specifics of the position being targeted. Short, module-based courses and onsite visits by skill experts are two potential solutions that were viewed favourably in roundtables and interviews. It was felt that these solutions would make use of existing expertise and infrastructure without incurring the high overhead costs of setting up new facilities. In addition, the unique production process and customized equipment at each plant reduces the value of standardized training programs.

4. Sustained labour productivity is key to long-term success

Several factors were identified that point to the need for innovation that drives ongoing labour productivity improvement. Employers were clear that there are many sources of such improvements such as the application of new skills and know-how, adoption of technology in its various forms (e.g., software, computers, machinery), and improvements in processes and the skills of current workers.

Factors that drive the need for innovative sources of labour productivity improvements include increased availability and continuing advancements in technology; more competition from other countries, especially in furniture manufacturing; a tight labour market; and a shrinking wood supply in BC.

Opportunities for action

In order to address the issues facing the value-added wood sector, the industry needs a coordinated effort to increase awareness and improve its public image, attract appropriately skilled workers, improve retention, and develop training programs that work. See Table 1 for an overview of how relevant each of the proposed opportunities are to address the challenges related to nine priority occupations.

Table 1: Shortages and importance of strategy, priority occupations[5]

	Current shortages	Annual additional openings	Opportunities for action, and relevance by occupation (H=High; M=Medium; L=Low)			
			Raise awareness	Improve attraction	Retain	Train
Production worker/labourer	780	140 - 280	H	H	M	L
Skilled trades workers (e.g., mechanic, electrician)	215	30 - 50	M	H	L/M	L/M
Machine operator	140	30 - 60	L	M	H	H
Manager/supervisor	100	30 - 60	L	L/M	H	H
Designer	70	10 - 15	M/H	M	M	M
Finisher	60	5 - 10	L	L	H	H
Salesperson	45	15 - 30	M	M	M/H	M/H
Technologist	40	0 - 5	M/H	H	L	L
Estimator	35	5 - 10	M	H	L	L
Total	**1485**	**265 - 520**				

1. Raise awareness

Employers and subject matter experts believe many people in BC are not aware of the career opportunities in the value-added wood industry, and said that some have a negative perception of the sector. This leads to challenges in finding both entry-level and skilled employees.

The sector should take action to improve its public image and raise awareness among prospective employees. Companies could engage more with secondary schools and post-secondary institutions through activities such as career fairs and co-op educational opportunities. The industry could take steps to raise its profile and differentiate itself from competing sectors among groups that may otherwise not be exposed to it.

2. Improve attraction

The sector needs to attract new entrants to address the large shortage of production-level workers and ensure there are enough staff available to promote to more senior or skilled positions.

[5] Source: Labour market modeling using data from Statistics Canada. See Appendix E for details.

Secondary data shows that women are among a number of groups that are underrepresented in the sector. Two-thirds of employers surveyed reported that targeting underrepresented groups for recruitment has often been an effective strategy. Young people are also an important source of new labour, especially for entry-level positions, and their demographic is shrinking.

To meet its growing labour needs, the value-added wood sector must develop a recruitment strategy with a compelling value proposition for prospective workers, including wages that are as competitive as possible, non-monetary benefits, and ongoing skills development. It should consider targeting specific, underrepresented groups, and attempt to align work expectations with those of coming generations.

3. Improve retention

Employers have reported difficulty retaining workers for multiple reasons. For example, the work environment may involve using equipment and processes which are outside the experience of some workers, or they may lose employees to the forestry, construction, and mining sectors. Retention is important so there are enough competent entry-level workers to move to advanced positions requiring more experience.

Careful attention to onboarding is key to successfully retaining employees. New employees should be gradually introduced to work that could otherwise be overwhelming or intimidating. Clear career pathways must be developed so employees can appreciate their long-term career possibilities.

4. Strengthen training

A workforce with up-to-date skills will help the value-added wood sector meet growth expectations and adapt to changing market and technological requirements. Employers and experts confirmed that there is a lack of training responsive to the needs of the industry. Training is especially important for occupations that require specific skills or use specialized equipment such as machine operators and finishers.

To address this gap, two solutions were proposed at employer roundtables: short off-site, module-based courses at institutions focusing on a specific occupation or skill, and onsite visits of specialists that focus on a particular process or discipline.

Acknowledgements

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We would like to thank the project advisory committee members for their guidance and contributions to the development of the project. We would also like to thank all the employers and industry experts who contributed to this report through surveys, roundtables, and interviews.

Introduction

BC's value-added wood sector comprises a wide variety of firms producing everything from prefabricated wood houses and engineered wood products to custom cabinetry, fine furniture, and a broad variety of remanufactured wood products. It is important both in terms of sales and employment, accounting for 10% of BC's total manufacturing sales ($5.1 billion) in 2017, and employing 16,600 workers in 2016, slightly higher than employment in forestry and logging[6].

This report presents findings from the sector labour market research project and builds on the findings of the sector engagement project completed in July 2017 which resulted in three preliminary findings regarding labour force challenges affecting the value-added wood sector:

1. Difficulty attracting new, especially young, entrants to the field.
2. A shortage of qualified skilled workers in a number of occupations.
3. A lack of suitable training and education, especially with changing demands as a result of technology and the implications for production processes and output.

The engagement project also led to the creation of an advisory committee consisting of nine sector employers from throughout the province. Based on the recommendation of the advisory group, and with support from the BC Wood board, the sector labour market research project was initiated to conduct a more detailed study of the labour market.

This report concludes presents the following:

A. **Project Approach** outlines the methodology for each of the research tools that were used and the role of the advisory committee. It explains data limitations, including the efforts taken to address gaps. A more detailed approach for each of the research tools can be found in its corresponding appendix.
B. **Research Findings** are presented as a sector and workforce overview and four themes:
    1. *Shortage of qualified workers* – An occupation-level description of the labour shortages the sector is currently facing, their impact, and the perceived reasons for them.
    2. *Difficulty attracting new entrants* – Employer recruitment strategies, how the public and younger workers view the sector, and wage competition from other sectors.
    3. *A lack of effective and accessible training* – Current training offered by employers, employer attitudes toward external training options, and industry needs for prospective training options.
    4. *Innovation is key to long-term success* – A set of factors pushing the sector to improve productivity through innovation.
C. **Opportunities for Action** sets out four recommendations to guide strategy development in Phase 3.
D. **Detailed Research Findings Appendices A-E** provide the detailed supporting research and analysis reports for the Labour Market Information Report.

[6] Forestry and logging (NAICS 113) employed 13,860 people in 2016. Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016290.

A. Project Approach

An advisory group (see Table 2) was an integral part of the project. Members met three times, providing input into the research methodology, participating in roundtable discussions, reviewing reports, and providing feedback on research findings and development of this report.

Table 2: Value Added Sector Labour Market Partnerships Advisory Group Members

Member	Affiliation	Location	Industry sub-sector
Brian Hawrysh (chair)	BC Wood	Langley	Sector association
Ken Kalesnikoff	Kalesnikoff Lumber Co. Ltd.	East Kootenay	Specialty lumber
John Lore	Live Edge Design	Vancouver Island	Furniture & fixtures
Grant McKinnon	Pacific Homes Ltd.	Vancouver Island	Prefabricated homes
Brian Ehrecke	Norelco Cabinet Solutions	Okanagan	Cabinets
Guido Wimmers	University of Northern British Columbia	Prince George	Education representative
Yavhel Velazquez	Ministry of Advanced Education, Skills and Training	Victoria	Government observer, Sector Partnership Program
Jessi Zielke	Zielke Consulting Ltd.	Vancouver	Project Lead (Observer)

Project Research and Analysis

Labour market research for this report was done through five primary tools: an employer survey, employer roundtables and interviews, secondary data analysis, a literature review and subject matter expert interviews, and a labour demand model. A report was prepared for each tool. These reports serve as stand-alone documents, and are included as appendices to this report. The findings and recommendations presented here are based on these tools.

Primary Data Employer Survey (Appendix A)

A survey was designed to collect data on the key issues identified in the sector engagement project from a larger, representative group of sector employers. Survey data was collected on a number of different aspects of the employer experience including:

- the extent to which employers are experiencing shortages in the nine in-demand occupations, as well as their difficulty attracting new entrants to the sector;
- their perception of current and potential training and education opportunities;
- how a number of external factors are expected to impact their ability to achieve future business goals; and
- the extent to which employers are implementing internal strategies to address labour shortages, including strategies to attract and retain employees.

Employer Roundtables and Interviews Summary (Appendix B)

Two employer roundtables were conducted to review preliminary results from the employer survey and findings from relevant literature and subject matter experts, and to collect responses and reactions to the initial research findings. They also offered an opportunity to gather additional information at the subsector and occupational level with respect to:

- the role of innovation and productivity growth;
- labour shortages, training gaps, and employee attraction; and
- opportunities to shape strategies going forward.

Six employers attended the roundtables, one conducted in Duncan on June 13 and the other in Langley on June 18. One-on-one interviews were held with two employers who were unable to attend a planned session in Kelowna.

Secondary Data Analysis (Appendix C)

Secondary data was used to build employment and other economic baselines (e.g., sales, productivity, firm size), to understand related trends over time, to develop go-forward labour supply and demand projections, and to model the impact of potential strategies to address labour shortages. It was also used to understand industry demographic characteristics and develop a labour demand model to estimate coming labour challenges.

Data was collected and analyzed at both the industry and the occupation level. Scoping was determined based on the sector engagement project analysis and consultations with the advisory committee. Table 3 shows the four NAICS industry groups that define the sector. They comprise two subsectors: wood product manufacturing and furniture manufacturing, which are in turn part of the greater manufacturing sector.

The following four-digit industry groups are excluded from this study:

- 3211 Sawmills and wood preservation includes mills that produce manufacturing boards, dimension lumber, timber, poles and ties from logs and bolts that are not further worked or shaped.
- 3379 Other furniture-related product manufacturing consists of mattress and blind and shade manufacturing.

Table 3: NAICS Classification system mapping[7]

Sector	Subsector	VAW Industry Group	LMI report group name
31 - 33 Manufacturing	321 Wood product manufacturing	3211 Sawmills and wood preservation	Out of scope of report
		3212 Veneer, plywood and engineered wood product manufacturing	**Wood product manufacturing**

[7] A detailed description of the NAICS classification system can be found on the Statistics Canada website.

		3219 Other wood product manufacturing	
	337 Furniture and related product manufacturing	3371 Household and institutional furniture and kitchen cabinet manufacturing	**Furniture manufacturing**
		3372 Office furniture (including fixtures) manufacturing	
		3379 Other furniture-related product manufacturing	Out of scope of report

Literature Review and Subject Matter Expert (SME) Interviews (Appendix D)

More than 25 reports on or related to the value-added wood sector were reviewed, analyzed, and synthesized along with webpages and other publications from government, industry, and educational organizations. These were used to understand the importance of a number of external factors that may impact the BC value-added wood sector and workforce, to collect relevant insights from other jurisdictions, and to inform roundtable discussions. For details on the reports reviewed, see Appendix D.

Eight non-employer interviews were conducted with subject matter experts in education, research, and recruitment related to the value-added wood sector. They were asked for their perspectives on technological, regulatory, environmental, and market forces that are expected to impact the sector and its workforce requirements now and in the coming years, and they recommended materials to include in the literature review.

Labour Demand Model (Appendix E)

A labour demand model was developed that combined data from employer surveys and secondary data from Statistics Canada. The model estimates required supply additions to meet expansion and replacement demand, and to address current shortages. Employer survey data was used to estimate current shortages. Job openings due to expansion were based on employer expectations of future sales growth and past trends in sales and labour productivity. Openings due to retirement (replacement demand) were estimated using age distributions of each occupation from the 2016 Census and the estimated probability of retirement by age group.

NOTE: Data limitations

Sector-specific occupational data from secondary sources are limited. The data collected from the BC Labour Market Information Office via special request for occupation-specific employment and demographic characteristics accounted for less than 40% of total sector employment. Follow-up requests led to no additional data. As a result, the employer survey was used as the key input to estimate employment in priority occupations and accompanying demographic characteristics. Since the response rates were lower than desired, these figures may not be representative of the sector as whole and should be interpreted accordingly.

An employee survey was also designed and distributed. Unfortunately, in spite of extensive efforts to engage employees, there were too few responses to include in the report. This represents a substantial gap in the findings which will likely need to be addressed before or as part of a labour market strategy to be developed in future Sector LMP-funded projects.

Secondary data sources are also limited in sector-specific regional information – the only secondary data available by region is employment. Regional nuances were discussed in employer roundtables and subject matter expert interviews, and these can be found throughout the report.

B. Research Findings

Based on the results of each of the five research tools, this section presents consolidated and synthesized research findings. For details on each of the research tools, please refer to the appendices. First, the sector and workforce overview is presented, providing details about the size of the sector and accompanying characteristics. This is followed by the four labour market themes: labour shortages, attraction of new entrants, findings on training and development opportunities, and the role of innovation.

1. Sector and Workforce Overview

Table 4 shows the number of value-added wood businesses in BC by number of employees. The BC manufacturing sector and total provincial business count are shown as benchmarks. As of December 2017, there were just over 1,000 businesses registered in the value-added wood sector, split almost evenly between wood product and furniture manufacturing. Businesses tend to be small – nearly 80% employ 19 or fewer employees. Wood product manufacturing businesses are somewhat larger than furniture businesses – 13% employ more than 50 workers compared with 5% for furniture.

The industry is concentrated in three geographic regions within BC, with 85% of employed labour in the Mainland/Southwest, the Thompson/Okanagan, and Vancouver Island/Coast[8].

Table 4: Business counts[9]

Employees	BC total	Manufacturing	Value-added wood		
			Wood product manufacturing	Furniture and related manufacturing	Total
1 to 4	111,555	2,759	180	201	381
5 to 9	38,643	1,565	115	118	233
10 to 19	25,103	1,207	106	86	192
20 to 49	15,119	992	85	51	136
50 to 99	4,956	376	42	14	56
100 to 199	1,992	186	11	9	20

[8] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016290.
[9] Statistics Canada. Table 33-10-0037-01- Canadian business counts, location counts with employees, by employment size and North American Industry Classification System (NAICS), Canada and provinces, December 2017, semi-annual

200 to 499	903	132	16	1	17
500 plus	333	15	0	0	0
Total	198,604	7,232	555	480	1,035

The sector accounts for about 10% of provincial manufacturing sales (see Table 5). In 2017 value-added wood sales were a combined $5.1 billion[10] – $4.1 billion for wood product manufacturing and $1 billion for furniture manufacturing. Growth of sales in the value-added sector has outpaced manufacturing by 6% a year from 2012 to 2017, largely driven by an 11% growth rate in wood product manufacturing.

Table 5: Manufacturing sales[11]

	Wood product manufacturing	**Furniture and related manufacturing**	**Value-added wood**	**Manufacturing**
2017 sales	$4.1B	$1.0B	$5.1B	$51.4B
Average annual growth, 2012-2017	11%	5%	10%	4%

Labour productivity shows a similar pattern. Sector-wide value-added wood sales per employee were $267,000 in 2016, with wood product manufacturing recording $309,000 of sales per employee, and furniture manufacturing recording $177,000 per employee. Figure 1 shows labour productivity trends from 2009. Value-added wood labour productivity growth rates are similar to those of manufacturing sales, with particularly strong growth since 2013.

[10] All sales numbers in this paragraph are from Statistics Canada. Table 16-10-0048-01 Manufacturing sales by industry and province, monthly.

[11] Statistics Canada. Table 16-10-0048-01 Manufacturing sales by industry and province, monthly. All numbers have been adjusted to account for inflation.

Figure 1: Labour productivity index 2009-2016 (2009=100)[12]

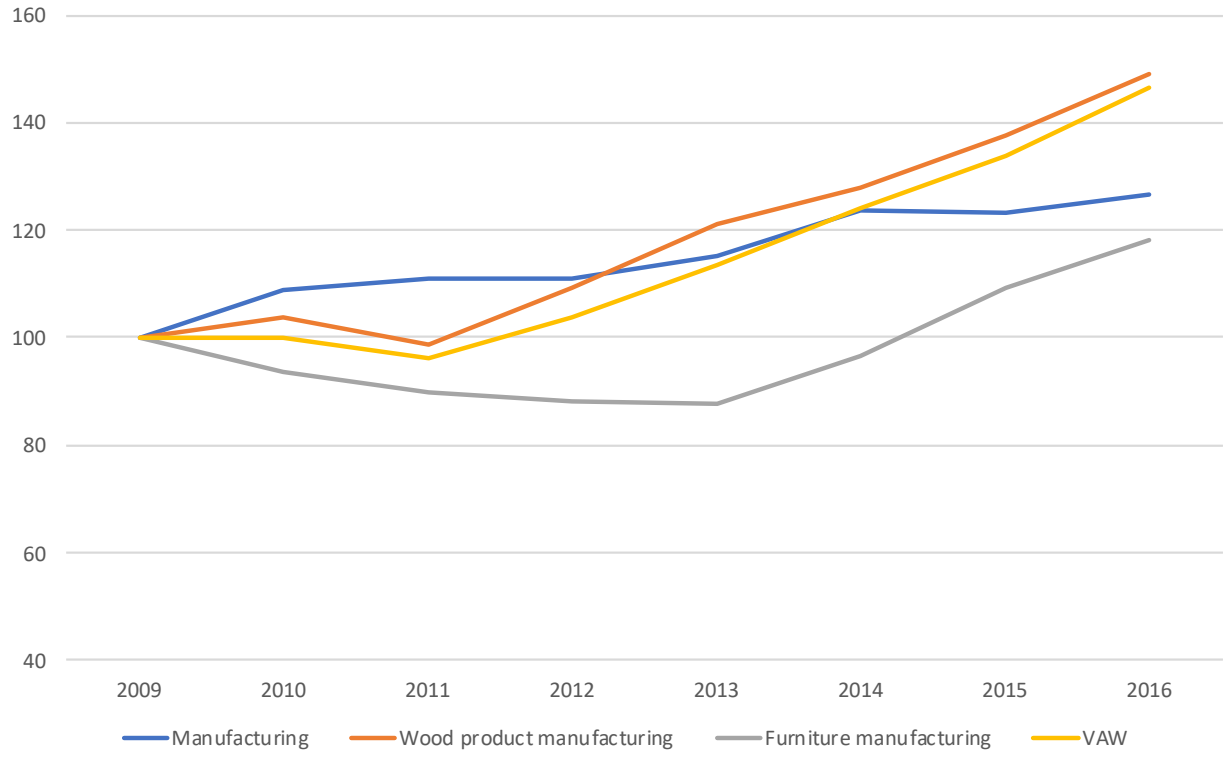


Table 6 shows demographic characteristics for the sector along with the equivalent benchmark statistics for the manufacturing sector and BC as a whole. Key observations include:

- In 2016, total BC employment in value-added wood was 16,660, with employment in wood product manufacturing slightly greater than furniture manufacturing.
- The 2016 value-added wood unemployment rate was 4.3%, 2.4% lower than BC as a whole and 0.8% lower than than the manufacturing sector[13].
- Median income for the sector is $51,000, higher than both manufacturing and the overall provincial median. There is a large difference between the two subsectors – wood product manufacturing has a median income of approximately $64,000, while median furniture manufacturing income is approximately $35,000, just below the provincial median. For comparisons to other sectors, see Table 12.
- About one quarter of sector employees are over the age of 55, slightly higher than the BC total and on par with manufacturing in the province. Wood product manufacturing has 5% more employees in this age bracket than furniture manufacturing.
- The percentage of women in the sector is just 19%, nearly 30 percentage points lower than the overall provincial rate. This is especially pronounced in wood product manufacturing at just 16%.

[12] Labour productivity is defined as manufacturing sales per employee, indexed to 100 in 2009. Source: Statistics Canada. Table 16-10-0048-01 Manufacturing sales by industry and province, monthly and Table 14-10-0202-01 - Survey of Employment, Payrolls and Hours (SEPH), employment by type of employee and detailed North American Industry Classification System (NAICS). Sales data have been adjusted to account for inflation.

[13] Provincial unemployment has since dropped to 4.8%.

- The sector has a slightly higher share of Indigenous employees than the BC manufacturing sector or the province as a whole. Wood products manufacturing employs a significantly higher share of Indigenous people at 9%.
- The share of visible minorities and immigrants employed in value-added wood is equivalent to shares employed in the province overall, and just slightly lower than those in the BC manufacturing sector. Again there is a large discrepancy between the two wood subsectors: shares of visible minorities and immigrants employed in wood product manufacturing are just over half those of furniture.
- The share of employees in value-added wood that have completed education beyond high school (41%) is 20 percentage points below that of the total employed population in BC and 12% less than BC manufacturing. The share is slightly lower in wood product manufacturing than in furniture.

Table 6: Employment and select demographic characteristics

Characteristic	BC	Manufacturing	Value-added wood		
			Wood product manufacturing	Furniture and related product manufacturing	Total
Employment[14]	2,305,690	149,455	9,125	7,535	16,660
Unemployment rate[15]	6.7%	5.1%	4.2%	4.4%	4.3%
Median income[16]	$36,282	$31,021	$64,573	$35,378	$51,369
% Over 55 years of age[17]	23%	26%	28%	23%	25%
% Female[18]	48%	28%	16%	23%	19%
% Indigenous[19]	5%	5%	9%	3%	6%
% Visible minority[20]	31%	34%	23%	41%	31%
% Immigrant[21]	30%	36%	26%	43%	34%
% Beyond high school	62%	53%	39%	44%	41%

[14] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016290.
[15] Ibid.
[16] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016358.
[17] Expected to retire within 10 years is defined as 55 years of age or older. Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016290.
[18] Ibid.
[19] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016359.
[20] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016360.
[21] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016361.

education attainment[22]					

Value-added wood priority occupations

The sector engagement project report identified nine occupations that were experiencing job shortages. These are referred to as priority occupations in this report. Table 7 presents employment estimates for priority occupations. Estimates are derived from employer survey and secondary data analysis results[23].

Approximately two-thirds of total staff are estimated to belong to one of the priority occupation groups. The largest occupation group is production worker/labourer, which is responsible for approximately 40% of the total employed labour. Machine operators, managers, and skilled trades workers are the next largest occupation groups.

Table 7: Employment by occupation[24]

	Share of total reported workers	**Value-added wood employment**
Production worker/labourer	39%	6,505
Machine operator	8%	1,301
Manager/supervisor	6%	987
Skilled trades workers (e.g., mechanic, electrician)	6%	948
Salesperson	3%	568
Designer	2%	306
Finisher	2%	255
Estimator	1%	172
Technologist	1%	102
Total	**67%**	**11,145**

Table 8 presents demographic information from employer surveys for each of the priority occupation groups. Due to relatively small numbers of businesses employing some occupations, demographic data should be interpreted cautiously. It is worth noting, however, that the results obtained for well-represented occupations in the survey do not differ drastically from overall sector demographics from the 2016 Census.

Occupational employment shares were slightly lower than the industry average for women and aboriginal people and somewhat lower for immigrants. The immigrant share is highest for production

[22] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016358.
[23] Employers were asked how many staff they would have to hire in each occupation to consider themselves fully staffed as well as total current employment. These results were combined with value-added wood employment from the 2016 Census to calculate occupational level employment.
[24] Source: Employer survey and Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016290.

workers and machine operators; the female share is highest for designers and finishers, and the aboriginal share is highest for finishers.

Table 8: Employee demographic characteristics[25]

	Survey respondents employing occupation	Median number of employees in the occupation	% Female	% Immigrant	% Indigenous
Production worker/ labourer	72	8	16%	23%	4%
Machine operator	64	4	10%	28%	2%
Manager/ supervisor	68	2	9%	10%	1%
Skilled tradesperson	44	2	10%	14%	4%
Salesperson	63	2	23%	9%	3%
Designer	29	2	35%	21%	3%
Finisher	28	2	28%	20%	5%
Estimator	32	1	25%	11%	0%
Technologist	12	2	12%	4%	0%
Total	87	N/A	16%	20%	3%

2. Labour Market Themes Emerging from Research

1. Shortage of Qualified Workers

The first theme identified in the sector engagement project report was a shortage of qualified workers in the nine priority occupations. The finding was confirmed in this phase with additional detail from employer surveys and roundtables, as well as subject matter expert interviews. Secondary data also supports this conclusion.

Employers were surveyed about 11 potential challenges they may face as they work toward achieving their business goals over the next five years. Limited access to quality and volume of wood was the most commonly cited response, followed by two choices regarding labour – difficulty accessing skilled labour and increasing labour costs. Labour challenges were identified as the top challenge by 31% of respondents, and second most important challenge by another 25%.

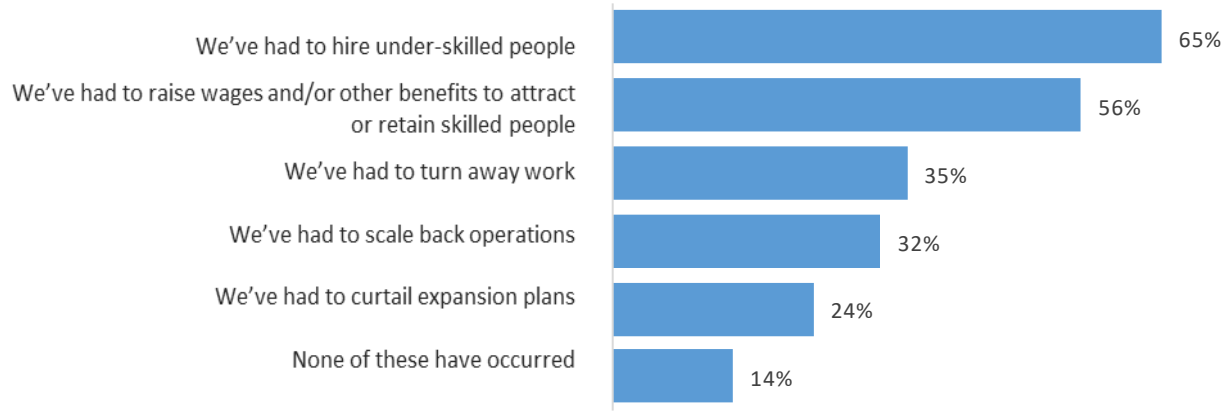
Employers were also surveyed about what other external factors will impact the quantity or quality of the labour that they will require in the next few years. Their verbatim comments were content-coded

[25] Source: Employer survey

into 12 thematic categories. The top two responses by thematic category were a lack of skilled/trained workers and difficulty attracting workers to certain regions.

Labour shortages have had real business consequences. While the top response to shortages is hiring under-skilled people, more than half of employers have had to raise wages or add benefits to attract or retain employees, and about one third have had to turn away work or scale back business operations. Another 24% have curtailed expansion plans.

Figure 2: Effects of labour shortages on business activities[26]



Job shortages by occupation

Table 9 shows the percentage of survey respondents employing at least one worker in each of the nine occupation groups, and the percentage currently experiencing shortages. It also presents the current operating capacity – the extent to which each job category is fully staffed – and the number of current vacancies for each occupation.

The occupation that is most widely employed across the sector is production worker/labourer. This group accounts for just under half of total sector employment and is employed by 83% of businesses. This category also accounts for more than half of the total reported vacancies.

Job shortages are most acute for skilled trades workers – 71% of businesses that employ them report being short-staffed. Technologists have the lowest operating capacity, though only 7% of companies report employing this occupation.

[26] Source: Employer survey

Table 9: Staffing by occupation category[27]

Job Category	% of businesses employing occupation	% of businesses employing occupation that report shortages	Current operating capacity[28]	Current number of vacancies[29]
Production worker/labourer	83%	61%	88%	780
Skilled tradesperson	51%	71%	77%	215
Machine operator	74%	27%	89%	140
Manager/supervisor	78%	23%	90%	100
Designer	33%	45%	77%	70
Estimator	37%	35%	79%	60
Finisher	32%	34%	77%	45
Salesperson	72%	11%	92%	40
Technologist	14%	50%	59%	35
Total	N/A	N/A	N/A	1485

In the survey, employers identified the primary reasons they are experiencing shortages in each job category. Across all categories, the most common reason is that young people are "not interested in doing this type of work" (see Table 10). This is particularly true for production and skilled trades workers – approximately 80% of employers believe young people are not interested in these positions. Retirements and workers leaving for other industries were also commonly cited reasons for shortages across all occupations. Disinterest among young workers was a theme heard throughout the research for this report, and is addressed in more detail in the section on attracting new entrants.

Table 10: Reasons for labour shortages[30]

Reasons for labour shortages	Production worker/ labourer	Skilled trades workers	All other categories
Young people not interested in doing this type of work	80%	77%	63%
Workers leaving for other industries	43%	39%	34%
Workers retiring	32%	35%	34%
Workers leaving for other provinces/countries	27%	10%	22%
Training not available for evolving skill requirements/to upgrade skills	23%	26%	34%

[27] Source: Employer survey
[28] Operating capacity is defined as the ratio of the number of workers in a job category to the number of workers in a job category plus the number of workers needed to be considered fully staffed.
[29] Number of vacancies is one minus operating capacity times total sector employment.
[30] Source: Employer survey

Education/training not available to make new entrants job ready	20%	26%	34%

A labour demand model was developed in order to better understand how job shortages and labour requirements will evolve over the next 10-year period. This model estimated the annual number of job openings the sector will have to fill for each of the priority occupations. Job opening estimates were calculated for three different scenarios: 0%, 5%, and 10% sales growth. Scenarios were based on employer growth expectations from the employer survey and historical sales trends[31]. See Appendix E for details on the modeling approach.

As Table 11 shows, total annual job openings are between 270 and 520 depending on the growth scenario, the majority of which are due to workers retiring from the industry. Retirements are constant under all growth scenarios as they are determined by the current age distributions of the value-added workforce, and it is assumed that new workers added to the sector do not retire during the 10-year period. As a result, they are not subject to fluctuations in sales. Expansion demand varies between zero in the no-growth scenario and 249 in the high-growth scenario.

As with current shortages, demand will be greatest for production workers. Due to the entry-level nature of these positions, this indicates that finding new entrants to the sector workforce will be a critical challenge for years to come. Machine operators, managers, and skilled trades workers are also expected to see relatively strong demand. During roundtables discussions, employers said that both machine operators and managerial roles are often filled through promotions. This points to the importance of retaining competent workers and providing them with appropriate and adequate training throughout their careers.

Table 11: Expected yearly job openings by revenue growth scenario, 10-year time horizon[32]

Occupation	Low sales growth (0%)			Medium sales growth (5%)			High sales growth (10%)		
	Expan-sion	Retire-ments	Total	Expan-sion	Retire-ments	Total	Expan-sion	Retire-ments	Total
Production worker/ labourer	0	139	139	70	139	209	147	139	286
Machine operator	0	33	33	14	33	48	29	33	63
Manager/ supervisor	0	31	31	11	31	42	22	31	54

[31] 31% of employers surveyed hoped to keep their business profitable without increasing revenue, 41% hoped to achieve revenue growth of 5 to 10% annually, and 28% hoped to achieve growth greater than 10%. With the exception of 2007-2009 when the industry contracted considerably, historical sales data show annual growth rates between -5% and 12%.

[32] Results of labour market model using data from 2016 Census, Survey of Employment, Payrolls and Hours, and Monthly Survey of Manufacturing. See Appendix F for details.

Skilled trades worker	0	30	30	10	30	41	21	30	52
Salesperson	0	16	16	6	16	22	13	16	29
Designer	0	8	8	3	8	11	7	8	15
Finisher	0	7	7	3	7	10	6	7	13
Estimator	0	5	5	2	5	7	4	5	9
Technologist	0	2	2	1	2	4	2	2	5
Total	**0**	**272**	**272**	**119**	**272**	**389**	**249**	**272**	**519**

These findings are similar to those reported in the 2016 report, *Advancing Wood Manufacturing in Canada*[33]. In that survey, 185 employers across Canada were surveyed, 76% of which reported having some or great difficulty attracting new workers. It was found that wood machine operators and managers were the second and third most difficult occupations to fill today. All occupations were expected to become more difficult to fill in the next five to 10 years.

In roundtable discussions, employers were not optimistic about recruiting for skilled positions. Employers conveyed a number of responses including:

- The only viable strategy available was poaching from other companies.
- Using a recruiter who specializes in the wood industry seemed the only option, but the recruiter had no success in finding any qualified candidates over a six-month period.
- Few appropriately trained people were available locally but there was some success recruiting from Europe where training programs may be more extensive and specific to the value-added sector than programs in BC.
- Accessing immigrant workers through Canada's Temporary Foreign Worker Program is time-consuming with long lead times.

Several explanations for these challenges were proposed in the roundtable discussions. The acuteness of occupational shortages appears to vary by region where key underlying causal factors are the cost of housing and availability of local workers – especially on Vancouver Island and in the Kelowna region. A third factor was competition from other sectors, especially construction and the primary wood sector. This final point is expanded on in the next section.

2. Difficulty Attracting New Entrants

The second theme identified in the engagement project report was difficulty attracting new workers to the sector, a finding corroborated in this phase through the employer survey and roundtables, subject matter expert interviews, and literature review. Employer survey respondents reported to be below operating capacity for all nine job categories. Changing demographics and several industry-specific factors suggest that this will continue for some time. The following factors were identified as contributing to this challenge:

[33] MacLaine, C., et al. *Advancing Wood Manufacturing in Canada, Canada's Advanced Wood Manufacturing Sector: 2015-2016 Labour Market Information Update.* . The Conference Board of Canada and the Wood Manufacturing Council. June 2016.

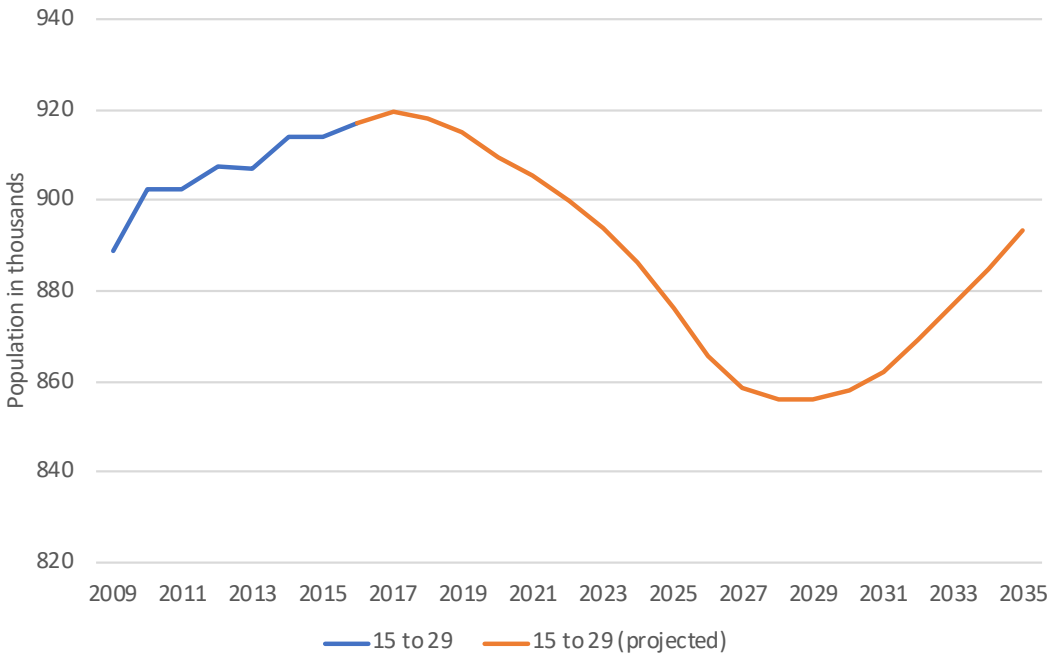
- Changing demographics means there are fewer young people available to fill entry-level positions.
- Potential entrants are either unaware of opportunities in the industry or view it as having a limited future.
- A dissonance between younger generations' expectations and preferences in the work environment and the nature of the work in the industry was identified in the employer roundtables and survey. High-school and post-secondary institutions lack initiatives to raise awareness and set realistic expectations about working in the sector such as career fairs, work experience, and employer talks.
- Other sectors, particularly the primary forestry sector, are able to offer higher wages.
- Many firms, especially smaller ones, underestimate the effectiveness of recruitment strategies and underutilize them.

These factors are explored further below, followed by a discussion of desired employee attributes and employer recruitment strategies.

Changing demographics

Figure 3 shows the historic and projected BC population of people aged 15 to 29 from 2009 to 2035. An expected drop of 7% from a peak of 920,000 in 2018 to 855,000 in 2029 is likely to heighten competition for new and entry-level workers.

Figure 3: BC population aged 15 to 29[34]



Lack of visibility to new entrants

[34] Source: BC Stats Population projections. Accessed July 25, 2018.

Across interviews, roundtable discussions and literature reviewed for this report, a lack of awareness and a negative perception of the industry among young people was frequently discussed.

Several roundtable participants said the value-added wood sector is seen by prospective hires as a sunset industry with little future. One said he went to the career fair with his daughter and heard a career counsellor strongly dissuading students from considering the sector. Two subject matter experts said many people do not realize the value-added sector is separate from the primary forestry sector. Several interviewees reported that new Canadian immigrants may be a promising source of labour for the industry as they do not seem to hold the same preconceptions held by much of the rest of the population.

In roundtable discussions, one employer said the sector needs to do a better job of appealing to young workers so they have a "better understanding of the career opportunities in the value-added wood sector".

The issue of poor perception of the sector was discussed in multiple studies consulted in the literature review. A 2014 report on the value-added wood sector in New Brunswick noted that all of the business representatives they spoke with cited a poor public image as a challenge for attracting workers to the industry. The 2016 *Advancing Wood Manufacturing in Canada* study found that more than 40% of survey respondents cited negative perceptions of the sector as a barrier to recruitment, including low wages, manual-intensive work activities, limited career advancement opportunities, and an industry in decline. These sentiments were echoed in the other research tools used in this report.

Work environment and changing work expectations

The employer survey asked participants to identify the primary reasons they are experiencing shortages in each of the nine job categories. The most commonly cited reason – more than 70% of respondents – across all occupation groups was that young people are not interested in doing the type of work required for the position. The number was highest in the production worker/labourer job category.

During the roundtables, employers frequently spoke of the challenges that changing expectations of young workers presents for their industry. The findings from the roundtable discussion brought forward observations that some young workers appear to feel overwhelmed or intimidated by the work environment, including exposure to loud noise, the constant movement of workers and materials from one location to another, and the repetitious nature of the work. Roundtable discussions also highlighted that young people may need to be more willing to accept "getting their hands dirty, doing manual work, and working a full day" and that appealing to entry-level workers will become harder with further increases in the minimum wage.

The challenge of changing work expectations was also identified in the literature review. In the *Advancing Wood Manufacturing in Canada* study, one employer acknowledges the high expectations of a younger generation of workers, and suggests that businesses will have to find ways to inspire them by adapting to their unique skills and talents.

Roundtable participants discussed the importance of a well thought out onboarding process to ensure that new workers are not put off by the working environment. It was suggested that this could be done, for example, by having new workers, during initial days on the job, learn critical safety awareness information so they are not immediately exposed to the production floor before they have settled in.

Roundtable discussions highilighted that there may be a need to meet the needs of new recruits such as introducing a phone break so they can catch up on social media during a shift.

Lack of initiatives in high school and post-secondary institutions

The issues of negative perceptions and mismatched work expectations among potential new entrants are closely related to the exposure these groups have to the industry. A perception among employers emerged in the literature review and employer roundtables that young people are getting less of this exposure than they used to.

The *Advancing Wood Manufacturing in Canada* study noted that most businesses participating in their survey held the belief that high school woodworking programs have diminished in recent years, and this has led to a reduction in the exposure of the industry to young people.

On the other hand, during a roundtable interview, it was identified that the sector needs to do a better job of appealing to young workers, saying the sector needs to "support people making the decision to invest in training that is embraced by our sector," and provide a "better understanding of the career opportunities in the value-added wood sector".

Competition from other sectors

The roundtables and expert interviews commonly cited construction and forestry as industries with which the value-added wood sector must compete for labour. Mining and oil and gas extraction were also mentioned. It was noted in roundtables and interviews that many of the graduates from the Centre for Advanced Wood Processing at the University of British Columbia choose the primary forestry sector over value-added, because wages are higher and primary firms are better engaged with the program through co-op work opportunities, career fairs, and similar activities.

Table 12 presents results from the secondary data analysis on median annual income for value-added wood and competing sectors. It shows that wood products manufacturing is competitive, but furniture manufacturing has the lowest income of all the sectors noted, making it much more susceptible to losing workers to other industries. The median wages for wood product manufacturing is significantly higher than construction, and on par with the forestry and logging sector. Income in mining and oil and gas extraction is significantly higher than all other industries. It is important to note that this data is for each industry as a whole. Data at the occupation-by-sector level is unavailable so wage comparisons of specific occupations within sectors cannot be made.

Table 12: Median wages, value-added wood and competing sectors[35]

BC	Forestry and logging	Construction	Mining and oil and gas extraction	Wood product manufacturing	Furniture manufacturing
$36,282	$63,483	$39,980	$94,011	$64,573	$35,378

[35] Forestry and Logging pertains to NAICS code 113, Construction to NAICS code 23 and Mining, quarrying, and oil and gas extraction to NAICS code 21. Wood product manufacturing and furniture manufacturing are defined in Table 3. Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016359.

Roundtable participants suggested that value-added wood businesses face a disadvantage because they are less likely than primary sector businesses to participate in cooperative educational opportunities. An employer said he participated in a co-op night at Centre for Advanced Wood Processing and was the only representative from his sector, while more than 15 companies attended from the primary sector. There was general agreement that co-ops are a good and underutilized opportunity for the value-added wood sector to engage with students and attract new workers.

Recruitment strategies

Only 37% of respondents to the employer survey said they have a recruitment strategy. The most common forms of recruitment for all employers are relational, through word of mouth or friends and family, or through free online job boards such as Craigslist, Indeed, and Kijiji. Firms with recruitment strategies use a much broader range of channels, such as employee referrals, industry associations, and recruiting companies. Relational strategies, online job boards, and recruiting companies were reported to be most effective.

More than half of employers surveyed (55%) have made efforts to recruit workers from underrepresented groups, such as young people under the age of 25, women, immigrants, and Indigenous peoples. Of these companies, 64% reported their efforts were successful.

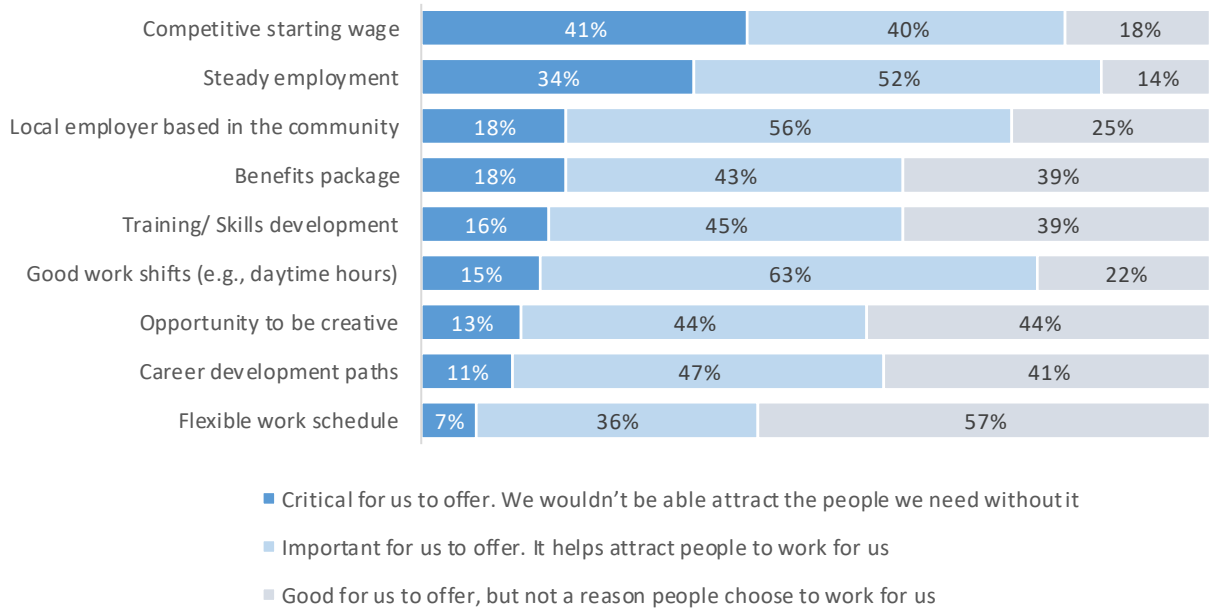
Survey results show that large firms with more than 20 employees are the most active in recruitment. Only 16% of firms with five or fewer employees have a recruitment strategy. Of these firms, 32% have made efforts to recruit workers from underrepresented groups. These numbers are somewhat higher for firms with six to 20 employees.

When asked about essential characteristics in new employees, 80% of survey respondents cited having a "work-ready attitude". A definition of "work-ready attitude" that emerged from employer roundtables and was reviewed by the steering committee is that employees meet baseline work requirements including being punctual, having a good attitude, and working efficiently.

The ability to quickly learn how to operate new tools and machinery was highly rated across all job categories in the survey. For production workers/labourers and skilled trades worker, experience using tools and machinery for the sector was highly valued. In the roundtables, employers said advancement is often decided through on-the-job observation – employees are more likely to be promoted if employers are able to see that they are dependable and quickly able to pick up new skills.

Employers responding to the survey had diverse views when asked what attracts prospective employees. The two that appeared most important were a competitive starting wage and steady employment. Respectively, 41% and 34% of employers said these are critical, and that they would not be able to attract employees without them. The rest of the benefits can be seen in Figure 4.

Figure 4: Importance of Benefits for Attracting Workers[36]



Just over half (56%) of employers indicated that their organization has a strategy in place to retain staff. When these firms were asked what strategies were most effective, the most commonly cited answer was to raise wages. Other important strategies to retain staff that were identified in the survey include providing a safe work environment, a positive workplace culture, effective leadership, and training and development. The importance of training and development was highlighted by a roundtable participant who said he paid for an employee to take an off-site wood finishing course and it benefited both the company by adding new skills and the employee by enhancing his career.

3. A Lack of Effective and Accessible Training

There was consensus among employers at roundtable sessions that effective training institutions are critical for the value-added wood sector to continue its growth and adequately address its labour market challenges. In-house, informal on-the-job training is the most prevalent form of training offered. External training options are often seen as inconvenient, inaccessible, and unavailable.

Current training landscape

According to survey results, the majority of employers offer some form of training to employees (see Table 13). The principal form of training offered is informal on-the-job coaching and mentoring – offered by 56% of participants – followed by apprenticeship training, other in-house training, and formal on-the-job training.

The types of training opportunities offered by companies are strongly correlated with company size – 90% of companies with more than six FTEs (full-time equivalents) say they offer training and are more likely to provide a wider range of training opportunities. Less than half of companies with one to five

[36] Source: Employer Survey

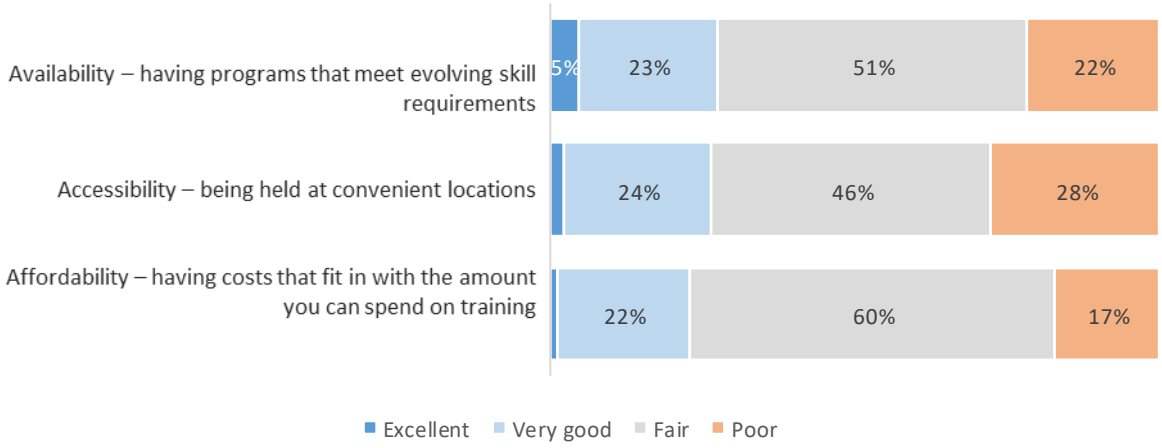
FTEs – about one-third of total businesses surveyed – offer training and, in most cases, the training they offer is limited to informal coaching and mentoring.

Table 13: Types of in-house training offered[37]

Type of training	Total	1-5 FTEs	6-20 FTEs	21+ FTEs
Informal coaching and mentoring	56%	40%	63%	63%
Apprenticeship training	37%	20%	30%	54%
In-house workshops/seminars/training sessions	24%	4%	26%	37%
Formal/organized on-the-job training program with goals/benchmarks	24%	0%	26%	40%
Online training/webinars	17%	0%	7%	37%
Workshops/seminars/training sessions held off-site	17%	0%	11%	34%
Formal mentorship/coaching program in which employees receive ongoing advice/support from senior colleagues	16%	8%	11%	26%
My company does not currently offer/support any of these	18%	52%	7%	3%

Employers were generally pessimistic about currently available external training and education opportunities, with only one-quarter of survey respondents reporting that these programs are very good or excellent with respect to availability, accessibility, and affordability (see Figure 5).

Figure 3: Perceptions of external education and training programs[38]



Data was also collected from BC Student Outcomes surveys of public post-secondary institutions from 2011 to 2016 for the 12 national occupational classification (NOC) codes most closely aligned to priority

[37] Source: Employer Survey
[38] Ibid.

occupations[39]. Many of these occupations could not be matched to educational data due to a lack of responses from these occupations. This suggests many workers may either not be pursuing education beyond the secondary level or may be undergoing private training that is not reflected in the BC Student Outcomes surveys.

This is in line with national patterns of educational attainment. 2016 Census data shows that for 10 of the 12 value-added wood NOC codes, the most common highest educational attainment for the population aged 25 to 64 is a high school diploma or below[40]. Unfortunately, this data is unavailable at the provincial level and BC has higher overall levels of educational attainment[41], so it cannot be stated with certainty if this pattern holds at the provincial level.

A scan of currently available training programs in BC[42] found that 18 have direct relevance to the sector. The programs all belong to one of four categories: woodworking (10), wood processing (10), cabinetry (three), and furniture (two). The majority of these are full-time certificate or apprenticeship programs lasting anywhere from three weeks (Intro to Trades – Carpentry) to four years (Bachelor degree in Wood Products Processing). Programs from all categories are offered in the Lower Mainland, and most are also offered in at least one other region (Okanagan/Central Interior, Vancouver Island/Coast, or Northern Interior).

In addition to programs directly related to the sector, more than 100 courses and programs were identified that may have some relevance to the sector. The programs cover a broad range of topics and disciplines from applied engineering, technician training (e.g., millwright), and equipment operation and mechanics (e.g., forklift, chainsaw) to health, safety, and management training. These programs vary widely in terms of delivery platform, location, length, and certification.

Roundtable findings have highlighted the fact that existing training programs do not meet the needs of the majority of employers' needs. Woodworking programs focus on hobbyists rather than those seeking a career in wood while the four-year advanced wood processing programs offered at the University of British Columbia (UBC) provide advanced business and managerial training that serves a small subset of sector needs.

Some employers may not be fully aware of existing training opportunities. For example, some roundtable participants were not aware of the UBC Centre for Advanced Wood Processing program on kiln drying, a 150-hour modular program.

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[39] These codes are 2252 Industrial designers, 2253 Drafting technologists and technicians, 5244 Artisans and craftpersons, 7204 Contractors and supervisors, carpentry trades, 7271 Carpenters, 7272 Cabinetmakers, 9532 Furniture and fixture assemblers and inspectors, 9533 Other wood products assemblers and inspectors, 9215 Supervisors, forest products processing, 9434 Other wood processing machine operators, 9437 Woodworking machine operators and 9534 Furniture finishers and refinishers.

[40] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016258.

[41] Source: Statistics Canada. 2017. Education Highlight Tables. 2016 Census.

[42] Programs were compiled from the BC Forest Sector Workforce Initiative website. The website "includes more than 500 programs from 25 recognized" public and private post-secondary institutions. The database is the work of a coalition of "leaders from forestry & logging, silviculture and wood and pulp & paper manufacturing sectors" as well as representatives from the education and training organizations. More information can be found by following the above link.

Value-added wood training competencies

Roundtables showed that employers want entry-level employees to have the necessary attributes to be successful. These include soft skills such as an ability and willingness to learn, punctuality, and demonstrating a consistent work effort, along with capabilities such as basic arithmetic, ability to use small machinery/hand tools, and being able to measure. Spatial awareness and recognition of safety risks are also critical. Employers noted that pre-employment training tends to focus on craftsmanship and custom design, and less so on commercial production. As a result, expectations are often not aligned between employers and graduates of these programs.

During the roundtables, employers were nearly unanimous about the need for skill-based training, and many said that much of what is currently available does not meet their needs. One often-referenced example was the Advanced Wood Manufacturing bachelor degree at the Centre for Advanced Wood Processing, which prepares students for managerial and business-related roles. Participants in the roundtables suggested two types of skill-specific training would be beneficial: module-based (short course) training and in-house training led by internal or external specialists.

Employers recommended using the physical infrastructure and expert knowledge available at existing institutions to offer more practical, skill-specific courses over a relatively short period of time. These short courses would provide training to address specific employer needs without requiring the large overhead costs of purchasing expensive machinery. Two roundtable participants reported good results when they sent employees to the Industrial Wood Finishing course at the Centre for Advanced Wood Processing and to the Oregon Wood Innovation Center at Oregon State University.

Roundtable participants also discussed onsite training. They suggested there may be opportunities to work with manufacturers to provide training when machinery is installed and during maintenance periods. For example, the sector could help coordinate site visits so that company representatives can visit multiple sites on one trip to British Columbia. More broadly, the idea of onsite visits by external experts to evaluate operations, provide training, and identify opportunities for operational or productivity enhancements appealed to participants. One employer pointed to the economic advantages of delivering this type of training over classroom-based training because fixed costs are low. Site visits could also present opportunities for significant productivity gains from simple-to-implement modifications to business processes and machine configurations. Participants agreed that these types of changes tend to improve employee morale because the benefits are immediately evident.

4. Sustained labour productivity is key to long-term success

A new theme that emerged from the research conducted for this report was the importance of innovative approaches to continuing labour productivity improvements. Of the employers surveyed, 69% said innovation and technology will impact the skills that both current and prospective workers need to have. The roundtable discussions confirmed these findings, with all participants saying that innovation will be either critically important or somewhat important across a number of business processes.

It is important to note that employers participating in the roundtables emphasized that innovation is about more than simply adopting new technologies. They said it needs to be interpreted broadly to include the application of new skills and know-how, the adoption of technology in its various forms (e.g.,

software, computers, machinery), the improvement of the skills of current workers, and process improvements such as the implementation of lean practices.

The following external factors were identified as driving the need for ongoing innovation in the sector[43]:

- strong sales and labour productivity growth in recent years, and the expectation that growth will continue;
- advances in engineered wood product manufacturing, and both cultural and legislative changes to support the expanded use of such products in new construction;
- heightened competition from the value-added wood sector in other countries, particularly in furniture manufacturing;
- a dwindling wood fibre supply in BC; and
- current and ongoing labour shortages pushing businesses to be more efficient and effective.

Labour productivity and growth expectations

As identified in the secondary data analysis and seen in the sector and workforce overview, manufacturing sales in BC's value-added wood sector rose 10% per year from 2012 to 2017. Employers are optimistic about future revenue growth. When asked in the employer survey about their revenue growth expectations over the next five years, 69% said they expect revenues to increase by at least 5% per year, while more than one-quarter (28%) said they expect annual revenue growth greater than 10%. When asked about the factors affecting their future labour needs, most cited increasing demand for their goods and services. It is worth noting that growth expectations vary by business size, with larger companies expecting stronger growth than smaller ones.

Table 14 shows that labour productivity has also seen large gains over this time period – the value-added wood labour productivity growth rate of 17% is twice that of BC overall, and is equal to that of manufacturing. This growth is largely driven by furniture manufacturing, which grew at a rate of 34% from 2012 to 2017.

Table 14: Labour productivity, value-added wood and benchmarks[44]

	BC	Manufacturing	Wood product manufacturing	Furniture manufacturing	VAW
2017 Labour productivity	54.7	56.8	57.8	32.5	49.8
Growth, 2012-2017	8%	17%	8%	34%	17%

Increased demand for engineered wood products

[43] See Table 6 for historical labour productivity and sales growth. 69% of employers surveyed expected at least 5% annual revenue growth over the next five years. The remaining factors were identified in expert interviews and the literature reviewed for the report. See Appendix D for details.

[44] Labour productivity is defined as total value added divided by total hours worked. Source: Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts

Respondents to the employer survey from the engineered wood products subsector had the highest future growth expectations (60% of respondents expect annual growth of 10% of more). Subject matter expert interviews and the literature review also showed strong evidence of increasing demand for these goods. This evidence includes:

- New products that increase the load-bearing capacity of wood, making it a viable alternative to materials traditionally used in the construction of large buildings[45].
- Government policies and regulations being updated[46] to reflect advances in wood technology by allowing, and in some cases actively promoting[47], the use of wood in new building projects.
- An increasing awareness and demonstration that wood buildings are safer and easier to build than once thought[48].
- Rising consumer preference for natural and sustainable building materials such as wood[49], which has a lower carbon footprint than many other traditional building products.

In the expert interviews, all of the above factors were cited to varying degrees as evidence of this trend. One interviewee said regulatory changes in favour of expanding the use of wood in building construction were, in part, a result of the fact that "the technology has proven itself". Others spoke of the increasing appeal of wood as an aesthetically pleasing and environmentally friendly building product, and said they expected the increased popularization and use of such materials.

Competition from other countries

Interviews and the literature reviewed for this report indicate that heightened competition from other countries is likely to push BC value-added wood producers to be more efficient with available resources. More than 30% of employers surveyed for this report cited a country outside of Canada as their primary market, indicating a large degree of exposure to international market forces. While these firms are most likely to be affected by increased international competition, businesses with primary markets in British Columbia and the rest of Canada will also be affected by stronger competition from abroad.

Table 15: Primary market served[50]

	BC	Elsewhere in Canada	USA	Europe	China, Japan, or Korea
Share of businesses responding	59%	8%	21%	6%	7%

[45] The Canadian Wood Council. Innovative Applications of Engineered Wood

[46] China has been revising building codes since as early as 2006 to promote the use of wood in construction, largely for environmental reasons.

[47] The BC Wood First initiative was established in 2009 requiring that all new government buildings first consider wood as a primary construction material. The provincial NDP government has also pledged to "make BC a world leader in engineered wood products" using such products extensively in new buildings.

[48] This view was expressed in most of the expert interviews and can be seen in the many articles such as this one.

[49] This was another common view in expert interviews and can be found in many consumer reports.

[50] Source: Employer survey

Europe and the United States are strong competitors in the engineered wood product and prefabricated home markets[51], while China, Malaysia, and Vietnam[52] are major producers of furniture and similar items. One subject matter expert interviewee noted that, due to lower labour costs in the latter countries, they will be very difficult to compete with as they continue to improve the quality of goods they produce.

Increasing competition from other countries puts downward pressure on product margins, emphasizing the importance of continued productivity improvements.

Wood fibre supply constraints

More than half (58%) of employers surveyed for this report cited wood supply constraints as the primary or secondary obstacle to achieving their business goals. The mountain pine beetle, and to a lesser extent the spruce beetle, continues to affect timber supply[53]. Forestry Innovation Investment (FII) predicts that the timber supply will drop by 20% from 70 million cubic metres in 2018 to 56 million in 2027[54].

Another element of uncertainty surrounding timber supply is the potential resolution of Indigenous title claims in the coming years[55]. It is unclear what effect this will have on fibre supply and the value-added wood sector specifically, but several experts interviewed for this report stated it could have a large impact on how forest tenure and harvesting rights are decided in British Columbia.

Fibre supply constraints will likely result in upward cost pressures, tightening profit margins and encouraging innovative productivity improvements.

C. Opportunities for Action

Based on the findings of the project research tools, four areas of action are recommended to address the challenges and opportunities currently facing the value-added wood labour market in British Columbia. These key concepts serve as a starting point for reconvening the advisory group to discuss options for the Strategy Development Phase (Phase 3) of the Sector Labour Market Partnerships Program.

Actions to consider:

1. Awareness: Raise awareness of the sector and its career opportunities, and improve its public image, especially among young people.
2. Attraction: Ensure the sector is able to recruit and attract the qualified labour it needs for its continued success.

[51] Manninen, Heikki. Long-term outlook for engineered wood products in Europe
[52] Binh, Dam Huy. Furniture Industry – Vietnam & Global Market Outlook
[53] Environmental Reporting BC Trends in Timber Harvest in B.C.
[54] Includes Timber Supply Areas (TSAs) and Tree Farm Licenses (TFLs) only; wood from private lands and from other tenures such as Community Forest Agreements, First Nation Woodland Licences or Woodlot Licences is excluded. Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development via FII's BC Forest Sector Data and Stats 2018
[55] In 2014, the BC Supreme Court ruled that the Tsilhqot'in Nation holds title to over 4,000 square kilometres of what was Crown land, giving them the right to reap the economic benefits of the natural resources on this land.

3. Retention: Create a comprehensive value proposition and onboarding experience to keep employees in the industry.
4. Training: Develop training that is flexible and responsive to industry needs.

Table 16 provides an overview of current job shortages and future estimated job openings for each of the nine priority occupations, and notes the relevance of the opportunities for action to each. Relevance of individual labour market strategies for each occupation is summarized below:

- Production worker: As primarily unskilled, entry-level labour, the strategy focus for production workers must be on raising awareness of the industry and attracting new workers. As the largest group, filling these positions is crucial. This group is also an important feeder for more advanced positions.
- Skilled trades workers: Skilled trades workers are employed across many sectors and, as such, the focus will be attracting these workers to the value-added wood sector, and providing a competitive value proposition so they are not be drawn away to other, more attractive industries.
- Machine operator/manager/finisher: Retention and training are key. High variation in machinery across subsectors and frequent customization make promotion from within most attractive, and promising workers must be trained and presented with clear career pathways so they are encouraged to remain in the industry over the long term.
- Designer/technologist/estimator: These specialized positions are likely to need formal pre-employment training outside the firm. As such, raising the level of awareness and ensuring that the proper incentives are in place to compete with offers from other industries are key.

Table 16: Shortages and opportunities for action[56]

	Current shortages	Annual additional openings	Opportunities for Action, and Relevance by Occupation (H=High; M=Medium; L=Low)			
			Raise awareness	Improve attraction	Retain	Train
Production worker/labourer	780	140 - 280	H	H	M	L
Skilled trades workers (e.g., mechanic, electrician)	215	30 - 50	M	H	L/M	L/M
Machine operator	140	30 - 60	L	M	H	H
Manager/supervisor	100	30 - 60	L	L/M	H	H
Designer	70	10 - 15	M/H	M	M	M
Finisher	60	5 - 10	L	L	H	H
Salesperson	45	15 - 30	M	M	M/H	M/H
Technologist	40	0 - 5	M/H	H	L	L
Estimator	35	5 - 10	M	H	L	L

[56] Source: Labour market modeling using data from Statistics Canada. See Appendix F for details.

Current shortages are calculated by scaling shortages reported by employers in the survey to current overall industry employment levels. Additional openings are those created through growth and expected retirements. Details on the approach used to model these numbers can be found in Appendix E. It is important to note that these recommendations were arrived at by making reasonable assumptions based on careful research, but as with any such exercise, the recommendations are subject to change if there is large change in the external conditions used to derive these assumptions.

Actions to Consider

I. Raise awareness

Analysis for this report found that awareness and perception of the industry stand to be improved. Subject matter experts reported that the value-added wood sector is perceived by many people as a sunset industry with few future career prospects to offer. This aligns with literature reviewed, which has cited a poor public image as a challenge for attracting workers to the industry.

The occupation for which this is most relevant is production workers, who tend to be young and have little job experience. Other occupations this applies to are those that require formal pre-employment training, which is nonspecific to the sector. Of the priority occupations, this includes skilled trades workers, designers, technologists, and salespersons. These potential workers may not be aware of career opportunities offered by the value-added wood sector.

There are a number of ways to raise awareness, including active engagement in secondary schools across BC with educators who influence career choices and with youth making transition plans. A number of employers suggested increasing participation in career fairs and co-op educational programs as a possible way to engage better with young people.

The value-added wood sector could also improve its image through a marketing campaign to highlight its strengths, differentiate itself from related industries, and dispel false myths about the sector. This campaign could educate the public about available career paths and the importance of the sector to the provincial economy.

II. Improve attraction

Employers reported through surveys and roundtables that they are struggling to attract workers across several key occupations. Attracting new entrants will help fill job openings and ensure there are adequate staff to promote to more senior positions such as machine operators and managers.

Employers cited a wide range of benefits from competitive wages to ongoing skills development when asked what is important to attract workers to the sector. A clear and compelling value proposition should be developed for key occupations that takes into consideration this range of benefits. The value proposition needs to appeal to numerous demographics, including young people, a demographic that is is shrinking and does not have a favourable view of the sector. Secondary data shows that women are highly underrepresented in the sector (see Table 8). Two-thirds of employers surveyed reported that,

when implemented, recruiting underrepresented groups, such as women, new Canadians, and Indigenous people, helped to meet labour demands.

Special effort is required for occupations that receive critical pre-employment training in traditional educational/vocational training programs such as skilled trades workers (e.g., electricians, plumbers), designers, technologists, and estimators. Effort needs to be made to reach out to existing training programs and appeal to potential entrants who are considering taking jobs in competing sectors.

III. Improve retention

Employers reported difficulty retaining workers for multiple reasons. In roundtables, there were examples given of employees leaving their job after being intimidated by the work environment or wanting a less physically demanding job with less responsibility. The employers said they compete with forestry, construction, and mining, and have lost workers to these sectors.

A successful retention strategy requires a clear understanding of key competencies and career development opportunities as well as onboarding best practices that gradually introduce new workers to the most challenging aspects of the job. Retention is most important for occupations that require specific expertise, and these are ideally filled through internal promotions. These occupations include machine operators and managers, but also may include designers and others.

There is a great diversity of firms and occupations in the sector, and it can be hard for potential employees to identify career development opportunities. Establishing career paths will help employees understand their options and the training they may need to advance within the sector. Similarly, key competencies for major occupations will help employees understand what is expected of them and allow interested workers to make choices that support their own professional development.

Employers reported a broad variety of successful retention strategies. This may indicate that there would be value in better understanding retention from the employee perspective, and that engaging employees in the development of such strategies would be beneficial.

IV. Strengthen training options and opportunites

One theme that emerged from the research for this report was the need for training that meets industry requirements. A workforce with up-to-date skills will allow the value-added sector to meet growth expectations and adapt to changing market and technological requirements, a capability that is essential to respond to innovation pressures. The current view of existing training programs among employers is largely negative, and they generally feel existing programs focus on niche roles that have limited use to their sector. Training must consider the needs of all subsectors and occupations.

Like retention, training is especially important for occupations that require specific skills such as machine operators, managers, and finishers. These positions often require the use of specialized and/or customized equipment, and the right training will focus on specific skills for which a degree program is unnecessary.

Suggested options for such training include institutional short courses and onsite training. The former would take advantage of existing knowledge and infrastructure at already established institutions to focus on building skills for specific occupations. This method of training was seen as highly valuable from the employer perspective, and may also be a good way to enhance the employee value proposition.

The onsite approach would also take advantage of existing skillsets and infrastructure but would consist of site visits by an expert to train employees on the worksite. Experts could also help to identify opportunities for operational or productivity improvements within the context of the specific firms that they were visiting. This approach may be of particular value to small firms who are especially unlikely to currently offer in-house training and may lack the resources to send workers to off-site training.

D. Appendices: Detailed Research Findings

Appendix A. Primary Data Employer Survey [57]

This appendix presents a summary of the primary data collected from employers in BC's Value-Added Wood sector. This primary data was collected via a survey designed to quantify the key issues identified in the sector engagement project among a larger, representative group of sector employers. As such, the survey measured the extent to which employers are experiencing shortages in the nine in-demand job categories identified in the engagement project, as well as the extent to which difficulty in attracting new (especially young) entrants to the sector, and a lack of suitable training and education options are perceived as contributing to labour shortages.

The survey also measured the extent to which employers perceive a number of external factors will impact their ability to achieve their business goals in the next five years, including: regulatory factors (e.g., access to quality wood, softwood lumber agreements), technological factors (e.g., innovation and automation) and consumer factors (e.g., changes in consumer preferences). The survey also measured the extent to which employers are implementing internal strategies – including strategies to attract and retain employees – to address labour shortages.

Executive Summary

Most Value-Added Wood employers expect to grow their businesses in the next five years. Overall, 7-in-10 employers surveyed indicated that their goal is to achieve revenue growth over the next five years – 41% reported expecting to achieve moderate growth (5 to 10% annually) and 28% reported expecting to achieve substantial growth (over 10% annually).

Employers consider access to skilled labour as among the most critical factors that will impact their ability to achieve their business goals. Difficulty accessing skilled labour was second only to limited access to quality wood as the biggest challenge that employers expect to face as they work toward achieving their business goals. Further, the need to increase labour supply to meet increasing demand is considered a greater business challenge than adapting to new technologies, automation and changing regulations.

The survey results illustrate that, among the nine in demand job categories identified in the sector engagement project, the skilled trades pose the biggest challenge. Among companies that currently employ skilled trades workers, 71% reported a shortage of these types of workers. Other job categories in which shortages are relatively prevalent include: designer, estimator, finisher and technologist.

The job categories of designer, estimator and finisher have notably higher percentages of female employees (25% to 35%) than other job categories. The job categories of designer and finisher are also among the categories with the highest percentage of immigrants (21% for designers, 20% for finishers).

Across job categories, employers cite a lack of interest among young people in working in the sector as the main cause for the labour shortage. This is considered a more important cause than workers exiting

[57] Document finalized 20 July, 2018

the sector, workers retiring or a lack of training and education programs. This suggests that attracting workers is the main challenge – as opposed to mitigating churn.

Consistent with the fact that 7-in-10 employers have a goal of increasing revenue over the next five years, most employers are coping with the labour shortage by hiring under-skilled people and raising wages – as opposed to coping by turning away work or scaling back operations or expansion plans.

While employers are seized with the importance of attracting workers to support the growth goals of the company, only 37% of employers reported having a recruitment strategy. Employers that have a recruitment strategy use a broader range of channels to recruit. They also use channels that are less "top of mind" than other channels. One example is the employee referral program. This channel is used by 50% of employers with a recruitment strategy but only by 22% of employers that do not have a recruitment strategy. Most employers who use employee referral programs consider them to be effective channels for recruitment.

When it comes to the essential characteristics that employers look for when hiring new employees, the most essential characteristic identified across all job categories is a work-ready attitude – 8-in-10 employers identified this as essential. This may not be surprising given that most employers are already hiring under-skilled workers to cope with the labour shortage. In the absence of a highly skilled talent pool to choose from, attitude becomes that much more critical.

Given that worker attraction is considered to be the primary labour challenge, it follows that employers would identify a competitive *starting wage* as the most critical element of their employment offer. This is considered far more important than longer term potential rewards like training and skills development or career advancement.

Just over half of employers (55%) have made efforts to recruit workers from one of the following groups: younger people (under age 25), recent immigrants, women, indigenous persons, people with disabilities and older people (over age 50). Employers have generally considered these efforts as helpful in addressing their labour shortages. The most common group targeted has been younger people (who employers perceive not to have a high level of interest in the sector). Overall, 34% of employers have made special efforts to target young people. In contrast, 17% have made special efforts to recruit indigenous persons and 7% have made special efforts to recruit people with disabilities.

Just over half (56%) of employers have a strategy in place to retain staff. While employers use a range of retention strategies, wage/salary increases are the most commonly used. This is not surprising given the reality of labour shortages in the sector. However, ensuring a safe work environment, creating a positive workplace culture and offering additional benefits and perks are also relatively common ways that employers try to retain staff.

The most common type of training that employers offer is informal coaching and mentoring – offered by 56% of employers. Training is highly correlated with company size, however. Larger employers (with more than 20 FTEs) are much more likely than smaller employers to offer a range of formal training opportunities and workshops.

Employers generally do not have positive perceptions when it comes to external education and training programs. Only one-quarter of employers have positive perceptions of the availability, accessibility and affordability of these programs.

Methodology

The following bullet points outline the steps taken to execute the survey among employers in the BC Value-Added Wood Products sector.

- The survey was conducted online between April 4th and June 14th, 2018
- The survey was programmed and hosted by Sentis Research
- BC Wood provided a list of 459 employers with email contact information. These employers were invited to the survey by email. (Note: Prior to launching the employer survey, BC Wood sent an email to all employers to inform them about the upcoming survey and, over the course of the survey being open, sent out three more communications via newsletter and from the desk of the BC Wood CEO)
- Regular updates were sent to advisory group members encouraging them to engage employers in their sector.
- An email reminder was sent one week after the initial invitation
- Given that the response rate was still low after the email reminder, BC Wood provided Sentis with an additional list of 966 employers that could be contacted by phone. This list included phone numbers for 293 of the employers that were initially invited by email.
- Sentis initiated phone reminders to the 293 employers that had previously been invited by email but had not yet completed the survey.
- Sentis also initiated phone calls to 673 additional employers that had not been previously contacted by email, to invite them to participate in the online survey.
- To further encourage participation, employers were also offered a chance to win one of five $100 Visa gift cards as a token of appreciation for completing the survey.
- As a final effort to encourage participation, Sentis sent an email reminder to employers who had agreed to participate in the survey but had yet to do so. In an effort to make the email reminder more personal, the email reminder was sent directly from Adam DiPaula (Managing Partner at Sentis) rather than from a general Sentis mailbox.
- A total of 87 employers completed the survey, the equivalent of a 9% response rate.

The survey contained 26 questions and took employers an average of 10 minutes to complete.

Note that the Research Methodology included a survey of Value-Added Wood sector employees. The purpose of this survey was to measure employee motivations to enter the sector, what factors of the employee value proposition drive employee attraction and retention most strongly and determine if there are any important mismatches with respect to employee and employer perceptions.

The employee survey data was to be gathered using a referral methodology in which employers would inform their employees of the opportunity to share their experiences about working in the sector via an

online survey. Unfortunately, there were too few employee surveys collected to warrant meaningful analysis.

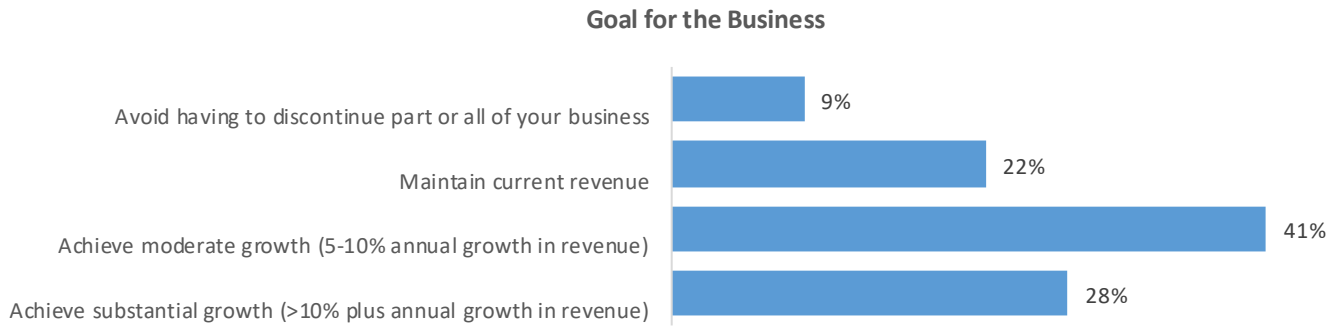
1. Growth Outlook & Challenges

Employers were asked to share their overall goal for business growth over the next five years as well as the key challenges they expect to face as they work toward achieving this goal. The results are summarized in this section.

Overall Goal for the Business

Employers are generally optimistic regarding their expectations for business growth over the next five years. Overall, 69% expect revenues to increase – with over one-quarter (28%) expecting substantial growth (over 10% in annual revenue).

Figure A-1.



Q6A. Thinking about the next five years, which of the following best reflects the financial goal of your company?

Note that those who are expecting substantial growth were less likely to report that their businesses are impacted by the softwood lumber agreements/negotiations between the U.S. and Canada (62% report being impacted) than those expecting moderate growth (78% report being impacted).

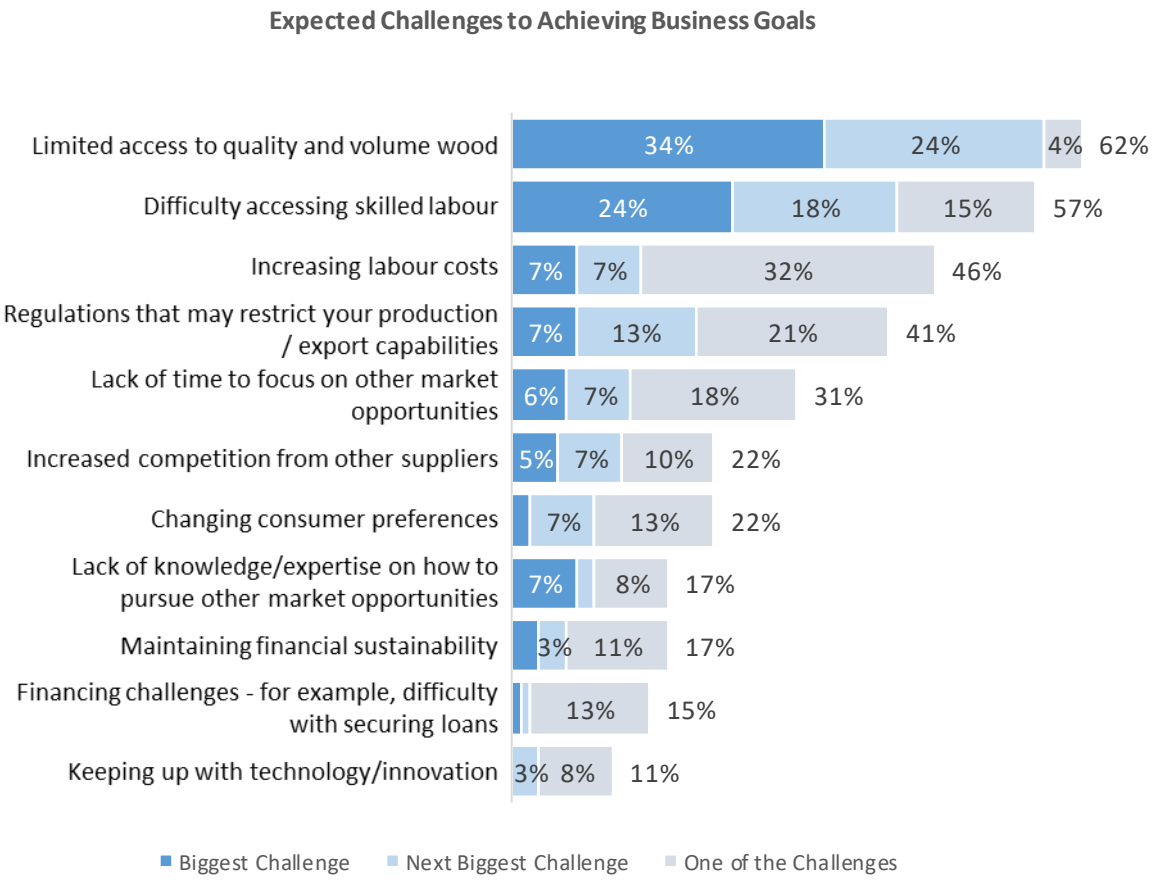
Also, company size is correlated with growth expectations. Companies with between 1 and 5 FTEs (full-time equivalents) were more likely to report wanting to maintain current revenue (36%) than companies with between 6 and 20 FTEs (19%) and more than 20 FTEs (14%). Only 12% of companies with between 1 and 5 FTEs reported wanting to achieve substantial growth, compared to 33% of companies with between 6 and 20 FTEs and 34% of companies with more than 20 FTEs.

Extent to Which Skilled Labour Shortages and Other Potential Challenges are Expected to Impact Business Goals

Employers were asked to indicate which of eleven potential challenges they expect to face as they work toward achieving their business goals over the next five years. By a wide margin, limited access to

quality and volume wood and difficulty accessing skilled labour are the two biggest challenges. Other secondary challenges include increasing labour costs, regulations that may restrict production/ export capabilities and a lack of time to focus on other market opportunities.

Figure A-2.



Q7A. What are the key challenges that you expect to face as you work toward achieving your business goals in the next five years? Please select all that apply. Q7B. Of these challenges you identified, which one do you think will be the biggest? Q7C. And which will be the next biggest?

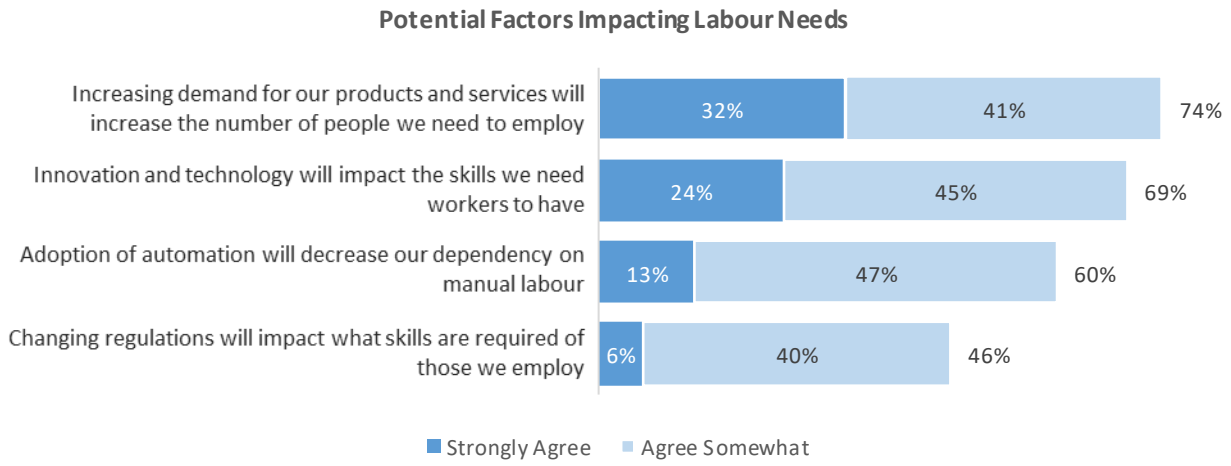
To further understand the factors that could impact their labour needs in the next few years, employers rated the extent to which their labour needs will be impacted by product demand, automation, changing regulations and innovation and technology.

Consistent with their generally optimistic growth outlook, three-quarters of employers (74%) indicated that increased demand for their products will increase the number of people they need to employ. A strong majority (69%) also indicated that innovation and technology will impact the skills they need workers to have.

The majority of employers (60%) indicated that automation will decrease their dependency on manual labour – however, only a relatively small percentage of employers indicated that this would have a strong impact.

The majority of employers (54%) indicated that changing regulations will not impact the skills that they will require workers to have.

Figure A-3.



Q8A. Thinking about your labour market needs for the next few years, please rate the extent to which you agree or disagree with the following.

Employers were asked what other external factors will impact the quantity or qualities of the labour that they will require in the next few years. Employers' verbatim comments were content-coded into thematic categories. Employers mentioned 12 different factors that will impact them. However, a lack of skilled/trained workers was mentioned twice as often as any other factor.

Table A-1.

Other External Factors that Will Impact Quantity or Qualities of Labour Needed	Total
Lack of skilled / trained workers	23%
Difficulty attracting workers to certain regions	12%
Schools / Programs not preparing workers for our industry	12%
Impact of treaties / agreements / duties	10%
Lack of interest in our industry among younger people	8%

Competing with other industry sectors for labour	8%
Poor work attitudes / Lack of work ethic	8%
Technological changes	7%
Broader economic forces -e.g., strength of economy, market competition	7%
Cost of living makes it difficult to attract workers to the industry	7%
Changing customer demands / needs	7%
Pressure to increase wages due to skilled worker shortage	5%

Q8B. What, if any, other external factors will impact the quantity and qualities of the labour you will require in the next few years?

1. Analysis of Target Job Categories

One of the key objectives of this survey was to gain a deeper understanding of the job categories identified in Phase I as posing the biggest staffing challenges for employers. An analysis of these nine target job categories is included in this section.

Number Workers, Wages and Types of Workers

Employers reported whether or not they currently employ workers in each of the nine target job categories as well as their average hourly wage for each job category. (To avoid biasing the responses, employers were not initially told that these categories were previously identified as posing the biggest staffing challenges.)

The reported hourly average wage ranged from $20 for production workers/ labourers to $35 for salespeople.

Table A-2.

Job Category	% Who Employ Workers in Category	Average Hourly Wage (Median)
Production worker/labourer	83%	$20
Manager/supervisor	78%	$30
Machine operator	74%	$23

Salesperson	72%	$35
Skilled trades workers (e.g., mechanic, electrician)	51%	$32
Estimator	37%	$25
Designer	33%	$28
Finisher	32%	$25
Technologist	14%	$30

Q9. Does your company have staff in the following job categories? Please select all that apply.

Q10. What is the average hourly wage for someone working in the following jobs at your company.

Table 3 below shows, for each job category, the percentage of workers falling into several occupational and demographic categories.

While there is some variation in the percentage of workers who are employees (as opposed to contractors) virtually all workers in each of these categories are employed full-time.

While the job categories are generally male-dominated, the job categories with the highest percentage of women are designer (35%) and finisher (28%).

The job categories with the highest percentage of immigrants include machine operator (28%), production worker/labourer (23%), designer (21%) and finisher (20%).

Currently, relatively small percentages of indigenous persons and persons with disabilities are employed in these job categories.

Table A-3.

Job Category	% Full-Time	% Employees as Opposed to Contractors	% Women	% Immigrants to Canada	% Indigenous Persons	% Persons with Disabilities
Production worker/labourer	96%	67%	16%	23%	4%	0%
Manager/supervisor	99%	82%	9%	10%	1%	0%
Machine operator	97%	83%	10%	28%	2%	2%
Salesperson	96%	69%	23%	9%	3%	2%

Skilled trades workers (e.g., mechanic, electrician)	98%	82%	10%	14%	4%	0%
Estimator	91%	77%	25%	11%	0%	2%
Designer	99%	72%	35%	21%	3%	0%
Finisher	98%	75%	28%	20%	5%	0%
Technologist	100%	81%	12%	4%	0%	0%

Q12. And of the [NUMBER SPECIFIED] [STAFF CATEGORY] how many are… Please enter 0 for none.

Shortages: Prevalence, Reasons, Impact

Table 4 below shows the total percentage of employers reporting a shortage in each job category and the percentage reporting a shortage among those who currently employee workers in each job category. It also shows the current "operating capacity", or the extent to which each job category is fully staffed. This is the ratio of the number of workers in a job category to the number of workers in a job category plus the number of workers needed to be considered fully staffed.

The results illustrate the job categories in which shortages are most acute. The job category with the most acute shortage is skilled trades workers. Seven-in-ten employers who employ workers in skilled trades report that they are experiencing a shortage in this job category, and the average current operating capacity is 77%.

Other job categories in which shortages are relatively prevalent include: designer, estimator, finisher and technologist.

Table A-4.

Job Category	Total % Reporting Shortages	% Reporting Shortages Among Those Currently Employing Workers in Category	Total Reported Workers	Number Needing to Hire to be Considered Fully Staffed	Current Operating Capacity
Production worker/labourer	51%	61%	1660	217	88%
Skilled trades workers (e.g., mechanic,	36%	71%	242	73	77%

electrician)					
Machine operator	20%	27%	332	42	89%
Manager/supervisor	18%	23%	252	27	90%
Designer	15%	45%	78	23	77%
Estimator	13%	35%	44	12	79%
Finisher	11%	34%	65	19	77%
Salesperson	8%	11%	145	13	92%
Technologist	7%	50%	26	18	59%

Q13. Initial engagement with the sector identified the following occupation types as being more likely than others to experience shortages. Are you experiencing labour shortages in any of these job categories? Please select all that apply.

Q14. How many individuals would you need to hire for the following positions for you to consider being "fully staffed"?

Employers identified the primary reasons they are experiencing shortages in each job category. Due to small sample sizes, the following job categories were combined into an "Other" category in Table 5: designer, estimator, finisher and technologist.

Across job categories, the most common reason cited for shortages is that younger people are not interested in doing the type of work that the job requires. A lack of training – whether it be training to upgrade skills or training to make new entrants job ready – was a reason cited by over half of employers who reported shortages in at least one of the Other job categories.

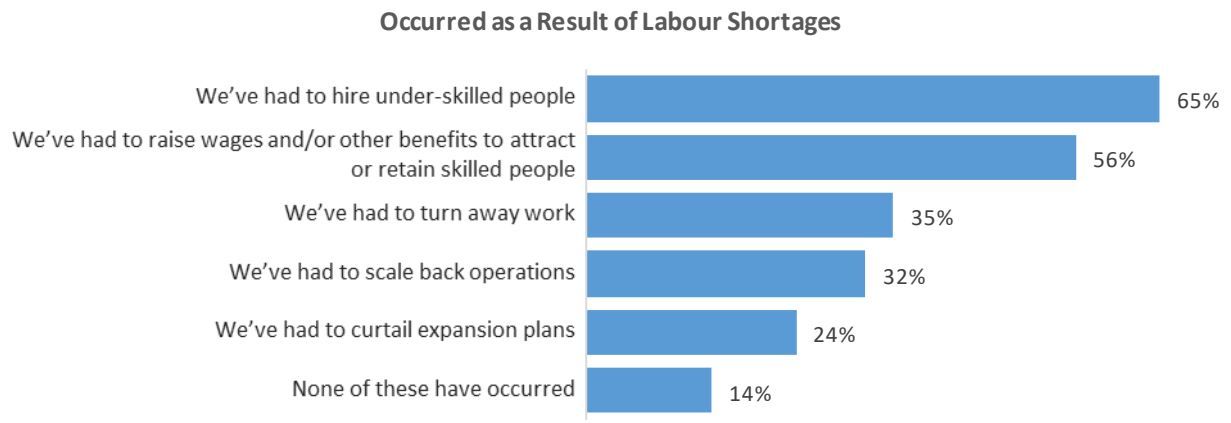
Table A-5.

Reasons for Labour Shortages	**Production Worker / Labourer**	**Skilled Trades Workers**	**Other Categories (Designer, Estimator, Finisher, Technologist)**
Younger people not interested in doing this type of work	80%	77%	63%
Workers leaving for other industries	43%	39%	33%

Workers retiring	32%	35%	37%
Workers leaving for other provinces/countries	27%	10%	15%
Training not available for evolving skill requirements/to upgrade skills	23%	26%	56%
Education/training not available to make new entrants job ready	20%	26%	52%

With respect to how employers are reacting to the labour shortages, the results generally show that, rather than taking steps that would lead either to downsizing or to passing up growth opportunities, employers acting in ways to mitigate business loss. This includes, first and foremost hiring under-skilled people and secondly increasing wages and other benefits to retain skilled workers.

Figure A-4.



Q16. Which of the following, if any, have occurred at your company as a result of the labour shortages you are experiencing? Please select all that apply.

2. Recruitment

Employers were asked to indicate the ways that they currently recruit employees and what ways have proved to be most helpful.

Recruitment Strategies

Overall, 37% of employers reported having a recruitment strategy. The table that follows shows the channels that employers rely on for recruitment - for all employers surveyed as well as for those who currently have a recruiting strategy and those who do not.

The results illustrate that recruitment is highly relational in the sector – the most common channels are word of mouth and friends and family. Employers who do not have a recruitment strategy tend to rely

on free listing websites (e.g., Craigslist) while employers with a recruitment strategy use a broader range of channels. Word of mouth, free listing websites and an employee referral program are the channels more likely to be considered particularly helpful.

Table A-6.

Recruitment Channel	Have Recruitment Strategies	Do Not Have Recruitment Strategies	All Employers	% Considering the Recruitment Channel as Particularly Helpful
Word of mouth	88%	64%	72%	56%
Friends and family	69%	42%	52%	44%
Craigslist, Kijiji, Indeed.com, Linkedin, and/or other employment related search engines	56%	45%	49%	53%
Posting on WorkBC job boards	53%	27%	37%	40%
Employee referral program	50%	22%	32%	54%
Industry associations	44%	24%	31%	30%
Print/newspaper advertisements	41%	25%	31%	31%
Social media (Facebook, Twitter, Instagram, etc.)	41%	18%	26%	22%
Recruiting companies	38%	16%	24%	48%
Career fairs	9%	7%	8%	28%

Q17. Does your organization have a recruitment strategy?

Q18A. What channels does your company use to recruit new employees? Please select all that apply.

Most Valued Qualities Among Prospective Hires

Employers identified the essential characteristics they look for when hiring new employees in each job category. Due to small sample sizes, the following job categories were combined into an "Other" category: designer, estimator, finisher and technologist.

Across job categories, having a work-ready attitude was identified as an essential characteristic by 8-in-10 employers. This was, by a wide margin, the characteristic considered most essential among the seven characteristics that employers evaluated.

For production workers/labourers, experience using tools and machinery for the sub-sector and the ability to quickly learn how to operate new tools and machinery were considered more essential than knowledge of the sub-sector, job-specific training and other foundational skills training.

For skilled trades workers, experience using tools and machinery for the sub-sector, the ability to quickly learn how to operate new tools and machinery and job-specific training were considered more essential than knowledge of the sub-sector and other foundational skills training.

For the other job categories, the ability to quickly learn how to operate new tools and machinery, knowledge of the sub-sector and job-specific training were considered more essential than experience using tools and machinery for the sub-sector.

Table A-7.

Essential Characteristics	Production Worker / Labourer	Skilled Trades Workers	Other Categories (Designer, Estimator, Finisher, Technologist)
Work-ready attitude	80%	81%	81%
Experience using tools and machinery for the sub-sector	48%	58%	26%
Can quickly learn how to operate new technical equipment, tools, or machinery	43%	48%	52%
Knowledge of the sub-sector (e.g., engineered wood products, furniture, millwork, etc.)	23%	29%	52%
Has taken job-specific training	20%	39%	48%
Has taken other foundational skills training	16%	16%	30%
Has taken health and safety training	9%	6%	7%

Q19. What essential characteristics do you look for when hiring new employees as a [JOB CATEGORY] Please select up to three.

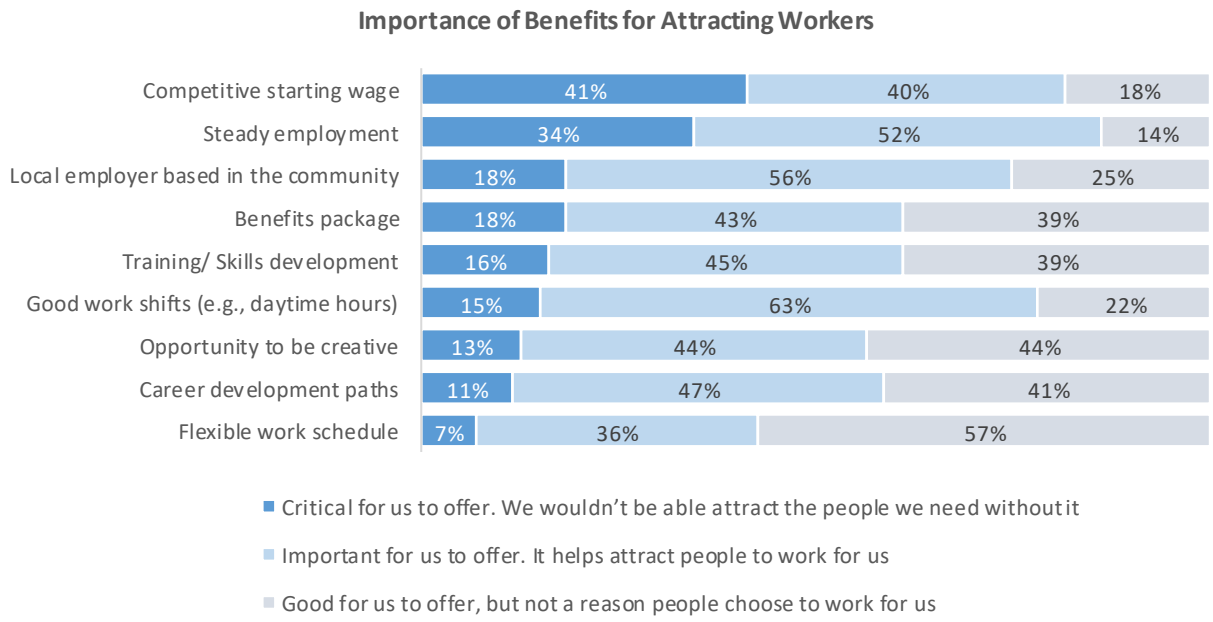
Benefits that Will Attract Workers to the Sector

Employers rated the importance of nine benefits with respect to how important they are to attract workers to the sector. Having a competitive starting wage was considered the most critical, followed by steady employment.

Being a local employer based in the community and the ability to offer good work shifts (e.g., daytime hours) were considered very important although less critical than a competitive starting wage and steady employment.

A benefits package, training and skills development, the opportunity to be creative and offering a career development path were all considered relatively important. Having a flexible work schedule was the only benefit not considered important by the majority of employers.

Figure A-5.



Q20. Below are some benefits that employers can emphasize to attract workers to the sector. Please indicate how important each one is for your business to offer in order to attract the talent you need.

Efforts to Recruit Workers from Underrepresented Groups

Just over half of employers (55%) have made efforts to recruit workers from underrepresented groups. The most common target of these efforts have been younger people (under the age of 25), followed by women, immigrants, older people (over age 50) and Indigenous persons. Only seven percent of employers have made efforts to recruit people with disabilities.

Figure A-6.

Q21A. Have you undertaken special efforts to recruit workers from the following groups? Please select all that apply.

Just under two-thirds (64%) of employers that have made efforts to recruit workers from non-traditional groups indicated that their efforts have been effective in helping them address labour shortages.

Among employers that have not made efforts to recruit workers from non-traditional groups, only 31% think these efforts would not be effective in helping them address labour shortages.

3. RETENTION & TRAINING

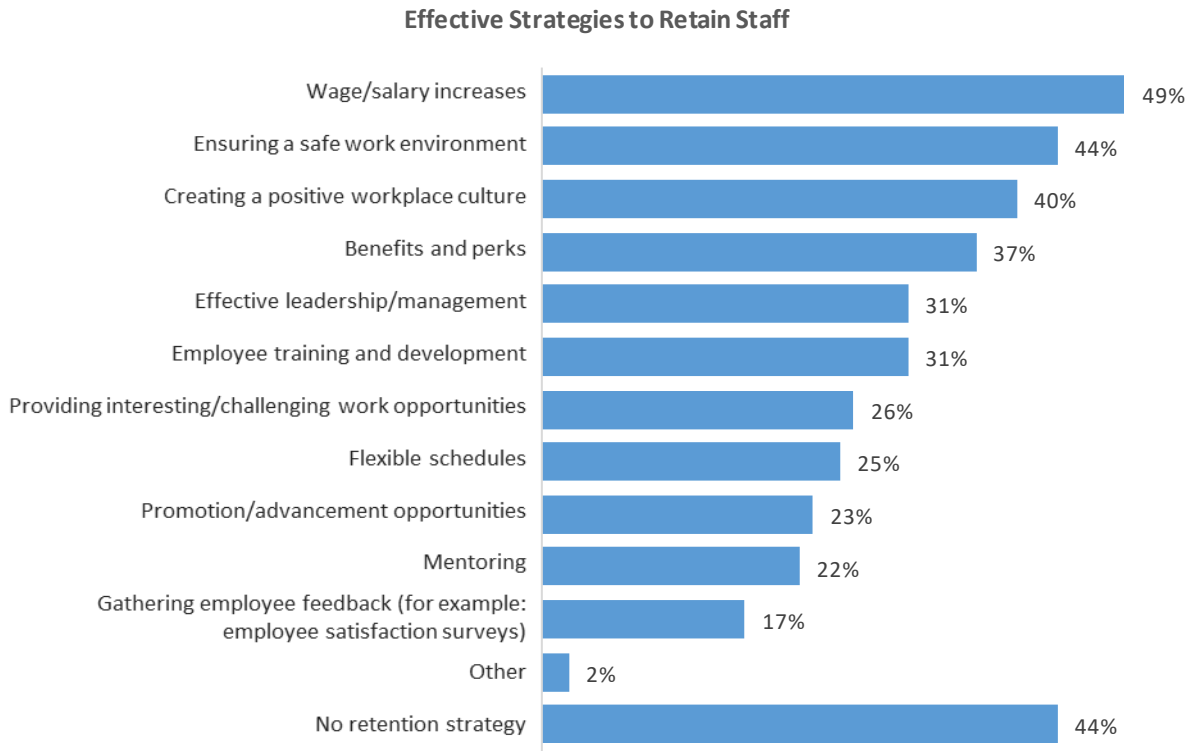
Employers were asked about the strategies that they use to retain staff as well as about the role that training plays at their company.

Effective Retention Strategies

Just over half (56%) of employers indicated that their organization has a strategy in place to retain staff. Employers reported using a range of strategies to retain staff. The most common strategy is to increase wages and salaries. This is followed by ensuring a safe work environment, creating a positive workplace culture and offering benefits and perks. The majority of employers do not currently view training and mentoring as effective retention strategies. Just under one-third (31%) of employers consider employee training and development to be an effective strategy, and only 22% consider mentoring to be an effective strategy.

The relatively large gap between the percentage of employers that consider wage/salary increases as effective and the percentage that consider providing opportunities for advancement and training as effective reflects the impact of labour shortages on the sector. Money is the primary tool to attract and retain – training and advancement are secondary.

Figure A-7.

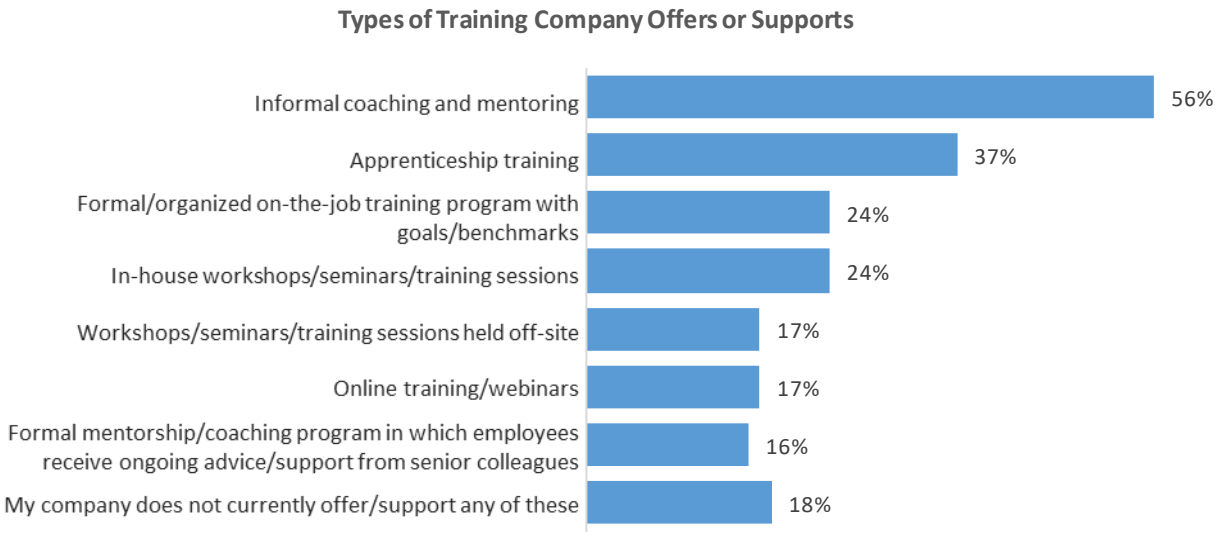


Q24. What have been some effective strategies to retain staff at your company? Please select all that apply.

Employer-Offered Training and External Education

Employers were asked if they currently offer, or support, eight different kinds of training. Just under 2-in-10 (18%) of employers indicated that they do not currently offer any of these types of training. The most common type of training offered is informal coaching and mentoring – currently offered by just over half (56%) of employers.

Figure A-8.



As illustrated in Table 8, training opportunities that are offered are related strongly to company size. For example, while 97% of companies with more than 20 FTEs (full-time equivalents) report offering at least one of these types of training, only 48% of companies with one to five FTEs report offering at least one of these types of training.

Other than informal coaching and mentoring, companies with more than 20 FTEs are significantly more likely than companies with fewer FTEs to offer each type of training.

Table A-8.

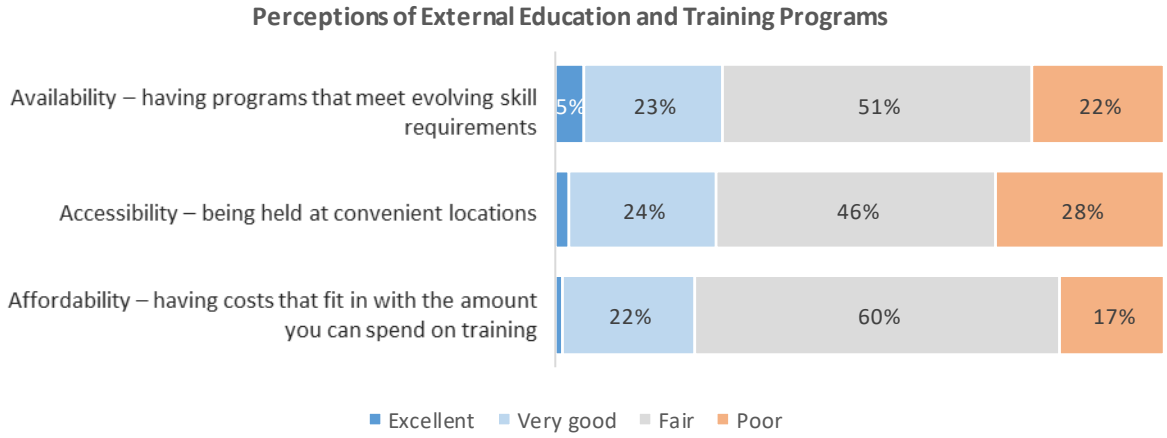
Full-Time Employees	Total	1-5 FTEs	6-20 FTEs	21+ FTEs
Informal coaching and mentoring	56%	40%	63%	63%
Apprenticeship training	37%	20%	30%	54%
In-house workshops/seminars/training sessions	24%	4%	26%	37%
Formal/organized on-the-job training program with goals/benchmarks	24%	0%	26%	40%
Online training/webinars	17%	0%	7%	37%
Workshops/seminars/training sessions held off-site	17%	0%	11%	34%
Formal mentorship/coaching program in which employees receive ongoing advice/support from senior colleagues	16%	8%	11%	26%

My company does not currently offer/support any of these	18%	52%	7%	3%

Q25. Which of the following types of training do you offer, or support, at your company? Please select all that apply.

Employers rated the availability, accessibility and affordability of external education and training programs. Perceptions of these programs were generally not positive among employers – only one-quarter of employers consider these programs to be very good or excellent.

Figure A-9.



Q26. How would you rate existing external education and training programs with respect to the following?

4. Characteristics of Employers Who Participated in the Survey

This section contains the regions and business characteristics of employers that responded to the survey.

The regional distribution of those responding to the survey is in line with the regional distribution of all employers in BC's Value-Added Wood sector.

Table A-9.

Region of Business	Total
Lower Mainland/Southwest	38%
Thompson-Okanagan	29%
Vancouver Island/Coast	18%

Cariboo	7%
Kootenay	5%
North Coast & Nechako	2%
Northeast	1%

Q1. In which region is your company located? If your company has more than one location, please select the region where most of your production work takes place.

The main area of business among employers responding to the survey is consistent with the main area of business among employers in BC's Value-Added Wood sector generally.

Table A-10.

Company's Main Area of Business	Total
Remanufactured Wood Products	31%
Millwork	23%
Log Homes and Timber frame	16%
Cabinets	15%
Engineered wood products	6%
Prefabricated Housing	6%
Furniture	3%
Other	0%

Q2B. Which do you consider your company's main area of business?

Employers responding to the survey represented a range of company sizes - 29% represented small companies (1 to 5 FTEs), 31% represented mid-sized companies (6 to 20 FTEs) and 40% represented large companies (over 20 FTEs).

Table A-11.

Number of Full-Time Employees (FTEs)	Total
1 to 5	29%

6 to 10	13%
11 to 20	18%
21 to 30	8%
31 to 50	15%
50+	17%

Q4. How many full-time employees, including full-time equivalents, does your company currently have?

While employers reported doing business in a range of Canadian, US and international markets, 6-in-10 employers reported that British Columbia is their primary market.

Table A-12.

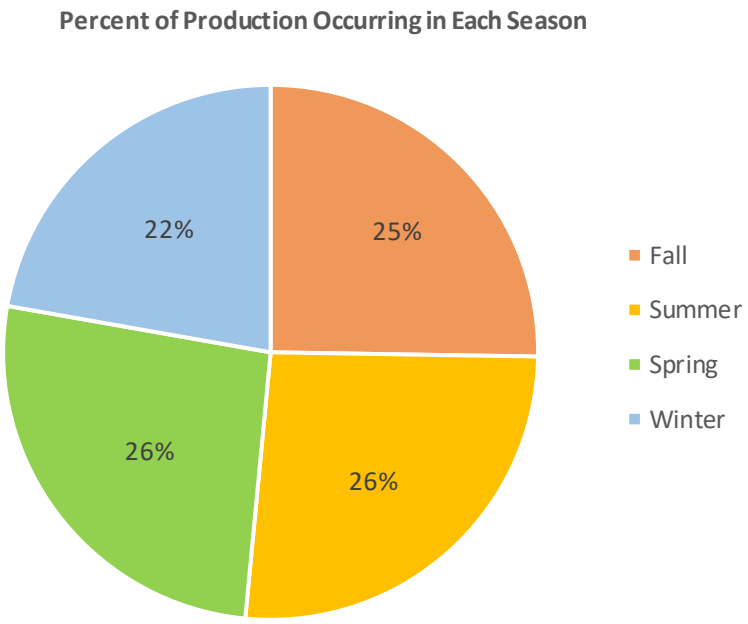
Markets Served	Primary Market of Business	% of Employers Doing Business in this Market
British Columbia	59%	98%
Western United States	11%	57%
Canada – outside British Columbia	8%	66%
Europe	6%	23%
Eastern United States	6%	36%
China	3%	16%
Central United States	3%	36%
Japan	2%	26%
South Korea	1%	11%
Southeastern United States	0%	29%
Other	0%	11%

Q3A. What markets does your company serve? Please select all that apply.

Q3B. What is your company's primary market?

Figure 10 illustrates that while there is some drop in production in the winter months, most employers report relatively steady production across seasons.

Figure A-10.



Q5. What percentage of your production occurs in the following seasons? Please enter a percentage for each season. Enter 0 if none for the season.

Appendix B. Employer Roundtables and Interviews Summary[58]

This appendix provides a summary of the roundtables and interviews that were conducted over May and June.

Approach

The purpose of the employer roundtables was to review preliminary results from the employer survey and findings from the literature and subject matter experts, and to collect participants' responses and reactions to the initial research findings. Also, the roundtables were an opportunity to collect additional information at the subsector and occupational level with respect to:

- The role of innovation and productivity growth
- Labour shortages, training gaps and employee attraction
- Opportunities to shape strategies going forward

Two roundtables were conducted, on June 13 in Duncan and June 18 in Langley. Two one-on-one interviews were also conducted with employers that expressed interest in participating in the Kelowna roundtables but were unable to attend the session. While it was hoped that we could attract 5 employers from each region, a total of only eight employers participated in either the roundtables or interviews.

Attendance was lower than desired, despite significant efforts by the project team to recruit participants, and adjusting the schedule multiple times. While this was disappointing, the employers that did participate represented all priority occupations as well as seven of eight in-scope subsectors (the log homes and timber frame subsector was not represented), including representing multiple subsectors.

Revised timelines to the survey and roundtables were such that it was not possible to review survey results at the roundtables (and interviews).

Findings

Findings are summarized in terms of four themes. Findings from the secondary data analysis, literature review, and subject matter experts introduced a new project theme – the desire to gain productivity advantage through innovation. The remaining themes – occupational shortages, low awareness among prospective candidates, training inadequacies – were from the sector engagement project.

1. Innovation

Defined broadly to include the application of new skills and know-how, adoption of technology in its various forms (e.g., software, computers, machinery), upskilling current workers, and process improvement such as the implementation of lean practices, participants agreed that "innovation" is

[58] Document finalized 20 July, 2018

important to the value-added wood sector. They were asked to identify how important innovation was to each of the following stages of the production process:

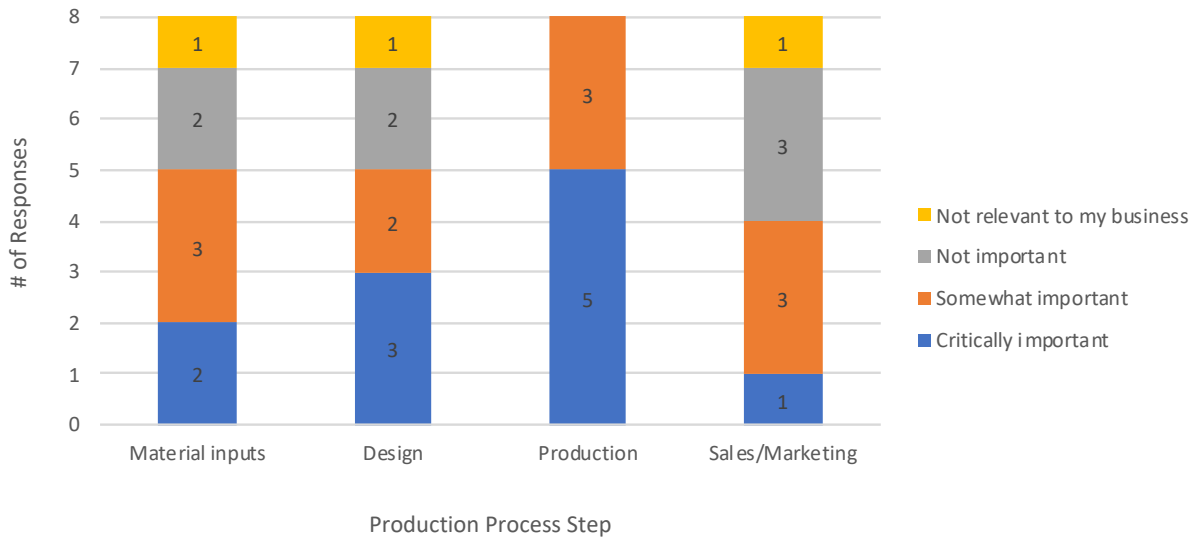
- Material inputs – sourcing and utilizing raw materials
- Design – designing new products to meet evolving customer needs
- Production – turning raw materials into products
- Sales / Marketing – getting products to market

Each stage was scored as either:

- Critically important
- Somewhat important
- Not important
- Not relevant to my business

Results are summarized below. All eight employers ranked innovation in Production as either critically (blue) or somewhat (orange) important to the profitability of their company. Only one of eight employers did not select innovation as critically important to any one stage.

Figure B-4: Participants' assessment of the importance of innovation on the four stages of the VAW production process



Participants emphasized that innovation was about more than adopting new technologies. Participants noted that optimizing how existing technology is used is as important if not more important than deploying new technology, because of the cost of acquiring new technology and the lack of skilled/knowledge-based labour locally that knows how to operate it. That said, one employer outlined a major technology upgrade they plan to undertake, citing that their operations are very labour-intensive compared to their competitors. The investment could reduce their labour requirement by 50%.

Processes will be highly automated. Machine operators will focus on quality control enabled by software and "managing flow," rather than having to make manual decisions in real-time. There will be a need for a new role called an "optimizer technician" that will focus on activities such as evaluating geometric qualities of the product to tune the grade scanner.

One employer in the cabinets subsector noted the need to streamline their product design process to more quickly deliver on one-off custom specifications, noting the growing sophistication of their customer base whose requirements have become more exacting in recent years (note: smaller, local cabinetmakers are their primary competition). This same employer noted the need to do a better job of knowledge management to support sharing of best practices and knowledge transfer from exiting to new employees.

2. Occupational Shortages

The acuteness of occupational shortages appears to vary especially by region where key underlying causal factors are the cost of housing and availability of local workers. These two conditions in combination were described as most pressing on Vancouver Island at the Duncan roundtable. A third factor highlighted was competition for labourers from other sectors; construction and the primary wood sector were cited as examples with which the value-added wood sector competes for new workers. Attributes sought in entry-level workers are a willingness to work, consistency in terms of showing up on time physically and mentally ready to work.

For skilled positions such as machine operators and designers, one employer said the only viable strategy available was poaching from other employers. They have tried using a recruiter who specializes in the wood industry, but the person has not been successful at finding any qualified candidates in six months. One employer said there are few appropriately trained people available locally, but has had some success recruiting from Europe where training programs are apparently more extensive and related specifically to the VAW sector than programs here; however, accessing immigrant workers through the Temporary Foreign Worker Program (TFWP) is time-consuming with long lead times. Employers generally agreed that English language proficiency is a must-have and a key barrier to bringing on new employees, even trained ones, primarily for safety reasons.

Participants discussed the need for experienced salespersons to have knowledge about wood, which gave rise to a discussion about the opportunity to create a short-course for non-technical roles that focuses on the need-to-know essentials of value-added wood products.

Finding skilled tradespersons is generally not a problem, although one employer highlighted that they have had trouble finding qualified millwrights, in large part because millwrights they need must have deep expertise across machinery and skills (welding, electrical, machine operations), and *de facto* require a prior trades ticket. As well, due to the high demand for this occupation, enticing tradespeople to small communities posed a challenge.

3. Awareness of VAW Sector

A second theme from the sector engagement project was difficulty in attracting suitable and/or qualified entrants to the sector. Employers at one roundtable observed that some young workers appear to feel overwhelmed or intimidated by the work environment on the production floor, including

exposure to loud noise and the constant movement of workers and materials from one location to another on the floor.

One "top graduate" hired out of local woodworker program was intimidated ("scared") and did not stay with the employer for long. The individual also did not like the repetitious nature of the work (his training prepared him for more custom-based design work). Another employer noted that his son chose to work for less pay at a fast food restaurant, because the work was less physically and mentally demanding. This employer noted that the ability to appeal to entry level workers will become harder with further increases in the minimum wage.

Participants agreed that the onboarding process for new entrants needs to be done carefully to ensure new entrants who have the desired attributes are not scared off, by, for example, not exposing them to the production floor on day one. They also noted that safety awareness is a critical must-have for new entrants; employers need to provide training accordingly.

One employer noted the biggest change required to better align labour supply and demand is for young people to have a greater acceptability of "getting their hands dirty, doing manual work, and working a full day" (flexible work hours is not an option). On the other hand, another employer spoke to the need for the sector to do a better job of appealing to young workers, saying the sector needs to "support people making the decision to invest in training that is embraced by our sector," and provide a "better understanding of the career opportunities in the value-added wood sector."

4. Training

Employers want entry-level employees to have the right attributes to be successful. These include soft skills such as an ability and willingness to learn, punctuality, and demonstrating a consistent work effort, and capabilities such as basic arithmetic, able to use small machinery/hand tools, and being able to measure. Spatial awareness and recognition of safety risks are also critical. Employers noted that pre-employment training in wood tends to focus on craftsmanship and custom design, and less so on commercial production; therefore, expectations are often not aligned between employers and graduates of these programs.

The basic idea of block or module-based training was suggested, and resonated with all participants. Ideas varied on what these blocks might be, and included:

- Value-added wood 101 for new entrants, and specialist roles such as salespeople that are transitioning into the sector
- Safety awareness specific to wood-based industrial settings:
    - hazard awareness training
    - lockout (electric/air/hydraulic) training
    - safe lumber handling practices
- Lumber grading
- Quality control in regards to lumber manufacturing

- Tree anatomy & species
- Mechanical aptitude training
- Machine-specific modules

One employer noted similar courses offered by the Oregon Wood Innovation Center at Oregon State University to which they have sent some of their employees:

- Kiln drying
- Quality control
- Optimization

Awareness of training programs available in B.C. was mixed. One employer, for example, was unaware of the UBC Centre for Advanced Wood Processing (CAWP) program on kiln drying, a 150-hour "modular" program.

Another area of discussion was onsite training. Participants suggested there may be opportunities to work with manufacturers to encourage them to provide free or subsidized training not only when machinery is installed but also during maintenance periods. For example, the sector could help coordinate site visits so that company representatives can visit multiple sites on one trip to B.C. More broadly, the idea of onsite visits by external experts to evaluate operations to identify opportunities for operational or productivity enhancements appealed to participants. One participant noted the economic advantages of delivering this type of training over classroom-based training in the sense that fixed costs are low (i.e. limited to no capital investment required to deliver the training), and because it presents opportunities for significant gains from simple-to-implement modifications to business processes and machine configurations. Participants agreed that these types of changes tend to improve employee morale, because the benefits are immediately evident.

Key Learnings

There was general agreement across subsectors about the need for continuous improvement to drive productivity improvements, and about shortages in several occupations. The roundtables highlighted some challenges that are largely out of range for employers to address, such as making local housing more affordable. In terms of solutions, much of the discussion focused on how to address training gaps. A range of potential solutions were brought up.

Overall, the sense from the participants was that there is an opportunity (or need) for the sector to play a more active and coordinated role to define training requirements that meet industry's needs, noting that much of the training currently available focuses on woodworking rather than production.

Table B-1: Participants

Name	Company	Roundtable	Subsector(s)
John Lore	Live Edge Design	Duncan	Furniture
Lorne Winship	Pacific Homes & Pacific	Duncan	Prefabricated Housing

	Truss		
Gordon Smith	Cowichan Wood Work	Duncan	Cabinets Furniture Millwork Interior
Dustin Elliot	Powerwood Corp.	Langley	Millwork Exterior Millwork Interior Remanufactured Wood Products
Stephen Harms	Pacific Pallet	Langley	Remanufactured Wood Products
Brian Ehreski	Norelco Cabinets	Langley	Cabinets
Bill Everitt	Princeton Wood Preservers	Interview (June 15)	Remanufactured Wood Products
Brad Mason	Kootenay Innovative Wood (Kalesnikoff Lumber)	Interview (June 15)	Millwork Exterior Millwork Interior
Brian Hawrysh	BC Wood	Langley	N/A

Appendix C. Secondary Data Analysis[59]

Approach

This appendix presents a summary of secondary data collected from sources such as the BC Labour Market Outlook, BC Stats, and Statistics Canada. The data was used to build employment and other economic baselines (e.g., output, productivity, firm size), understand related trends over time, and develop go-forward labour supply and demand projections and model the impact of potential strategies to address labour shortages.

Publicly available data is generally identified using one of two classification structures: the North American Industry Classification System for industries (NAICS), and the National Occupation Classification for occupations (NOC). Both systems are used in this study and each presents its own set of limitations with regards to the value-added wood sector and the project's scope.

With regards to the NAICS system, the sector engagement project identifies nine in-scope national industries (6-digit level codes) that pertain to four different industry groups (4-digit level codes). An additional ten national industries pertaining to the relevant industry groups are out of scope. With the exception of the Canadian Business Register, secondary data is only available at the level of industry group, and therefore any analysis conducted using this data will include data on out of scope national industries. Almost all of the analysis in this document is at the industry group level and should be interpreted accordingly.

While a number of occupations are likely to be almost entirely employed in the VAW sector (e.g., 9437 Woodworking machine operators, 9533 Other wood products assemblers and inspectors), several occupations identified in the the engagement project report as presenting recruitment challenges (referred to as "priority occupations" in the report and this appendix) are primarily employed in other sectors (e.g., 2252 Industrial designers, 6411 Sales and account representatives – wholesale trade). With the exception of a handful of occupational characteristics obtained through a special request, data is unavailable to identify the degree to which these occupations are employed in VAW.

For these reasons, the project relies critically on results from the primary data sources and the results from the secondary data provide supporting evidence and guidance around the size and extent of primary data results where possible.

The following list provides an overview of the guiding research questions and the data sources that were used to evaluate each question. This appendix summarizes the secondary data collected; see other appendices for details from the other data sources. The secondary data provides information on characteristics of the sector, with some additional information on factors affecting labour supply and demand, training availability and outcomes, and as a source of data for the dynamic labour demand model.

Table C-1: Summary of Data Collected

[59] Document finalized on 20 July, 2018

Research question	Primary data source			Secondary data source
	Employer survey	Subject matter expert interviews	Employer roundtables/ interviews	
What are the main characteristics of the value-added wood sector's workforce?	✓			• 2011 National Household Survey (NHS) • 2016 Census • Monthly Survey of Manufacturing (MSM) • Survey of Employment, Payrolls and Hours (SEPH) • Business Register
What are the main factors affecting the demand for labour now and in the future?	✓	✓	✓	• GDP by industry • SEPH • BC Labour Market Outlook (LMO) • Literature review
To what extent is the sector currently affected by labour shortages?	✓	✓	✓	• 2016 Census • SEPH • MSM
How does the sector attract new entrants?	✓	✓	✓	• Canadian government data on work permits issued, Temporary Foreign Worker Program and International Mobility Program
What are the gaps in the current training landscape?	✓	✓	✓	• BC Forest Sector Workforce Initiative • BC Student Outcomes Surveys
What are the key components to align labour supply and demand?	✓	✓		• 2016 Census • SEPH • BC Student Outcomes Surveys

Findings: Secondary Data

Findings are presented by research question.

1. **What are the main characteristics of the value-added wood sector's workforce?**

In December 2017, there were 756 registered businesses in the nine in-scope national industries (6-digit NAICS) identified in the sector engagement project report. Businesses tend to be small – 77% of the in-scope businesses employ 19 or fewer employees – but there is some variation across national industry. Although demographic and employment data is not available at this level of detail, VAW employment is estimated to be approximately 16,660.

In general, VAW national industries can be grouped into two distinct categories – those belonging to NAICS subsector 321 Wood Product Manufacturing and those belonging to NAICS subsector 337 Furniture and related product manufacturing. The two groups each employ about half of total workers

but diverge significantly along demographic lines, though what is driving these differences is unclear. The wood product manufacturing workforce has higher yearly income ($65,000 versus furniture manufacturing's $35,000); a lower share of females, immigrants and visible minorities; and a larger share of Indigenous workers. With the exception of share of female employees, when the two VAW groups are combined, these numbers are very similar to the manufacturing sector as a whole. Share of females employed is 9 percentage points lower than manufacturing on the whole. Age and education distribution of VAW industry groups is generally in line with industry benchmarks, with the exception of 3372 Office furniture (including fixtures) manufacturing, which is older and has completed fewer years of formal education education than the others. 93% of the industry's employed labour (16,660 people) is concentrated in three economic regions: Mainland/Southwest, Thompson/Okanagan, Vancouver Island/Coast and Cariboo.

2. What are the main factors affecting the demand for labour now and in the future?

The gross domestic product (GDP) of the relevant industry groups was a combined $1.9 billion in 2016, 80% of which came from wood product manufacturing. Growth in the GDP of these groups has outpaced growth in furniture manufacturing, averaging 7% from 2009 to 2016 compared to furniture's 3%. Labour productivity shows a similar pattern. VAW wide output per employee was $110,000 in 2016, with wood product manufacturing recording $126,000 of output per employee, and furniture manufacturing recording $75,000 per employee. Growth rates in labour productivity are similar to those of GDP, though the gap between wood product and furniture manufacturing is somewhat less pronounced, primarily due to falling employment in the latter group. The higher GDP growth of wood product manufacturing suggests strong demand for labour relative to furniture, though higher labour productivity growth should offset this somewhat.

Priority occupations are grouped into three categories: design, sales, and laborers. Design occupations show the lowest VAW employment demand, with approximately 5 additional VAW job openings per year for the next ten years though economy-wide demand is expected to rise, putting upward pressure on competition for these workers. VAW Sales job openings are expected to be 18 per year, and economy-wide competition for these positions is also expected to grow. Laborer occupations will see the most job openings, with 161 new openings per year, while supply is expected to fall, suggesting these jobs will be the most difficult to fill.

Other factors that have been identified as affecting demand for labour are changing consumer preferences, global market dynamics, product innovation, production automation, and regulatory change. As there is no publicly available secondary data on these factors, they have been addressed where possible in the survey, literature review, and roundtable sections of the research.

3. To what extent is the sector currently affected by labour shortages?

There is no publicly available secondary data to answer this question. It is addressed in the survey literature review, and roundtable portions of the research[60].

How does the sector attract new entrants?

[60] The Job Vacancy and Wage survey provides data on job vacancies and characteristics, but data is unreported or suppressed for the occupations identified in the sector engagement project report.

Although there is no publicly available secondary data on recruitment strategies, skill and knowledge requirements for priority occupations were collected using data from the O*Net database and a mapping of relevant NOC to SOC codes[61]. Top skills in order of importance are critical thinking, active listening, and reading comprehension for design occupations; active listening, speaking, and critical thinking for sales occupations; and operation monitoring, quality control analysis, and critical thinking for laborer occupations. Top knowledge areas are design, engineering and technology, and mechanical for design occupations; English language, sales and marketing, and customer and personal service for sales occupations; and production and processing, mechanical, and mathematics for laborer occupations.

4. **What, if any, are the gaps in the current training landscape?**

Secondary data related to training is sparse. Insofar as it is available, it is likely incomplete. Hence primary data sources are key in identifying training gaps.

Thirty-four training programs were identified that are directly related to the VAW sector. These primarily cover carpentry and woodworking, but also cabinetry, furniture and advance wood processing. In addition to programs directly related to VAW sector, 186 programs have been identified that either provide training for occupations employed in, but not central to the sector. These additional programs cover a broad range of fields from Applied Engineering, Technician training (e.g., CADD), and Equipment operation (e.g., forklift, chainsaw) to Health and safety and management training. They are offered by many different institutions across the province and are administered in person as well as online[62]. The entire list of such programs is available on the BC Forest Sector Workforce Initiative website. The database was last updated in early 2017.

Through BC Student Outcome surveys, post-secondary feeder program fields have been identified for 12 occupations. Post-secondary programs fall into one of four fields: engineering technologies and engineering-related fields, construction trades, precision production, or visual and performing arts. Notably, four occupations likely to be primarily employed in VAW did not return any primary post-secondary areas of study, indicating too few survey respondents to report.[63]

5. **What are the key components to align labour supply and demand?**

This will be primarily identified through primary research and roundtable discussions, though much of the secondary data cited in this document will be used in the construction of the dynamic labour demand model.

Key Learnings

There is some corroboration of the skilled labour shortage identified in the sector engagement project, particularly surrounding labourer occupations. It is expected that demand for additional workers will

[61] O*NET is a database of worker attributes and job characteristics built around a standard taxonomy and support by the US Department of Labor. Data is collected from stakeholders and regularly updated for all codes under the Standard Occupational Classification System (SOC) framework to describe the occupations

[62] The entire list of such programs is available on the BC Forest Sector Workforce Initiative website.

[63] These NOCs are 9215 Supervisors, forest products processing, 9434 Other wood processing machine operators, 9437 Woodworking machine operators, and 9534 Furniture finishers and refinishers.

grow, while their supply will fall. Sales and design workers appear to be less in demand, though competition for these workers is expected to grow.

While the secondary data is mostly silent regarding the need for additional training opportunities and attracting new entrants, data was compiled on currently available training programs and skills required for priority occupations.

Additionally, two clear subgroups appear in the secondary data analysis, suggesting that caution be exercised when developing a workforce strategy as different subgroups may require different actions.

Detailed Findings: Secondary Data

1. **What are the main characteristics of the value-added wood sector's workforce?**

Employer characteristics (Tables 3 and 4, Figures 1 and 2)

- In December 2017, there were 756 registered businesses in the nine in-scope national industries (6-digit NAICS) in British Columbia. These account for just under 75% of registered businesses in the two industry groups (4 digit NAICS 3212 and 3219). 337110 Wood kitchen cabinet and counter top manufacturing is the largest of the national industries, with 263 registered businesses.
- While businesses tend to be small – 77% of the in-scope businesses employ 19 or fewer employees – there is some heterogeneity across national industry:
    - 321215 Structural wood product manufacturing has the largest companies, with only 14% of businesses, but nearly half of all businesses with over 200 employees. It also has the largest share of companies in the 20 to 49 employee range.
    - 337123 Other wood household furniture manufacturing has the smallest companies, with approximately half of its businesses employing fewer than four people.
- With the exception of industry group 32125 Structural wood product manufacturing, which has larger firms on average, the size distribution of firms is roughly in line with the parent NAICS groups.

Table C-2: Registered businesses in BC by NAICS, December 2017[64]

NAICS code	Number of firms
31-33 Manufacturing	7232
• **321 Wood product manufacturing**	791
○ **3212 Veneer, plywood and engineered wood product manufacturing**	76
▪ **321215 Structural wood product manufacturing**	47
○ **3219 Other wood product manufacturing**	479

[64] Statistics Canada. Table 33-10-0037-01 - Canadian business counts, location counts with employees, by employment size and North American Industry Classification System (NAICS), Canada and provinces, December 2017, semi-annual)

▪ **321911 Wood window and door manufacturing**	76
▪ **321919 Other millwork**	170
▪ **321992 Prefabricated wood building manufacturing**	31
• **337 Furniture and related product manufacturing**	503
○ **3371 Household and institutional furniture and kitchen cabinet manufacturing**	421
▪ **337110 Wood kitchen cabinet and counter top manufacturing**	263
▪ **337121 Upholstered household furniture manufacturing**	24
▪ **337123 Other wood household furniture manufacturing**	93
○ **3372 Office furniture (including fixtures) manufacturing**	59
▪ **337213 Wood office furniture, including custom architectural woodwork, manufacturing**	38
▪ **337215 Showcase, partition, shelving and locker manufacturing**	14

Figure C-5: Employment distribution, in scope national industries[65]

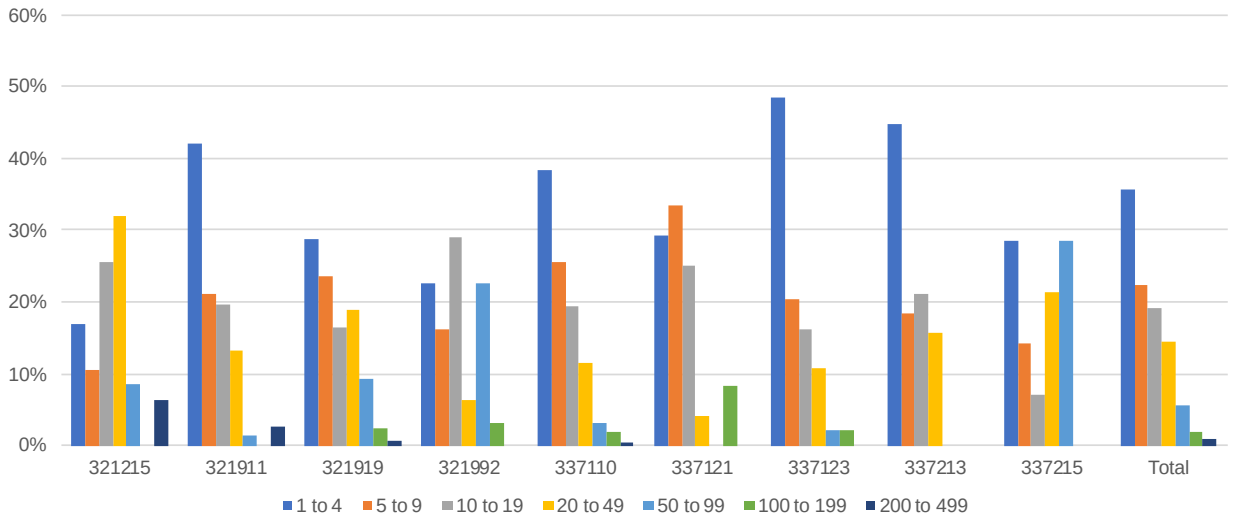
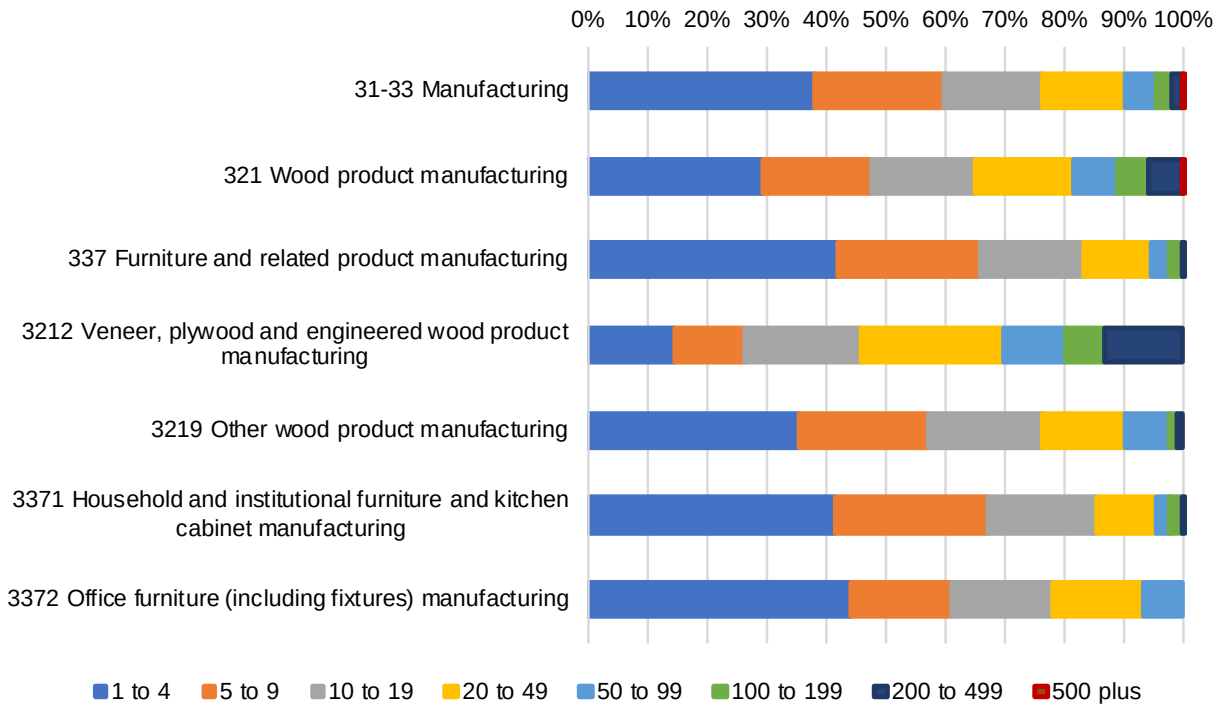


Figure 6: Distribution of firm size as measured by number of employees[66]

[65] Ibid
[66] Ibid



Workforce demographic characteristics (Tables 5, 6, and 7 and Figures 3 and 4)

- According to Census 2016, there are 16,660 people employed in the four VAW industry groups (3212, 3219, 3371, and 3372) making a median income of approximately $51,000 per year. At 19%, female employment is lower than manufacturing as a whole (28%), and even lower still than the provincial average (48%), although there is variation among the four industry groups. Immigrant, visible minority and indigenous shares of employment are approximately in line with manufacturing and provincial shares. All of these numbers vary significantly between the two subsectors, 321 – Wood product manufacturing and 337 – Furniture and related product manufacturing.
- Industry groups in the 321 – Wood product manufacturing subsector are somewhat larger (in terms of employment) and pay substantially more than VAW industry groups in 337 – Furniture and related product manufacturing. Median annual income is over $60,000 for NAICS 3212 and 3219, versus $35,000 to $40,000 for NAICS 3371 and 3372. Median income for manufacturing as a whole is $31,000, and $36,000 for all of British Columbia.
- There is also variation in the share of females, immigrants and visible minorities between the two subsectors. 321 – Wood product manufacturing employs a smaller share of females, immigrants and visible minorities than the furniture manufacturing subsector and a larger share of Indigenouss.
- With the exception of 3372 Office furniture (including fixtures) manufacturing, approximately 50% of the workforce is between 15 and 44, while the remaining half is between 44 and 64. This

age distribution is in line with industry benchmarks. Industry group 3372 is significantly older on average, with approximately 65% of the employed workforce over the age of 44.

- With the exception of 3372 Office furniture (including fixtures) manufacturing, VAW industry groups generally have lower education levels than manufacturing as a whole. Approximately 60% of employees in 3212, 3219, and 3371 have a secondary school diploma or less, while for 3372 this number is approximately 45%, equivalent to manufacturing.

Table C-2: Employment and select demographic characteristics

NAICS code	Employed[67]	Median annual income[68]	% Female[69]	% Immigrant[70]	% Visible minority[71]	% Indigenous[72]
All industries, British Columbia	2,305,690	$36,282	48%	30%	31%	5%
31-33 Manufacturing	149,455	$31,021	28%	36%	34%	5%
321 Wood product manufacturing	24,775	$61,845	14%	19%	18%	10%
337 Furniture and related product manufacturing	8,075	$35,063	24%	44%	42%	3%
3212 Veneer, plywood and engineered wood product manufacturing	3,905	$63,760	13%	21%	20%	10%
3219 Other wood product manufacturing	5,220	$65,182	18%	29%	25%	8%
3371 Household and institutional furniture and kitchen cabinet manufacturing	7,010	$35,019	23%	43%	41%	3%
3372 Office furniture (including fixtures) manufacturing	525	$40,175	26%	43%	36%	3%
VAW industry group average (total for employment)	16,660	$51,034	19%	34%	31%	6%

[67] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016290.

[68] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016358.

[69] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016290.

[70] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016361.

[71] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016360.

[72] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016359.

Figure C-7: Age distribution of VAW industry groups and benchmarks[73]

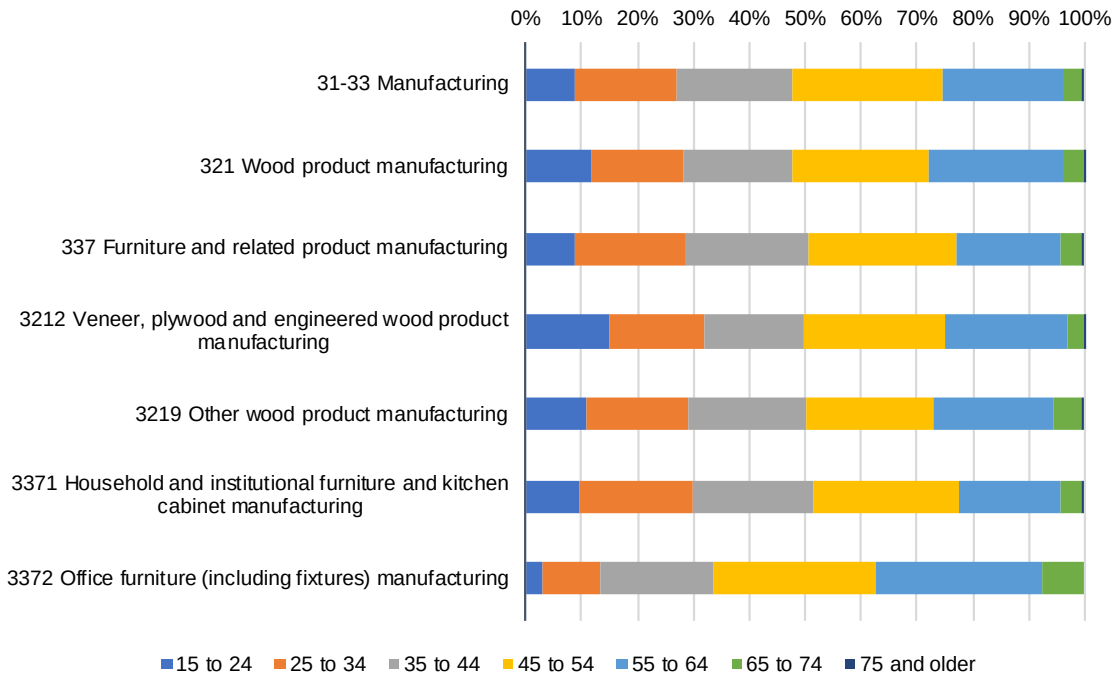
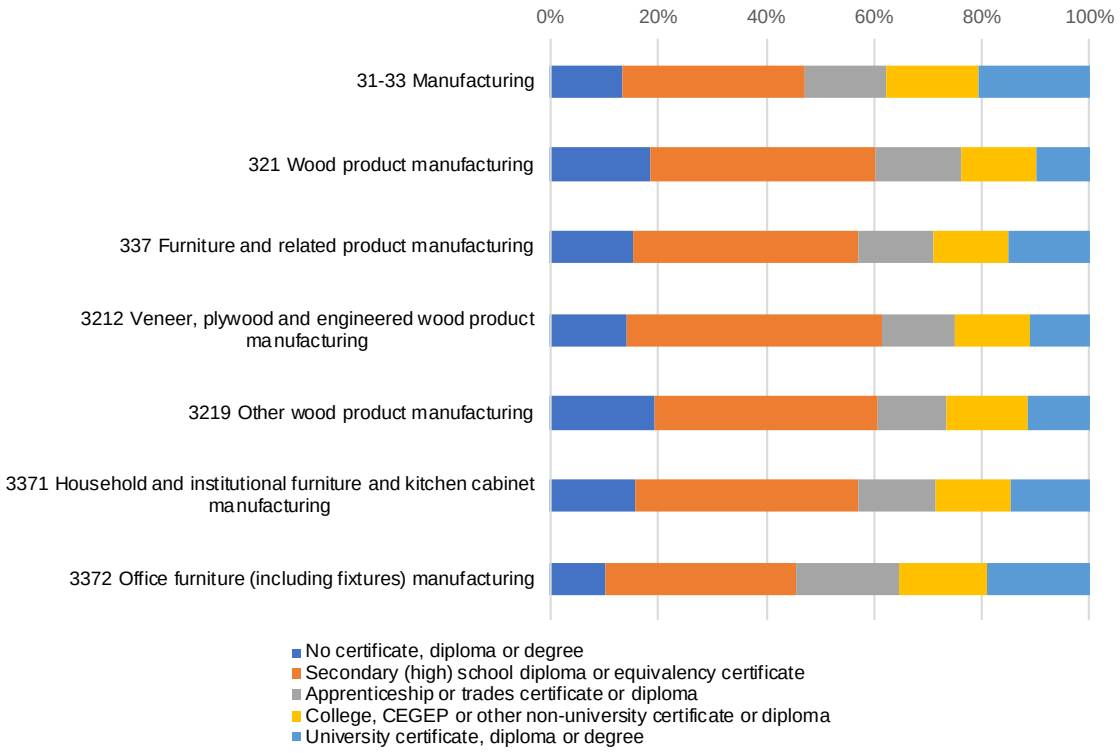


Table C-3: Employment by age group, VAW industry groups and benchmarks[74]

Age	31-33 Manu-facturing	321 Wood product manu-facturing	337 Furniture and related product manu-facturing	3212 Veneer, plywood and engineered wood product manu-facturing	3219 Other wood product manu-facturing	3371 Household and institu-tional furniture and kitchen cabinet manu-facturing	3372 Office furniture (including fixtures) manu-facturing
15 to 24	12,835	2,930	700	580	565	660	15
25 to 34	27,310	4,110	1,600	675	960	1,445	55
35 to 44	30,895	4,735	1,790	695	1,100	1,505	105
45 to 54	40,265	6,125	2,135	975	1,190	1,835	150
55 to 64	32,060	5,905	1,490	865	1,105	1,270	155
65 to 74	5,430	885	320	105	270	260	40
75 and older	660	85	40	15	30	40	-

[73] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016290.
[74] Ibid

Figure C-8: Highest education level of VAW industry groups and benchmarks[75]



[75] Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016358.

Table C-4: Employment by age group, VAW industry groups and benchmarks[76]

Education	31-33 Manu-facturing	321 Wood product manu-facturing	337 Furniture and related product manu-facturing	3212 Veneer, plywood and engineered wood product manu-facturing	3219 Other wood product manu-facturing	3371 Household and institutional furniture and kitchen cabinet manu-facturing	3372 Office furniture (including fixtures) manu-facturing
No certificate, diploma or degree	21140	4875	1285	575	1050	1120	55
Secondary (high) school diploma or equivalency certificate	54270	11010	3470	1915	2240	2980	195
Apprenticeship or trades certificate or diploma	23890	4210	1160	550	670	1035	105
College, CEGEP or other non-university certificate or diploma	27415	3680	1160	565	830	1015	90
University certificate or diploma below bachelor level	4270	455	170	65	95	155	10
University certificate, diploma or degree at bachelor level or above	28940	2120	1075	380	525	900	95

Geographic distribution (Figure 5 and Table 8)

- 93% of the industry's employed labour (14,170 people) is concentrated in three economic regions: Mainland/Southwest, Thompson/Okanagan, Vancouver Island/Coast and Cariboo.
- The regional unemployment rate is below eight percent for all regions with good data quality.

Figure C-9: Employees by region[77]

[76] Ibid

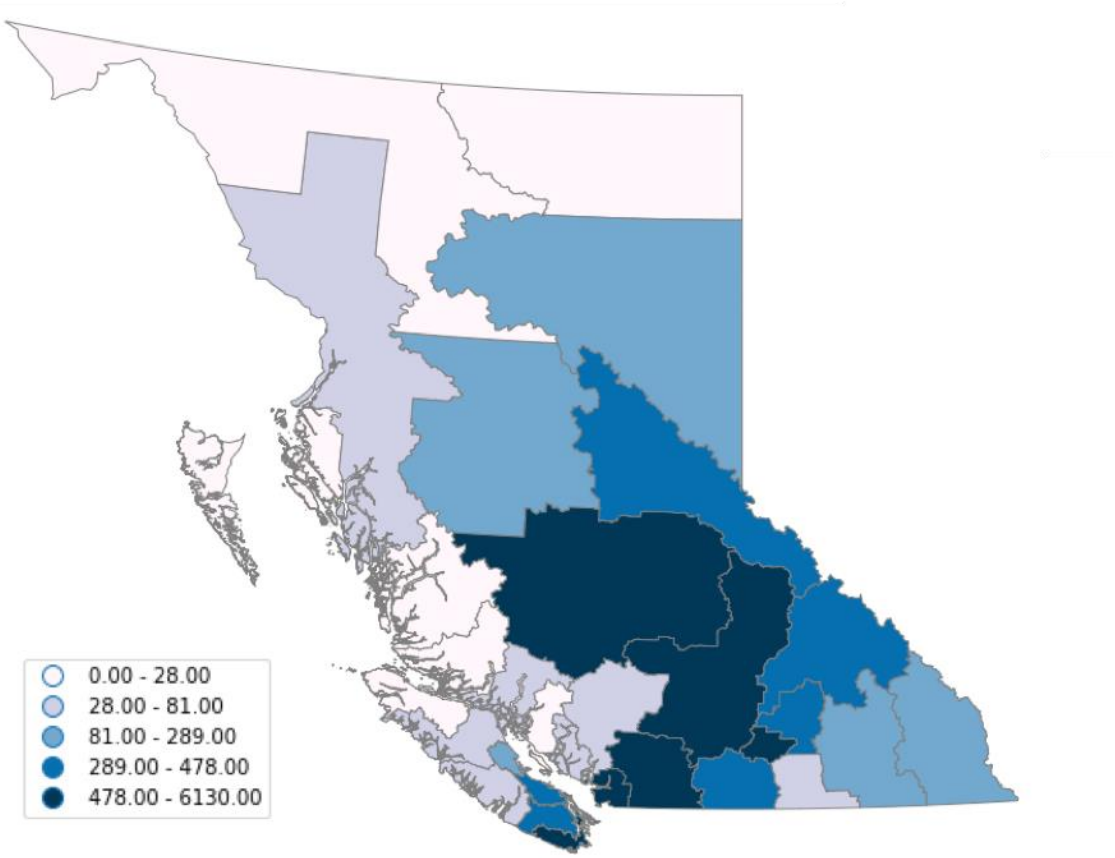


Table C-5: Business size by Economic Region[78]

Economic Region	Employment	Share of total VAW employment	VAW unemployment rate
Cariboo	1505	8%	5%
Kootenay	465	3%	5%
Mainland/Southwest	9935	57%	4%
Nechako	300	2%	10%
North Coast[79]	65	0%	17%
Northeast	395	2%	5%
Thompson/Okanagan	3606	18%	4%
Vancouver Island/Coast	1690	10%	7%

[77] Number of employees for NAICS categories 3212, 3219, 3371, and 3372. Author's calculations using Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016290 and Boundary Files, 2016 Census. Statistics Canada Catalogue no. 92-160-X.
[78] Ibid.
[79] Due to small sample size, numbers for the North Coast region should be interpreted with caution

2. What are the main factors affecting the demand for labour now and in the future?

Industry output and labour productivity (Tables 11 and 12 and Figures 7 and 8)

- GDP of 3212 Veneer, plywood and engineered wood product manufacturing and 3219 Other wood product manufacturing accounted for nearly 80% of output ($1.5 billion) for the four in-scope industry groups in 2016. Combined GDP of 3371 Household and institutional furniture and kitchen cabinet manufacturing and 3372 Office furniture (including fixtures) manufacturing was $416 million.
- Industry groups 3371 Household and institutional furniture and kitchen cabinet manufacturing and 3372 Office furniture (including fixtures) manufacturing saw output fall from 2009 to 2012, but have been growing since 2011. Average annual growth rates for these groups are 3% and 2% respectively.
- Industry groups 3212 Veneer, plywood and engineered wood product manufacturing and 3219 Other wood product manufacturing have been growing steadily since 2009 at an average rate of 7%.
- Labour productivity was relatively flat through 2010 and has been steadily rising since. All industry groups were over 10% more productive in 2016 than a decade previous. 3212 Veneer, plywood and engineered wood product manufacturing has seen the strongest productivity gains, while 3372 Office furniture (including fixtures) manufacturing productivity grew from 80% its initial level in 2012, to over 130% its initial level in 2016.
- While the secondary data is useful in teasing out historical trends with respect to GDP and productivity, the literature review and primary data are relied upon to understand factors affecting labour demand going forward.

Expected job openings growth, by occupation groupings (Figure 11 and Table 14)

- The large majority of job openings from 2017 to 2027 is expected to be for the labourer priority NOCs, needing approximately 161 new employees per year.

Figure C-6: Projected job openings due to expansion and replacement[80]

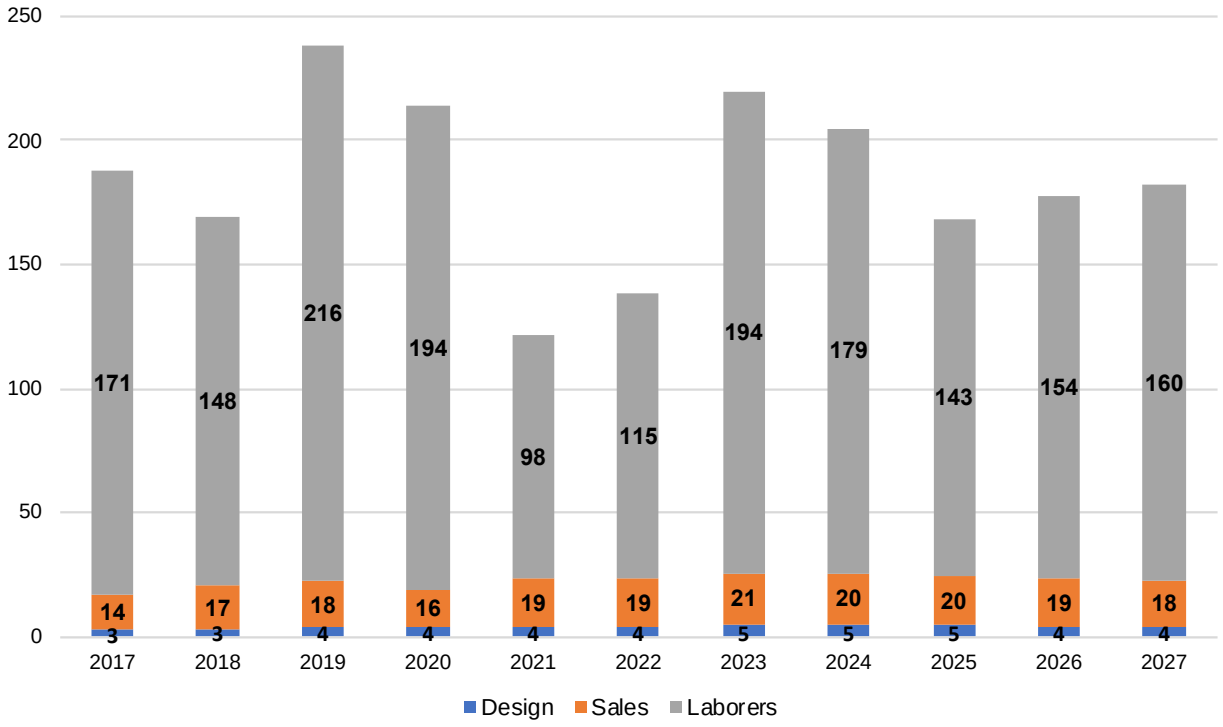


Table C-6: VAW job openings, 2017 - 2027[81]

Occupation group	NOC	Total	Yearly average
Design	2252 Industrial designers	7	1
	2253 Drafting technologists and technicians	34	3
	5242 Interior designers and interior decorators	6	1
	Design group total	**47**	**5**
Sales	6221 Technical sales specialists - wholesale trade	70	6
	6411 Sales and account representatives - wholesale trade (non-technical)	132	12
	Sales group total	**202**	**18**
Labourers	9434 Other wood processing machine operators	643	58

[80] Author's calculations from BC Stats data. VAW-specific job openings were calculated using the VAW sector's share of total BC employment to scale total job openings by occupation. Source: Ministry of Advanced Education, Skills and Training. BC Labour Market Outlook, Job openings, Expansion, Replacement by occupation for BC and regions. Accessed on: May 3, 2018

[81] Ibid

	9437 Woodworking machine operators	236	21
	9532 Furniture and fixture assemblers and inspectors	459	42
	9533 Other wood products assemblers and inspectors	435	40
	Laborers group total	**1773**	**161**
	Total for all nine priority occupations	**2022**	**184**

Projected labour supply composition (Table 15)

- Supply additions accounts for additional turnover
- Supply additions are also required for people switching occupations or leaving for other jurisdictions. The LMO provides some insight into the scale of that turnover by including projections for net in-migration from other provinces and counties and inter-occupational mobility/change in labour force participation.
- The occupation with the largest number of supply additions over the 10-year timeframe is 9532 Furniture and fixture assemblers and inspectors.

Table C-7: Projected labour supply composition 2017 - 2027, priority occupations[82]

NOC	Description	New Entrant Supply	Net In-Migration	Inter-Occupational Mobility/Change in Labour Force Participation	Total Supply Addition	Total Positive Supply Additions	Manufacturing Supply Additions[83]	VAW Supply Additions[84]
2252	Industrial designers	162	253	-219	196	415	116	13
2253	Drafting technologists and technicians	1354	1186	-724	1816	2,540	381	42
5242	Interior designers and interior decorators	910	339	-29	1220	1,249	50	6
6221	Technical sales specialists - wholesale trade	1676	784	1876	4336	4,336	564	63
6411	Sales and account representatives - wholesale trade (non-technical)	4227	3005	-447	6785	7,232	1157	129
9434	Other wood processing machine operators	91	268	289	648	648	531	531
9437	Woodworking machine operators	98	74	83	255	255	207	207
9532	Furniture and	217	1288	-981	524	1505	1219	1219

[82] Source: Ministry of Advanced Education, Skills and Training. BC Labour Market Outlook, Supply Composition – Post Secondary Supply. Accessed on: May 3, 2018

[83] Assumes share of supply additions equal to manufacturing share of occupation outlined in Table 5

[84] For NOCs 2252, 2253, 5242, 6221, and 6411, it is assumed that the share of VAW supply additions is equal to the employment share of VAW in the overall manufacturing sector (11%). For NOCs 9434, 9437, 9532, and 9533, it is assumed that the NOC is employed entirely by the VAW industry.

	fixture assemblers and inspectors							
9533	Other wood products assemblers and inspectors	184	486	-188	482	670	523	523

3. How does the sector attract new entrants?

Worker characteristics (Figures 17-21)

- O*NET is a database of worker attributes and job characteristics built around a standard taxonomy. Data is collected from stakeholders and regularly updated for all codes under the Standard Occupational Classification System (SOC) framework to describe the occupations.
- Priority NOC codes were mapped to corresponding SOC codes to retrieve relevant data.
- A score of 50 or higher is considered "Important" for a given occupation.
- Aggregated data presented in the figures do not reveal anything very noteworthy; disaggregated data at the NOC/SOC level may be more meaningful and will be considered in the writing of the LMI report.

Figure C-7: Average importance of top twenty Skills, priority design occupations[85]

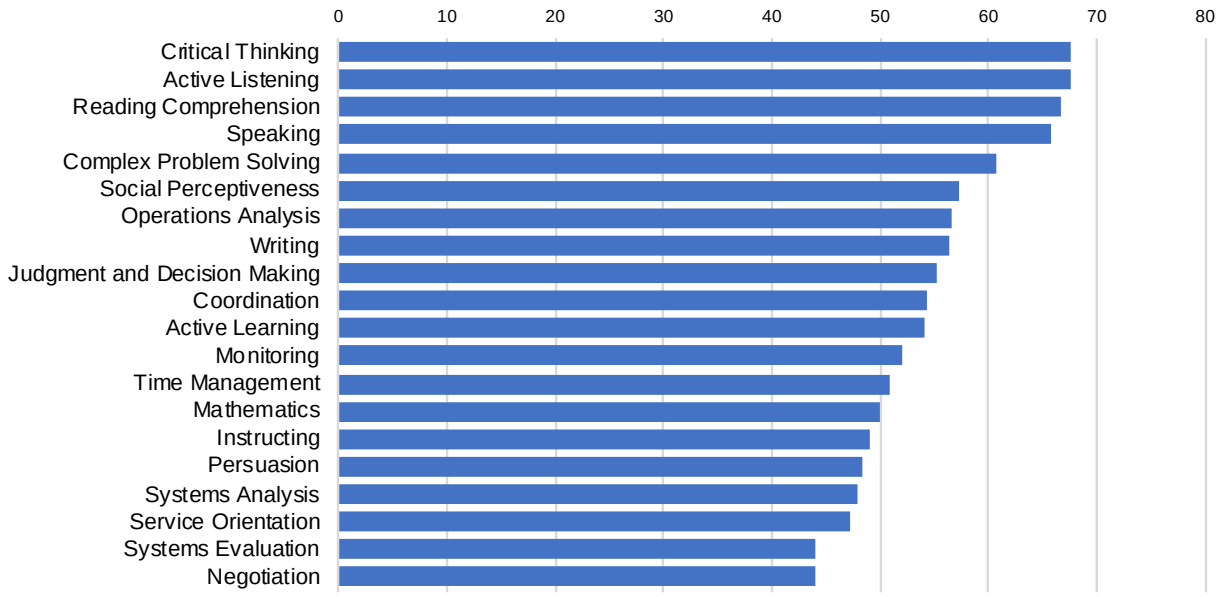


Figure C-8: Average importance of top twenty Skills, priority sales occupations[86]

[85] Priority design occupations are NOCs 2252, 2253 and 5242. Source: US Occupational Information Network (O*NET) Online service

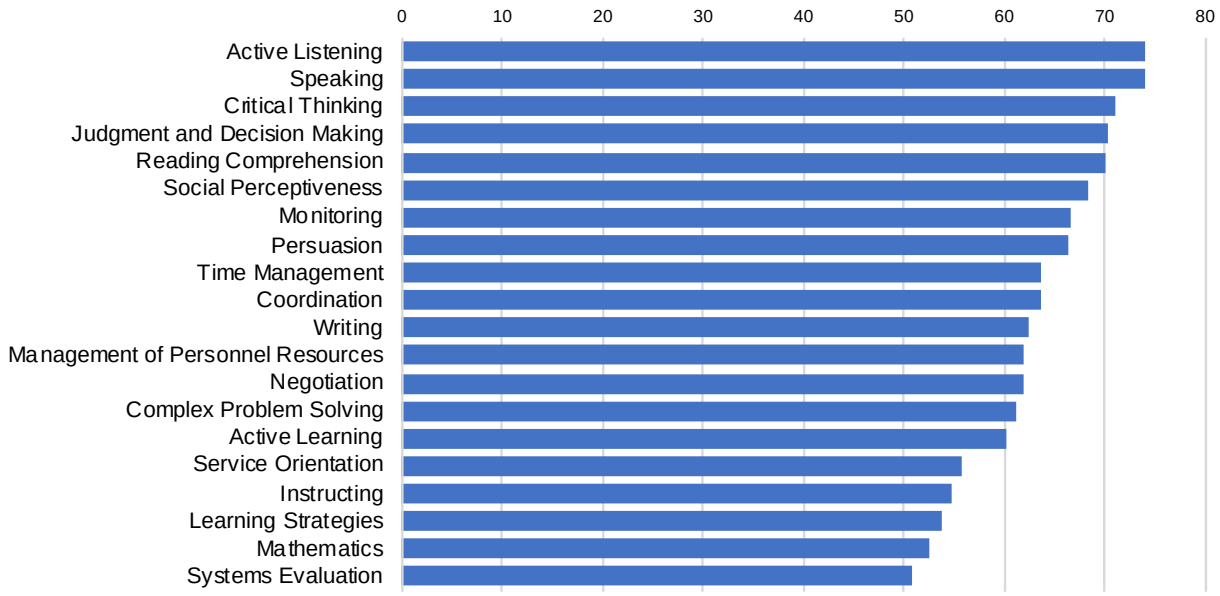


Figure C-9: Average importance of top twenty Skills, priority laborer occupations[87]

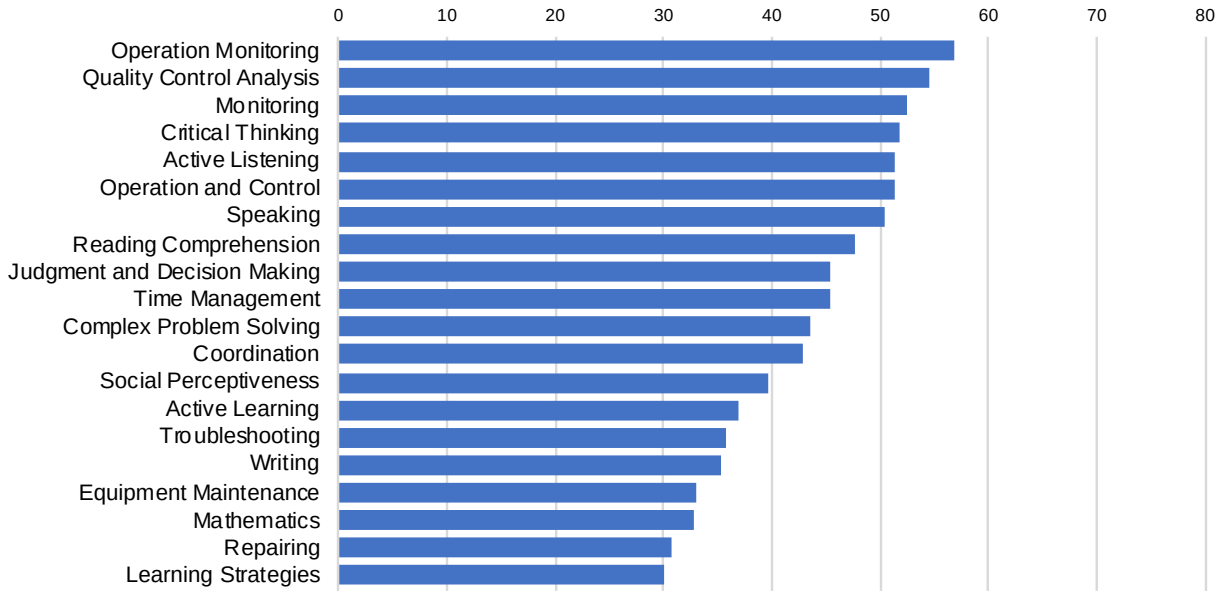


Figure C-10: Average importance of top twenty Knowledge Areas, priority design occupations[88]

[86] Priority sales occupations are NOCs 6221 and 6411. Source: Ibid
[87] Priority laborer occupations are 9434, 9437 and 9532. Source: Ibid

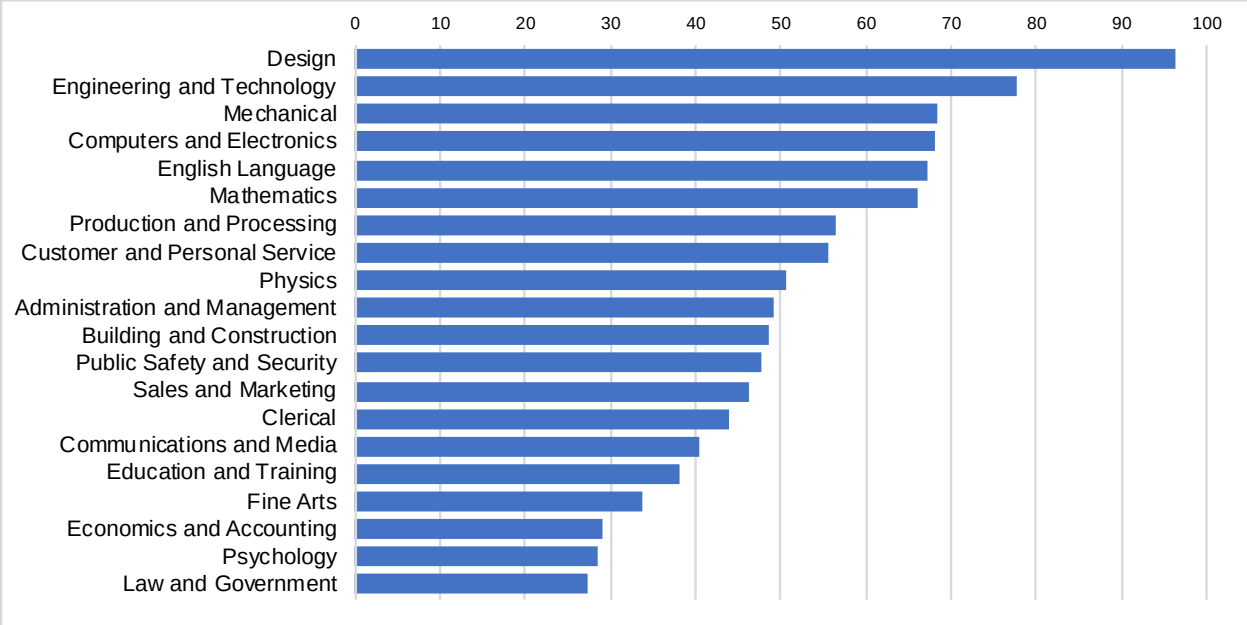
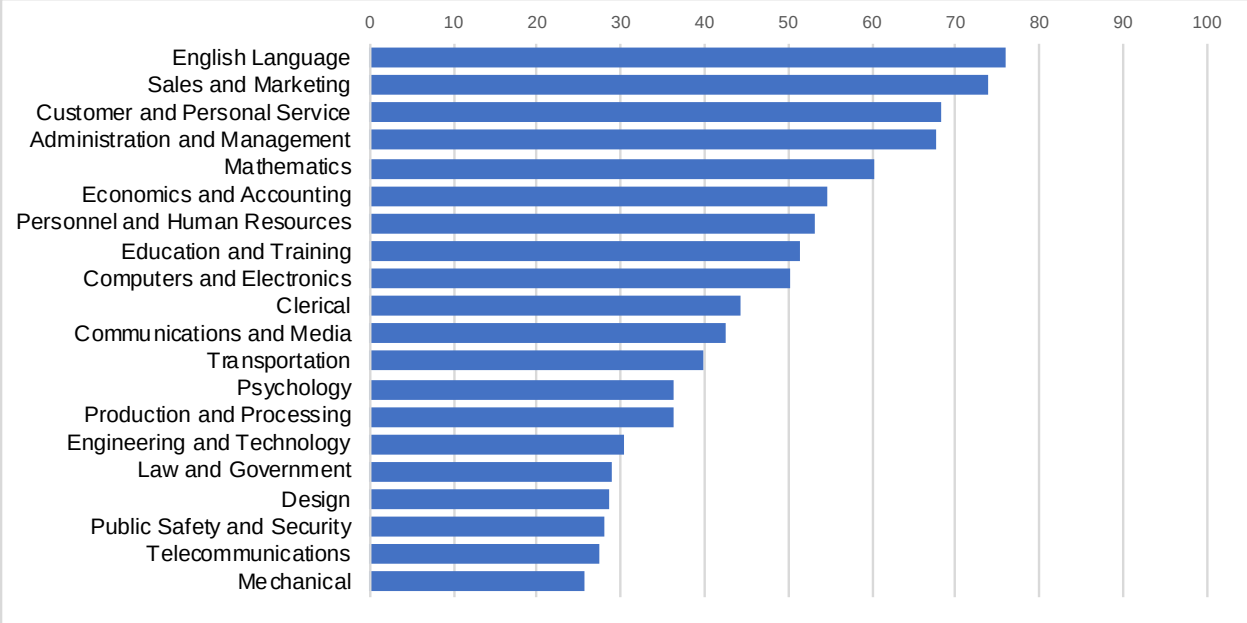


Figure C-11: Average importance of top twenty Knowledge Areas, priority sales occupations[89]



[88] Source: Ibid
[89] Source: Ibid

Figure C-12: Average importance of top twenty Knowledge Areas, priority laborer occupations[90]

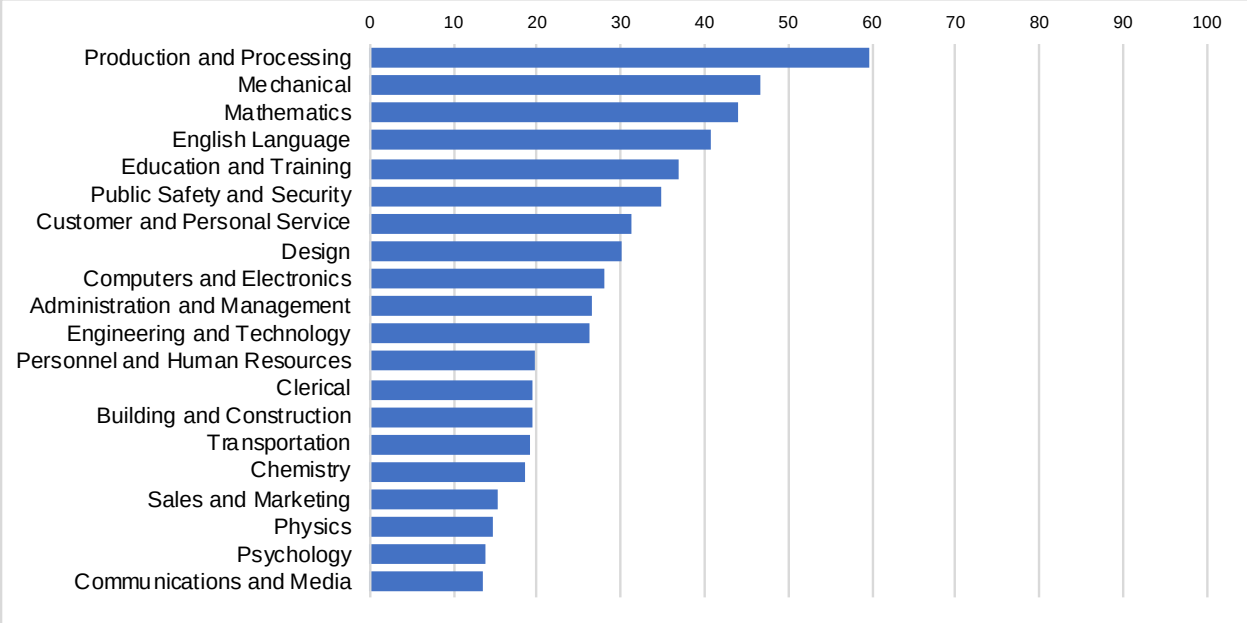
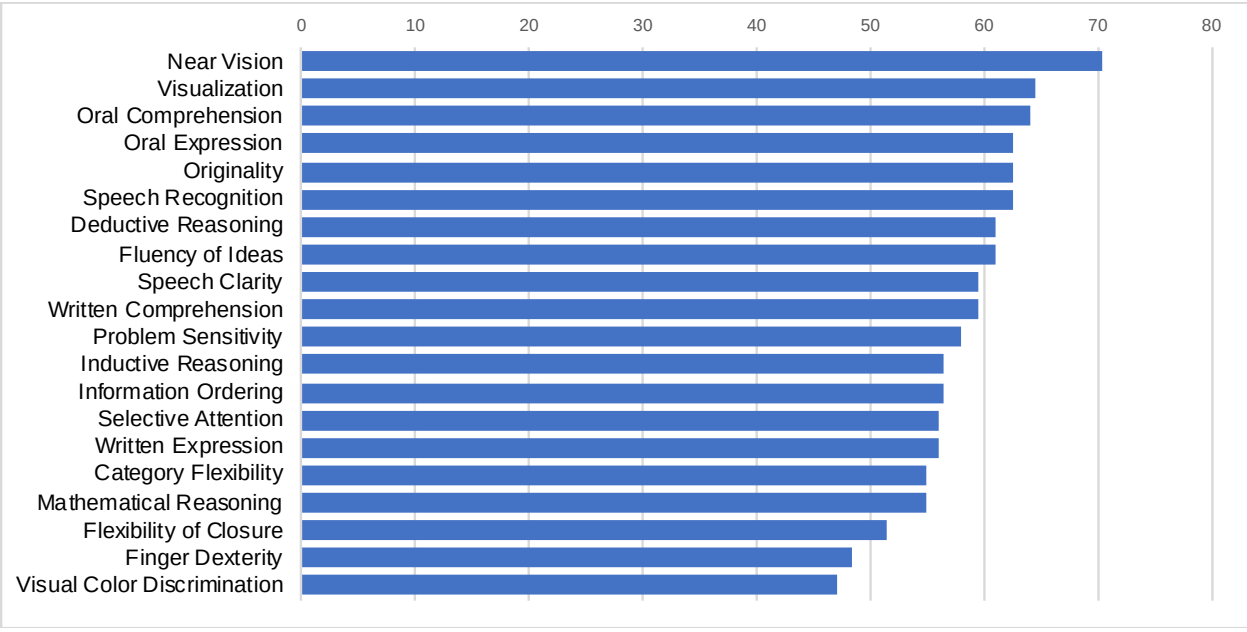


Figure C-13: Average importance of top twenty Abilities, priority design occupations[91]



[90] Source: Ibid
[91] Source: Ibid

Figure C-14: Average importance of top twenty Abilities, priority sales occupations[92]

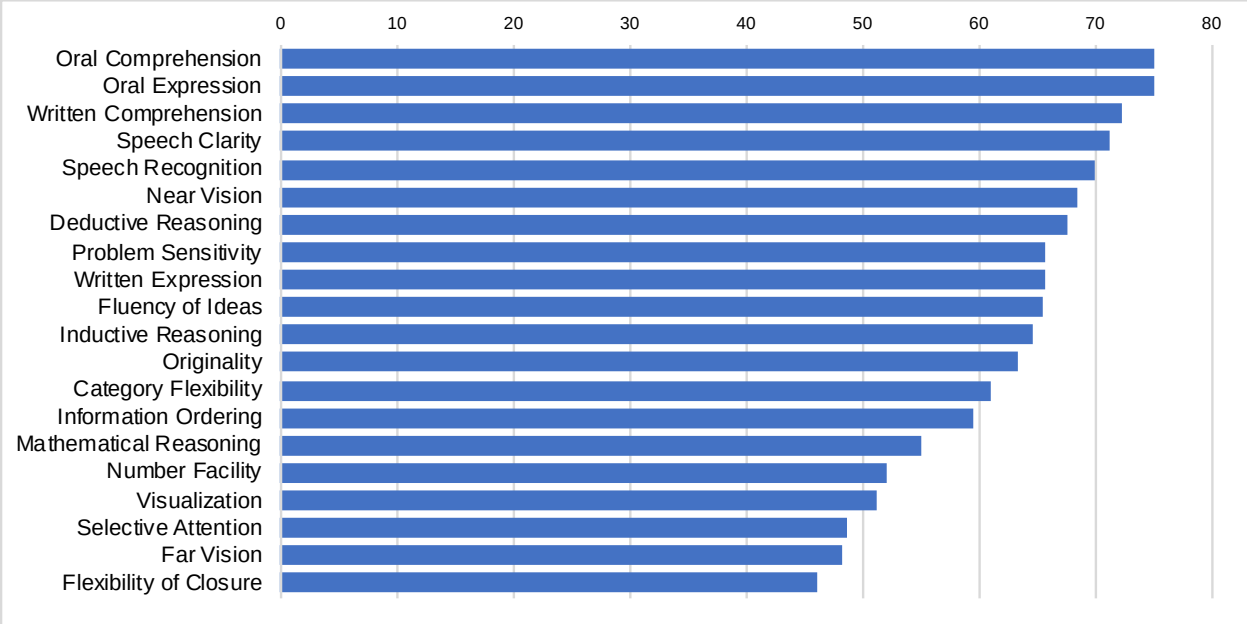
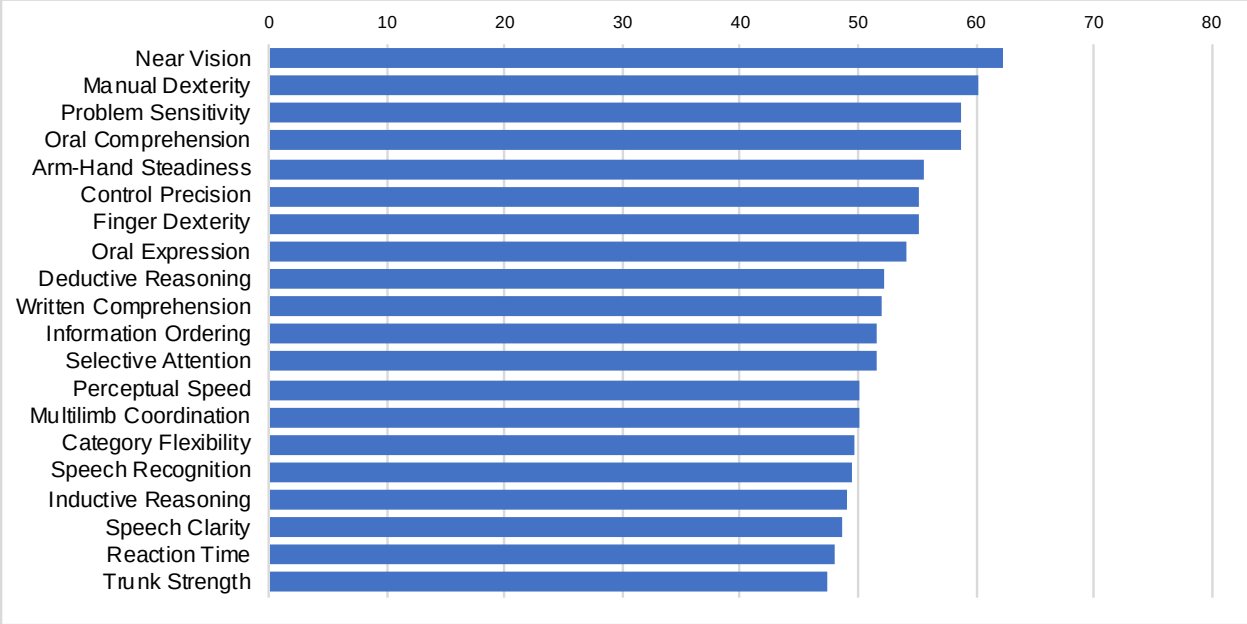


Figure C-15: Average importance of top twenty Abilities, priority labourers occupations[93]

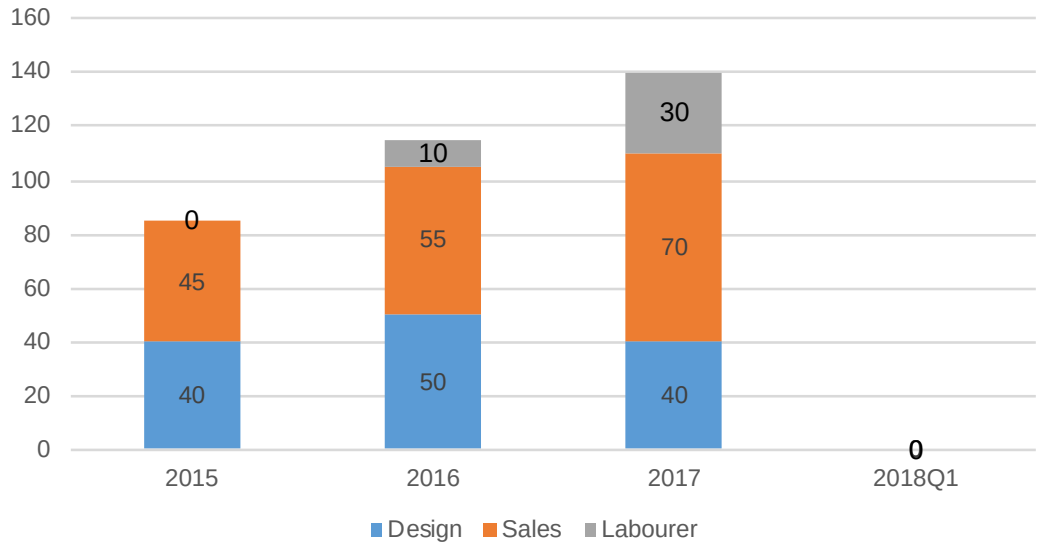


[92] Source: Ibid
[93] Source: Ibid

In-migration from other countries (Figure 21)

- Data was sourced from Immigration, Refugees and Citizenship Canada on permit holders by intended destination (B.C.) and occupations under the Temporary Foreign Worker Program (TFWP) and International Mobility Program (IMP)
- While there has been a steady increase in the number of permit holders from 2015 to 2017, total numbers are small compared to estimated supply additions, especially for the labourer category of occupations.

Figure C-16: Work permit holders year in which permit became effective, Temporary Foreign Worker Program (TFWP) and International Mobility Program (IMP), by occupation[94]



4. **What, if any, are the gaps in the current training landscape?**

Public post-secondary training for the VAW sector (Tables 16, 17, and 18)

- Data for priority NOCs 5242, 6221, 6411 and 9532 were unavailable in the student outcomes data.
- CIP codes corresponding to most frequent field of study were not reported for NOCs 9215, 9434, 9437, and 9534 because there were too few survey respondents in these occupations that completed public post-secondary training.

Table C-8: Most Frequent Study Area of Graduates Working in Selected NOCs, by Classification of Instructional Program (CIP) Code

NOC	NOC Description	4-Digit CIP	CIP Description

[94] Source: IRCC, January 31, 2018 (data access on March 24, 2018 from webpage).

2252	Industrial designers	5004	Design and applied arts
		1508	Mechanical engineering related technologies/technicians
2253	Drafting technologists and technicians	1513	Drafting/design engineering technologies/technicians
		1501	Architectural engineering technology/technician
		1508	Mechanical engineering related technologies/technicians
		1502	Civil engineering technology/technician
		1503	Electrical and electronic engineering technologies/technicians
		5004	Design and applied arts
		2401	Liberal arts and sciences, general studies and humanities
		1510	Construction engineering technology/technician
		1511	Engineering-related technologies
5244	Artisans and craftspersons	5007	Fine arts and art studies
7204	Contractors and supervisors, carpentry trades	4602	Carpentry/carpenter
		4807	Woodworking
		4604	Building/construction finishing, management and inspection
		5202	Business administration, management and operations
		1501	Architectural engineering technology/technician
7271	Carpenters	4602	Carpentry/carpenter
		4302	Fire protection
		4706	Vehicle maintenance and repair technologies, general

		4807	Woodworking
		4805	Precision metal working
		4605	Plumbing and related water supply services
		4603	Electrical and power transmission installers
		3105	Health and physical education/fitness
		4604	Building/construction finishing, management and inspection
		5202	Business administration, management and operations
7272	Cabinetmakers	4807	Woodworking
		4602	Carpentry/carpenter
9532	Furniture and fixture assemblers and inspectors	4807	Woodworking
9533	Other wood products assemblers and inspectors	4602	Carpentry/carpenter
		4807	Woodworking
9215	Supervisors, forest products processing	None	None
9434	Other wood processing machine operators	None	None
9437	Woodworking machine operators	None	None
9534	Furniture finishers and refinishers	None	None

Table C-9: Post-Secondary Education Enrollments by Academic Year[95]

CIP Series	CIP Description	Academic year (September 1 - August 31)				
		2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016
15.01	Architectural engineering technology/technician	1,785	1,775	1,850	1,935	2,135

[95] Student Transitions Project, Fall 2016 Submission

15.02	Civil engineering technology/technician	370	380	385	370	445
15.03	Electrical and electronic engineering technologies/technicians	1,145	1,210	1,200	1,260	1,305
15.08	Mechanical engineering related technologies/technicians	805	815	885	915	935
15.13	Drafting/design engineering technologies/technicians	1,160	1,015	940	935	940
46.02	Carpentry/carpenter	3,620	3,205	3,090	2,940	2,935
46.04	Building/construction finishing, management and inspection	880	870	815	795	850
48.07	Woodworking	580	505	500	535	540
50.04	Design and applied arts	4,315	4,105	3,985	3,955	4,015
50.07	Fine arts and art studies	4,725	4,520	4,290	4,050	4,170

Table C-10: Credentials awarded, post-secondary VAW feeder programs[96]

CIP Series	CIP Description	Academic year (September 1 - August 31)				
		2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016
15.01	Architectural engineering technology/technician	175	155	150	165	155
15.02	Civil engineering technology/technician	120	120	110	145	115
15.03	Electrical and electronic engineering technologies/technicians	245	240	285	275	240
15.08	Mechanical engineering related technologies/technicians	170	190	160	185	185
15.13	Drafting/design engineering technologies/technicians	160	150	165	175	205
46.02	Carpentry/carpenter	630	560	475	480	525
46.04	Building/construction finishing, management and inspection	85	65	55	45	40
48.07	Woodworking	110	105	105	110	105
50.04	Design and applied arts	550	570	550	600	575
50.07	Fine arts and art studies	550	575	585	555	535

Training programs and institutions (Table 19)

- In addition to programs directly related to VAW sector, 186 programs have been identified that either provide training for occupations employed in, but not central to the sector. Supplementary skills training not directly related to a specific occupation is also included. These additional programs are from a broad range of fields from Applied Engineering, Technician

[96] Ibid

training (e.g., CADD), and Equipment operation and mechanics (e.g., forklift, chainsaw) to Health and safety and management training. These programs are offered by many different institutions across the province and are administered in person as well as online. They last anywhere from two days (Basic Chainsaw Operation) to five years (Environmental Engineering) and award and equally diverse set of qualifications. The entire list of such programs is available on the BC Forest Sector Workforce Initiative website.

- The data was compiled in late 2016 and updated February 2017 and was a result of a coalition of industry and education leaders wishing to address forest-related labour market challenges.

Table C-11: Training programs for professions directly related to VAW sector[97]

Profession	Number of programs	Institutions	Regions offered	Program types	Qualifications
Wood processing	3	• University of British Columbia • University of Northern British Columbia	• Lower Mainland • Northern British Columbia	• Undergraduate • Graduate	• Bachelor's degree • Master's degree
Cabinetry	3	• BCIT • Okanagan College • Thompson Rivers University	• Lower Mainland • Okanagan Valley and Central Interior • Northern British Columbia	• Trade	• ITA certification
Carpentry	19	• Camosun College • College of New Caledonia • College of the Rockies • Northern Lights College • Northwest Community College • Okanagan College • Selkirk College • Thompson Rivers University • Vancouver Island University	• Vancouver Island and Coast • Northern British Columbia • Kootenay and Rocky Mountain Region • Okanagan Valley and Central Interior	• Trade	• ITA certification • Apprenticeship Levels 1-4 • Other certificate

[97] Source: BC Forest Sector Workforce Initiative. Accessed May, 2018. Database updated February 2017. Some training programs may not be represented as the project was primarily undertaken on behalf of the primary forestry sector.

Woodworking	10	• Camosun College • Langara College • Northwest Community College • Selkirk College • Thompson Rivers University	• Lower Mainland • Vancouver Island and Coast • Kootenay and Rocky Mountain Region • Northern British Columbia	• General interest • Trade	• ITA certification • Other certificate
Furniture	2	• Camosun College • Thompson Rivers University	• Vancouver Island and Coast • Lower Mainland	• Trade • General interest	• ITA certification • Other certificate

Table C-12: Detailed secondary data sources

Research Question	Attribute	VAW Sector Specific		Broader Sector Benchmark		Province benchmark	
		Source	Dataset	Source	Dataset	Source	Dataset
RQ1							
What are the main characteristics of the value-added wood sector's workforce?	Business count	Business register	CANSIM table 552-0007	Business register	CANSIM table 552-0007	Business register	CANSIM table 552-0007
	Business size	Business register	CANSIM table 552-0007	Business register	CANSIM table 552-0007	Business register	CANSIM table 552-0007
	Employee location/region	Census 2016	Census catalogue 98-400-X2016290	Census 2016	Census catalogue 98-400-X2016290	Census 2016	Census catalogue 98-400-X2016290
	Employee count	Census 2016	Census catalogue 98-400-X2016290	Census 2016	Census catalogue 98-400-X2016290	Census 2016	Census catalogue 98-400-X2016290
	Employee age	Census 2016	Census catalogue 98-400-X2016290	Census 2016	Census catalogue 98-400-X2016290	Census 2016	Census catalogue 98-400-X2016290
	Employee gender	Census 2016	Census catalogue 98-400-X2016290	Census 2016	Census catalogue 98-400-X2016290	Census 2016	Census catalogue 98-400-X2016290
	Compensation (Weekly earnings, Hours)	SEPH	CANSIM table 281-0027	SEPH	CANSIM table 281-0027	SEPH	CANSIM table 281-0027
	Compensation			Census 2016	Census catalogue 98-400-X2016364	Census 2016	Census catalogue 98-400-X2016364
	Education	Census 2016	Cenus catalogue 98-400-X2016295	Census 2016	Cenus catalogue 98-400-X2016295	Census 2016	Cenus catalogue 98-400-X2016295
	Output	GDP by Industry	CANSIM table 379-0030	GDP by Industry	CANSIM table 379-0030	GDP by Industry	CANSIM table 379-0030
RQ2							
What are the main factors affecting the demand for labour now and in the future?	Labour productivity	GDP by Industry	CANSIM table 379-0030	GDP by Industry	CANSIM table 379-0030	GDP by Industry	CANSIM table 379-0030
		SEPH	CANSIM table 281-0024	SEPH	CANSIM table 281-0024	SEPH	CANSIM table 281-0024
	Labour supply and demand	BC LMO		BC LMO		BC LMO	

	projections						
	Employment projections	BC LMO		BC LMO		BC LMO	
RQ3							
To what extent is the sector currently affected by labour shortages?	Job openings			BC LMO		BC LMO	
	Wages	SEPH	CANSIM table 281-0027	SEPH	CANSIM table 281-0027	SEPH	CANSIM table 281-0027
RQ4							
How does the sector attract new entrants?	Work permit holders, Temporary Foreign Worker Program (TFWP) and International Mobility Program (IMP)	Immigration, Refugees and Citizenship Canada (IRCC)		IRCC		IRCC	
	Top skills, knowledge and abilities for priority occupations	US Occupational Information Network (O*NET) Online service					
RQ5							
What, if any, are the gaps in the current training landscape?	Training programs	BC Forest Sector Workforce Initiative					
	Enrollments and credentials awarded	BC Student Outcome Surveys	Provided by special request, Ministry of Advanced Education, Skills and Training				
RQ6							
What are the key components to align labour supply and demand?	In additions to employer and employee surveys data, the above data will be used in						

	the dynamic labour demand model to identify labour supply and demand gaps.
Abbreviations:	
SEPH - Survey of Employment, Payrolls and Hours	
LFS - Labour Force Survey	
BC LMO - BC Labour Market Outlook	
JVWS - Job Vacancy and Wage Survey	

Appendix D. Literature Review and Subject Matter Expert (SME) interviews[98]

Approach

- The purpose of the literature review was to understand what external factors have and will impact the BC value-added wood sector and workforce, to collect relevant insights from other jurisdictions, and to inform roundtable discussions and approach.
- In addition to reviewing more than 25 reports (see bibliography for details), the project team interviewed nine non-employer subject matter experts for their perspectives on long-term trends that influence workforce requirements.
- Research was conducted along five lines of inquiry that were identified as difficult to address with the other tools, and likely to be most relevant to the sector going forward. These were:
    - Technology – What sorts of technological innovations are expected to drive the development of the sector's labour market?
    - Regulatory – What will be the effects of government regulations, policies, or programs on the value-added labour market?
    - Environmental – What environmental concerns (wood fibre supply, climate change, etc.) might affect VAW labour market needs?
    - Demographic – How do changing demographics and public perception of the industry affect recruitment and retention?
    - Market Forces – What trends surrounding market access, market potential and production in other markets may be relevant to the VAW labour market?

Findings

The overall picture emerging from the literature review and subject matter expert interviews is of an industry transitioning from traditional manufacturing and woodworking to greater technological sophistication and fine craftsmanship. Market forces, innovation, and changing regulations will increase the importance of productivity in the VAW sector. This will continue to put pressure on a training network that already struggles to meet demand. This challenge is exacerbated by a poor public image that does not reflect the actual state of the industry. If companies are willing to invest in new technologies and are supported by up-to-date building codes and adequate training, the changes will create new opportunities while at the same time supporting the skills that the sector has traditionally required.

Four major trends emerged from the analysis:

1. A number of forces are driving growth in productivity including
    a. Increased demand for engineered products
    b. Competition from other countries
    c. A shortage of available workers

[98] Report finalized 20 July, 2018

    d. Fibre supply constraints

2. There is a perception that the demand for training exceeds its supply
    a. Employers have a hard time finding adequate employment, from entry-level, all the way up to management
    b. Skill development of existing workers is also a challenge
    c. Several potential reasons cited, most commonly that industry structure (lots of small / medium sized firms) presents challenges
3. Public perception of the industry does not reflect reality
    a. VAW is either unknown or considered part of the forestry industry, which is thought of by many as an industry in decline
4. In addition to the trend toward advanced engineered wood products, there will continue to be demand for high-quality, custom craftsmanship
    a. Employers that are unable to either compete using technology or sell high value / margin products will be challenged going forward

The VAW sector is a diverse mix of businesses and products and as a result is subject to experience different results from the same forces. Furthermore, there are large regional differences in both wood supply and subsector specialization. While the importance of innovation and training is important to all subsectors, their role may vary. Also, as highlighted in the interviews, there may be a disconnect for some employers who may not be aware of, or may underestimate, the impact of external trends on their workforce. Hence, the literature review was important in shaping the employer roundtable approach to ensure discussions address how innovation and productivity feature in their business model, and what are the related implications for their workforce.

The Wood Manufacturing Council based in Ottawa has a long-standing history developing training programs that reflect the VAW sector's needs while also considering practices in other jurisdictions. The Centre for Advanced Wood Processing (CAWP) at UBC is an early example of this work, drawing inspiration from the Rosenheim Institute, a trade school in southern Germany.

Though distinct, the primary and the secondary sector have clear interdependencies, with the latter being dependent on the former for its input materials. The focus of this report is value-added wood production in British Columbia, but what happens in the primary sector has important downstream implications for VAW. Fully understanding the issues affecting the primary sector is beyond the scope of this project.

Key Learnings

Overall the literature review and SME interviews validated that all three themes that emerged from PAppehase 1 are relevant. This research tool raised the prominence of the role of innovation in the sector by highlighting a number of external pressures that pressure employers to continue to sustain and/or increase labour productivity. The reports and SME perspectives were generally at a high level

and did not yield clear insights into subsectoral, regional and occupational levels. There is some coverage at the subsector level, specifically the advanced structural wood product manufacturing subsector. Other subsectors are not considered specifically in the research reviewed. No reports that address wood education and training program best practices in other jurisdictions were uncovered.

Detailed Findings

Four key themes emerged from the literature and subject matter expert interviews:

Theme #1 – There are a number of forces driving the need to gain productivity advantage:

a. **Increased demand for engineered wood products**

b. **Competition from other countries**

c. **A shortage of available workers**

d. **Fibre supply constraints**

Increased demand for engineered wood products

A host of factors points toward increasing demand for engineered wood products in the coming years. These factors include:

- New products increasing the load-bearing capacity of wood, making it a viable alternative to materials traditionally used in the construction of large buildings[99];
- Government policies and regulations being updated[100] to reflect advances in wood technology by allowing (and in some cases actively promoting[101]) the use of wood in new building projects;
- An increasing awareness and demonstration that wood buildings are safer and easier to build than once thought[102];
- Rising consumer preference for natural and sustainable building materials[103].
- Lower carbon footprint than alternative construction approaches

All of the above factors were cited to varying degrees as evidence of this trend in SME interviews. One interviewee stated that regulatory changes in favour of expanding the use of wood in building construction were in part a result of the fact that "the technology has proven itself". Others spoke of the increasing appeal of wood as an aesthetically pleasing and environmentally friendly building product and expected the increased popularization and use of such materials.

[99] The Canadian Wood Council. Innovative Applications of Engineered Wood

[100] China has been revising building codes since as early as 2006 to promote the use of wood in construction, largely for environmental reasons.

[101] The BC Wood First initiative was established in 2009 requiring that all new government buildings first consider wood as a primary construction material. The provincial NDP government has also pledged to "make BC a world leader in engineered wood products" using such products extensively in new building work.

[102] This view was expressed in most of the SME interviews and can be seen in the many articles such as this one,

[103] Another point that frequently came up in interviews.

Competition from other countries

Competition from other value-added wood producers will put pressures on BC to keep apace in order to take advantage of expanding market opportunities. Europe and the United States present competition in the engineered wood product and prefabricated homes markets[104], while China, Malaysia, and Vietnam[105] are major producers of furniture and similar items. One interviewee cited China and Vietnam as countries that are fast improving their production capacity and quality in low to mid-range furniture. In his view, due to labour costs that are much lower than those found in Canada, these and similar countries will be very difficult to compete with in the coming years.

Many interviewees were optimistic about BC's opportunities in the market for engineered wood products and prefabricated homes. The province has historically been a leader in the development of engineered wood and has built several showcase projects, including the recently completed 17-story Brock Commons Tallwood House on the Vancouver UBC campus and the Wood Innovation and Design Centre in downtown Prince George. According to interviews, while BC began as a leader in engineered wood applications[106], other jurisdictions are quickly catching up and beginning to set the standard in the use and regulation of these products[107]. Growth prospects for the industry are good and the general consensus among interviewees was that British Columbia manufacturers have an opportunity to maintain their position at the forefront of this field if they take the necessary steps – both from a regulatory and technological perspective – to stay competitive.

A shortage of available workers

The 2016 report, Advancing Wood Manufacturing (AWM) in Canada surveyed 185 employers across Canada, of which 76% reported having some or great difficulty attracting new workers. The BC Value-added wood products: sector engagement report also found a shortage of qualified entrants into the sector. Both of these issues were echoed in the interviews conducted for this report. Several interviewees cited difficulty finding suitable labour as a driver of innovation, forcing companies to "produce more with less".

Another common theme amongst interviewees was that VAW wages are low when compared with other manufacturing and forestry jobs. One regularly cited example of this was regarding graduates from the Bachelor of Science in Wood Products Processing at UBC. While the program is housed in the Centre for Advanced Wood Processing and designed to prepare students for a career in advanced wood processing, most students end up being recruited by large, primary sector wood companies. The universally stated reason for this was that secondary manufacturers, who tend to be much smaller than the primary sector firms, simply do not (or cannot) pay enough to compete for the highly regarded graduates.

[104] Manninen, Heikki. Long-term outlook for engineered wood products in Europe
[105] Binh, Dam Huy. Furniture Industry – Vietnam & Global Market Outlook
[106] In 2009, BC passed the Wood First act, requiring that wood be the first material considered in the construction of all provincial buildings
[107] China has been revising building codes since as early as 2006 to promote the use of wood in construction, and Europe has a number of showcase projects featuring advanced wood building.

A third reason given for the perceived shortage of workers is a poor public image of the sector, a point that is expanded upon below.

A fourth reason given was population shifts from rural to urban centres.

Fibre supply constraints

One interviewee noted the role of climate change on fibre supply including the impact of the pine beetle in the past and potentially the spruce beetle going forward. A timber supply forecast from the BC Government sourced from Forestry Innovation Investment (FII) suggests supply will drop from 70 million cubic metres in 2018 to 56 million in 2027, a 20% decline over 10 years.[108] A webpage on the BC Government website attributes the drop to the effect of the mountain pine beetle. Another interviewee highlighted that the resolution of Indigenous title claims will impact ownership of forest lands which will have an uncertain effect on the value-added sector. This factor may also see an increase in Indigenous-owned firms in the VAW sector and other businesses tied to forestry. The interviewee noted some estimates that within the next 10 to 15 years, 50% of Crown land could be controlled by Indigenous interests. The impact of fibre supply depends on the region and the subsector, with those sectors that tend to depend on local fibre supply being more susceptible to supply constraints, while some employers in higher value-added subsectors such as cabinetry that rely on hardwood fibre sourced from out-of-province may not be impacted at all.

Theme #2 - There is a perception that demand for training exceeds its supply

According to the AWM report, 84% of their survey respondents reported a shortage of skilled workers, saying "to remain competitive, the advanced wood manufacturing sector needs to ensure that education and training programs offered by educational institutions, sector associations, labour groups, and governments provide workers with the right knowledge and skills." The 2016 British Columbia forest sector competitiveness: Value added sector action plan echoes this finding, with representatives from industry associations and key ministries agreeing that "current training and skills development programs do not meet the specific needs of the value-added sector". This view was also echoed in the SME interviews conducted for this report.

Two possible reasons for this training shortage have been proposed: 1) increased access to technology and continuing innovation in wood products production has led to a change skill requirements and training has not kept pace, and 2) VAW businesses tend to be small and have little time and resources to devote to training, be it in-house or external.

Many SME interviewees indicated that changing production processes will continue to change the skills required in the VAW workplace. Furthermore, the costs of technology adoption have fallen, providing greater access to businesses that would otherwise not be able to afford it. This combination of new processes and greater access has heightened the demand for more highly skilled and specialized labour.

[108] Includes Timber Supply Areas (TSAs) and Tree Farm Licenses (TFLs) only; wood from private lands and from other tenures such as Community Forest Agreements, First Nation Woodland Licences or Woodlot Licences is excluded. Source: Ministry of Forests, Land and Natural Resource Operations via FII's BC Forest Sector Data and Stats 2017

Again, the AWM report states, "the increased use of automated machinery has increased the demand for workers with Computer Numerically Controlled, Computer Aided Design, and other technological and computer-related skills." In March 2018, Joel Neuheimer noted a need for engineers[109] at the Montreal Wood Convention, while the the sector engagement project identified technologists, designers, and other skilled workers as being difficult to find.

Companies in the sector tend to be small. According to the AWM report, across Canada more than 96% of businesses employ fewer than 100 people. Using Statistics Canada data from December 2017, 92% of BC VAW companies with employees have fewer than 50 workers. This accounts for 693 of the 756 businesses registering employees[110]. According to interviewees, these small companies have few resources to spare on supporting necessary training programs. This is corroborated in Forestry Innovation Investment's 2017 3-year strategy plan which states that "many value added firms have few internal resources and may need assistance developing necessary technological know-how and keeping up with demand for new products." The BC NDP government has stated that it "will partner with colleges and universities to train designers, engineers and tradespeople needed to put wood products to use"[111], which may work to offset some of these shortages.

Interviewees were asked about best practices from other jurisdictions with respect to training that should be considered. One highlighted that the UBC Centre for Advanced Wood Processing (CAWP) was modeled on a co-op program at the Rosenheim Institute, a trade school in southern Germany. Richard Lipman of the Wood Manufacturing Council in Ottawa highlighted training programs delivered and/or overseen by WMC. These include:

- WoodLINKS – a high school training program to prepare work-ready, entry level employees which is not available in BC, but is offered in in other Canadian jurisdictions
- The Wood Employee Readiness Curriculum (WERC) – an entry-level training program offered across Canada which is designed to attract workers from a variety of backgrounds including Indigenous peoples, persons with disabilities, new Canadians and immigrants working in Canada
- WMC Management Training – an online training program offered through UBC for VAW companies to develop business management skills
- Rapid Internal Skills Enhancement (RISE) – an onsite program that offers practical plant floor training in a variety of areas.

Theme #3 – The common perception of the industry does not reflect reality

Nearly every subject matter expert engaged for this report spoke of the generally poor image that many people have of the industry. One SME told a story of going to a career fair with his daughter and listening to the career counselor strongly dissuade students from considering entering the wood sector.

[109] Wood Business. Montreal Wood speakers offer solutions to labour challenge
[110] Data comes from the Canadian Business Register. Statistics Canada. Table 33-10-0037-01 Canadian Business Counts, with employees, December 2017.
[111] 2017 BC NDP Platform

Several times people brought up the fact that VAW is seen as an industry with little future to offer. Two interviewees mentioned that many people are unaware of value-added sector as separate from the primary forestry sector, and that many of the stereotypes of the latter get wrongly applied to the former. Several interviewees reported that new Canadians may be a promising source of labour for the industry as they don't seem to hold the same preconceptions held by much of the rest of the population.

This issue with perception is also identified in many of the studies that have been done on the sector. A 2014 report on the VAW sector in New Brunswick noted that all of the business representatives they spoke with cited a poor public image as a challenge for attracting workers to the industry. In the 2016 AWM study, over 40% of survey respondents cited negative perceptions of the sector as a barrier to recruitment.

Contrary to these perceptions, the picture of the industry that emerged from interviews and literature review is instead of an industry in transition, moving toward a split between high value-added products made with the latest technology and high-quality, custom craftsmanship.

Theme #4 - In addition to the trend toward advanced engineered wood products, there will continue to be demand for high-quality, custom craftsmanship.

While the most frequently cited trend in the sector was the increasing importance of technology, especially in the production of engineered wood products, there was a general consensus among interviewees that there will be a continued demand for traditional woodworking skills. Furthermore, the AWM report found that "new and experienced workers often develop skills that relate to technical requirements and new machinery, but traditional craftsmanship skills remain valuable."

Interviewees believed that as countries with low labour costs improve production processes and quality, profit margins will be pushed down and it will become increasingly difficult for BC furniture and cabinet makers to compete. However, there will continue to be demand for traditional BC woodworking, especially for high-end products that are either custom-made, are notable for the use of local woods, or are prohibitively expensive to transport.

Interviewees

1. Bryan Bogdanski, Research Economist, Natural Resources Canada
2. Chris Gaston, Associate Professor of Markets and Economics, UBC and FPInnovations
3. Kelly and Sandy McCloskey (Wood n Frog Communications, strategic planning and forest product promotion consultants)
4. Kevin Regan, Director of Corporate Relations, Forestry Innovation Investment (FII)
5. Richard Lipman, President of the Wood Manufacturing Council (WMF)
6. Ron Hogg (President of Forest People, forest industry personnel recruiting firm)
7. Simon Ellis, UBC Centre for Advanced Wood Processing (CAWP)

8. Guido Wimmers, Chair, Associate Professor, Master of Engineering, Integrated Wood Design, UNBC

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Appendix E: Labour Demand Model

Due to the scope of the industry, employment forecasts from the BC Labour Market Outlook 2018 edition (LMO) are not appropriate for this project. LMO data is available for the NAICS code 321 Wood product manufacturing, which is broader than the scope of the current project. Forecasts for the 3-digit NAICS code containing the in-scope furniture businesses is not available at all.

The LMO employment forecast for Wood product manufacturing industry (NAICS 321) is largely driven by the sub-industry Sawmills and wood preservation (NAICS 3211), which is the largest sub-industry within wood product manufacturing. As Sawmills and wood preservation are tightly linked to the forestry sector, trends within the LMO data are not representative for the smaller sub-industries this study is focusing on. The Sawmills and wood preservation sub-industry is expected to be heavily impacted by a number of external supply constraints that are unlikely to affect VAW to the same degree (forest fires, pine beetle damage, declining annual allowable cuts, etc). Employment projections for the larger Wood product manufacturing NAICS group (NAICS 321)are driven by these factors and as a result, employment for the entire Wood product manufacturing industry is projected to fall. This is contrary to high growth expectations reported in the employer survey. While employers were not asked directly about employment expectations, there was no indication given in roundtables and interviews that demand for labour would be falling in the near future.

As a result, a model was developed for this report that combines data from employer surveys on employment by occupation group, the 2016 Census, the Survey of Employment, Payrolls and Hours (SEPH), and the Monthly Survey of Manufacturing. All secondary data is available publicly and was collected via the Statistics Canada website.

The model first estimated current job shortages by occupation based on the distribution of employment reported by employers in the employer survey and total labour force in the industry according to Census 2016. Then past trends in sales and labour productivity were used to forecast job openings due to demand for each of the nine priority occupations over the course of the next ten years for three different growth scenarios. Job openings due to retirement were estimated using age distributions from the 2016 Census and a probability of retirement for each Census age group.

The detailed procedure for deriving job openings due to expansion is the following:

- Calculate share of total industry employment for each occupation based on employer responses to questions regarding total employment and employment in each of the nine priority occupation groups.
- Using these occupation shares of employment and total sector employment from the 2016 Census, calculate total employment for each occupation.

- Based on survey responses and historical sales growth numbers[112], establish three possible sales growth scenarios for the next ten years: 0%, 5% and 10%
- Calculate the elasticity of monthly labour productivity[113] with respect to monthly sales using six-month moving averages from January 2002 to December 2017[114].
- Using this elasticity, calculate labour productivity for each of the three growth scenarios.
- Labour productivity is then used to derive employment for each growth scenario.
- Calculate employment over a ten-year time horizon using Census 2016 figures as a baseline. The difference between employment in 2016 and 2025 is total job openings due to demand over the ten years. This number is divided by ten to arrive at an annual number.

The procedure for deriving job openings due to retirements is the following:

- Identify "representative" NOC codes for each of the nine priority occupations to obtain age distributions for each occupation. This is done by choosing the NOC code with the highest employment in VAW that is consistent with the name of the occupation group as defined in the employer survey. For example, 9614 Labourers in wood, pulp and paper processing is the most populous occupation in NAICS 321 and 337 and was chosen to represent the Production worker/labourer occupation group.
- Assume constant probabilities of retirement for all occupations as the following:
    - 15 to 24: 0%
    - 25 to 34: 0%
    - 35 to 44: 2%
    - 45 to 54: 20%
    - 55 to 64: 80%
    - 65 to 74: 90%
    - 75 and older: 100%

  The interpretation of these probabilities is "the probability of someone who is between the ages of 55 and 64 in the next 10 years is 80%"..
- Using the occupational age distributions and retirement probabilities, calculate total retirements for the ten-year period and from this number derive the number of annual retirements per occupation in VAW. The overall retirement rate from these calculations is 1.6% for the VAW sub-industry, 0.3 percentage points higher than the BC retirement rate for 2017.

[112] 31% of employers surveyed hoped to keep their business profitable without increasing revenue, 41% hoped to achieve revenue growth of 5 to 10% annually, and 28% hoped to achieve growth greater than 10%. With the exception of 2007-2009 when the industry contracted considerably, historical sales data show annual growth rates between -5% and 12%. Given employer expectations and strong recent sales growth, the stated scenarios were chosen.

[113] Labour productivity is defined as dollars of sales per employee. Source: Statistics Canada. Table 16-10-0048-01 Manufacturing sales by industry and province, monthly and Statistics Canada. Table 14-10-0201-01 Employment by industry, monthly, unadjusted for seasonality

[114] An increase in the growth rate of sales of one percent corresponds to an increase in labour productivity of 0.7%.