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Structure, economic contribution and changes since 1990

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List of Abbreviations

BC	British Columbia
BR	Business Register
BT	business type
EWP	engineered wood products
FTE	full-time equivalent
m³	cubic metres
ROC	rest of Canada
RWE	roundwood equivalent
S & S	shakes and shingles
SPF	spruce-pine-fir
US	United States
WRC	Western red cedar

Acknowledgements

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Abstract

The British Columbia forest industry continuously faces challenges from commodity market volatility, increased global competition, and declining timber supply. Such challenges were front and centre during the housing and financial crisis in the United States and subsequent great recession of 2007–2009. This report presents survey results for the province's secondary wood manufacturing industries in 2016. The survey gathered operational, employment, production, marketing, and financial information on business types, with supplemental information gathered for panelboard producers. Analysis of the survey results provides a comprehensive picture of the state of the sector's industries and allows for comparison with past surveys conducted by the Canadian Forest Service, including the last one undertaken in 2012. The industry has grown since the last survey, but the relative economic contribution of the two largest subsectors, remanufacturing and engineered wood products, remained largely unchanged. The changes occurred among the smaller subsectors, with strong growth in shakes and shingles and other wood products offsetting the decline in millwork.

Keywords: employment, forest industry, markets, policy, secondary manufacturing, value-added

Résumé

L'industrie forestière de la Colombie-Britannique doit continuellement surmonter les défis posés par la volatilité du marché des produits de base, l'accroissement de la concurrence mondiale et le déclin de l'approvisionnement en bois. Ces problèmes se sont particulièrement fait sentir durant la crise du marché de l'habitation et la crise financière qui ont frappé les États-Unis et entraîné la grande récession de 2007-2009. Ce rapport présente les résultats d'une enquête menée auprès des industries de transformation secondaire du bois de la province en 2016. Des renseignements supplémentaires ont été obtenus sur les producteurs de carton pour panneaux. L'analyse des résultats d'enquêtes dresse un portrait global de l'état des industries du secteur et permet de les comparer aux résultats d'enquêtes précédentes menées par le Service canadien des forêts, y compris la dernière de 2012. L'industrie a connu une croissance depuis la dernière enquête, mais la contribution économique relative des deux principaux sous-secteurs, soit la seconde transformation et les produits dérivés en bois, est à peu près restée la même. Les changements se sont produits dans les sous-secteurs plus petits, où la demande de bardeaux, de bardeaux de fente et d'autres produits du bois a connu une forte croissance, en contrepoids du déclin de la menuiserie.

Mots-clés : emploi, industrie forestière, marchés, politiques, transformation secondaire, valeur ajoutée

Key Points

- This report summarizes the results of a comprehensive survey on secondary manufacturing of solid wood products in British Columbia for the year 2016. The final survey population included 680 firms, of which 179 responded, yielding a 26% response rate.
- In 2016, the 680 firms in the sector (all business types) employed an estimated 16,888 full-time equivalent workers, generating $4.46 billion in sales. The sector grew since 2012: employment rose by 8.4%, inflation adjusted sales were up 12.8%, and the number of firms increased by 15.4%.[1]
- The sector (all business types) processed an estimated 23 million m^3 of fibre (roundwood equivalent), up from the estimated 20 million m^3 in 2012 and down from 25 million m^3 in 2006.[2]
- The industry was concentrated in the Vancouver–Fraser Valley area (55% of firms) and the Southern Interior (20% of firms). Overall, 70% of firms were located in the Coastal region and 30% in the Interior.
- Millwork and engineered wood products represented the largest subsectors in our survey, comprising 22% and 20% of all firms, respectively. The cabinets subsector followed at 17%.
- In terms of sales, panelboard producers and remanufacturers made the greatest economic contribution, each accounting for 20% of total sales. Engineered wood products followed closely, contributing 19%.
- Engineered wood product producers were the largest employers, representing 22% of sector employment. Remanufacturers and panelboard producers each accounted for 18%.
- Responding firms employed an average of 23 people, whereas median employment was 13 people.[3]
- 11% of responding firms earned greater than $15 million in gross revenue and 58% of firms fell into the medium sales group, earning between $1.1–15 million.
- Average capacity utilization was 76%, up from 66% in 2012. A high of 77% was reached in 1994.
- The majority (69%) of responding firms relied on British Columbia for over half of their sales. The United States and the rest of Canada were also important markets for many firms.

1 Nominal sales were up 16.7%.

2 Excluding plywood & panelboard manufacturing, the estimates were 14.9 million m^3 in 2016, 16.3 million m^3 in 2012 and 17.3 million m^3 in 2006.

3 Excludes plywood & panelboard producers.

1 Introduction

In 2017, the Canadian Forest Service undertook its seventh survey of the secondary wood manufacturing sector in British Columbia (BC) to examine its structure and economic contribution to the provincial economy. This series of surveys and associated reports on this important sector date back to 1990, and provide a statistical basis for understanding the trends and changes within secondary manufacturing. In 2014, a separate survey was introduced for Alberta, and in 2017/2018 the survey program expanded to Saskatchewan, Manitoba, Ontario, Quebec, Nova Scotia and New Brunswick. The BC survey format was updated to maintain consistency with similar surveys conducted across Canada. As this latest BC survey collected operational data on 2016 sector activity, we refer to it as the "2016 survey" throughout this report. Similarly, all prior surveys are referred to by the year for which information was gathered.

The 2016 survey continues with the definition of secondary manufacturing established in earlier surveys. Secondary manufacturing is the further processing of primary mill wood or wood-based material into semi-finished or finished products. Clustered by business type (BT), the major wood products in the secondary manufacturing industry include the following:

- remanufactured products (reman)
- millwork
- engineered wood products (EWP; including log homes and timber frames)
- cabinets
- furniture
- pallets and containers
- other wood products
- shakes and shingles (S & S)
- panelboards

Our definition of a "manufacturer" excluded several activities, the primary exclusions being contractor/builders, or custom one-off operations. Most affected firms were log home manufacturers within the EWP category and cabinet manufacturers. For example, a firm that manufactures pre-built houses in a plant and then ships them out for final assembly fell within our definition of "engineered wood products," whereas a contractor or builder who constructs houses at a job site did not. We also excluded small one-off custom manufacturers of specialty furniture or cabinets. Finally, we did not include a small group of lumber/remanufacturing mills that were more lumber manufacturers than remanufacturers given their consumption of whole logs instead of lumber. Appendix A contains a reasonably comprehensive listing and logical taxonomy of the products produced in solid wood secondary manufacturing.

Previous BC surveys showed strong, sustained growth through the 1990s and 2000, albeit with a reduction in the number of firms between 1999 and 2006 (Stennes, Wilson, & Wang, 2005; Stennes & Wilson, 2008). Between the 2006 and 2012 surveys, the province's primary wood industries were subject to a prolonged downturn in the United States (US) housing market and the great recession of 2007–2009, as well as new and impressive demand growth in China. The secondary manufacturing industry contracted during this period, but became much more balanced across the subsectors, with a shift from panelboards and remanufactured products to value-added businesses that were more closely tied to the domestic construction industry (Bogdanski & McBeath, 2015).

Forestry stakeholders, including policy makers, industry, and timber-producing communities, maintain considerable interest in promoting value-added processing as a means to maximize the level of economic activity from fibre harvested in British Columbia. The coastal sawmill and pulp and paper industries, for instance, face declining revenue and employment. These continuing problems are linked to competitiveness issues, restructuring, and changes in demand, as well as persisting fibre/timber supply shocks from the mountain pine beetle outbreak in the Interior. Communities in pine-dominated areas have been examining options to diversify away from commodity forest products (i.e., lumber, plywood, oriented strand board, particleboard, and medium-density fibreboard). Secondary manufacturing of lumber into intermediate and finished products, or adding value to waste streams from the primary industries, are seen as important strategies to help diversify these economic regions. Ensuring effective policy responses requires credible and up-to-date information on the sector. Current data also helps communities and industry associations fine-tune their diversification efforts and increase their chances of success.

Secondary manufacturing, by its very definition, increases the level of economic activity associated with harvested timber when compared to the production of primary commodity products. Table 1 shows employment and gross sales per unit of roundwood equivalent used (RWE).[4] In the case of employment, for most business types these jobs are incremental to those generated by woodlands and primary mill operations, which represent approximately 0.61 jobs per 1000 cubic metres (m^3) of timber harvested.[5]

The business types producing the greatest levels of employment and sales per unit of fibre input are cabinet/furniture manufacturers and millwork, which have the highest coefficients for both of these measures. In addition to looking at sales per unit of fibre, we also looked at sales per full-time equivalents (FTEs). This value is highest for other wood products

4 Roundwood equivalent volume (log volume equivalent) is an estimate of the volume of logs used to manufacture wood-based products.

5 This employment coefficient was calculated using total employment in logging, forestry, and primary mill employment for 2016 (i.e., 42,593 jobs; see Statistics Canada, n.d.) as a ratio of the BC harvest for 2016 derived from the province's Harvest Billing System (https://a100.gov.bc.ca/pub/hbs/). There is some discrepancy between harvest volumes from the Province and harvest volumes published in the National Forestry Database (http://nfdp.ccfm.org/en/data/harvest.php). Using the latter, this coffecient is 0.64.

Table 1. Job and sales coefficients per unit of roundwood equivalent used, 2016

Business type	Jobs per 1000 m^3	Sales per m^3	Sales per full-time equivalent (000s)
Cabinets and furniture	13.6	$2,009	$148
Engineered wood products	1.2	$273	$236
Millwork	12.9	$2,777	$216
Other wood products	0.2	$96	$473
Pallets and containers	1.0	$246	$248
Remanufactured products	0.4	$129	$291
Shakes and shingles	1.3	$484	$384
Sector excluding panelboards	0.8	$204	$257
Sector	**0.7**	**$193**	**$264**

as well as shakes and shingles. The different indicator values across business types reflect the varying combinations of labour, capital, and other inputs involved in the production of the different products within each business group. For example, cabinet and furniture production requires significant inputs of skilled labour and other materials, such as hardware, textiles, glue, and stone, whereas the production of "other wood products," which is dominated by wood energy pellet production, requires little labour but lots of machinery and wood waste materials.

2 Research Methods

Our inventory of BC secondary wood manufacturers is a product of past surveys. With each survey, we update this inventory using membership lists from producer associations, the Internet, commercial directories, communication with industry experts and the ongoing survey process. For this latest survey, we also incorporated information from Statistics Canada's Business Register. This was done to ensure a consistent population frame was used for BC and the other provinces surveyed in 2017/2018.

680 firms comprised the target population of manufacturers. Although panelboard manufacturers were surveyed, their results are only included in Section 4 ("Secondary Manufacturing Trends, 1990–2016") due to their relatively small population size and issues related to confidentiality.

Past surveys employed a two-part questionnaire where respondents were asked for basic company information in Part A and more detailed operational data in Part B (see Appendix 2 of Bogdanski and McBeath (2015)); it was emphasized that Part B was optional. This latest survey combined these two parts into a single, comprehensive questionnaire (Appendix B). Respondents took an average of two hours and forty minutes to complete the survey, and this change in methodology may have impacted the response rate (Table 2), which is somewhat lower than past years.

The survey was mailed-out in two phases. The first phase, using an existing in-house survey frame, was mailed-out in October 2017. In early 2018, a second mail-out took place to businesses identified in the Statistics Canada's Business Register (BR) but not in the in-house survey frame. The second mail-out also included 20% of all firms categorized in the BR as having no identified legal business structure or employment (employee class of "0"). Firms that did not respond to the mail-outs or faxes were contacted by phone or email between November 2017 and May 2018, and asked to complete and return the survey. 179 surveys were returned, representing a 26% response rate, down from 41% in each of 2012 and 2006. If, however, we only considered surveys with both parts completed, the response rates were 27% for 2012 and 34% for 2006.[6]

Table 2 summarizes the survey population and respondents by business type and region. Each firm in the survey population was classified into a business type according to its distribution of product sales (see Appendix C for specific activities within our defined business types). The majority of firms were classified as millwork firms (22%), EWP firms (20%), or cabinet manufacturers (17%).

The classification of firms into business types raises interesting questions. First, by maintaining the classification definitions from previous years, we are able to report on trends such as closures and openings over time, which may give insight into the impact of economic conditions. Nevertheless, as some business types (e.g., millwork, cabinets, and furniture manufacturers) engage in very similar work, aggregating these may have advantages. We also know that firms will change their products from time to time and thus move in and out of a particular business-type classification. For instance, remanufacturers may do more primary lumber production in a given year and therefore move out of that business type. Although this may indicate a falling number of remanufacturing firms, this is not necessarily because of a downturn in the demand for those products but rather the firm evolving its business.

Section 3 ("Survey Results") presents information provided by the survey respondents. Section 4 ("Secondary Manufacturing Trends, 1990–2016"), extrapolates these results to the total population, presenting estimates of sector employment, sales, and raw material use. The method of extrapolation started with the 2006 survey (Stennes & Wilson, 2008) and differed from our past surveys (Wilson, Stennes, Wang, & Wilson, 2001b; Wilson, Stennes, & Wang, 1999). All companies contacted in follow-up phone calls were asked for the number of full-time equivalent employees. Combined with survey responses, this process elicited employee information for 51% of firms. Information for a further 24% was obtained from estimates based on information in Statistics Canada's Business

6 Of the firms with no employees in the BR that were sent surveys (212), five responses were received for a response rate of 2%. Only three of these businesses had employees and fell within the scope of the survey. Follow-up on the remaining businesses found they were not in business anymore or were out of scope of the survey. Consequently, all entries (1060) in the BR database with an employee class of "0" were discounted from the overall estimate of the sector population

Table 2. Distribution of survey population and response rates

	Number of firms			Response rate (%)		
Business type	**Coast**	**Interior**	**Total**	**Coast**	**Interior**	**Total**
Cabinets	99	14	113	33	57	36
Engineered Wood Products	61	77	138	13	18	16
Furniture	46	4	50	20	75	24
Millwork	115	33	148	18	15	18
Other Wood Products	27	25	52	19	40	29
Pallets and Containers	30	10	40	23	60	33
Remanufactured Products	61	30	91	28	47	34
Shakes and Shingles	33	3	36	42	67	44
Subtotal	**472**	**196**	**668**	**24**	**35**	**26**
Plywood & Panelboards	2	10	12	0	30	25
Total	**474**	**206**	**680**	**24**	**32**	**26**
Percentage	**70**	**30**				

Register. For the firms that refused to provide employment information, or could not be reached, we estimated employee numbers from sample medians.[7] The employee numbers were then used to scale other variables of interest within each business type after developing coefficients per employee.

The survey was broadened in 1997 to include both panelboard producers and shake and shingle producers. Since such producers further process primary mill wood or wood-based material into semi-finished or finished products, both of these activities fit within our definition of secondary manufacturing (Wilson, Stennes, Wang, & Wilson, 2001a). To facilitate comparisons with our previous surveys, some results in Section 4 ("Secondary Manufacturing Trends, 1990–2016") were calculated net of these two business types.

Selected results were reported using regions constructed from provincial forest district designations (BC Ministry of Forests, Lands, Natural Resource Operations & Rural Development, 2018), although most results were regionally disaggregated only on the basis of Coast versus Interior. However, in some cases, Coast and Interior regions were divided into sub-regions, such that the Coast region was sometimes separated into Vancouver–Fraser Valley and Vancouver Island–Coast, and the Interior region was separated into the Northern, Central and Southern Interior (see Figure 1).

Prior surveys used pre-2003 forest region boundaries where the Northern Interior consisted of the Northern and Cariboo forest regions and Southern Interior consisted of the Kamloops and Nelson forest regions (see Stennes & Wilson (2008). The slight changes to the regional boundaries between 2012 and 2016 impact the comparability of some results for the Northern and Central Interior (see Appendix D).

Figure 1 shows the regional distribution of firms by business type. The majority of firms were located on the Coast (70%) and the rest were Interior operators, located primarily in the Southern Interior (20%). Of the firms operating on the Coast, 78% were in the Vancouver-Fraser Valley and 22% in the Island-Coast. The Interior had a higher proportion of EWP firms (37% of Interior firms vs 13% of Coastal firms) and the Coast had a higher proportion of cabinet (21% vs 7%) and millwork (24% vs 16%) firms.

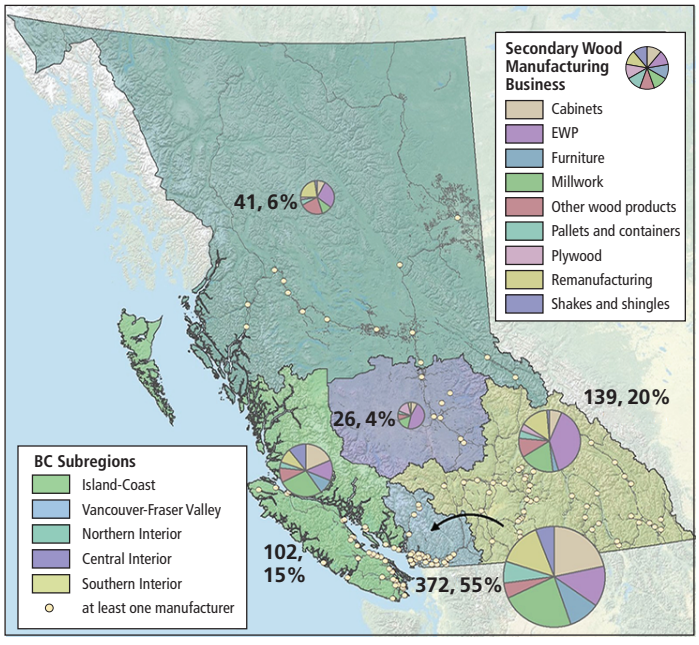

Figure 1. Location, number and percentage of British Columbia secondary wood manufacturers, 2016.

7 Extrapolation was done using medians rather than means because the distribution of sales and employment were skewed toward a small number of large firms. Under these conditions, using means to scale up sample results would overestimate population values.

3 Survey Results

This section contains results from the 2016 survey prior to any extrapolation methods. In the interest of confidentiality, data for panelboard producers were excluded.

3.1. Employment

Figure 2 shows the distribution of firms by region in 2016, with firms classified into three groups according to the number of employees. The median number of employees was 13 and the average was 23.[8] Although large firms (>50 employees) only made up 11% of all firms, they accounted for almost half of employment, and while 62% of firms were classified as small (having no more than 15 workers), they employed just 20% of the sector's workers (Figure 3).

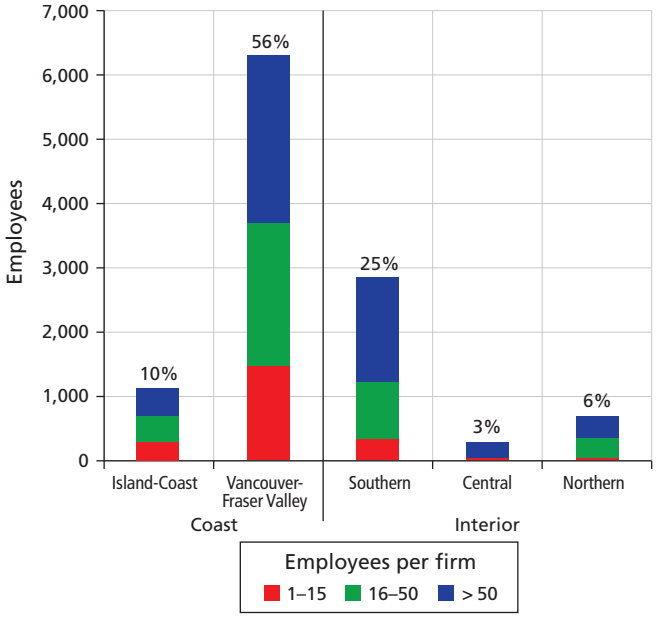

Figure 2. Number of employees for firms with employment data (503 firms), by size of firm (employees per firm) and region.

Regionally, the Coast—dominated by the Vancouver-Fraser Valley—accounted for 66% of employment, compared to 70% in 2012—a decline that was largely driven by lower employment numbers in the Vancouver-Fraser Valley (a 4 percentage point decrease from 2012). The Southern Interior accounted for 25%, up 4 percentage points from the last survey.[9] The employment shares for the remaining regions were within 1 percentage point of 2012 values.

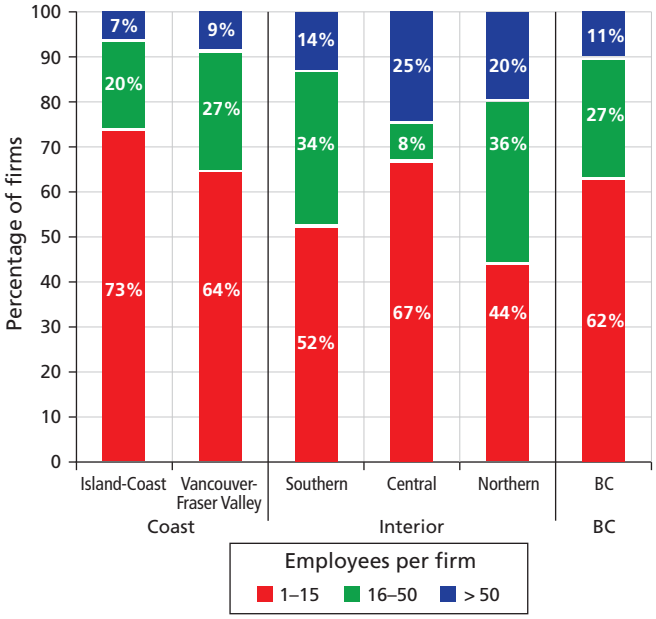

Figure 3. Geographical distribution of secondary manufacturers by size of firm.

As Figure 3 shows, the two regions with the greatest proportion of large firms were the Central (25%) and Northern Interior (20%).[10] The Coastal regions and the Central Interior had the greatest proportion of small firms.

Figure 4 illustrates the relative size of firms in each business type based on number of employees. With the exception of remanufacturing, small firms dominated—making up over 70% of firms in each of the furniture, millwork and cabinet categories and at least half of the firms in each of the remaining categories.

Remanufacturing (26%) and EWP (20%) had the greatest shares of large firms. Consequently, the average (median) number of employees were also highest for these two categories—38 (24) for remanufacturing and 33 (15) for EWP.[11]

3.2 Sales

The majority of respondents generated modest sales, with 32% of firms selling less than $1 million and only 5% with sales exceeding $24 million in 2016. Average sales revenue was $5.76 million. Median sales revenue was $2.35 million, with approximately 73% of firms earning $5 million or less. Figure 5 provides the revenue distribution across secondary wood manufacturers—the remanufacturing, EWP and other wood products business types accounted for 61% of 2016 sales.

8 In 2012, these values were 14 and 24, respectively. 2012 values have been revised to correct calculation errors.

9 These changes were not due to differences in regional boundaries.

10 In 2012, the two regions with the greatest share of large firms were the Southern Interior (19%, composed of Kamloops and Nelson) and the Northern region (17%). 2012 values were revised due to typographical errors.

11 If log homes and timber frames are excluded from EWP, the average number of employees and the median would be 40 and 20, respectively.

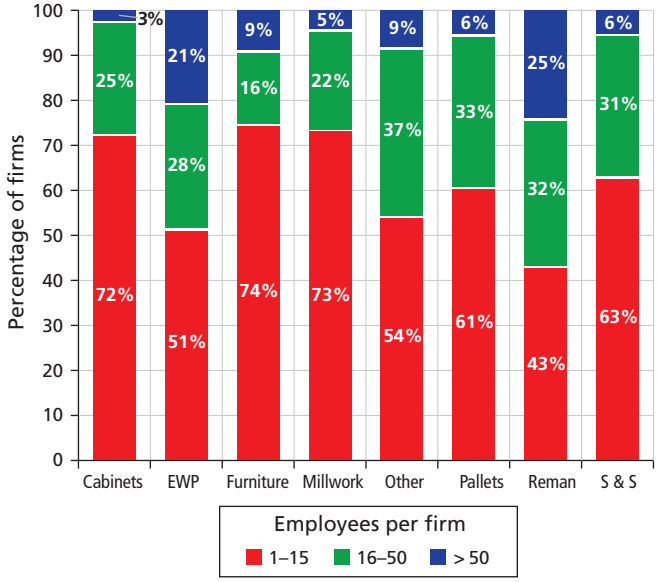

Figure 4. Distribution of secondary manufacturers by business type and size of firm.

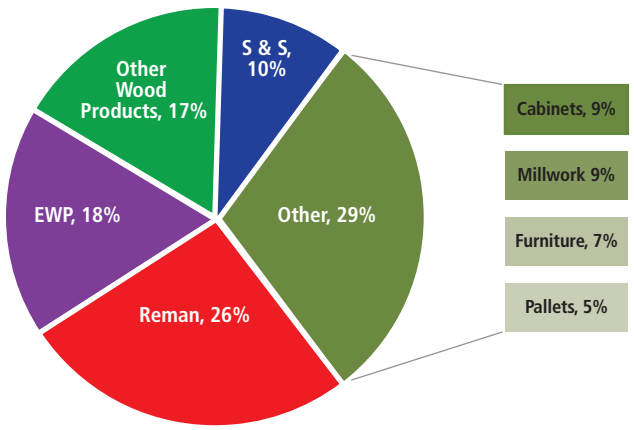

Figure 5. 2016 revenue distribution of secondary wood manufacturing respondents ($1 billion).

Figure 6 shows that smaller firms dominated the furniture, cabinets and millwork categories, each with median revenues of less than $1.5 million. Remanufacturing (30%), other wood products (22%) and EWP (20%) accounted for almost 75% of firms having $12 million or more in sales.

Respondents were asked to provide sales from 2015 as well as expected 2017 sales. Figure 7 shows the change in nominal sales by business type in relation to 2016.[12]

From 2015 to 2016, sales increased by 10% with 70% of respondents reporting an increase in revenue and 23% reporting a decrease. Although no business type experienced a decrease in sales, revenue fell for 42% of shake and shingle and 40% of furniture respondents over this period. The cabinets (+14%), EWP (+14%), and shakes and shingles (+13%) business types experienced the largest changes in total sales.

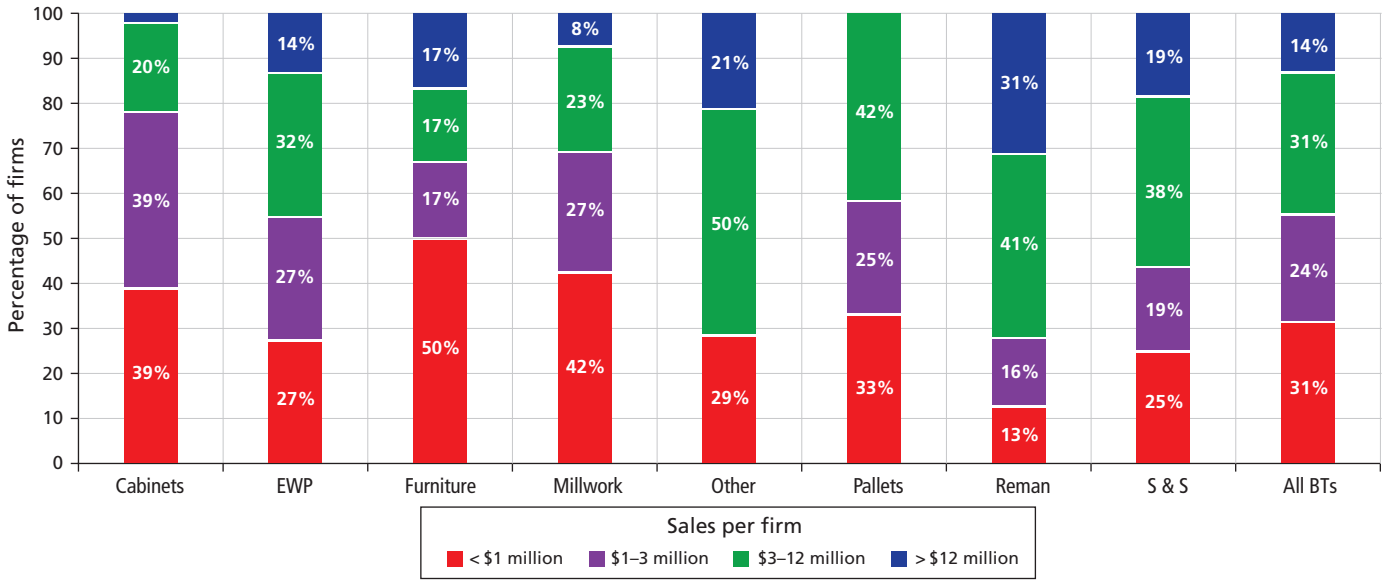

Figure 6. Distribution of respondents by revenue class and business type.

12 Constructed as the percentage change in total sales for each business type.

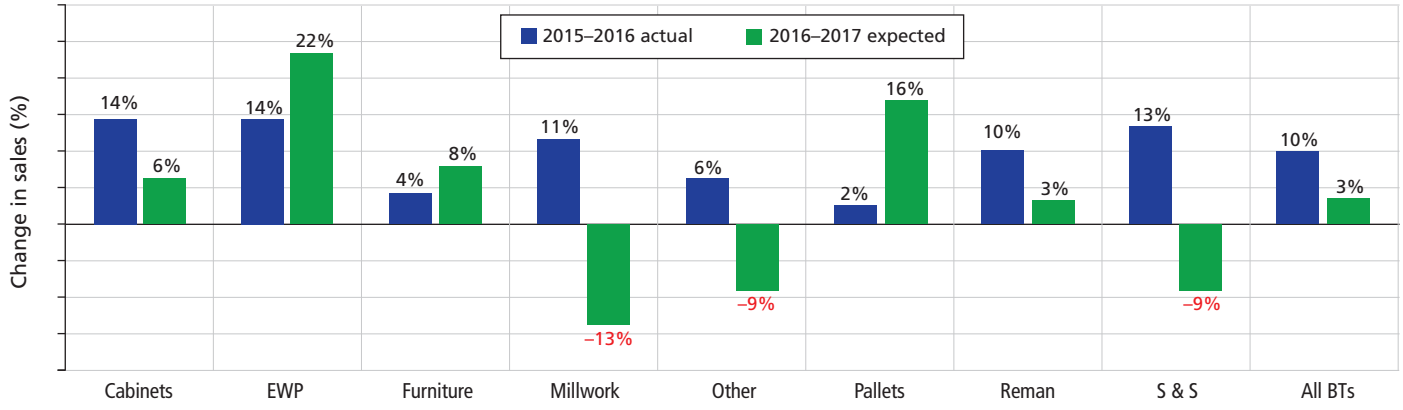

Figure 7. Percentage change in sales revenues.

For many business types, the outlook for 2017 was quite different than 2016. Overall, the expected change in total sales increased by 3%, with 59% of respondents expecting an increase in revenue and 32% anticipating a decrease. 67% of shakes and shingles, 62% of millwork, and 46% of other wood products firms expected a decrease in sales over this period. The EWP (+22%), pallets & containers (+16%), and millwork (–13%) categories expected the largest changes in total sales.

3.3 Products and Services

Reintroduced to the 2016 report are summaries of the end-use markets that secondary manufacturers produce products for and the services that they provide and purchase. Table 3 contains the percentage of respondents in each business type that manufacture for particular end-use markets.

The majority of respondents produced products for new residential buildings (76%) and remodelling (62%)—virtually all firms in the categories that serviced the building sector (cabinet, shakes and shingles, millwork, EWP and remanufacturing business types) targeted these markets, with a significant share producing for commercial buildings as well. The pallets & containers and other wood products categories primarily produced for industrial uses and had the fewest outlets for their products (Figure 8), with 91% and 86% of firms, respectively, targeting just a single market. Cabinet manufacturers had the most diverse end-use markets, with over 50% of respondents serving at least four markets. When aggregated across business types, the majority of respondents focused on one or two end-use markets.

Respondents were asked whether they bought or sold custom services, and about the types of services acquired or provided. Custom services were classified as manufacturing (e.g., resawing, planning, kiln drying, etc.) or non-manufacturing (e.g., logistics, distribution, and marketing). Table 4 and Figure 9 summarize these results.

Table 3. Percentage of respondents that produce products for select end-use markets

	New residential	Remodeling	Commercial buildings	Multi-unit housing	Industrial uses	Industrial buildings	Other
Cabinets	90	87	64	59	10	26	8
EWP	90	24	57	29	14	10	5
Furniture	67	42	50	17	25	17	8
Millwork	85	85	50	31	12	27	–
Other	14	21	7	7	71	14	7
Pallets	9	–	9	–	82	9	18
Reman	90	76	38	41	45	41	–
S & S	100	85	31	46	15	8	–
All BTs	76	62	44	35	28	22	5

Table 4. Percentage of respondents buying or selling custom services in 2016

Region	Purchase custom services (%)	Sell custom services (%)	Sell manufacturing services[a] (%)	Plan to expand services (%)
Coast	50	45	93	5
Interior	51	50	95	16
BC	50	47	93	9

Notes: Values are percentage of respondents unless otherwise noted.
a Percentage of custom service providers that sell manufacturing services.

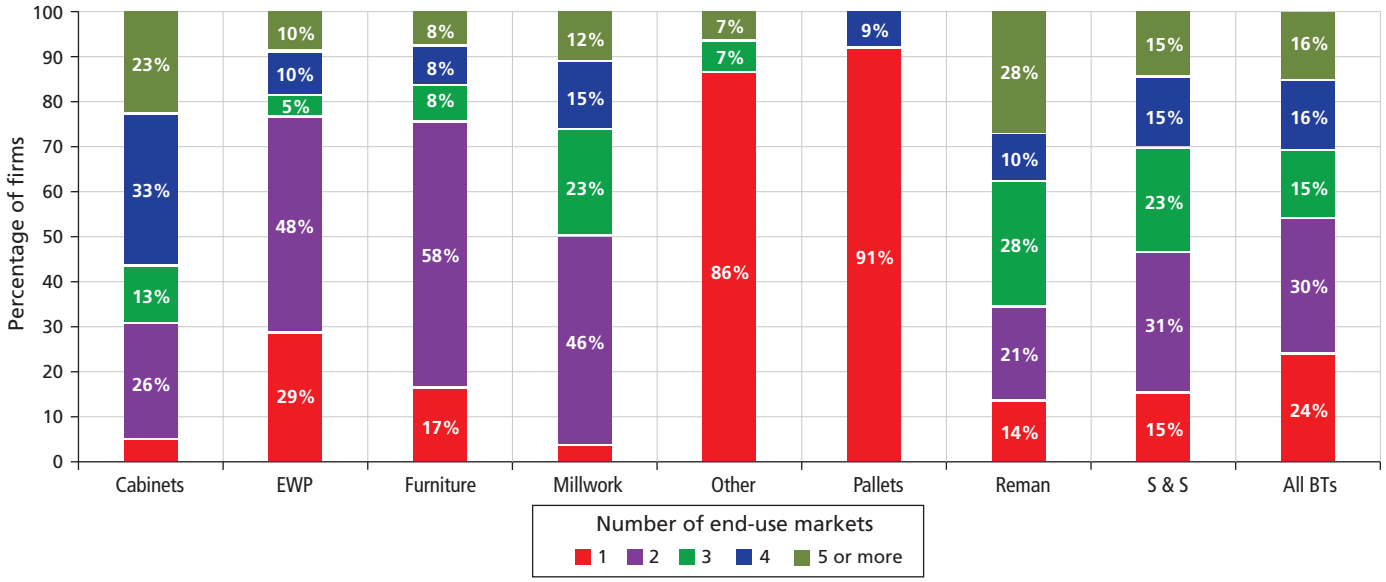

Figure 8. Number of targeted end-use markets by business type.

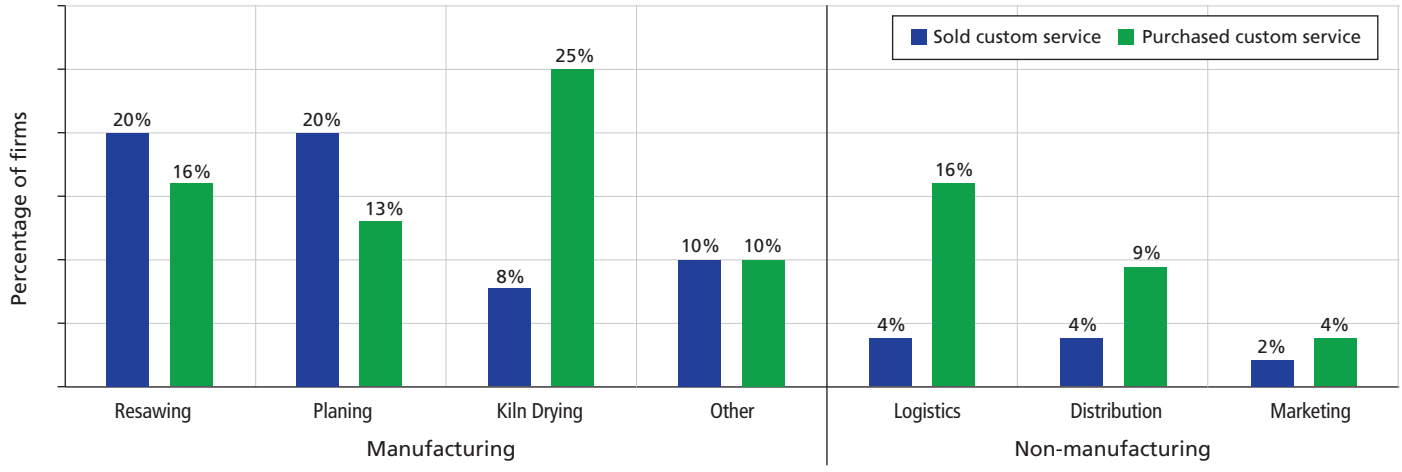

Figure 9. Percentage of respondents selling or purchasing custom services in 2016.

47% of respondents provided custom services and 50% purchased these services from other businesses.[13] Of the businesses that sold custom services, 82% provided manufacturing services only, 7% provided non-manufacturing services only, and 12% provided both.[14] As shown in Figure 9, resawing and planing were the main services sold, each offered by 20% of respondents. Kiln drying (25% of respondents) was the main service purchased, followed by resawing (16%) and logistics (16%). Of the businesses that offered custom services, 80% provided no more than two services (Figure 10). The remanufacturing and EWP business types offered the greatest variety, with 40% of firms providing three or more services. The top two services sold by remanufacturers were kiln drying and logistics. Kiln drying and resawing were the services most frequently sold by EWP producers.

9% of respondents planned to expand into new business services. These were primarily remanufacturing and pallet & container firms in the Interior that intended to add kiln drying and planing services.

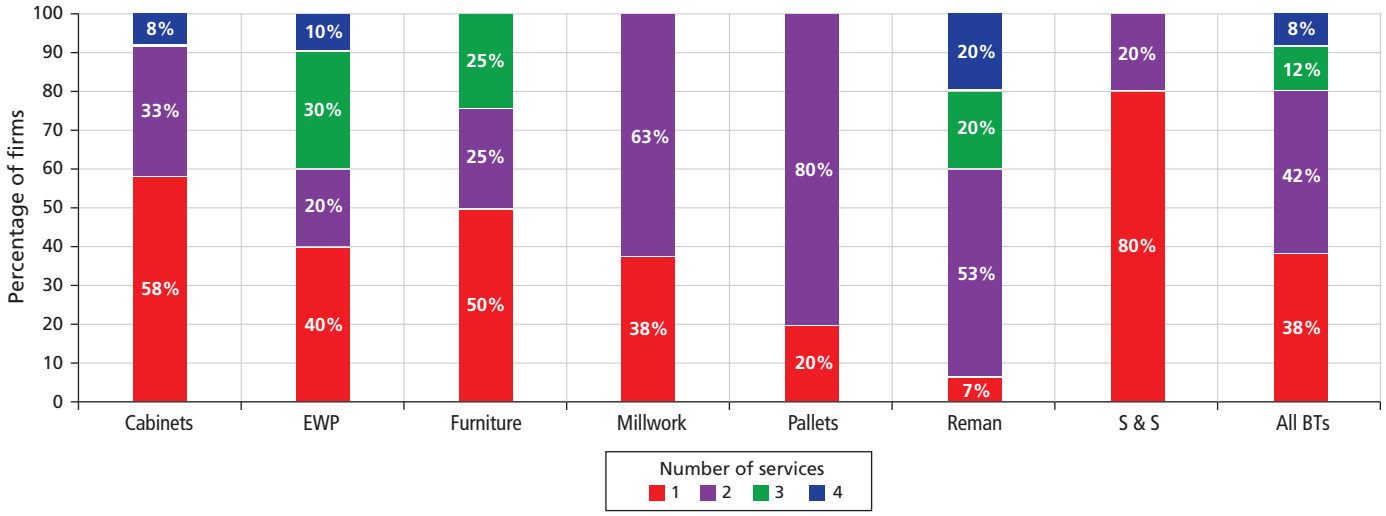

Figure 10. Number of services offered by business type.

3.4 Markets

British Columbia was the most important market for 68% of respondents, compared to 61% in 2012, and the sole market for 37%, up from 25%. Following past surveys, "most important market" was defined as the market where at least 50% of revenue was earned.[15] Figure 11 shows that 96% of firms sold some of their product within BC—a similar percentage as in 2012, while 43% sold to other Canadian markets, down 11 percentage points from 2012.

Compared to 2012, a smaller proportion of firms participated in US markets—47% exported to the US, down from 52% in 2012. For 13% of respondents, the US was the most important market, compared to 16% in 2012. The proportion of firms that exported to Japan is largely unchanged. Exporters to Europe and regions in the "Other" category increased by 8 and 4 percentage points, respectively, while exporters to other regions in Asia decreased by 5 percentage points compared to 2012.

The distribution of revenue from Canadian and US markets is quite different from 2012. Figure 12 shows that just under half of 2016 sales were generated in domestic markets, with 34% of revenue earned from BC and 15% from sales in the rest of Canada. In 2012, 48% of revenue was earned in BC while 12% was earned from other Canadian markets.[16] The key factor in this difference was activity in the EWP category. In 2012, 41% of BC sales revenue was attributed to the EWP sub-sector, which declined to 17% in 2016.

While the share of offshore exports remained at 20%, the share of revenue generated in US markets increased from 20% in 2012 to 31% in 2016 (Figure 13). Activity in the remanufacturing and EWP categories largely accounted for this difference. In 2016, 43% of remanufacturing revenue was earned in US markets, up from 28% in 2012.[17] For EWP, this share was 26%, a 15 percentage point increase.

13 26% of respondents engaged in both the sale and purchase of custom services.

14 Does not sum to 100% due to rounding.

15 If we define "most important market" as the market where the most revenue was earned, BC was the most important market for 71% of respondents in 2016 and 67% of respondents in 2012.

16 In 2006, the distribution was 32% BC, 31% US and 16% Rest of Canada.

17 Experts have commented that many independent lumber remanufacturers sell their products to wholesalers/aggregators who then distribute to markets in the United States and overseas. We acknowledge this may be the case. We therefore caution readers that the estimates provided here on market sales for lumber remanufacturers may not accurately capture the total value of sales to the United States nor the distribution of sales across markets. In future surveys this potential issue will be explored further.

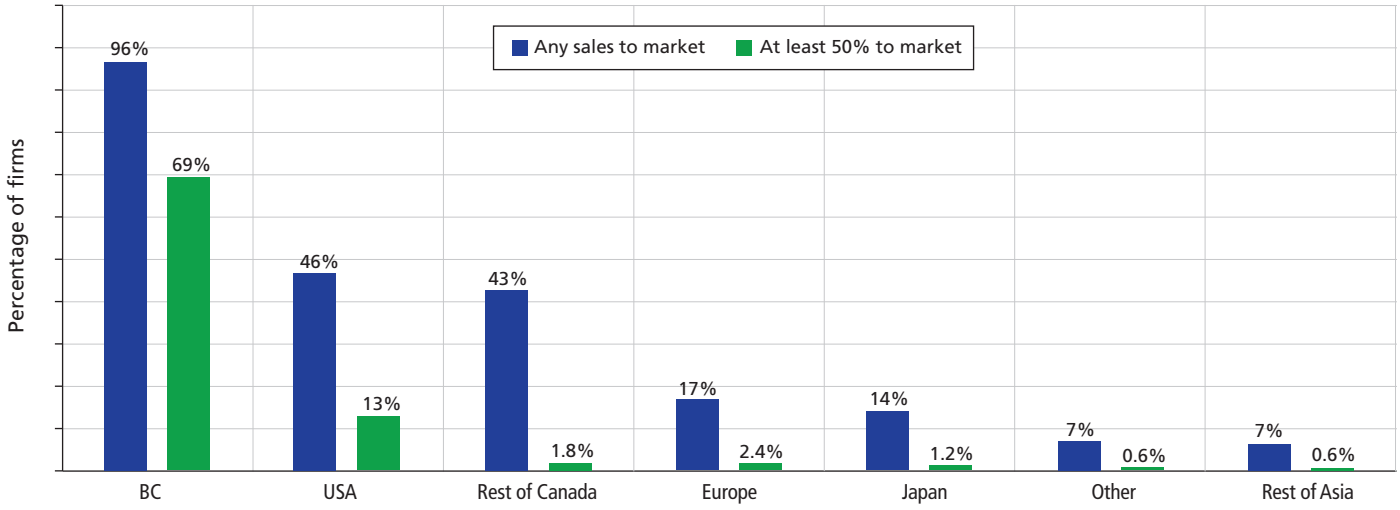

Figure 11. Percentage of firms reporting sales to various markets in 2016.

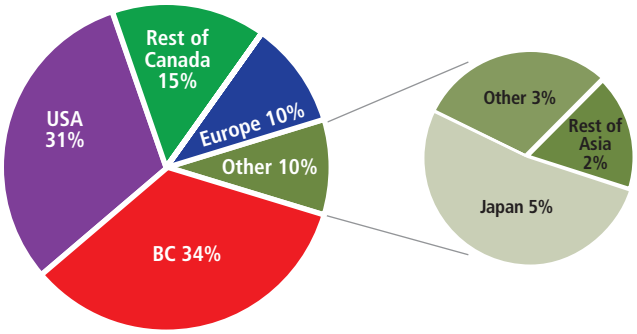

Figure 12. Distribution of sales revenue by market in 2016.

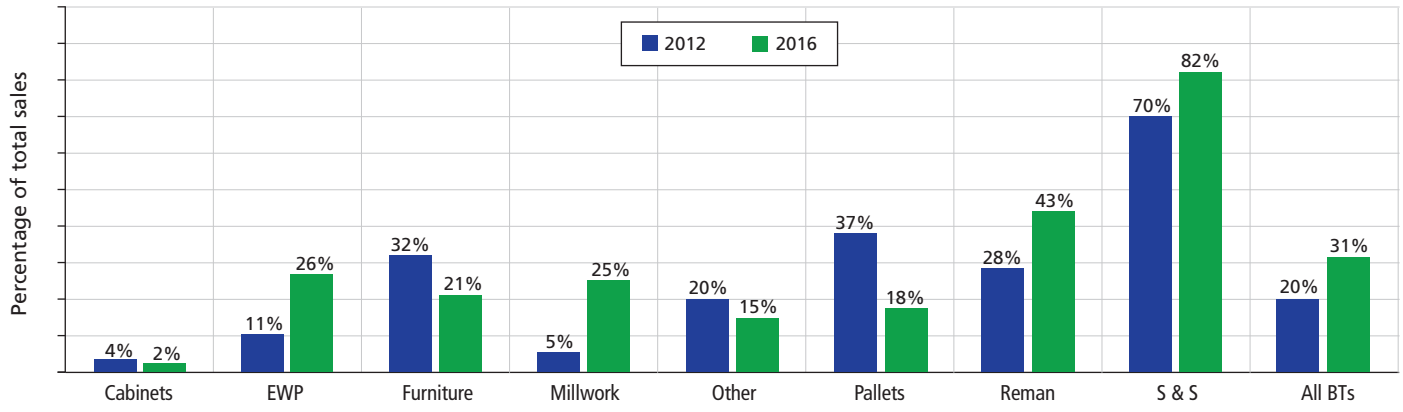

Figure 13. Share of sales revenue from US markets, 2012 vs 2016.

For the remaining markets, there was a noticeable decline in exports to Japan—the share of remanufacturing and EWP revenue earned in this market fell dramatically (falling from 16% and 13% in 2012 to 2% and 1% in 2016, respectively), but was somewhat offset by an increase in exports from pellet producers in the other wood products category.[18]

Figure 14 provides more detail on the share of revenue earned by each business type in various markets. The market mix varies considerably across business types. The shakes and shingles and other wood products categories relied heavily on export markets, each earning over 85% of their revenue abroad, whereas the cabinets and pallets and containers categories each made over 80% of their revenue domestically. Remanufacturing and EWP firms also earned a significant share of revenue in overseas markets while furniture and millwork firms were more reliant on domestic markets.

Respondents were asked whether they intended to expand into new market regions and to indicate the regions of interest. 33% of respondents planned to expand sales to new market regions—the EWP (with 45% of respondents) and remanufacturing (with 39% of respondents) business types were the most interested in expansion while furniture (with 17%) and shakes and shingles (with 27%) were the least. Figure 15 illustrates the appeal of new market regions for each business type. Of the respondents that planned expansion, 54% were interested in expanding into other provinces and 52% were interested in expanding into the US. 43% of respondents wished to increase their market presence within British Columbia. As for overseas markets, 22% were interested in Asia and 29% were looking to bring products to Australia, Europe and regions not elsewhere specified.

Of the respondents who planned expansion, 41% wished to expand into a single new market while 9% aimed at four or more (Figure 16). The millwork and shakes and shingles categories had the broadest interests, with 60% and 50% of respondents considering three or more markets, respectively. For each of the cabinets and furniture, pallets, remanufacturing, and other wood products categories, at least 80% of respondents were considering only one or two new markets.

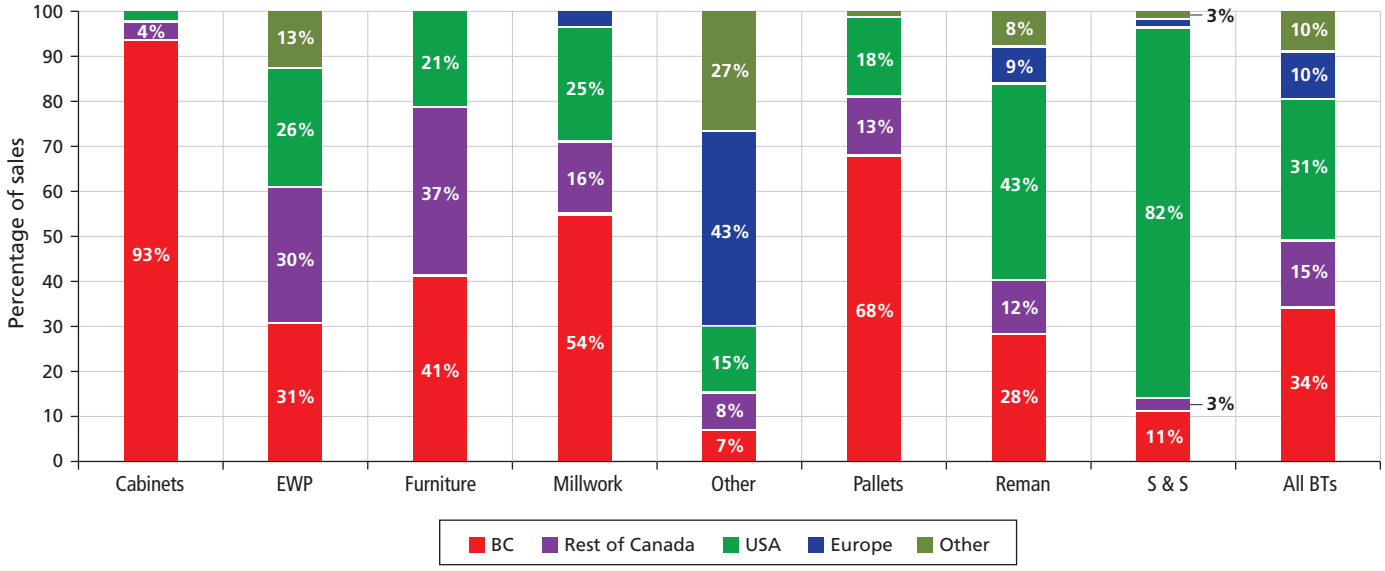

Figure 14. Distribution of 2016 sales by market and business type.

18 The decline in exports to Japan is due to two significant exporters who completed the 2012 survey but did not participate in 2016.

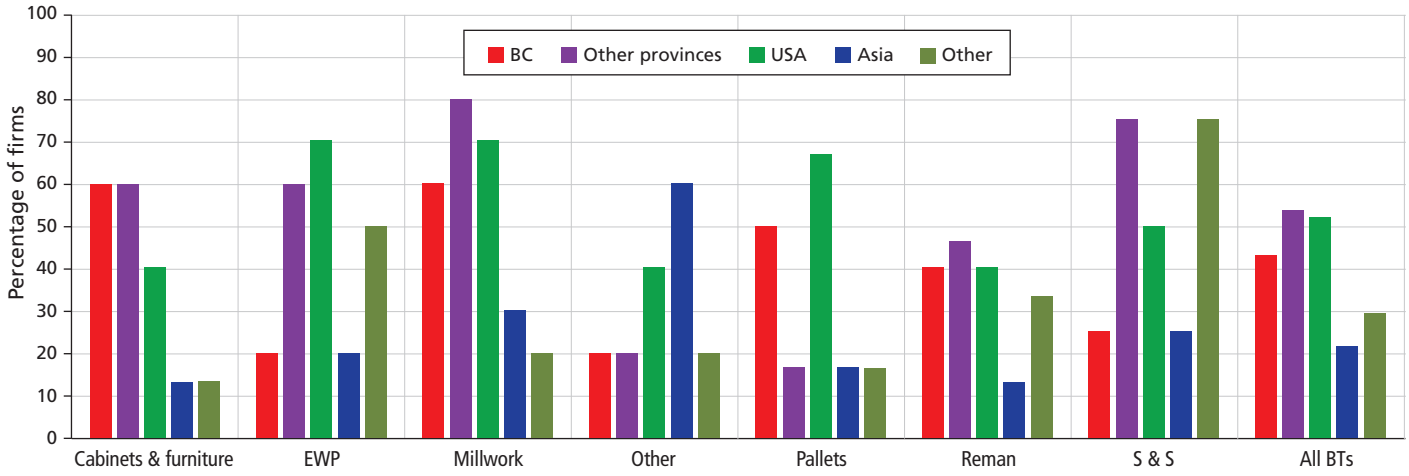

Figure 15. New market regions of interest for firms that planned expansion.

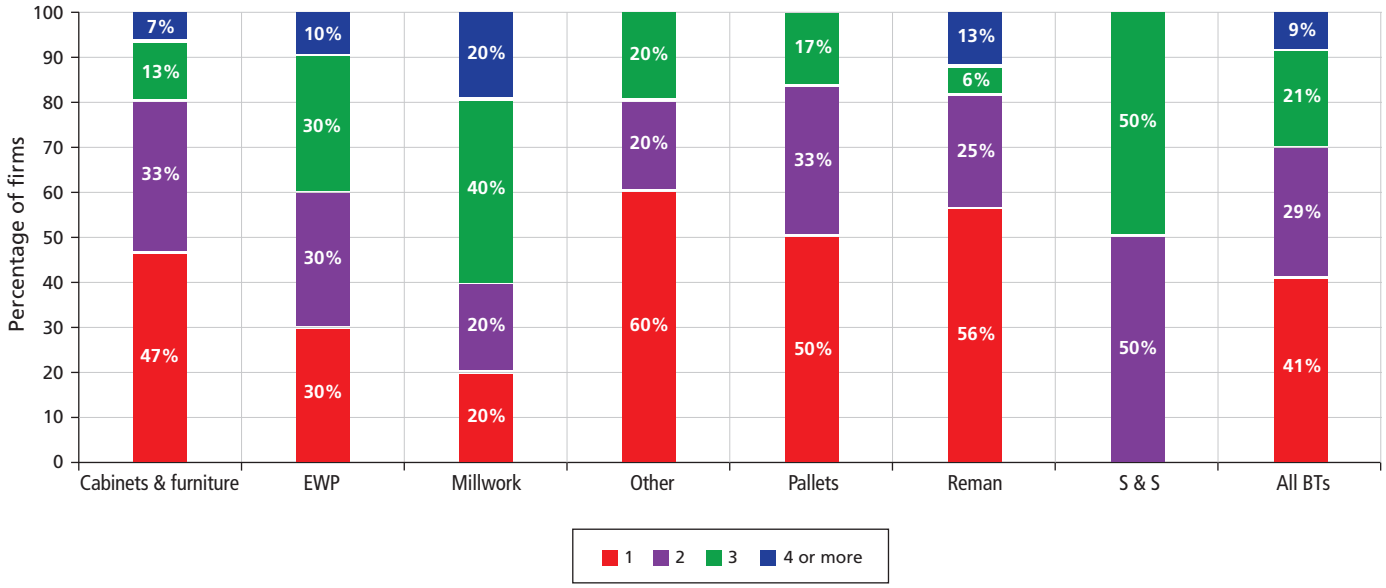

Figure 16. Number of new market regions of interest for firms that planned expansion.

3.5 Operating Costs

Respondents were asked to provide the proportion of their operating costs attributable to wood, labour, interest payments, depreciation, and other production costs. Figure 17 shows the operating cost mix by business type for 2016, calculated as a simple average for each business types.[19] Across all business types, wood purchases was the largest cost component at 42% of operating costs, up from 35% in 2012, and labour followed closely at 37%, up from 34%. The "other" category is quite varied, but the larger components can be classified as operating and maintenance, non-wood supplies and transportation costs.

The importance of the different inputs into overall operating costs varied widely across business types. Wood costs went from a high of 59% for shake and shingle firms to a low of 31% for furniture firms. Labour costs ranged from 25 to 46%, making up the largest share of operating costs for furniture firms and the lowest for shakes and shingles.

19 Following past surveys, we calculated the simple average. As the survey questionnaire did not elicit information on total costs or profit, we were not able to construct an adequate weighted average. However, if we assumed no profits and constructed a weighted average based on 2016 sales revenue, then wood costs would still make up the largest component at 47%, followed by labour at 27%, other costs at 19%, and interest and depreciation at 7%.

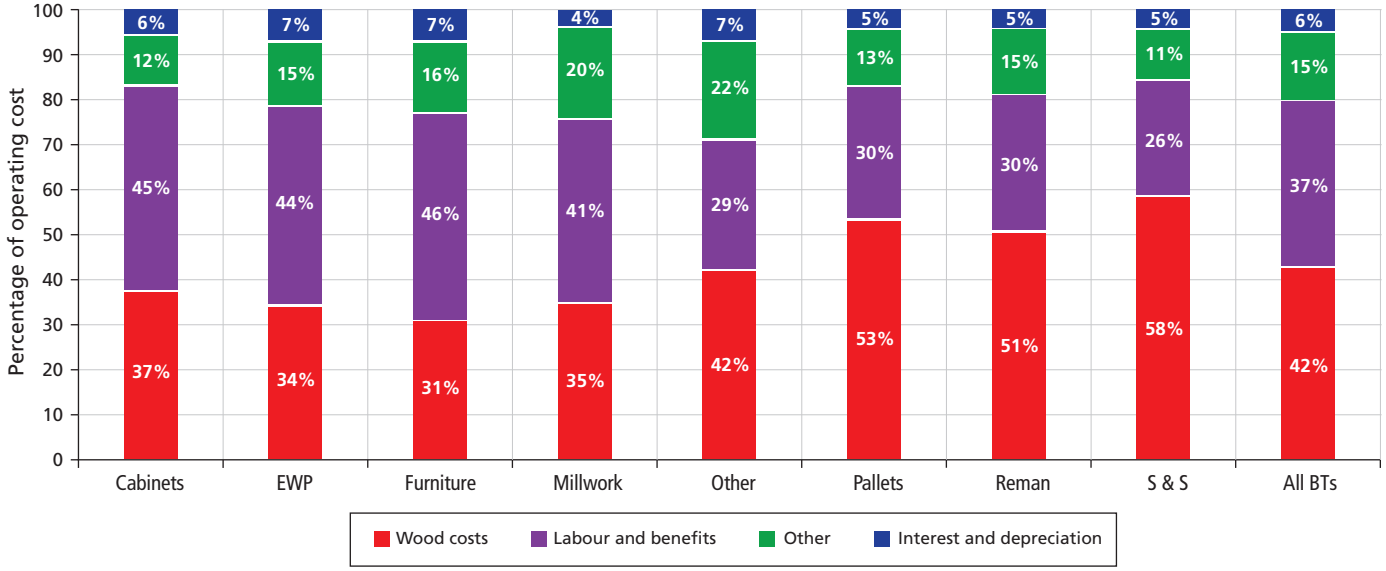

Figure 17. Operating cost mix by business type.

3.6 Raw Material Use

Firms were asked to estimate their total wood fibre use in 2016 by species and form (e.g., lumber, logs, panels, etc.); responses were then converted to roundwood equivalent cubic metres to facilitate comparisons. [20] In 2016, respondents used 5.0 million m^3 of fibre, compared 5.7 million m^3 in 2012. The main input materials were lumber (43%), wood residue (35%) and logs (12%).[21]

Figure 18 shows that Douglas-fir and Western red cedar (WRC) were used most frequently by respondents, with 57% using some Douglas-fir and 49% using some WRC. Additionally, 35% of respondents indicated use of some type of hardwood.[22] WRC was the primary species for 28% of firms, similar to 29% in 2012.[23] Douglas-fir was the primary species for 18% of firms, again similar to 19% in 2012. Hardwoods were the primary input for 24% of firms, up from 17% in 2012.

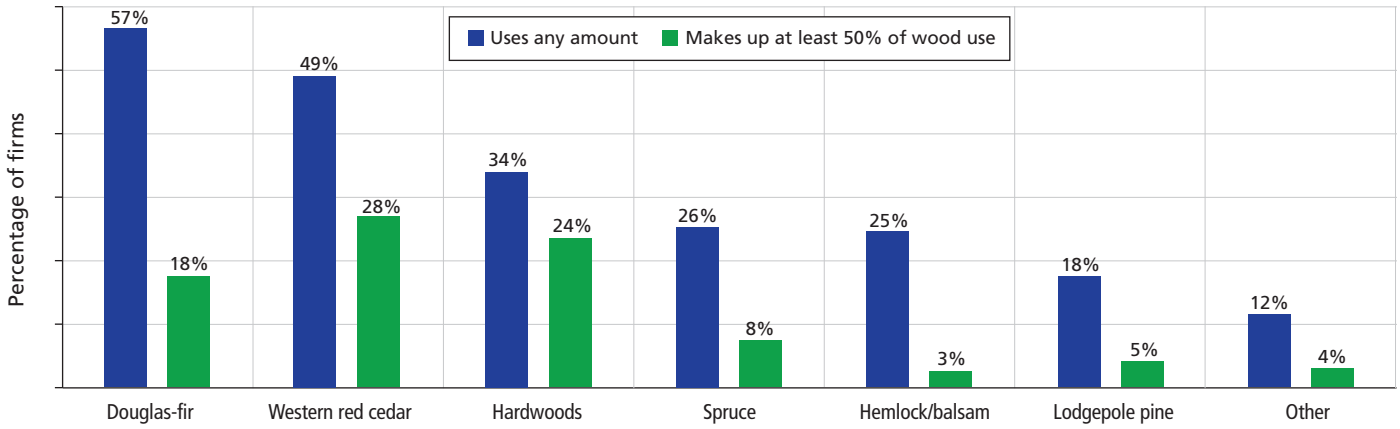

Figure 18. Percentage of secondary manufacturers reporting species of wood used in 2016.

20 Conversion factors were based on Nielson, Dobie, & Wright (1985).

21 In 2012, these values were 54%, 24% and 16% for lumber, wood residue and logs, respectively.

22 In 2012, cedar (57%) was used the most frequently, followed by Douglas-fir (46%) and some type of hardwood (27%). The 2012 value for hardwood has been revised. The 2016 survey questionnaire listed WRC as a species; however, past survey questionnaires listed cedar rather than WRC. Nevertheless, the values are still comparable as the use of other cedar species is uncommon (less than 0.1% of cumulative RWE volume for 2016).

23 Following past surveys, "primary species" is defined as the species that made up at least 50% of wood use. If we take the primary species to be the one where the largest volume was used, then WRC was the primary species for 28% of firms in 2016 and 32% of firms in 2012.

In terms of cumulative RWE volumes, Douglas-fir accounted for the largest share at 26%, followed by lodgepole pine at 25%, WRC at 19.5%, and spruce at 19% (Figure 19). This distribution was quite different from the past two surveys where spruce-pine-fir (SPF) accounted for 31% in 2012 and 29% in 2006, followed by cedar (WRC and yellow cedar) at 20% and 28% for 2012 and 2006, respectively. In 2012, the primary users of SPF were wood pellet producers (these respondents elected to write SPF as a response as it was not listed as a species in past questionnaires). For the 2016 survey, these producers reported lodgepole pine and spruce rather than SPF; we are uncertain of the reasons behind this change in classification. The increase in Douglas-fir's share was largely due to activity in the remanufacturing and other wood products subsectors, which consumed 40% and 38% of cumulative RWE volume, respectively. In 2012, Douglas-fir represented 7% of the species mix for remanufacturers, but this share jumped to 24% in 2016 (Table 5).[24] In 2016, Douglas-fir accounted for 17% of the species mix used by other wood product producers, up from 4% in 2012.[25]

Table 5 provides species use across business types, calculated by dividing each business type's RWE volume use for each species by RWE volume use by business type. Western red and yellow cedar were the sole feedstock for shake and shingle manufacturers, who consumed 4% of cumulative RWE volume. Cabinet manufacturers predominantly used a mix of hardwoods (86%), but their fibre consumption was the lowest among the business types. The species mix for the EWP category was quite different from 2012—there was a large shift away from lodgepole pine and spruce towards Douglas-fir (69%), which only occupied 29% of the mix in 2012. The remaining business types had more variety in their species mix. Lodgepole pine (56%) was an important input for the other wood products category, driven largely by pellet producers. Compared to 2012, hardwoods occupied a much lower share of the species mix for furniture and millwork. For furniture, the shift was towards lodgepole pine and spruce, whereas it was towards hemlock/balsam for millwork.

Table 5. Species mix by business type (%)

	Douglas-fir	Lodgepole pine	Western red cedar	Spruce	Hemlock/ balsam	Other SW species	Hardwoods
Cabinets	9	2	1	0	0	1	86
EWP	69	1	11	14	3	2	0
Furniture	8	25	0	22	34	0	11
Millwork	29	10	13	0	32	0	14
Other	17	56	2	18	3	3	1
Pallets	30	22	0	32	11	4	0
Reman	24	6	34	22	13	2	0
S & S	0	0	98	0	0	2	0
All BTs	26	25	20	19	8	2	1

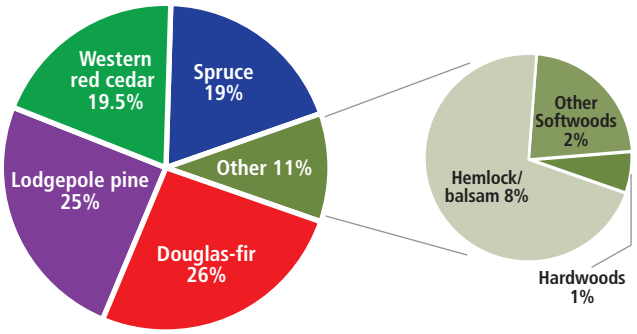

Figure 19. Roundwood equivalent volume used by species for survey respondents.

By volume, the largest consumers of fibre in 2016 were remanufacturing (40%), other wood products (38%) and EWP (12%). The 2012 values are 52%, 27% and 14%, respectively.

Secondary wood manufacturers in British Columbia have been very consistent with sourcing fibre locally over the years, with imports from outside of BC accounting for only 5% of fibre purchases (Figure 20).[26] BC market purchases (89%) were the main source of fibre, while supply from provincial tenures and BC Timber Sales represented 5% and 1%, respectively. On the Coast, 97% of fibre was sourced from the BC market. Compared to the Coast, firms in the Interior acquired a much larger share of their supply from provincial tenures (7% vs 0.4%), but the majority was obtained through the BC market (85%). BC Timber Sales and imports from outside Canada each accounted for 7% of the supply for the Interior.

24 In 2012, remanufacturing consumed 52% of cumulative RWE volume.

25 In 2012, other wood product manufacturing consumed 27% of RWE volume.

26 In 2012, this value was 6%, split almost equally between international and interprovincial imports.

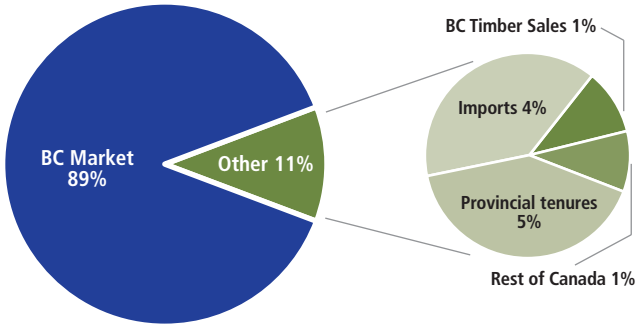

Figure 20. Sources of fibre supply.

3.7 Capacity Utilization and Expansion Plans

Table 6 shows that respondents operated at an average capacity utilization level of 76% in 2016, a 10 percentage point increase over 2012 and a 3 percentage point increase over 2006, with average utilization higher on the Coast (79%) than the Interior (70%). Firms operating two or more shifts (21% of respondents) had higher average utilization (82%) with little difference between the Coast and the Interior; however, firms operating a single shift had lower average utilization in the Interior (65%) than the Coast (78%).

Table 6. Average capacity utilization (%)

Region	1 shift	2 or more	All
Coast	78	82	79
Interior	65	81	70
BC	74	82	76

33% of respondents planned to increase capacity over the 2017–2019 period, with Coastal firms less optimistic about future expansion (Table 7); this value was markedly lower than the past two surveys where 55% and 56% of respondents planned to expand in the three-year period following 2012 and 2006, respectively. Additionally, the average level of planned expansion declined, driven largely by Coastal firms. The average for the Interior remained stable across the 2006, 2012 and 2016 surveys.

Table 7. Expansion plans

Region	Planning expansion (%)	Average level of expansion (%)
Coast	30	26
Interior	39	61
BC	33	40

Survey respondents were asked to rank a predefined list of constraints to capacity expansion, using a five-point scale (where "1" equalled "not at all constraining" and "5" equalled "extremely constraining"). Figure 21 shows the distribution of responses and Table 8 provides the mean score for each constraint. One-tailed *t*-tests were used to test whether the mean score of a particular constraint was lower (i.e., less constraining) than that of the constraint ranked immediately higher.[27]

Table 8. General constraints to expansion: mean constraint scores

General constraint	Coast	Interior	BC
Labour	**3.7**	3.0**	**3.4**
Wood supply	2.9	**3.5**	3.1**
Markets	3.0***	2.4***	2.8**
Finance	2.5**	2.2	2.4***
Management capacity	2.3	1.9	2.2**
Transportation/distribution	1.8***	2.2	1.9**

The highest mean score is in **bold**. A one-tailed *t*-test, using Welch's approximation, was used to compare each factor to the one ranked immediately higher.

** means are statistically different at the 5% level.

*** means are statistically different at the 1% level.

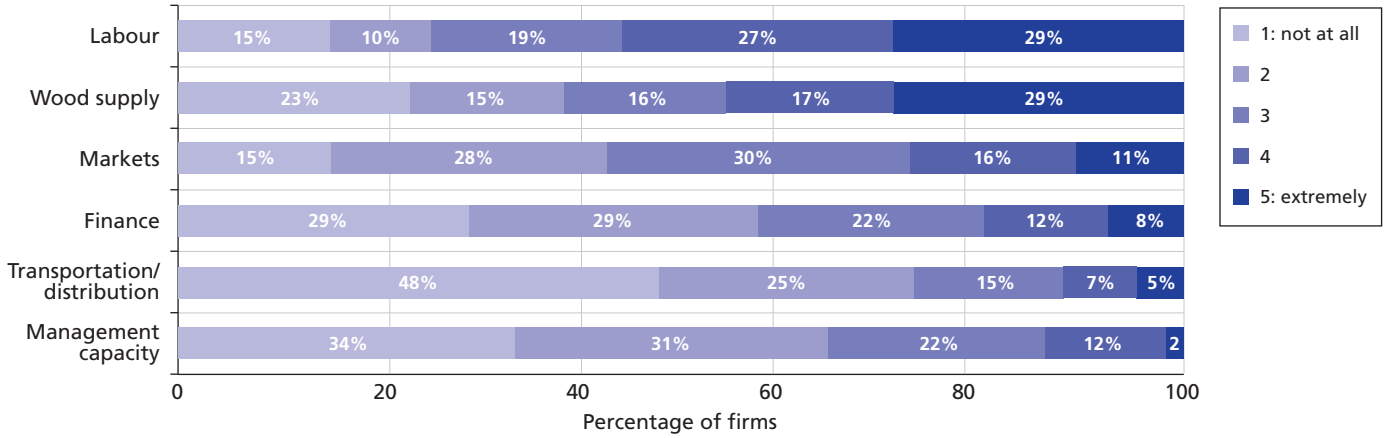

Figure 21. General constraints to expansion: distribution of rankings.

27 For the 2012 survey, the average level of planned expansion was 45%, with an average of 36% for the Coast and 59% for the Interior. The corresponding averages for the 2006 survey were 55% (BC), 50% (Coast) and 60% (Interior).

Over previous surveys, the most important constraints to capacity expansion have regularly been Markets, Labour and Wood supply, although the rank order changed over time. In 2016, Labour was the most important constraint, followed by Wood supply and Markets. These rankings are similar to 2006 survey results, although in 2012 Markets was the most important constraint, followed by Labour and Wood supply.

On the Coast, the greatest constraint was Labour, but firms operating in the Interior had more difficulty with Wood supply. With the exception of Finance, the regional means are statistically different at the 5% level or better.[28]

Within each constraint category, respondents were asked to rate a more detailed set of constraints to expansion using the method described previously. Table 9 presents the results. One-way ANOVA was first used to compare means within each constraint category. If we did not reject the null hypothesis and the equal variance assumption was not violated, then we concluded that the detailed constraints within a category were not statistically different. For example, at the 5% significance level, the specific wood supply constraints were all moderately constraining for BC respondents, but no single constraint was more important, statistically speaking, than the others in this category. If we concluded that at least one constraint was statistically different from the others, then one-tailed *t*-tests were used in the manner described for the general constraints.

Wood supply

When considering all responses, Price was the top wood supply constraint and its rank was statistically higher than the second most constraining factor, Volume, at the 10% significance level. For firms operating on the Coast, Price was the most constraining, followed by Quality/Grade (close to 50% of respondents ranked price as 4 or 5). In the Interior, Volume was the most constraining (close to 60% ranked Volume as 4 or 5), but its rank was not statistically different from price. Comparing the regional means for each constraint, Volume was statistically different at the 1% level; there were no statistical difference between the Coast and the Interior for the other constraints.

Labour

Lack of experience and training/skills were the most constraining labour specific impediments to expansion (60% ranked experience and 48% ranked Training/Skills as 4 or 5). Cost was more constraining on the Coast than the Interior (statistically different at the 5% level), but for the remaining constraints, there were no statistically significant regional differences.

Markets

The 2006 Softwood Lumber Agreement (which expired on October 2015) was the most important market specific constraint, and was statistically different from the remaining

28 Based on two-tailed *t*-tests using Welch's approximation. The regional means for Labour, Wood supply and Markets were statistically different at the 1% level.

Table 9. Detailed constraints to expansion

Detailed constraint	Coast	Interior	BC
Wood supply			
Price	**3.3**	3.2	**3.3**
Volume	2.8	**3.5**	3.0
Quality/grade	3.0**	2.9	2.9
Price volatility	3.0	2.8	2.9
Labour			
Experience	**3.7**	**3.3**	**3.5**
Training/skills	3.5	3.1	3.3
Cost	3.1**	2.6**	3.0***
Flexibility	2.7**	2.4	2.6**
Markets			
Softwood Lumber Agreement	**2.6**	**2.8**	**2.7**
Market diversification	2.3	2.1	2.2***
Product diversification	2.0	2.1	2.1
Market/product research	2.0	2.0	2.0
Foreign regulations	1.7**	2.2***	1.9
Finance			
Cost	**2.5**	2.2	**2.4**
Availability	2.3	**2.2**	2.3
Flexibility	2.3	2.2	2.3
Repayment schedule length	2.1	1.9	2.0**
Manufacturing advice for:			
Increasing labour efficiency	**3.0**	**2.9**	**3.0**
Reducing manufacturing costs	2.8	2.9	2.9
Improving raw material recovery	2.4***	2.5**	2.4***
Implementing lean manufacturing technology	2.4	2.2	2.3
Improving product quality	2.3	2.1	2.2
Transportation			
Costs	**2.4**	**2.8**	**2.5**
Logistics	2.0**	2.5	2.2***
Access	2.0	2.4	2.2
Frequency	2.0	2.3	2.1

1 = not at all constraining and 5 = extremely constraining.

One-way ANOVA was used to compare means within a constraint category. If the null hypothesis was rejected at the 10% level or if the equal variance assumption was violated, a one-tailed *t*-test, using Welch's approximation, was used to compare each factor to the one ranked immediately higher.

** significantly different at the 5% level.

*** significantly different at the 1% level.

limitations; however, the majority of respondents ranked the constraints in this category as 2 or lower. There were no statistically significant regional differences.

Finance and Manufacturing Advice

The majority of respondents ranked constraints in the Finance category as 2 or lower. Repayment schedule length was less of a hindrance to expansion than the other constraints, but neither the Coast nor the Interior were particularly restricted by these factors. Respondents found that the lack of means to increase labour efficiency and reduce manufacturing costs were the greatest management specific constraints.

Transportation

Cost was the most important transportation specific constraint and was statistically different from the remaining factors; however, the majority of respondents ranked the constraints in this category as 2 or lower. Cost, Logistics and Access were more limiting for the Interior than the Coast (statistically different at the 5% level).

Figure 22 presents the general constraints to expansion by business type. Wood supply adequacy was very constraining (mean score of 4 or higher) for the shakes and shingles and remanufacturing business types, whereas cabinet manufacturers regarded this factor as mildly limiting (mean score of 2 or lower). Labour was also very restricting for shakes and shingles manufacturers; the other business types identified labour as a moderate constraint. In 2012, market issues emerged as the top constraint for all business types except for remanufacturing and shakes and shingles manufacturers.[29] In 2016, this constraint was surpassed by labour or wood supply.

Furniture and shakes and shingles manufacturers on the Coast regarded labour issues as more constraining than their counterparts in the Interior.[30] As for wood supply issues, pallet manufacturers in the Interior reported being more constrained by wood supply than their Coast counterparts. Market issues were regarded as more constraining for EWP firms on the Coast, and remanufacturers in the Interior found transportation issues to be more constraining than their counterparts on the Coast.

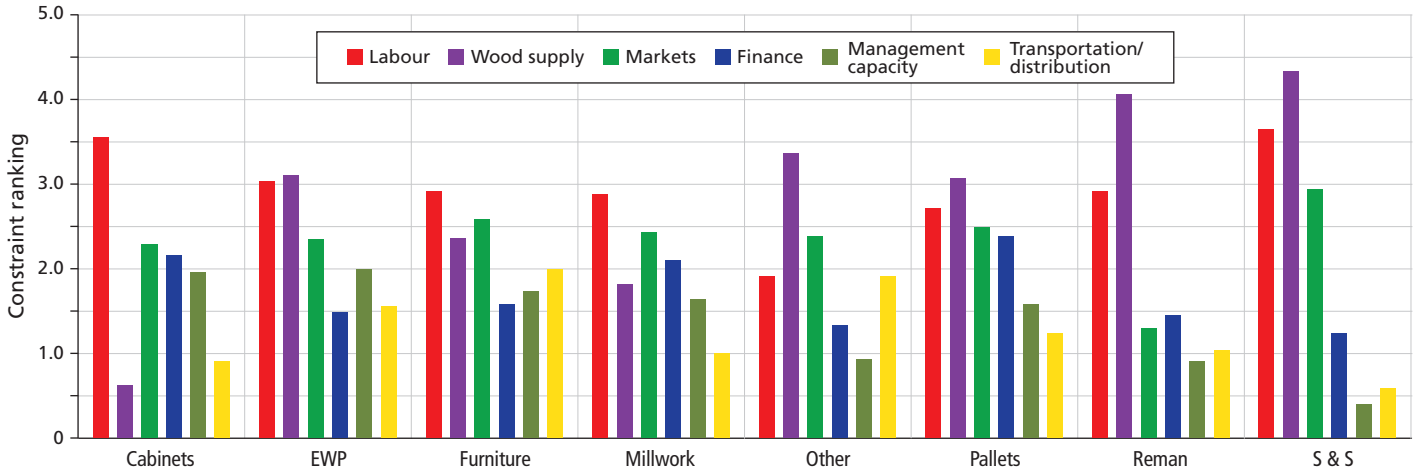

Figure 22. General constraints to expansion by business type.

3.8 Electronic Commerce

The survey contains four questions related to electronic commerce. Respondents were asked whether their firm: (1) had a website; (2) sold products over the Internet; (3) searched for or purchased, inputs over the Internet; and (4) searched the Internet for manufacturing advice. Respondents were also asked whether their firm uses social media; this question was introduced in 2012 survey. Figure 23 summarizes the responses to these questions.

Overall, 82% of responding firms hosted a website in 2016, compared to 84% in 2012 and 75% in 2006. 22% of firms sold products online and 52% purchased inputs online, down 4 and 7 percentage points, respectively, from 2012. 68% of respondents searched for manufacturing advice online, up from 60% in 2012 and 50% in 2006. Social media use in 2016 was similar to 2012, with 40% of respondents using some form of social media. Facebook was by far the most popular, used by 88% of firms with a social media presence, followed by LinkedIn at 37%.

29 In 2012, wood supply was the top constraint for remanufacturing and shakes and shingles.

30 Statistical difference at the 5% level or better for all regional comparisons in this paragraph.

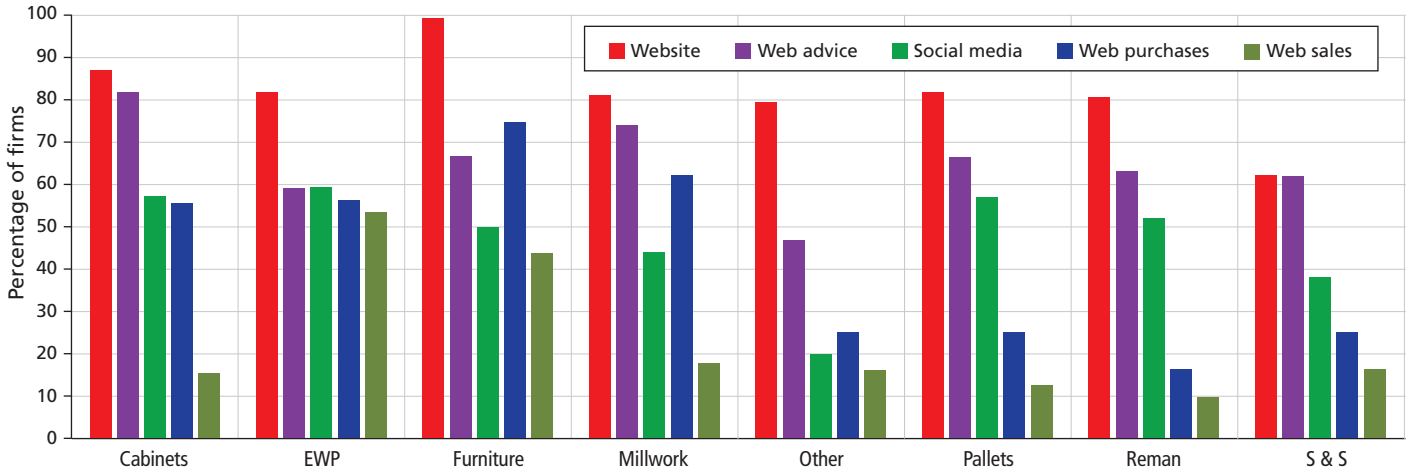

Figure 23. Internet use by secondary manufacturing firms in 2016.

4. Secondary Manufacturing Trends, 1990 – 2016

Since 1990 the Canadian Forest Service has conducted periodic surveys of secondary wood product manufacturing in British Columbia. The resulting dataset now contains information from seven surveys spanning 27 years that reveals changes in both the sector's scale and composition. Here we examined some of the sector's emerging trends (1990–2016) by extrapolating our latest survey results to the total population of secondary wood product manufacturers, presenting estimates of employment, sales and raw material use. As our earlier surveys did not include shake and shingle and panelboard producers, these two business types were (for the most part) excluded from the analysis to facilitate comparisons.

4.1 Trends in Sales, Jobs and Number of Firms

Table 10 shows trends in the three main indicator variables from our surveys—number of firms, gross sales revenue and employment. The public policy goal of increasing solid wood product manufacturing activity was realized in the 1990s, when the magnitude of all three indicators increased. After a plateau in the early- to mid-2000s, activity declined by 2012 to levels comparable to the early 1990s; however, the sector has started to rebound, with inflation adjusted sales, employment and number of firms increasing by 12.9%, 5.5% and 15.5% respectively from 2012 to 2016 (excluding shake and shingle and panelboard producers).

Table 10. Sector trends in number of firms, gross sales and employment, 1990–2016

	1990	1994	1997	1999	2006	2012	2016	% change (2012–2016)
Excluding shakes and shingles and panelboard firms								
Firms	565	525	683	703	660	547	632	15.5
Employment	11,660	14,010	14,460	14,410	14,800	12,417	13,095	5.5
Sales ($B)	1.54	1.93	2.69	2.90	3.15	2.80	3.27	16.8
- inflation adj.*	2.51	2.92	3.87	4.11	3.68	2.90	3.27	12.9
All business types								
Firms	n.a	n.a	774	774	732	589	680	15.4
Employment	n.a	n.a	19,490	20,190	19,670	15,576	16,888	8.4
Sales ($B)	n.a	n.a	3.87	4.68	4.88	3.82	4.46	16.7
- inflation adj.*	n.a	n.a	5.57	6.63	5.70	3.95	4.46	12.8

* Inflation adjustment using implicit GDP deflator (2016 = 100). Source: Statistics Canada Table 36-10-0130-01.

In an attempt to capture changes in productivity over time, Table 11 presents select inflation adjusted sales coefficients. Sales per firm and sales per employee both peaked in the late 1990s/early 2000s, and while the latter stabilized after a decade of decline, the former continued its downward trend. Wood usage estimates for the earlier surveys were unavailable, but when considering all business types, sales per unit of fibre also followed a downward trend since 1997.

Compared to 1999, remanufacturing was no longer a clear leader within British Columbia's secondary wood manufacturing sector (Table 12). Panelboard producers shared the lead, tying for first place in relative sales in 2006 and surpassing remanufacturing in 2012, despite undergoing a similar reduction of total sales since 1999. In terms of relative sales, the fall in economic contribution from panelboards and remanufacturing was met by gains made by EWP and pellet producers, the growing economic force within the other wood products category.

Table 11. Sector trends in inflation adjusted sales coefficients

	1990	1994	1997	1999	2006	2012	2016	% change (2012–2016)
Excluding shakes and shingles and panelboard firms								
Per firm[a]	4,444	5,568	5,669	5,841	5,571	5,297	5,175	–2.3
Per FTE[a]	215	209	268	285	248	233	250	7.0
Per RWE[b]	n.a	n.a	243	194	237	183	194	6.2
All business types								
Per firm[a]	n.a	n.a	7,197	8,562	7,782	6,711	6,558	–2.3
Per FTE[a]	n.a	n.a	286	328	290	254	264	4.1
Per RWE[b]	n.a	n.a	252	230	226	195	193	–0.8

Hidden footnote here

Inflation adjustment using implicit GDP deflator (2016 = 100). Source: Statistics Canada Table 36-10-0130-01.

a $1000s per firm or per full-time equivalent (FTE).

b $ per roundwood equivalent m^3.

Table 12. Economic contribution (% of total) by business type

	% of Employment				% of sales			
Business type	**1999**	**2006**	**2012**	**2016**	**1999**	**2006**	**2012**	**2016**
Cabinets	4	10	9	10	2	5	6	5
Engineered Wood Products	18	21	19	22	14	15	18	19
Furniture	6	5	8	6	3	2	5	4
Millwork	9	10	18	12	4	6	15	9
Other Wood Products	2	5	4	7	1	7	8	13
Pallets & Containers	1	2	2	3	1	1	2	3
Remanufactured Products	32	22	21	18	36	28	20	20
Shakes & Shingles	9	7	3	4	7	7	3	6
Plywood & Panelboards	20	18	17	18	31	28	24	20

Changes in the share of total employment were modest. The fall in remanufacturing's share from 1999 to 2006 was taken up by gains in the cabinets and EWP categories. With the exception of the millwork category, employment shares only fluctuated by a few percentage points since 2006, with most categories fluctuating by merely one or two percentage points.[31] Figure 24 shows employment trends (in full-time equivalents) by business type since 1990. In 1997, employment at remanufacturing firms increased to nearly 6,000 employees, but subsequently dropped to just over 4,300 in 2006 and to fewer than 3,300 in 2012. In 2016, employment in this subsector saw a mild decrease to just under 3,200. With the exception of furniture, millwork and remanufacturing, all business types increased employment between 2012 and 2016.

31 The spike in millwork's share of 2012 total employment was partially due to the misclassification of a few large firms, which led to an overestimate of employment totals for this category. If this estimate were to be amended, millwork's share would be closer to 14%, with remanufacturing, shakes & shingles, and plywood & panelboards each increasing by one percentage point as a result.

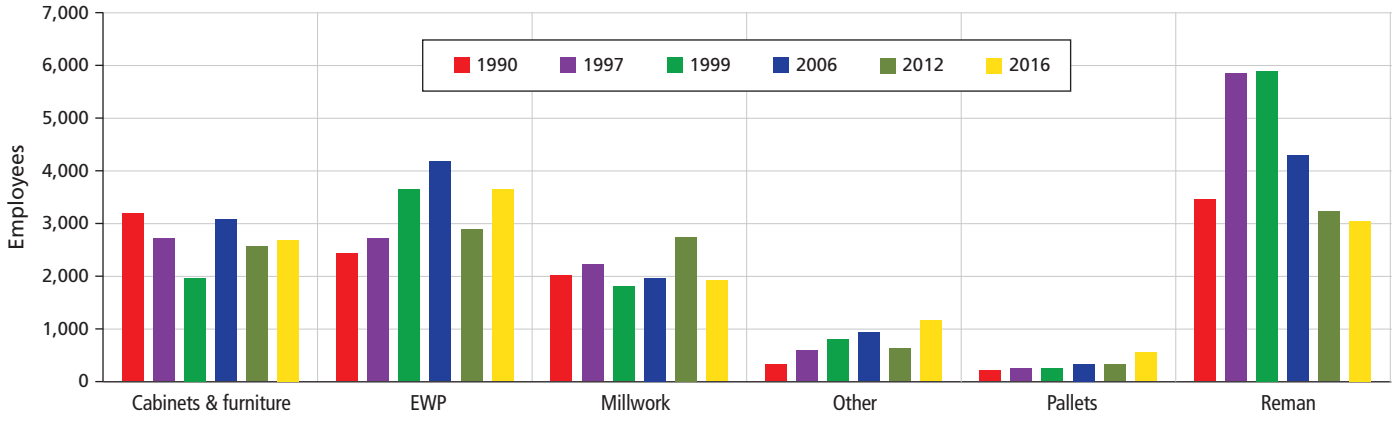

Figure 24. Trends in number of employees by business type, 1990–2016.

The proportion of sales to domestic and export markets changed over time (Figure 25).[32] Throughout the 1990s, the greatest growth was seen in increased exports to US markets.[33] This shifted between 1999 and 2006, with the proportion of sales to the US falling while those into local BC markets were increasing. This trend continued into 2012, but did not persist into 2016. The latest survey showed that the share of exports to the US rose once again while the share to the BC market fell. The proportion of sales into other Canadian markets (ROC) moved in tandem with the US series. The Asian market decline that began in the mid-1990s rebounded slightly in 2012, but lost some ground in 2016. Finally, the gradual growth in sales to European markets continued into 2016.

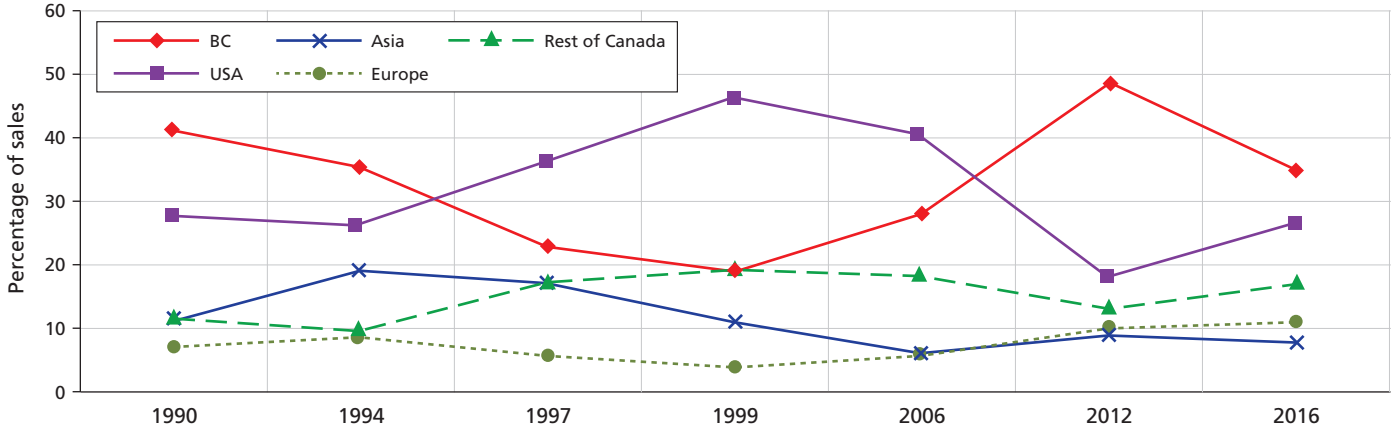

Figure 25. Trends in share of sales to major markets, 1990–2016.

4.2 Trends in Wood Use

Figure 26 illustrates trends in fibre inputs for the past five surveys. In 1997, cedar was the most important species, but was overtaken by SPF by 2006; however, virtually no SPF use was reported by 2016 survey respondents (see explanation in Section 3.6 Raw Material Use). The continued decline in cedar's share was largely due to changes in remanufacturing activity, although less wood use by shakes and shingles manufacturers also contributed.[34]

In 2016, Douglas-fir emerged as the most important species, driven by increased usage in other wood products and remanufacturing. Worth restating is that remanufacturers were the heaviest consumers of wood fibre among secondary manufacturers. In 2006, 2012 and 2016, SPF made up 38%, 15% and 0% of the input mix for remanufacturers, respectively, while lodgepole pine and spruce combined represented 26%, 37% and 21%, respectively.[35] For other wood product manufacturers, SPF made up 28%, 83%, and 0% of the species mix for 2006, 2012, and 2016, respectively, while lodgepole pine and spruce combined comprised 42%, 5%, and 74%, respectively. It is evident that there may have been some cross-labelling among SPF, lodgepole pine and spruce; however, it is unlikely that Douglas-fir would have been affected.

32 Excludes panelboard and shake and shingle business types.

33 Total sales grew in all markets except for Europe.

34 As mentioned in Section 3.6, cedar is the sole feedstock for shakes and shingles manufacturers.

35 Lodgepole pine, spruce and hemlock/balsam combined made up 32%, 47% and 31% for 2006, 2012 and 2016, respectively.

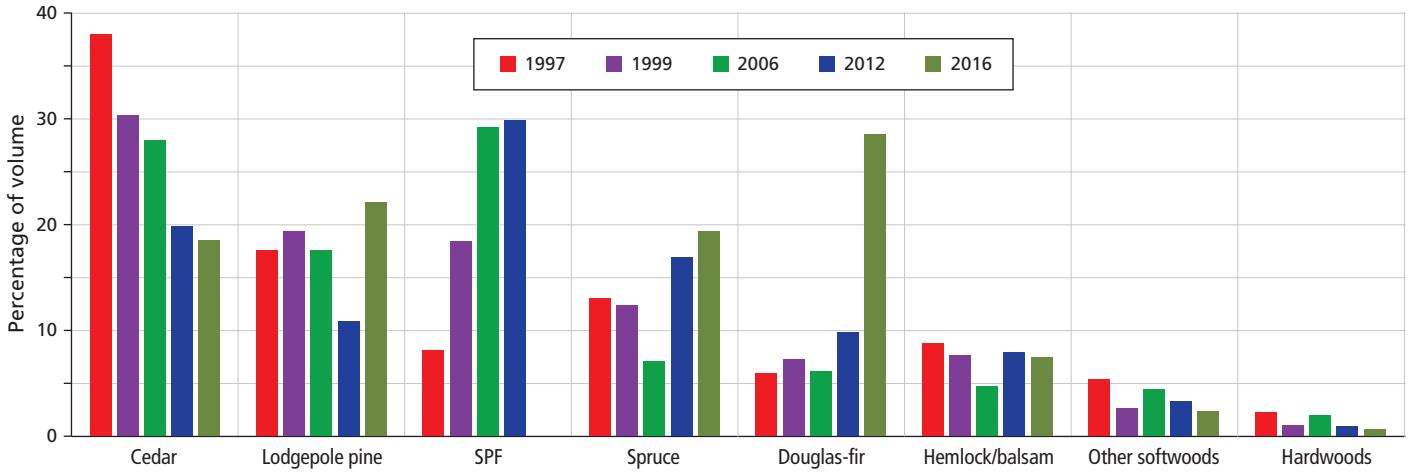

Figure 26. Trends in overall species use, 1997–2016 (excludes panelboard producers).

4.3 Trends in Capacity and Expansion

Questions on capacity utilization and plans for expansion were introduced in 1994. Figure 27 shows that capacity utilization remained mostly static for the past two decades, although there was a slight fall in 2012. The 1990s saw both an increase in the number of firms that planned to expand their manufacturing capacity and in the average amount (%) of planned expansion. Since 1999, however, fewer firms were interested in expansion.

Table 13 shows how constraints to expansion of secondary wood product manufacturing changed over the past four surveys. In 2012, Markets was the most important constraint to expansion, but this factor returned to third place in 2016. In fact, the 2016 rankings were identical to what prevailed in 2006—labour was the greatest challenge to expansion followed closely by wood supply adequacy.

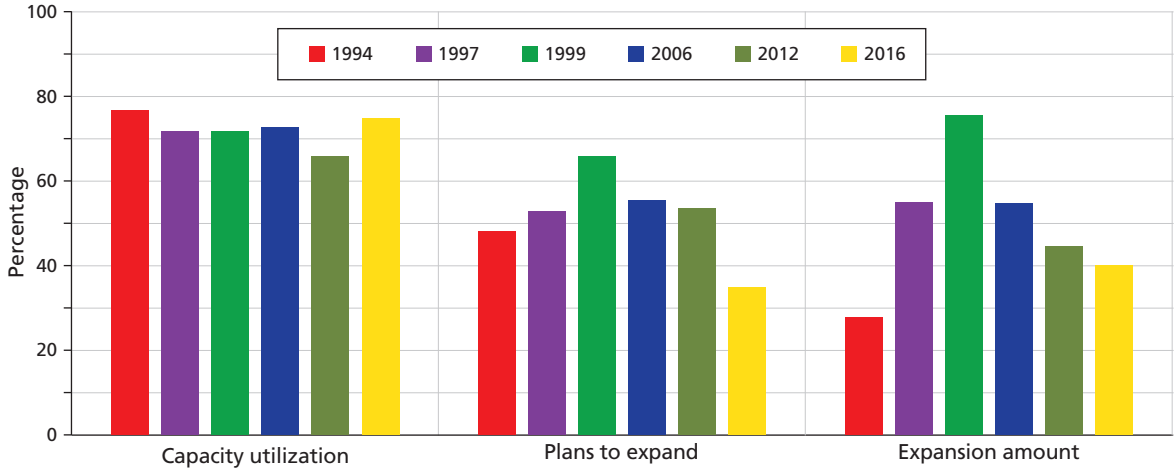

Figure 27. Trends in capacity utilization and expansion plans, 1994–2016.

Table 13. Ordinal ranking of constraints to expansion, 1999–2016

	Ranking			
Constraint	**1999**	**2006**	**2012**	**2016**
Labour	3	1	2	1
Wood supply	2	2	3	2
Markets	1	3	1	3
Finance	4	4	4	4

5. Summary and Conclusions

The 1990s saw strong growth in the secondary wood product manufacturing sector in British Columbia, with increases in the number of firms, gross sales revenue, and employment levels. This growth stalled in 2006, with the second consecutive survey in 2012 showing a downward trend in the sector's key indicator variables. However, by 2016 the sector had started to rebound, with inflation adjusted sales, employment and number of firms respectively increasing by 12.9%, 5.5% and 15.5% over 2012 levels (excluding shake and shingle and panelboard producers).

The 1990s also saw strong growth in sales to our most important export market, the United States (Stennes, Wilson, & Wang, 2005), with the top three business types in sales volume—remanufacturing, engineered wood products, and panelboards—all relying on this market. As a result of the 2008 US recession and housing demand that remained lower than pre-recession levels, sales growth shifted to the domestic British Columbia market, with the business types that depend most heavily on the local market (i.e., cabinet and furniture makers and millwork firms) performing better than those more reliant on export sales to the United States (Bogdanski & McBeath, 2015). Firms using mill residuals, most notably wood pellet producers whose sales were primarily to Europe, increased their relative share of the "Other Wood Product" business type and reversed a declining trend seen in our earlier surveys of sales to that export market.[36] In general, a modest number of the firms surveyed in 2016 expected to expand sales over the 2017–2019 period; the responding firms identified labour and fibre supply as the top constraints to growth facing the secondary wood product industry.

Geographically, most secondary wood product manufacturing activity still occurred in the more urban areas of the lower mainland and the Okanagan; however, some business types were more prevalent in rural, forest-dependent areas, including log home and timber frame businesses, as well as finger-jointing and wood pellet producers, which use low-value fibre from sawmills. Future studies will investigate why secondary manufacturing firms tend to locate near urban areas rather than near the wood supply. This research question is especially relevant in British Columbia's Interior, which has faced a restructuring of the primary sector linked to the effects of the mountain pine beetle infestation on timber volume and quality.

Policy makers have struggled to respond effectively to the impacts of timber supply shocks and competitive global markets (Wilson, 2000). Nevertheless, considerable interest remains in promoting the sustainable growth of value-added processing as a means to maximize the level of economic activity from fibre harvested in the province. By providing accurate and timely information on the existing structure and dynamics of secondary wood product manufacturing in British Columbia, this survey and subsequent updates will allow for a comprehensive assessment of various options, greatly benefitting future policy responses.

36 See Stennes and McBeath (2006) for an examination of the factors contributing to this flow of fuel pellets.

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Appendices

Appendix A: Taxonomy of secondary manufactured wood products

This taxonomy is based on Wilson and Ennis (1999). Some products can be intermediate as well as final.

	Wood products		
Log products	**Primary[a]**	**Intermediate**	**Final**
Chopsticks	Boards	Building/home	Boxes, bins and crates
Firewood	Cants	Components	Cabinets
House logs	Flitches	Cutstock	Coffins
Pilings	Lumber/Industrial timber	Door stock	Countertops
Poles	Treated timber	Edge glued components	Decking
Posts	Veneer	Finger-jointed stock	Fencing
Log homes		Furniture components	Finger-jointed lumber
Shakes		Joinery stock	Flooring
Shingles		Ladder stock	Flooring/Engineered
Treated pilings		Laminated components	Furniture/Commercial
Treated poles		Laminated stock	Furniture/Household
Treated posts		Metric stock	Furniture/Patio
Novelties		Moulding, panel blanks	Furniture/Ready-to-assemble (RTA)
		Pallet, crating stock	Garden buildings/products
		Medium density fibreboard	Laminated veneer lumber
		Particleboard	Millwork/Architectural
		Pattern stock	Medium density fibreboard
		Sawmill specialty products	Mouldings
		Staircase components	MSR lumber
		Turning squares	Oriented Strandboard
		Window stock	Pallets
			Paneling
			Plywood
			Prefab buildings/manufactured homes
			Siding
			Staircases
			Stakes, lathe, strips and batten
			Structural laminated beams
			Treated lumber
			Trusses
			Turned wood products
			Windows
			Wood novelties
			Wood pellets

a This column does not include secondary products but is inserted to provide a more complete taxonomy.

Appendix B: 2016 survey of secondary wood product manufacturing in BC

1. Please give the location of where the mill site is located, if different from mailing address.

   Complete a separate questionnaire for each of your mill sites, if more than one. Please contact us if you have questions.

Address (number and street)	
Town/City	Postal Code

2. In what year did the mill begin operations? _____

3a. What is the legal status of your business?

- ☐ Sole proprietorship
- ☐ Partnership
- ☐ Corporation
- ☐ Other _____

3b Is this business owned by Indigenous people?

- ☐ Yes, wholly owned
- ☐ Yes, partially owned
- ☐ No

4a. Please select the activity that accounted for the majority of your **2016** manufacturing sales revenue. Please select **one** only.

- ☐ Remanufactured products (finger joint, lumber specialties, fencing, panels, rig mats)
- ☐ Engineered wood products (glulam, LVL, I-joists, laminated posts/beams, trusses, prefab buildings, log homes, treated wood)
- ☐ Millwork (doors, windows, architectural and custom woodwork, turned wood products, mouldings)
- ☐ Cabinets (kitchen/vanity cabinets, cabinet doors, countertops)
- ☐ Furniture (household, ready-to-assemble, commercial, institutional and patio)
- ☐ Pallets and containers (pallets, boxes, bins, crates)
- ☐ Plywood & Panelboards (excluding/net of veneer production)
- ☐ Other (please specify) _____

4b. Does a majority of your sales revenue come from construction/building at the job site or involve making one-off products (such as cabinets or furniture) for individual customers?

- ☐ Yes
- ☐ No
- ☐ Don’t know/unsure

Wood Use

5a. Please provide the estimated volume of raw wood materials used by your mill in **2016**.

Note: **m³** = cubic meters; **mbf** = thousand board feet; **msf** = 1000 square feet 3/8" basis; **odt** = oven-dried metric tonnes

Type of Raw Wood Material	Volume	Units of Measure
Logs		☐ m³ ☐ mbf ☐ other _____
Lumber		☐ m³ ☐ mbf ☐ other _____
Plywood		☐ m³ ☐ mbf ☐ other _____
Veneer		☐ m³ ☐ mbf ☐ other _____
Oriented Strand Board (OSB)		☐ m³ ☐ mbf ☐ other _____
Medium density fibreboard (MDF)		☐ m³ ☐ mbf ☐ other _____
Wood residues		☐ m³ ☐ odt ☐ other _____
Other wood material (please specify):		
		☐ m³ ☐ mbf ☐ msf ☐ other _____
		☐ m³ ☐ mbf ☐ msf ☐ other _____

5b. Please provide the sources of raw wood material used by your mill in **2016** (provide best estimate):

Source of Wood Supply	%
BC market purchases	
Logs from own tenured lands	
Other wood materials from own primary mills	
Log/lumber trades with other companies	
BC Timber Sales	
Canadian purchases outside of BC	
Imports from outside Canada	
Total = 100%	

5c. If you sourced wood material from outside BC in **2016**, please indicate where you sourced these raw materials from. Please check all that apply.

Alberta	☐	Europe	☐
Other prairie provinces	☐	Japan	☐
Eastern Canada	☐	China	☐
US West	☐	Korea	☐
US South	☐	Other Asia	☐
US Midwest	☐	Latin America	☐
US Northeast	☐	Africa	☐
		Australia/New Zealand	☐

6. Please provide an estimate of the wood species used by your mill by **percentage** of total volume in **2016**.

Softwood	Lodgepole pine	
	Hemlock/balsam	
	Spruce	
	Douglas-fir	
	Western red cedar	
Other softwoods (please specify):		
Hardwoods	Aspen	
	Western birch	
	Alder	
Other hardwoods (please specify):		
	Total volume of wood fibre used	**100%**

Operations

7. Please provide the percentage breakdown of operating costs for your mill in **2016**. (Provide your best estimate.)

Main Operating Costs		**%**
Wood Costs		
Labour and Benefits		
Interest		
Depreciation		
Other (please specify):		
	Total of operating costs	**100%**

Employment

8a. Please provide the average number of full-time equivalent employees working at this mill in **2016**.
A full-time equivalent is 220 or more days worked in the year.

Production (manufacturing) staff	
Non-production staff	
Total	

8b. Of the total number of full-time equivalent employees reported in question 8a, how many are Indigenous people?

_____

Manufacturing Capacity and Expansion

Manufacturing capacity refers to the maximum volume of products that your mill is designed to produce for a one-year period.

9a. Approximately what percentage of manufacturing capacity was the plant operating at in 2016? _____%

9b. On average how many 8- to 10-hour shifts were running in **2016**?

- ☐ 1
- ☐ 2
- ☐ More than 2

9c. Does your business plan to expand manufacturing capacity over the three-year period **2017–2019**?

- ☐ Yes
- ☐ No
- ☐ Don't know

If you responded yes, please continue to question 9d otherwise go to question 9e.

9d. By what percentage does your business plan to expand capacity over the three-year period of **2017–2019**?

_____%

9e. What percentage of your manufacturing capacity is used to provide custom manufacturing services to other businesses?

_____% ☐ Unknown/unsure

Constraints to Expansion

10a. For each item below, please indicate the extent to which they represent a constraint to expand your business with **1** being not at all constraining and **5** being extremely constraining.

General constraints to expansion	**1**	**2**	**3**	**4**	**5**
Wood Supply	☐	☐	☐	☐	☐
Labour	☐	☐	☐	☐	☐
Markets	☐	☐	☐	☐	☐
Finance	☐	☐	☐	☐	☐
Management Capacity	☐	☐	☐	☐	☐
Transportation/Distribution	☐	☐	☐	☐	☐
Other (specify) _____	☐	☐	☐	☐	☐

10b. For each general constraint category below, please indicate the extent to which each specific factor represents a constraint to expand your business with **1** being not at all constraining and **5** being extremely constraining.

i. Wood supply specific constraints	**1**	**2**	**3**	**4**	**5**
Volume	☐	☐	☐	☐	☐
Price	☐	☐	☐	☐	☐
Quality/Grade	☐	☐	☐	☐	☐
Price Volatility	☐	☐	☐	☐	☐
Other (specify) _____	☐	☐	☐	☐	☐
ii. Labour specific constraints	**1**	**2**	**3**	**4**	**5**
Training/Skills	☐	☐	☐	☐	☐
Flexibility	☐	☐	☐	☐	☐
Cost	☐	☐	☐	☐	☐
Experience	☐	☐	☐	☐	☐
Other (specify) _____	☐	☐	☐	☐	☐
iii. Markets specific constraints	**1**	**2**	**3**	**4**	**5**
Softwood Lumber Agreement	☐	☐	☐	☐	☐
Product Diversification	☐	☐	☐	☐	☐
Market Diversification	☐	☐	☐	☐	☐
Market/Product Research	☐	☐	☐	☐	☐
Foreign Regulations	☐	☐	☐	☐	☐
Other (specify) _____	☐	☐	☐	☐	☐
iv. Financing specific constraints	**1**	**2**	**3**	**4**	**5**
Availability	☐	☐	☐	☐	☐
Cost	☐	☐	☐	☐	☐
Flexibility	☐	☐	☐	☐	☐
Repayment Schedule Length	☐	☐	☐	☐	☐
Other (specify) _____	☐	☐	☐	☐	☐
v. Management capacity specific constraints	**1**	**2**	**3**	**4**	**5**
Improving Product Quality	☐	☐	☐	☐	☐
Reducing Manufacturing Costs	☐	☐	☐	☐	☐
Increasing Labour Efficiency	☐	☐	☐	☐	☐
Improving Raw Material Recovery	☐	☐	☐	☐	☐
Implementing Lean/Just-in Time Manufacturing Techniques	☐	☐	☐	☐	☐
Other (specify) _____	☐	☐	☐	☐	☐
vi. Transportation & distribution specific constraints	**1**	**2**	**3**	**4**	**5**
Costs	☐	☐	☐	☐	☐
Access	☐	☐	☐	☐	☐
Logistics	☐	☐	☐	☐	☐
Frequency	☐	☐	☐	☐	☐
Other (specify) _____	☐	☐	☐	☐	☐

Electronic Commerce and Social Media

11a. Does your company use social media (See list in 11b, below)?

- ☐ Yes
- ☐ No
- ☐ Don't know

11b. If yes, which social media sites does your company use? Please check all that apply.

- ☐ Facebook
- ☐ Twitter
- ☐ Pinterest
- ☐ Instagram
- ☐ Linked-in
- ☐ YouTube
- ☐ Snapchat
- ☐ Other (please specify) _____

11c. If no, does your company plan to use a social media site?

- ☐ Yes
- ☐ No
- ☐ Don't know

11d. Does your company currently engage in e-commerce?

- ☐ Yes
- ☐ No
- ☐ Don't know

11e. If no, what are the key issues for not adopting e-commerce? Check all that apply.

- ☐ Too costly
- ☐ Too much time required
- ☐ Do not have required skills
- ☐ No business need
- ☐ Other (please specify) _____

If you answered no to 11d please go to question 11i, otherwise continue to 11f.

11f. Is your company planning to expand its use of e-commerce?

- ☐ Yes
- ☐ No
- ☐ Don't know

11g. If no, what are the key issues for not expanding e-commerce? Check all that apply.

- ☐ Too costly
- ☐ Too much time required
- ☐ Do not have required skills
- ☐ No business need
- ☐ Other (please specify) _____

11h. If yes, what type of e-commerce expansion are you planning?

- ☐ New web design
- ☐ Sales
- ☐ Purchases
- ☐ Other (please specify) _____

11i. Does your company sell products or services through the web?

- ☐ Yes
- ☐ No
- ☐ Don't know

11j. Does your company purchase or search the web for inputs?

- ☐ Yes
- ☐ No
- ☐ Don't know

11k. Does your company search the web for manufacturing knowledge/information?

- ☐ Yes
- ☐ No
- ☐ Don't know

11l. Does your company have a website?

- ☐ Yes
- ☐ No
- ☐ Don't know

11m. If yes, what is your website name? _____

Markets

12a. What was the percentage breakdown of sales and revenues from the following markets in **2016**?

British Columbia	
Alberta	
Other Prairie	
Eastern Canada	
US West	
US South	
US Midwest	
US Northeast	
Europe	
Japan	
China	
Korea	
Other Asia	
Latin America	
Africa	
Australia/New Zealand	
Total sales	**100%**

12b. What end markets do you target for your products? (Mark all that apply.)

- ☐ New Residential
- ☐ Remodeling
- ☐ Multiple-unit Housing
- ☐ Industrial buildings
- ☐ Industrial uses
- ☐ Commercial buildings
- ☐ Other _____

12c. Does your company plan to expand sales to new markets?

- ☐ Yes
- ☐ No
- ☐ Don't know

12d. If yes, please indicate new market areas (provinces/states/countries/regions) of interest. Mark all that apply.

- ☐ Alberta
- ☐ British Columbia
- ☐ Other Prairie
- ☐ Eastern Canada
- ☐ US West
- ☐ US South
- ☐ US Midwest
- ☐ US Northeast
- ☐ Europe
- ☐ Japan
- ☐ China
- ☐ Korea
- ☐ Other Asia
- ☐ Latin America
- ☐ Africa
- ☐ Australia/New Zealand
- ☐ Other (please specify) _____

12e. Please identify how you plan to access **new** markets (check all that apply).

- ☐ Own effort
- ☐ Partnering with other manufacturers
- ☐ Selling to wholesaler/distributors
- ☐ Working with existing BC wood industry associations
- ☐ Other _____
- ☐ Don't know/unsure

12f. Please identify resources your company considers important to develop and evaluate **new** markets (check all that apply)

- ☐ Timely market intelligence
- ☐ Evaluation of new products and market opportunities
- ☐ Coordinated presence on international market development missions and at trade shows
- ☐ In-market support from organizations like BC Wood
- ☐ Other _____
- ☐ Don't know/unsure

Sales Revenue

13a. Please indicate this mill's **2016** gross revenue (to the nearest dollar). **(Free On Board at mill – C$)**.

Gross 2016 revenue: _____

13b. Please indicate this mill's **2015** gross revenue (to the nearest dollar). **(Free On Board at mill – C$)**.

Gross 2015 revenue: _____

13c. Please estimate the **expected 2017** gross revenue (to the nearest dollar). **(Free On Board at mill – C$)**.

Expected gross 2017 revenue: _____

13d. Please indicate the **percentage** of your mill's 2016 gross revenue that was attributed to custom **manufacturing services** such as planning or kiln drying services and **non-manufacturing services** such as marketing or distribution services.

Percentage of 2016 revenue: _____

Products

14a. Please list up to **4** of the top grossing products manufactured at this mill and indicate approximate percentage of **2016** total sales revenue reported in question 14a.

Main products	% of 2016 sales
All others products	
Total	**100%**

14b. Does your company plan to expand its product offering?

- ☐ Yes
- ☐ No
- ☐ Don't know

14c. If yes, what new products do you plan to offer?

Possible new products

Services

15a. Do you sell custom services?

- ☐ Yes
- ☐ No
- ☐ Don't know

15b. If yes, please indicate which custom services you provide. Please check all that apply.

Manufacturing Services		Non-manufacturing Services	
Planing	☐	Marketing	☐
Kiln Drying	☐	Distribution	☐
Resawing	☐	Logistics	☐
Other (specify): _____	☐	Other (specify): _____	☐

15c. In relation to your mill, where are the businesses you provide services to generally located?

- ☐ within 50 km
- ☐ within 51 to 100 km
- ☐ greater than 100 km

15d. Do you currently plan to expand into new businesses services?

- ☐ Yes
- ☐ No
- ☐ Don't know

15e. If yes, please indicate which services you plan to offer? Please check all that apply.

Manufacturing Services		Non-manufacturing Services	
Planing	☐	Marketing	☐
Kiln Drying	☐	Distribution	☐
Resawing	☐	Logistics	☐
Other (specify): _____	☐	Other (specify): _____	☐

15f. Do you currently purchase services from other businesses?

- ☐ Yes
- ☐ No
- ☐ Don't know

15g. If yes, please indicate which services you currently purchase? Please check all that apply.

Manufacturing Services		Non-manufacturing Services	
Planing	☐	Marketing	☐
Kiln Drying	☐	Distribution	☐
Resawing	☐	Logistics	☐
Other (specify): _____	☐	Other (specify): _____	☐

15h. And if yes, what percentage of the volume of logs or lumber used by your business in 2016 did you have custom processed by another business?

_____% ☐ Unknown/unsure

15i. In relation to your mill, where are the businesses you purchase services from generally located?

- ☐ within 50 km
- ☐ within 51 to 100 km
- ☐ greater than 100 km

Company and product directory and survey reports

We publish a directory of BC companies that produce secondary wood manufacturing products. This electronic directory is made freely available through the on-line bookstore of the Canadian Forest Service (http://cfs.nrcan.gc.ca/publications/) and distributed through organizations such as BC Wood. The directory includes company name, contact information, and a list of principle products. We welcome you to be included in this directory. We also publish a report that summarizes the findings from the analysis of the data produced from this survey. This report is also made freely available on the on-line bookstore. If you would like participate in the directory or directly receive either the directory or survey report, please indicate below.

Would you want to be included in the BC secondary wood product manufacturers' directory?

☐ Yes

☐ No

Would you like to receive a digital copy of the company/product directory?

☐ Yes

☐ No

Would you like to receive a digital copy of the final survey report?

☐ Yes

☐ No

Contact Person (name of person to contact about this questionnaire):

First name: _____

Last name: _____

Title: _____

Email: _____

Telephone number ( ) _____ Fax number ( ) _____

How long did you spend to collect the data and complete the survey? _____ hours _____ minutes

We invite your comments. Please be assured we read all comments with the intent of improving the survey.

Remember, all questionnaire responses are confidential. Thank you for your time.

Appendix C: Listing of products within each business type

Remanufactured Products

- Lumber specialties
- Sawmill specialties
- Custom processing
- Fencing
- Cutstock
- Siding
- Decking

Engineered Wood Products

- Laminated beams
- Log homes
- Trusses
- Treated wood
- Prefab buildings
- Laminated veneer lumber

Millwork

- Doors
- Architectural woodwork
- Windows
- Turned wood
- Moulding
- Stairs
- Flooring

Cabinets

- Kitchen cabinets
- Cabinet doors
- Vanity cabinets
- Countertops

Furniture

- Household
- Commercial and institutional
- Ready to assemble (RTA)
- Patio

Pallets and Containers

- Pallets
- Boxes, bins, and crates
- Shipping materials

Shakes and Shingles

- Shakes
- Shingles

Panelboards

- Plywood
- Oriented strandboard
- Particleboard
- Medium density fibreboard

Other Wood Products

- Poles and posts
- Wood novelties
- Veneer
- Woodcrafts
- Instruments
- Fuelwood pellets

Appendix D: Correspondence between regions used in analyses and BC Natural Resource Regions

2016 Region	2012 Region	Natural Resource Region or District[37]
Vancouver-Fraser Valley	Vancouver-Fraser Valley	Chilliwack and Sea to Sky Natural Resource Districts
Island-Coast	Island-Coast	Remaining districts in the South Coast and West Coast Natural Resource Regions
Southern Interior*	Kamloops and Nelson	Thompson-Okanagan and Kootenay-Boundary Natural Resource Regions
Central Interior*	Cariboo	Cariboo Natural Resource Region
Northern Interior*	Northern	Northeast, Omineca, and Skeena Natural Resource Regions

* The two notable differences between 2016 and 2012 were the apportionment of the Prince George (DPG) and Thompson Rivers (DKA) Natural Resource Districts. Prior to 2016, the southern half of DPG was part of the Cariboo region while the remainder was part of the Northern region; this entire district was part of the Northern Interior for current analyses. As a result, four firms in the 2016 population (one of whom completed our survey) were designated as part of the Northern Interior when they would have been included in the Cariboo region in prior analyses. However, the Northern and Cariboo regions were often grouped together in past reports. Prior to 2016, the northern portion of DKA was part of the Cariboo region, but this reassignment to the Southern Interior did not affect population counts for the Central or Southern Interior.

A map for the 2012 Coastal subregions was unavailable. A comparison of cities assigned to the Island-Coast and Vancouver-Fraser Valley in 2016 and 2012 did not show any differences.

37 A map is available at https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/district-contacts/natural_resource_regions_and_districts_map2017.png