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Secondary manufacturing of solid wood products in Ontario 2017: Structure and economic contribution

Bryan E.C. Bogdanski, Lili Sun, and Linda Wong



Canadian Forest Service
Pacific Forestry Centre

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The Pacific Forestry Centre, Victoria, British Columbia

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Abstract

This report presents survey results for Ontario's secondary wood manufacturing industries in 2017. The survey compiled operational, employment, production, marketing, and financial information on eight business types. This was the first Canadian Forest Service survey of this segment of the Ontario forest sector. The Ontario secondary wood manufacturing sector has grown significantly over the past two decades. This sector struggled somewhat over the past decade following the Great Recession of 2009 but has recently shown signs of growth. In 2017, Ontario secondary wood product industries were largely concentrated in the heavily urbanized southern part of the province. The majority of the wood fibre (69%) was sourced from within Ontario. The majority of sales (68%) were to the Ontario market and the bulk of the rest went to the United States (25%). Two out of five responding companies planned to expand operations, though opportunities to do so were tempered by existing constraints. Lack of experienced labour and labour cost were identified as potential constraints, as were markets and finance.

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

Résumé

Le présent rapport présente les résultats d'une enquête menée en 2017 auprès d'industries de transformation secondaire du bois de l'Ontario. Ce document expose les données de l'enquête qui portait sur les activités, l'emploi, la production, la commercialisation et les finances de huit types d'entreprises. Il s'agissait de la première enquête du Service canadien des forêts sur ce secteur de l'industrie forestière de l'Ontario. Le secteur de la transformation secondaire du bois de l'Ontario a connu une croissance importante au cours des deux dernières décennies. Il a rencontré quelques difficultés au cours de la dernière décennie à la suite de la Grande Récession de 2009, mais a récemment présenté des signes de croissance. En 2017, les industries de transformation secondaire du bois de l'Ontario se trouvaient principalement dans la région fortement urbanisée du Sud de l'Ontario. La majorité des fibres de bois (69 %) provenaient de l'Ontario. La majorité des ventes (68 %) étaient effectuées sur le marché ontarien, et le reste des ventes étaient en grande partie réalisées aux États Unis (25 %). Deux des cinq entreprises interrogées prévoyaient étendre leurs activités, mais les possibilités de le faire étaient limitées en raison de contraintes existantes. Parmi les contraintes possibles, les entreprises ont relevé le manque de main d'œuvre qualifiée, les coûts liés à la main d'œuvre, ainsi que les contraintes liées aux marchés et aux finances.

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

Key Points

- This report summarizes the results of a comprehensive survey of secondary wood product manufacturing firms in Ontario for the year 2017. The survey had a population of 1,221 firms and 303 respondent firms, resulting in a 25% response rate.
- For 2017, we estimated that 1,210 secondary wood product firms in Ontario (excluding panelboard businesses) employed 26,115 people, had sales of \$5.3 billion and used 9.3 million m³ of wood fibre.
- Most sales for respondents were to Ontario (68%), to the United States (25%), and to other Canadian provinces (6%).
- The most common business types for respondents were cabinets (41%), millwork (26%), and furniture (11%).
- Most frequently used wood fibre species for respondents was spruce (35%) in the form of lumber and logs. Wood fibre was mainly sourced from Ontario (69%).
- Internet use was prevalent among respondents, with 75% of companies reporting some form of internet use. Use of social media, such as Facebook and LinkedIn, were in its initial stages. Early adopters tended to be companies that produced finished products, such as furniture, millwork and cabinets.
- Forty percent of respondents expected to expand in the near future but labour, markets, and finance posed potential constraints.
- Labour issues stood out as a significant potential constraint for industry growth, with the main labour-related issues attributed to a lack of experienced workers and the cost of labour.

1 Introduction

In 2018, the Canadian Forest Service conducted a survey of secondary wood manufacturing firms in Ontario to learn more about this subsector of Ontario's forest industry as the last comprehensive studies of the subsector were done in the early 2000s for Ontario's Living Legacy Trust. The Canadian Forest Service, with support from the Association of Lumber Remanufacturers of Ontario (ALRO) and The Ontario Forest Industry Association (OFIA) conducted the study to create a current and comprehensive understanding of the subsector.

There is a renewed interest to promote value-added wood processing to maximize the level of economic activity from each unit of wood fibre harvested in Ontario. Ongoing challenges in the very competitive economic environment for primary forest product industries such as lumber, and pulp and paper, necessitate the consideration of strategies to support the sustainability of the Ontario forest industry. One such strategy is the promotion of secondary manufacturing of lumber and panels into intermediate and finished wood products for domestic and foreign markets. Current and relevant sector information is needed to support such a strategy. This report provides information to support the development of new strategies to sustain the growth and diversification of the secondary wood product manufacturing subsector in Ontario.

In 2001, Jaako Pöyry published a study of the Ontario secondary wood product manufacturing sector for the Ontario Living Legacy Trust—a five-year funded trust to improve Ontario's management of its natural resources and build relationships with stakeholders. The Jaako Pöyry study used data from Statistics Canada and elsewhere to profile the size and comparative performance of the Ontario sector. The study found that:

- 1) the sector employed 37,000 people in 1997, three times the amount of the primary wood product sector;
- 2) the sector exported about three quarters of all output, mostly to the US market (89% of exports);
- 3) proximity to markets was important but not necessary for business success; and
- 4) the furniture industry was the largest industry group in the sector.

The report concluded that the growth and success of the sector would happen with greater vertical clustering through supply chains (forest to market) and between inter-related industries (machinery and chemical suppliers). Following the Jaako Pöyry study, three follow-up reports were produced by Woodbridge Associates and Clayton Research Associates (2003) for the Ontario Living Legacy Trust. The purpose of these reports was to identify potential markets for industry expansion within the United States (US) Great Lakes states. These studies identified that the greatest opportunities for Ontario secondary wood manufacturers were prefabricated floors, walls and roofs (engineered wood products), windows and doors (millwork), and prefabricated buildings (engineered wood products).

The current study closely follows the definition of secondary manufacturing used in similar studies of British Columbia (Bogdanski and McBeath 2015). To provide important trend information and context for the survey results as well as supplementary information on the panelboard industry, we complemented the survey data with publicly available data from Statistics Canada (see Appendix 1).

Secondary manufacturing is the further processing of primary wood or wood-based materials into semi-finished or finished wood products. Secondary manufacturing wood products manufacturers can be grouped into the following business types:

- millwork
- cabinets
- engineered wood products (EWP)
- pallets and containers
- furniture
- other wood products (OWP)
- remanufactured products (Reman)
- plywood and panelboards

Our definition of a "manufacturer" excludes several activities, the primary being a "contractor/builder" or a "custom one-off operation." The firms most impacted by this definition are in the engineered wood products (i.e., buildings and building components) and cabinets business types. For example, a firm that manufactures houses in a plant and then ships them to a site for assembly falls within our definition of an engineered wood products business type but a contractor or builder who constructs houses at a job site does not. Appendix 2 contains a comprehensive listing of wood products organized by level of processing and Appendix 3 contains a non-exhaustive listing of wood products by business type.

2 Research Methods

The list of companies surveyed was produced from Statistics Canada's Business Registry (BR) database and was augmented by an inventory of companies provided by the Association of Lumber Remanufacturers of Ontario. An initial list was created from the BR using all companies having at least one employee and a random sample of companies without a classified employment number. This list was augmented with a directory provided by the Association of Lumber Remanufacturers of Ontario, though most of these companies were already included in the BR. The final combined list formed the initial survey frame of 2,305 firms to whom paper surveys were mailed. During the process of administering the survey, 1,052 companies were found to be misclassified, outside the scope of the survey, or no longer in business. A further 32 firms were deemed to be integrated lumber and remanufacturing businesses as the majority of their business was not secondary manufacturing. After excluding these firms, 1,221 firms made

up the final survey population of the secondary wood product manufacturers in Ontario for the 2017 survey year.¹

A multi-part questionnaire was developed based on previous surveys administered by the Canadian Forest Service for studies on the British Columbia and Alberta secondary manufacturing sectors (Wilson et al. 2001; Stennes and Wilson 2008; Bogdanski and McBeath 2015, 2017). This survey design was also used to survey secondary wood manufacturers in other provinces during 2017 and 2018 as part of the first national secondary wood manufacturer’s survey. The first part of the survey sought to collect basic business information. The subsequent parts focused on wood use, operational costs, employment, capacity utilization and expansion plans, constraints to expansion, use of electronic commerce and social media, markets, sales revenue, and products (see Appendix 4).

The questionnaire was mailed out in middle of January 2018 to all firms identified in the final survey frame, with follow-up in various forms in February and March. Firms that did not respond to faxes, emails, or mail-outs were contacted again by phone in April, and asked to complete and return the survey. By April, the bulk of the responses were received but surveys continued to be returned into the summer months. By the end of July, 303 of the 1,221 secondary manufacturing firms in the final survey population had returned the survey for a response rate of 25%.

Table 1 summarizes the survey population and respondents by business type. Each respondent firm was classified into a business type according to its reported sales of specified product types. Non-respondent firms were classified based on communications with the company or indirectly through company webpages and industry directory information (see Appendix 3 for the specific activities within our defined business types). Most firms were classified as cabinets (41%), millwork (26%), or furniture (11%).

Table 1 shows that the number of respondents for plywood and panelboards was very low. To respect confidentiality, this business type was dropped from the study. For those interested in this industry, Statistics Canada produces very good supplementary data, some of which are found in Appendix 1. Also, results for some specific questions were suppressed to maintain confidentiality in cases where only a few individual enterprises of a particular business type responded.

Table 1. Survey population, response, and working sample

Business Type	Number of firms		
	Population	Respondents	Response rate (%)
Cabinets	504	98	19%
Millwork	318	78	25%
Furniture	136	37	27%
Pallets & containers	90	29	32%
EWP	88	31	35%
OWP	41	19	46%
Reman	33	9	27%
Plywood & panelboards	11	2	18%
Total	1,221	303	25%

Data from completed surveys were stored in a secure database, and survey results were checked for errors and anomalies. Employment and sales data were acquired directly from non-participating firms through follow-up communication, indirectly from websites, news articles, or company reports, or were estimated from employment category information in the original Statistics Canada Business Registry database. Ultimately, employment and sales data were obtained for 887 and 407 firms, respectively. In some cases, returned surveys had missing sales or employment data. For these records, the missing data were estimated using information from similar businesses. For businesses for whom we could not acquire employment data, employment values were imputed by using the mid-point of the employment range data provided in the BR for firms categorized below 100 employees and the minimum of the employment range of the Business Registry for large businesses. For example, a business with a BR employment range of 20–49 employees was given a value of 35, the midpoint of the range, while a business with a BR employment range of 200–499 was given an employment estimate of 200. Imputing the mid-point for smaller class businesses and the minimum of the range for larger firms provided a consistent estimator, as confirmed by comparing the predicted values with values actually reported by responding businesses. For missing sales values, estimates were assigned by multiplying the employment value by the average sales per employee for each business type derived from the information provided by responding businesses. Using the sample and imputed values resulted in aggregate sales and employment estimates for all 1,221 businesses in the population.

Non-response to the survey by businesses raised concern of biased results. Firms that did not participate may be very different than firms that did respond, resulting in biased results and perhaps false conclusions. For example, larger firms with more resources at their disposal could have been more likely to respond. We conducted two statistical tests to check for possible response bias by considering the bias of the distribution of business types and the bias of distribution of firm sizes. The results of these tests are presented in Appendix 5.

¹ Another list was created from the BR database comprising firms with no employment class information. Of the 2,023 entries in the BR list of companies with no employment information, a random sample of 20% were sent a survey. Of the 406 surveys sent, only 23 were returned and of these, 20 firms were identified as within the scope of the survey. Further investigation of the remaining 383 firms found that 243 were not in business or not within the scope of the survey. Twenty-two firms were found to be active but refused to provide information. The status of the remaining 117 firms was not verified given time and resource constraints. The majority of the 20 responding firms were single-person businesses involved in cabinet making or millwork. This indicates that at least 42 companies were excluded from the population estimate of the sector.

The first test compared the frequency distribution of the responding firms across business types against the population distribution. This test found a difference between the population distribution and the sample distribution so the survey respondent group did not provide a good representation of the distribution of business types across the population. In particular, the cabinet businesses were under-represented while other wood product businesses were over-represented in the sample vis-à-vis the population.

A second test compared the size distribution between respondent and non-respondent firms to determine possible firm size bias. For this test, we used supplementary employment data and imputed missing information using a variety of techniques so each firm had employment data. This test found no difference between the two groups.

In sum, the survey respondents were generally representative of the entire population of firms in terms of size but not in composition across business types. As with any census survey that fails to collect information from all firms, some uncertainty remains and therefore caution should be exercised in extrapolating results to the entire population.

3 Current State of the Sector

First, we characterized the geographical distribution and scale of the sector using information from all identified businesses.

3.1 Sales, Jobs, and Wood Use

The estimated number of secondary wood product manufacturing firms was 1,221. For 2017, aggregate employment and sales (excluding plywood and panelboards) were estimated to be 26,115 and \$5.3 billion, respectively. The sector (excluding plywood and panelboards) used approximately estimated 9.3 million cubic metres (m³) of wood fibre.

Table 2 shows employment and gross sales per unit of roundwood equivalent (i.e., the roundwood equivalent volume resulting when the volumes of logs, lumber, panelboards, etc. used by a company was converted into roundwood equivalents) and gross sales per full-time equivalent. Sales per employee are an indicator of the potential wage levels available to employees, and higher sales per employee may indicate the manufacture of higher value-added products. Nevertheless, businesses with high sales per employee may also have high material (e.g., raw lumber) and capital costs, and so may not generate much value-added per employee, which is required to support higher wages. Jobs per cubic metre are an indicator of how much more employment is created through further processing of primary wood products.

In the case of employment, the labour-intensive business types such as cabinets, furniture and millwork generated the most jobs per 1,000 m³ of wood fibre. These business types also had

Table 2. Jobs and sales per unit of roundwood equivalent (m³) and sales per full-time equivalent 2017

Business type	Jobs per m ³ (000s)	Sales per m ³	Sales per full-time equivalent (000s)
Cabinets	19.8	\$2,877.00	\$146
EWP	1.2	\$382.75	\$313
Furniture	10.4	\$1,880.94	\$181
Millwork	5.1	\$1,072.58	\$210
OWP	0.3	\$113.12	\$395
Pallets & Containers	1.3	\$225.35	\$180
Reman	2.4	\$542.61	\$229
Total	2.3	\$529.45	\$229

the highest sales value per cubic metre of wood fibre. Engineered wood products and other wood products businesses created the highest sales per full-time equivalent employee but had low employment per 1,000 m³. The other wood products business type had the highest sales per employee but relatively low sales per cubic metre.

3.2 Locations

Figure 1 shows the distribution of the businesses across Ontario in 2017.² The vast majority (96%) of businesses were located in the south of the province, especially around heavily populated Toronto (Southern–Aurora: 48%) and west of Toronto (Southern–West: 38%). Secondary manufacturing was very sparse in the Northwest and Northeast regions of the province, with a combined share of 4% of all secondary wood manufacturing businesses.

All business types were represented in the heavily populated southern region but we found a few differences across the three southern sub-regions. In and around Toronto millwork, cabinets, and furniture business types dominated while the east and west southern regions were slightly more diversified with a greater presence of other wood products, remanufacturing and engineered wood products business types. The northeast region population, though small, is relatively diversified with a number of plywood and panelboard, remanufactured products, other wood products, and engineered wood products businesses. The Northwest is the least diversified region, with no remanufactured products and furniture businesses, but there were a number of engineered wood products, other wood products, and plywood and panelboards businesses.

² The two northern regions correspond to the natural resource regions used by the Ontario Ministry of Natural Resources (OMNR) while the southern regions correspond to the OMNR southern region subdivided into three sub-regions using OMNR natural resource district groupings.

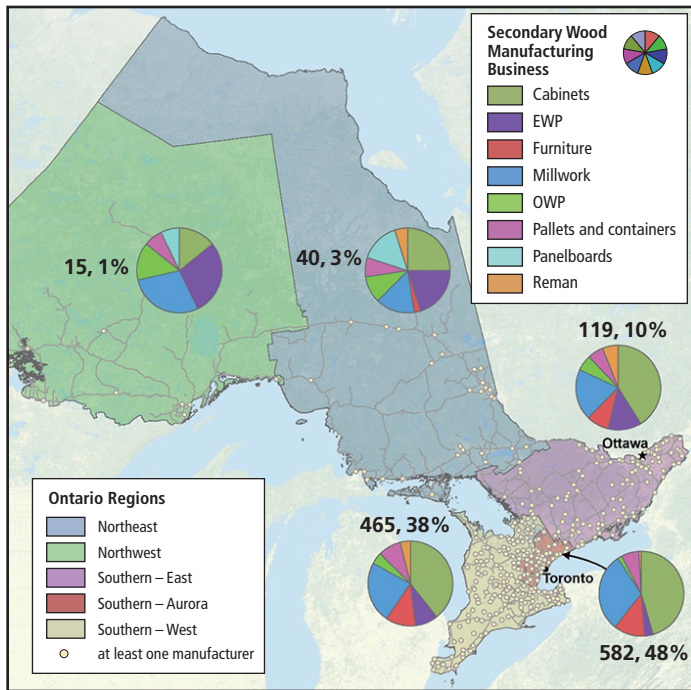


Figure 1. Locations of Ontario's secondary wood manufacturers in 2017, showing number of firms and business type.

4 Survey Results

This section provides results and insights from the survey respondents. First, we profile the various businesses by products, employment, costs, and sales. Then, we take an in-depth look at the type and source of fibre used by the businesses. Next, we report on how respondents used the internet to support their businesses. Finally, we discuss the opportunities and challenges facing the survey respondents to understand the future outlook, and highlight possible areas where effort could be directed to support industry growth.

4.1 Employment

Employment information presented here comes from companies that completed the survey with employment information (280), companies that provided employment information by phone/email (467), and from internet sources (137). Across all businesses, the average number of employees per firm was 25.8 and the median was 10. A distribution of firms into three employee class sizes in Figure 2 shows that: 64% of firms had 1–15 employees, 25% had between 16–50 employees, and 11% had over 50 employees. A disproportionate share (4%) of large firms (> 50 employees) were located in the northeast region but the majority of large firms were located in either Southern-Aurora or southwest regions.

Figure 3 shows the geographic distribution of the number of employees by firm size. Although large firms (> 50 employees) made up only 11% of all firms, they accounted for 56% of

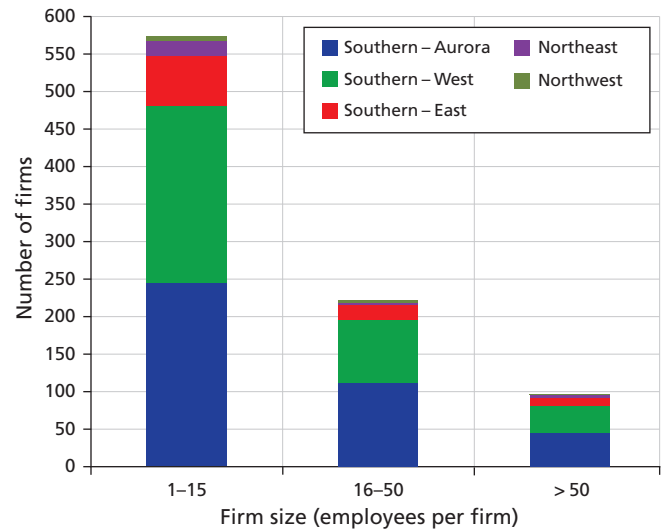


Figure 2. Geographical distribution of firms by firm size (884 responding firms).

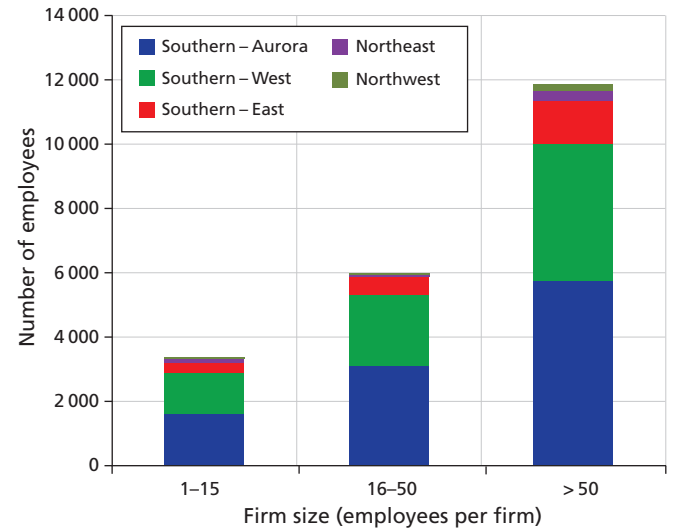


Figure 3. Geographical distribution of the number of employees by firm size (884 responding firms).

employment in the sector, and although small firms made up 64% of all businesses they accounted for only 16% of total employment. Geographically, 96% of employment was in the southern regions, with about 50% within Southern-Aurora.

Figure 4 indicates the employment distribution by business type. Approximately 76% of employment was concentrated in cabinets, millwork, or furniture businesses and 13% was in engineered wood product businesses.

Figure 5 shows the distribution of firm size by business type. Engineered wood products and furniture business types had the greatest share of large firms (> 50 employees) while other wood products and cabinet business types had the greatest share of small firms (< 15 employees).

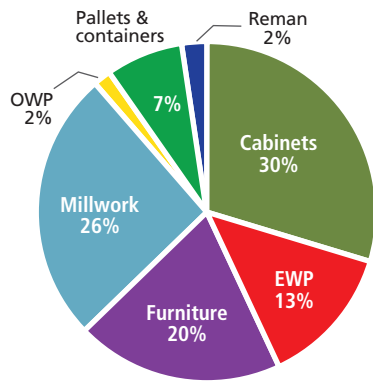


Figure 4. Employment distribution by business type (884 responding firms).

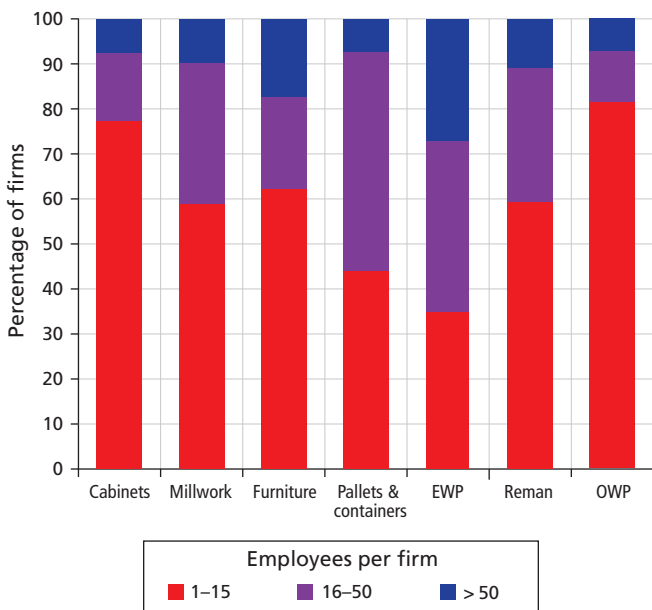


Figure 5. Distribution of firm size by business type (884 responding firms).

4.2 Sales

Four hundred and four companies provided gross sales figures for 2017. The average sales per firm were \$5.3 million and the median sales per firm were \$1.5 million. Many respondents generated relatively modest sales, with 41% of firms selling less than \$1 million, and only 10% of firms selling more than \$12 million. Figure 6 shows the revenue-class distribution by business type. Cabinets firms had the lowest average revenues, with approximately 60% of firms selling less than \$1 million—a significantly higher share than any other business type. Cabinets also had the lowest proportion of firms with sales exceeding \$12 million per year. Engineered wood products, on the other hand, had the smallest proportion of low-revenue firms and the largest proportion of high-revenue firms than any other business type.

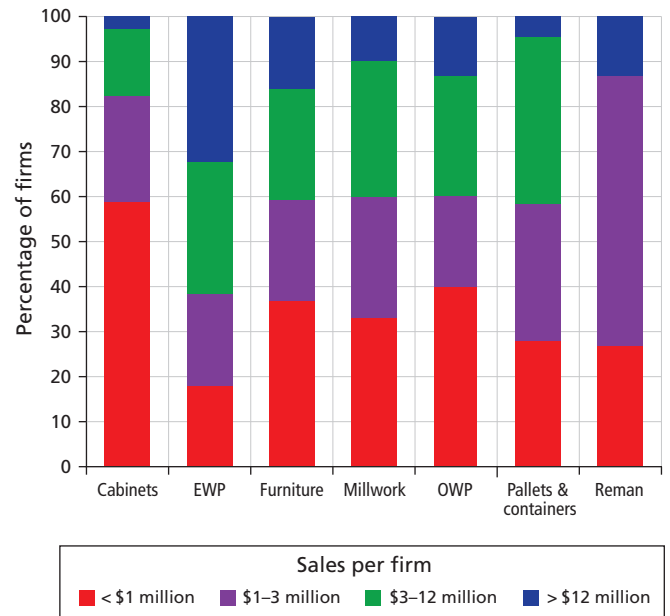


Figure 6. Distribution of respondents by revenue class and business type (404 responding firms).

Figure 7 illustrates the sales revenue distribution across business types. Millwork, furniture, and engineered wood products accounted for 73% of total sales. Remanufactured products was the smallest business type with only 2% of sales. However, it should be noted that several Ontario businesses involved in producing lumber or providing lumber wholesaling and distribution services also produced remanufactured products. Sales of remanufactured products, however, did not make up more than 50% of the total sales of this business type and so was excluded from the final population, as per our definition of a secondary wood product manufacturer.

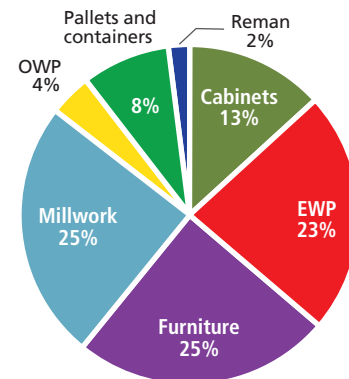


Figure 7. Distribution of revenue across business type (404 responding firms).

In addition to 2017 gross sales, we asked respondents to provide gross sales from 2016 and expected sales for 2018. Figure 8 shows the change in nominal sales by business type for 2017 vis-à-vis 2016 and 2018 vis-à-vis 2017. Of the firms that provided such information (219 firms with \$1.3 billion in sales in 2017), average

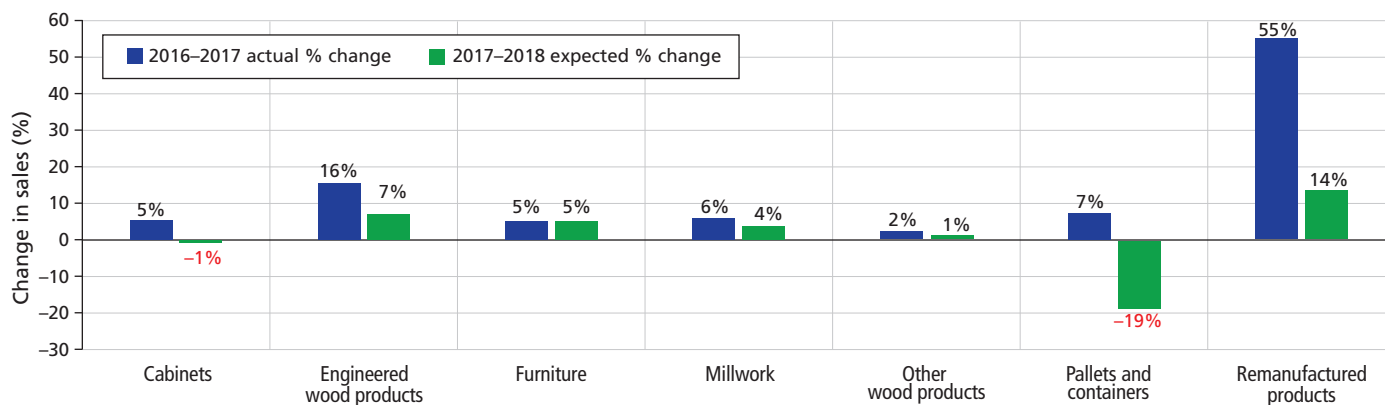


Figure 8. Percentage change in annual sales by business type (219 responding firms).

sales increased 9% between 2016 and 2017 and were expected to increase another 3% between 2017 and 2018. All business types improved sales in 2017 from 2016, with remanufactured products and engineered wood products increasing a 55% and 16%, respectively. These two business types expected the greatest percentage growth in sales in 2018, 14% and 7%, respectively. Pallets and containers and cabinets expected negative growth in 2018 of -19% and -1%, respectively.

4.3 End-use Markets and Services

This section summarizes the end-use markets that secondary wood products sector supply and the services that they provide to and purchase from other secondary wood product manufacturers. Table 3 indicates the percentage of respondents in each business type that manufacture for a particular end-use market.

Table 3. Percentage of respondents that produce products for select end-use markets (269 responding firms)

Business type	New residential (single-family homes)	Remodeling	Commercial buildings	Multiple-unit housing	Industrial uses	Industrial buildings	Other
Cabinets	82	93	31	39	6	13	1
Engineered wood products	93	43	54	54	18	32	–
Furniture	75	67	50	25	19	25	11
Millwork	75	65	53	36	17	24	8
Other wood products	31	31	8	–	38	15	31
Pallets and containers	–	4	–	–	92	12	4
Remanufactured products	100	86	29	43	29	43	14
All business types	71	65	38	32	22	20	6

The majority of firms manufactured products for new residential buildings (71%) and remodelling of existing buildings (65%). Other end-use markets were served by fewer than 40% of firms. The cabinets and remanufactured products business types concentrated on these two markets. The pallets and containers business type were most focused on industrial uses. The other business types targeted a variety of end-use markets.

We asked respondents if they bought or sold custom services, and the types of services acquired or provided (Table 4). Custom services were classified as manufacturing (e.g., resawing, planing, kiln drying) and non-manufacturing (e.g., marketing, distribution, logistics). Of respondents, 53% indicated that they purchased a custom service and 44% sold a custom service to another business. For the businesses that sold custom services and provided detailed responses ($n=92$), 46% provided non-manufacturing services, 77% provided manufacturing services, and 33% provided multiple services. Businesses were also

queried if they planned to expand into new services and, of the firms that responded ($n=249$), only 5% of firms indicated an intention to offer new services.

Table 4. Percentage of respondents purchasing (250 respondents) or selling custom services (262 respondents) or planning to expand services (249 respondents)

	Purchase custom services (%)	Sell custom services (%)	Plan to expand services sold (%)
Northern regions	33	46	27
Southern–East	35	52	4
Southern–Aurora	52	40	3
Southern–West	59	45	2
Ontario	53	44	5

4.4 Cost Structure

Respondents were asked to list the proportion of operating costs attributable to four cost categories: wood, labour, interest payments, depreciation, and other production costs. Wood represented 41%, labour 34%, other 16%, and depreciation and interest 6% (though this does not add to 100% due to rounding) of the total costs for responding firms. The other category varied across business type and included such costs like overhead, maintenance, transportation, and utilities.

Figure 9 highlights the cost distribution by business type across the four cost categories. Wood and labour expenditures ranged from 72% to 81% of operating costs across business types. Wood costs were the most significant cost for all business types, except for cabinets and furniture where labour was the most important cost component. Other costs varied between 12% and 22% across business types, and were most significant for engineered wood products. Depreciation and interest made up the smallest part of operating costs for all business types.

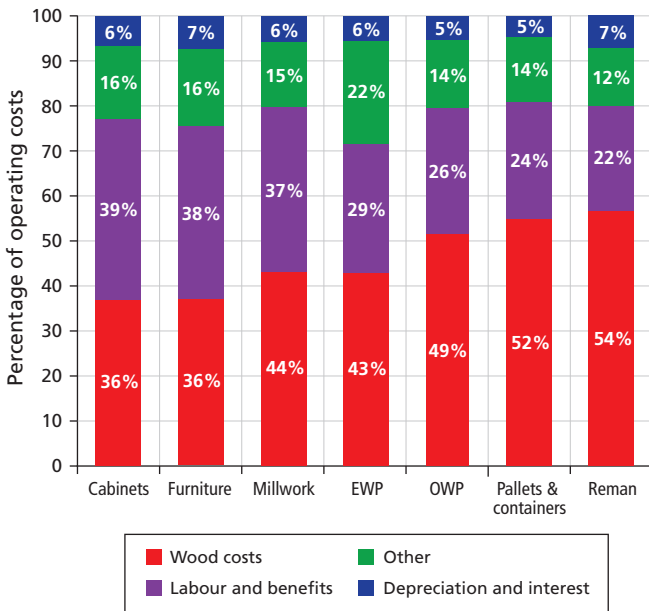


Figure 9. Distribution of operating costs across business types (223 responding firms).

4.5 Wood Material Utilization and Species

We asked respondents to report their wood fibre inputs in terms of logs, lumber, panelboards, and other primary wood products. All responses were converted into roundwood equivalent to allow for comparison across different types of wood inputs. The survey respondents ($n=228$) used over 3.2 million cubic metres of roundwood equivalent. Of the total wood fibre, 42% was lumber, 30% was wood residues, and 21% was logs (Figure 10). Only a small amount of wood fibre came from the other types of input: oriented strand board; medium-density fibreboard; plywood; veneer; other panelboards; and other wood fibre.

Respondents were also questioned about the source and percentage of total wood fibre used in their secondary

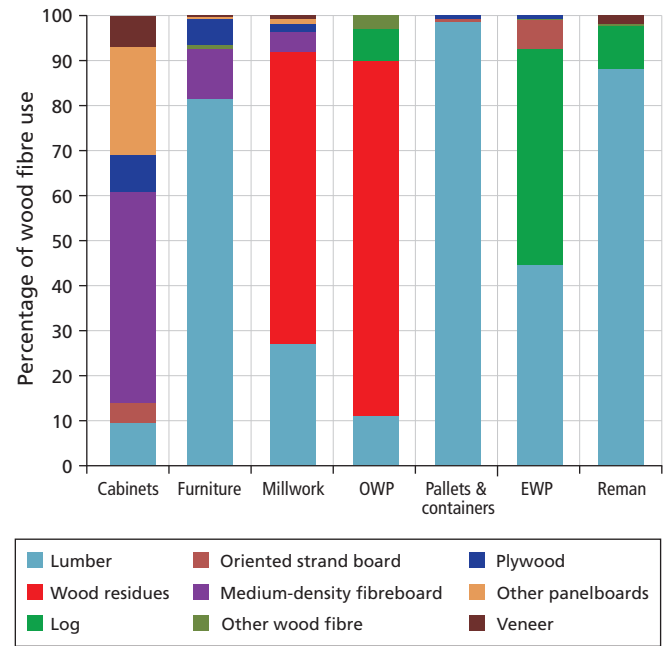


Figure 10. Distribution of wood fibre by business type (228 responding firms).

manufacturing facilities. Of the total volume of wood material used by the respondent businesses, 38% was sourced from the Ontario market, 26% from other parts of Canada, and 21% from log or lumber trades with other companies (Figure 11). The remainder of the wood material was sourced from either owned or tenured timberland (6%), imports from outside Ontario (5%), or material from own primary mills (4%). The percentage of companies that imported wood fibre from outside Ontario was 57% or 150 of the 263 responding firms. For these firms, Quebec was the most common source ($n=92$), followed by western Canada ($n=31$), northeastern US ($n=25$), and Atlantic Canada ($n=19$).

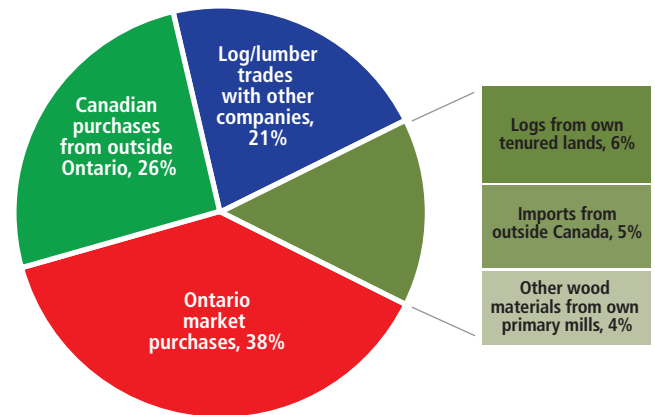


Figure 11. Source of wood fibre (263 responding firms).

Figure 12 illustrates the species of wood fibre used by all businesses (excluding plywood and panelboards). Coniferous species (such as spruce, red or white pine, or jack pine) comprised 73% and non-coniferous species (such as maple, oak and aspen) made up 27%.

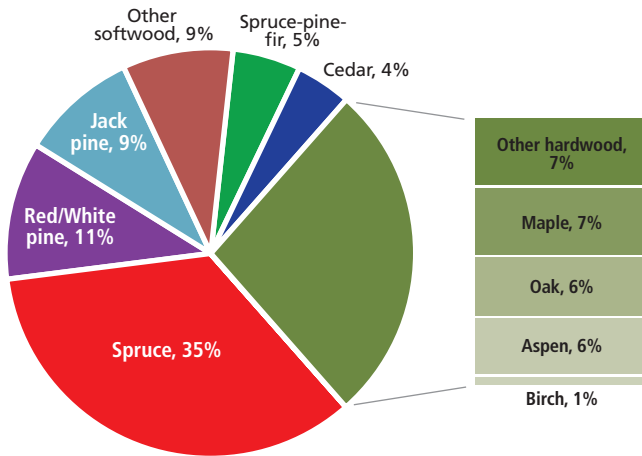


Figure 12. Wood species used by all business types excluding plywood and panelboards (250 responding firms).

Figure 13 shows wood species used by different business types. Cabinets and millwork used the highest percentage of hardwoods at around 40% and all other business used around 20% hardwoods. Pallets and containers, engineered wood products, and remanufactured products consumed the highest percentage of spruce and red or white pine.

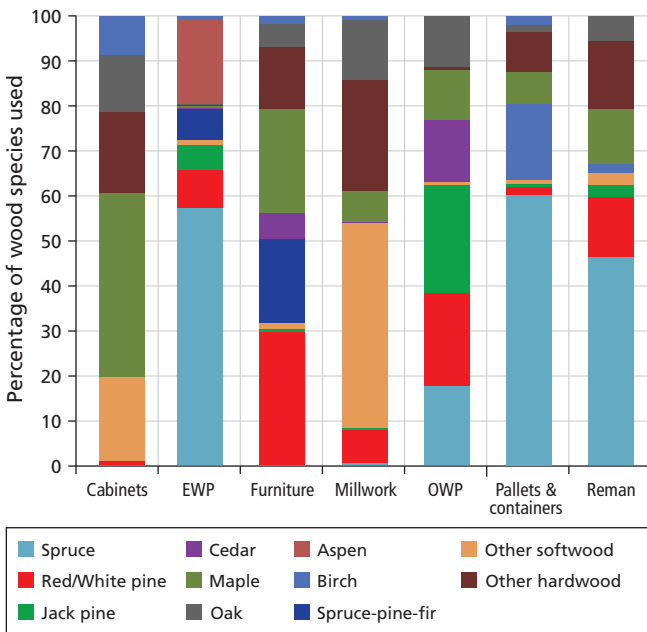


Figure 13. Wood species use by business type (250 responding firms).

4.6 Destination Markets

We also asked respondents where they sell their products. Figure 14 indicates the distribution of total sales (\$1.5 billion) by all responding firms ($n=219$) across markets. Of total sales, 68% was to Ontario, 25% was to various US regions, 6% was to other Canadian regions outside Ontario, and only 1% was to non-US overseas markets.

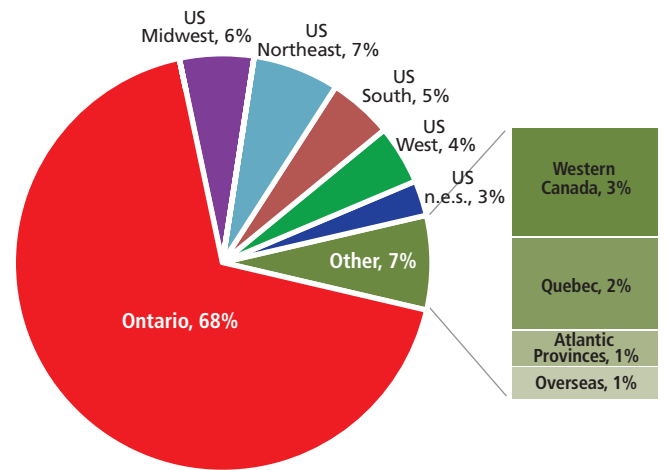


Figure 14. Distribution of total sales across destination markets (219 responding firms).

Figure 15 shows the sales distribution across destination markets by business type. Cabinets, pallets and containers, and remanufactured products were most focused on the domestic Ontario market while the furniture business type had the most market diversification, followed by engineered wood products, and other wood products.

Additionally, firms were asked if they planned to expand into new markets but only 35% of respondents indicated an interest in doing so. Of these companies ($n=77$), the markets of greatest interest were Ontario (77%), US Northeast (56%), Quebec (42%), and US Midwest (40%), while Asia (14%) and Europe (17%) were of least interest.

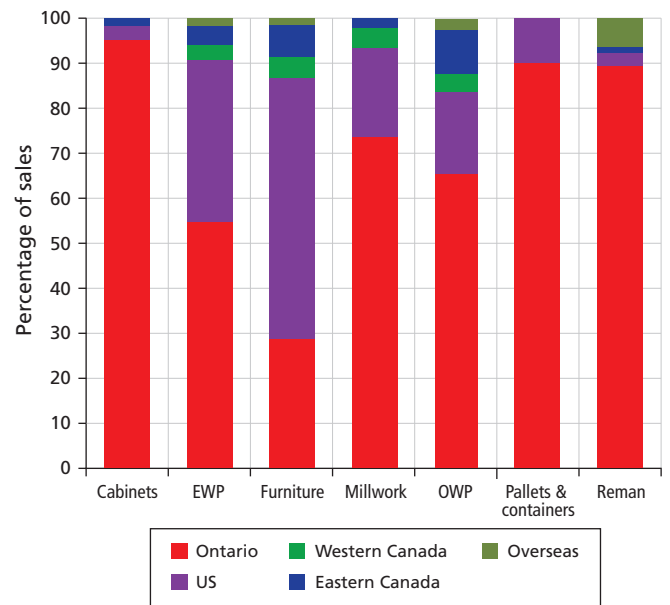


Figure 15. Sales distribution across destination markets by business type (219 responding firms).

4.7 Use of the Internet

To measure the use of existing and emerging electronic business practices, we asked survey respondents if they used the internet in some way to conduct their business. The survey responses were arranged into three groups that represented the firms' use of the internet: 1) management, 2) e-commerce, and 3) marketing (Table 5).

Table 5. Percentage of firms using the internet for management, e-commerce, or marketing by business type (302 responding firms)

Business type	Management		E-commerce		Marketing					
	Knowledge/ Info	Linked-In	Purchase	Sell	Website	Facebook	YouTube	Twitter	Instagram	Other
Cabinets	69	14	32	8	76	44	6	6	20	13
EWP	68	16	32	6	84	39	6	6	0	10
Furniture	78	19	42	17	72	39	11	17	22	11
Millwork	72	17	35	15	78	28	8	12	23	14
OWP	47	5	32	21	47	26	5	11	5	0
Pallets & containers	71	6	42	16	77	10	0	10	0	0
Reman	33	0	11	0	56	33	0	11	11	11
Total	69	14	34	12	75	34	6	10	16	11

firms utilized it to purchase goods or services and 12% used it to sell goods and services. Furniture and pallets and containers were the most likely business types to purchase goods on-line while other wood products was the most likely to use the internet to sell products.

About 75% of all respondents had a website. This was by far the most common use of the internet for marketing. Facebook and Instagram were used by 34% and 16% of companies, respectively. Cabinet and furniture business types, that tend to produce finished products where visual appeal is important, tended to use Facebook or Instagram more than others. The website Houzz, which brings together home owners, designers, and home improvement professionals, was mentioned by several cabinet, furniture, and millwork firms (recorded under "Other" in Table 5).

4.8 Capacity Utilization and Expansion Plans

Respondents were asked about their level of manufacturing capacity utilization and expansion plans. Manufacturing capacity refers to the maximum volume of products that a mill is designed to produce over a one-year period. Table 6 indicates that all business types were operating at an average capacity of 78%. Remanufactured products was operating at the lowest average operating capacity of 57%, and the cabinet and millwork business types were operating at average rates over 80%.

With regard to expansion plans, 40% of respondents had intentions to expand capacity over the period of 2018–2020 (Table 7). Of these firms, the average expected capacity expansion was 26%. Interestingly, 63% of engineered wood products business type expressed intentions of increasing capacity over the three-year period, with an average expansion plan of 36%.

Of firms employing the internet for management purposes, 69% used it to acquire knowledge and information. Fourteen percent utilized Linked-in for the latter purpose although this social media tool suited for employee recruitment, was used to some extent by all businesses types except remanufactured products. Of firms using the internet for e-commerce, 34% of

Table 6. Capacity utilization by business type (273 responding firms)

Business type	2017 capacity utilization (%)
Cabinets	83
Engineered wood products	79
Furniture	67
Millwork	82
Other wood products	71
Pallets and containers	69
Remanufactured products	57
All business types	78

About 40% of furniture, cabinets, millwork, and other wood products business types intended to expand their capacity by an average of 30%. Remanufactured products as well as pallets and containers business types had the lowest expansion intentions at 13% and 25%, respectively, with averages of 25% and 19%, respectively.

Table 7. Percentage of respondents expecting to expand capacity and average expansion by business type (273 responding firms)

Business type	Plan to expand (%)	Expected expansion (%)
Cabinets	40	30
Engineered wood products	63	36
Furniture	46	30
Millwork	36	30
Other wood products	38	25
Pallets & containers	25	19
Remanufactured products	13	25
All business types	40	26

4.9 Constraints to Expansion

We asked respondents to rate six factors that might constrain their ability or expectations to expand capacity over the next few years. The six factors we were interested in were: labour, markets, finance, management capacity, wood supply, and transportation/distribution. Respondents rated each factor on a scale of 1 to 5, with 1 as not at all constraining and 5 as very constraining. Based on firms' responses, the most constraining factor was labour, with over 50% of the firms scoring labour as a 4 or 5 (Figure 16). This was followed by markets, with over 30% of respondents rating it a 4 or 5. All other constraints were relatively modest with less than 20% of businesses rating them as either a 4 or 5. Note that further grouping of the data into regions showed that wood supply was a dominant constraint to capacity expansion for companies located in the northwest and northeast regions of Ontario, with an average rating of 3.4 out of 5.

Responding companies were also requested to rate subcategories of the six factors in order to provide some insights into the specific issues that may constrain expansion. Table 8 provides the average score for each factor and their subcategories. Labour-related constraints that had the highest mean scores were labour experience (3.6) and labour costs (3.4). Even though market constraints were rated second highest on average (2.9) by all businesses, no sub-factor was rated above 2.5 indicating they were at most moderate constraints to expansion. In terms of finance constraints, finance costs and availability were rated highest in terms of constraining factors although the values were still modest at around 2.5. The highest rated management related constraints were increasing labour efficiency and reducing manufacturing costs, both of which are arguably also associated with labour constraints. For wood supply, price and price volatility were ranked as moderate constraints to capacity expansion. Finally, transportation cost was identified as a moderate constraint with an average rating of 2.8.

Figure 17 presents the general constraints by business type and shows how key factors that could constrain growth may differ between business types. While labour was the highest rated constraint factor for all businesses types, it was least limiting for

Table 8. Detailed constraints to capacity expansion (236 responding firms)

Detailed constraint	Score
Labour	3.5
Experience	3.6
Cost	3.4
Training/skills	3.1
Flexibility	2.7
Markets	2.9
Market diversification	2.2
Market/Product research	2.1
Product diversification	2.0
Softwood Lumber Agreement	2.0
Foreign regulations	1.9
Finance	2.6
Cost	2.6
Availability	2.4
Flexibility	2.3
Repayment schedule length	2.2
Management capacity	2.4
Increasing labour efficiency	3.2
Reducing manufacturing costs	3.1
Improving raw material recovery	2.5
Implementing lean/just-in-time manufacturing techniques	2.4
Improving product quality	2.4
Wood supply	2.0
Price	3.1
Price volatility	3.1
Quality/Grade	2.6
Volume	2.2
Transportation/distribution	1.9
Costs	2.8
Access	2.2
Logistics	2.2
Frequency	2.1

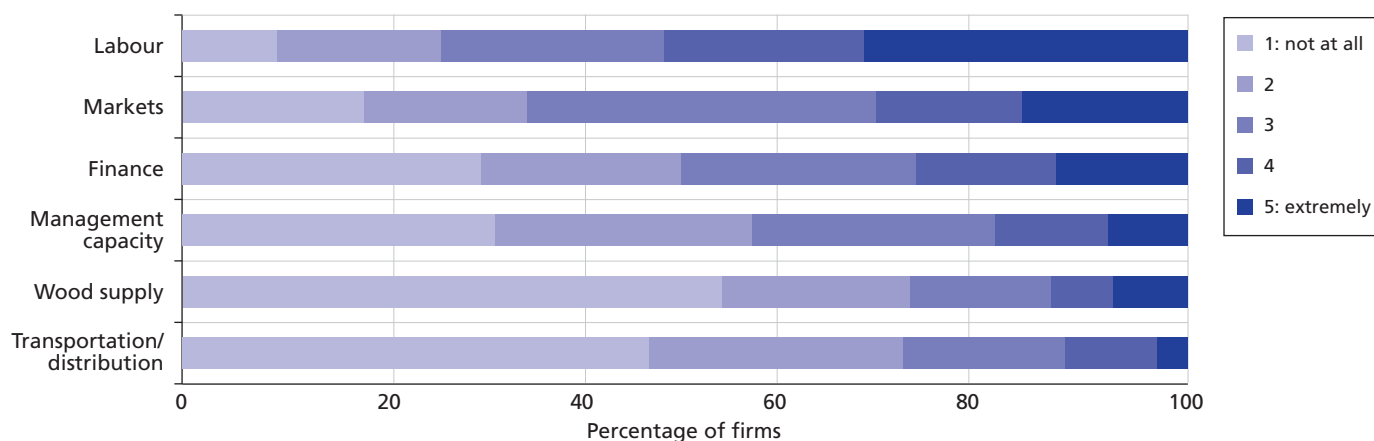


Figure 16. General constraints to expansion: distribution of rankings (236 responding firms).

other wood products for which the main constraining factor was markets. Markets was also a significant factor for furniture and pallets and containers. For pallets and containers, wood

supply was clearly an issue while transportation seemed to be a somewhat important constraint. Finally, finance appeared to be a moderate issue for furniture, cabinets, and millwork business types.

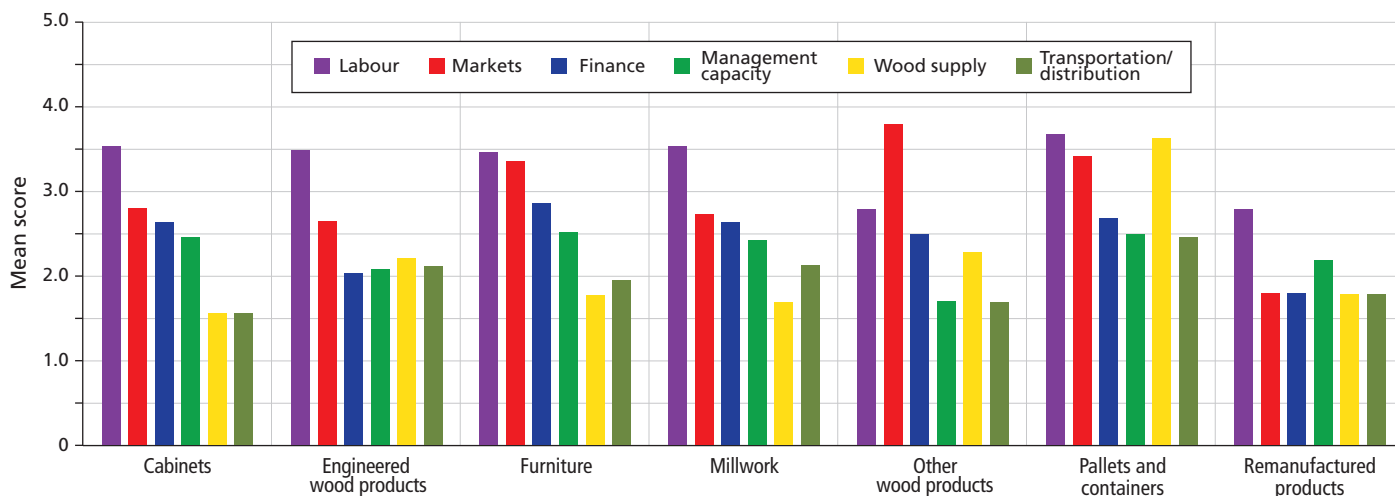


Figure 17. General constraint rating by business type (236 responding firms).

5 Conclusion

The Ontario secondary wood product manufacturing sector was not much different in 2017 than it was 15 years ago when the last comprehensive study of the industry was conducted. Since the early 2000s, the industry has decreased in size. The sector was still largely located in the more densely populated area of southern Ontario, and was heavily structured to millwork, furniture and cabinet businesses. One difference between the North and South was that the North had a more commodities-focused industry grouping co-located near primary industry and had a timber supply. The sector was heavily focused on the domestic Ontario market, though 25% of 2017 sales of survey respondents were to the US. As the US housing market continues to improve, there will be opportunities for growth within North America. However, expanding sales to overseas markets from the current small base remains a challenge.

The Ontario sector contracted like other forest sectors during the recession of 2008–2009 but continues to rebound. Many firms surveyed expected to grow over the near term. At the time of this survey, firms indicated that labour, markets and finance were the key constraints to growth. Responses suggested that labour issues such as lack of experienced workers and the costs of workers were the most pressing challenges.

The cyclical nature of commodity forest product markets continues to support interest in promoting sustainable growth of the Ontario value-added wood processing sector. The key challenge going forward is how to expand the production base outside the southern region. Through accurate and timely information on the existing structure and challenges provided by this survey, a comprehensive assessment of various options is made possible, greatly benefitting future policy development focused on the Ontario secondary wood product sector.

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Appendices

Appendix 1: Statistics Canada data and analysis

North American Industry Classification System (NAICS) and correspondence to our Business Type classification

Secondary wood manufacturing industries, as defined in our study, largely fall within five industrial groups of the North American Industry Classification System (NAICS) used by Statistics Canada:

- 3212 – Veneer, Plywood and Engineered Wood Product Manufacturing;
- 3219 – Other Wood Product Manufacturing;
- 337110 – Wood Kitchen Cabinet and Countertop Manufacturing;
- 337123 – Other Wood Household Furniture Manufacturing; and
- 337213 – Wood Office Furniture, including Custom Architectural Woodwork, Manufacturing.

The business type “Remanufacturers” falls under several NAICS groups:

- 3211 – Sawmills and Wood Preservers (Siding and Dressed Lumber);
- 321919 – Other Millwork (Planed Lumber);
- 321999 – All Other Miscellaneous Wood Product Manufacturing (Fencing).

Also, businesses producing products such as wood fuel pellets or horticultural products that are under our “other” business category, are listed under NAICS 321999 (i.e., All Other Miscellaneous Wood Product Manufacturing). Table A1 lists the NAICS codes and names corresponding to the business groupings of secondary forest products used in this study.

Table A1. Correspondence between business types used in this study and North American Industrial Classification System (NAICS) 6-digit groups

NAICS code	NAICS description	Corresponding business type in this study
321114	Wood preservation	Other wood products
321211	Hardwood veneer and plywood mills (US)	Panelboards
321212	Softwood veneer and plywood mills (US)	Panelboards
321215	Structural wood product manufacturing	Engineered wood products
321216	Particle board and fibreboard mills	Panelboards
321217	Waferboard mills	Panelboards
321911	Wood window and door manufacturing	Millwork
321919	Other millwork	Millwork/remanufacturing
321920	Wood container and pallet manufacturing	Pallet and containers
321991	Manufactured (mobile) home manufacturing	Buildings – Engineered wood products
321992	Prefabricated wood building manufacturing	Buildings – Engineered wood products
321999	All other miscellaneous wood product manufacturing	Other wood products/remanufacturing
337110	Wood kitchen cabinet and countertop manufacturing	Cabinets
337121	Upholstered household furniture manufacturing	Furniture
337123	Other wood household furniture manufacturing	Furniture
337213	Wood office furniture, including custom architectural woodwork, manufacturing	Furniture/millwork

Statistics Canada’s Annual Survey of Manufacturers and Logging provides information on Ontario’s forest sector industries and includes information on revenues, employee numbers, number of firms, and costs; the most recent release is for the 2017 manufacturing year (Statistics Canada 2017). Because of confidentiality laws, information is often suppressed, preventing a detailed disaggregation of the industry to separate out non-wood and wood material industries, such as with furniture manufacturing and related industries (NAICS 337). In other cases, data were not available for each year; however, the available data can still provide a good understanding of historical and recent trends.

For the aggregation of furniture (NAICS 337), other wood product manufacturing (NAICS 3219), structural wood product manufacturing (NAICS 321215), and wood preservation (NAICS 321114), sales from manufacturing and employment experienced significant growth between 1990 and 2001 followed by a relatively stable period before falling quickly during the Great Recession (2008/2009) (Figures A1 and A2). Furniture manufacturing grew steadily from 1990 to around 2000 before leveling off for several years, declining gradually between 2003 and 2007 and followed by a sudden drop in 2008. Since 2011 furniture sales have been rising steadily. Because this broad aggregate includes both wood and non-wood furniture, it is not clear how wood furniture manufactures fared over this period. A closer look at sub-industries that fit the definition of wood furniture manufacturing (NAICS 337121, 337123, 337213) and cabinetry (NAICS 337110) shows that only cabinetry has seen sales and employment growth since 2009 (Figure A3). Other wood products (3219) grew steadily between 1994 and 2003 and then declined between 2004 and 2011. Since 2012 this aggregate has been on a slow ascent in terms of sales (Figure A1) and employment (Figure A2), but most of the growth has been in the subsectors 321919 and 33711 (Figure A3). These sub-sectors include moulding and flooring (NAICS 321919) and cabinets and countertops (33711). In contrast to NAICS 321919 and 33711, other wood household furniture (NAICS 337123), wood container and pallet manufacturing (NAICS 32192), wood door and window manufacturing (321911), and all other wood product manufacturing (32199), which included among other things prefabricated/ manufactured buildings and wood fuel pellets, experienced steady to slightly growing nominal sales between 2009 and 2017.

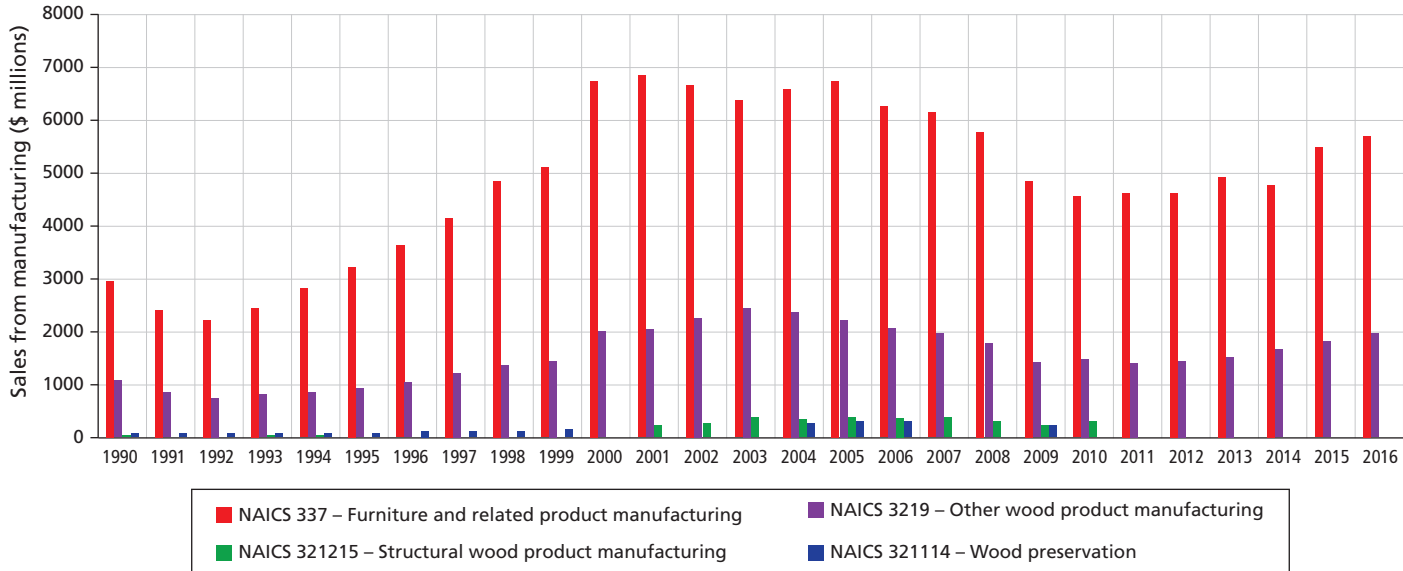


Figure A1. Sales from manufacturing select industry aggregates, 1990–2016 (source: Statistics Canada 2005, Statistics Canada 2014, and Statistics Canada 2017).

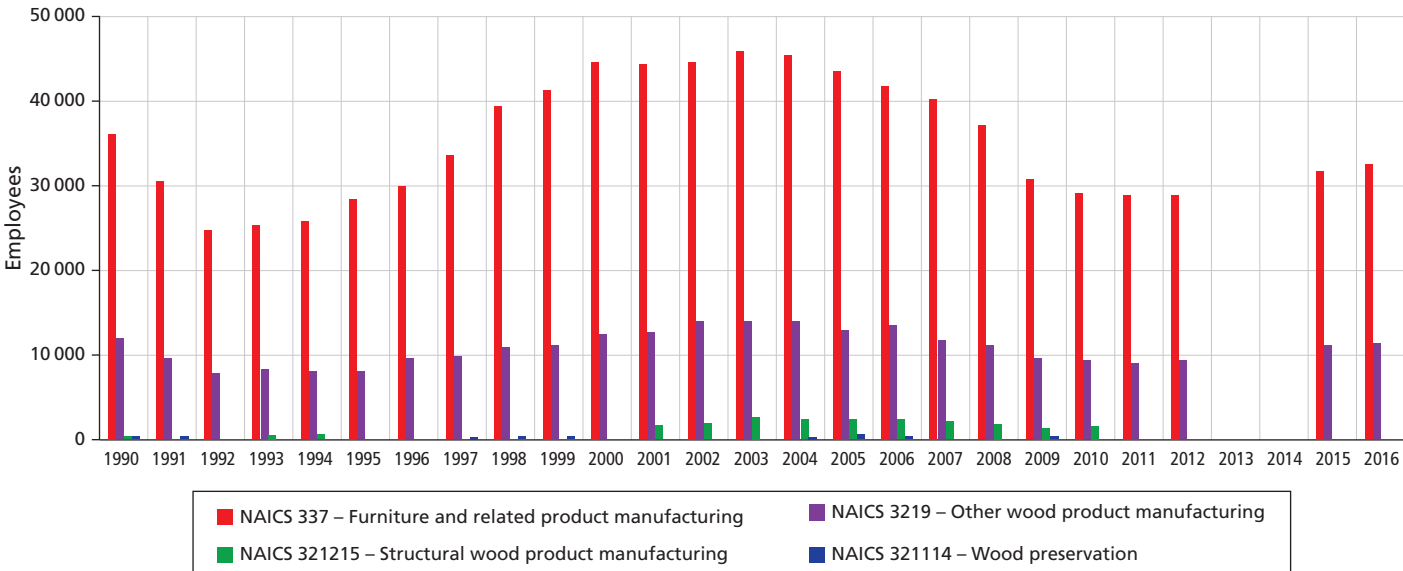


Figure A2. Total number of employees for select industry aggregates, 1990–2016 (source: Statistics Canada 2005, Statistics Canada 2014, and Statistics Canada 2017).

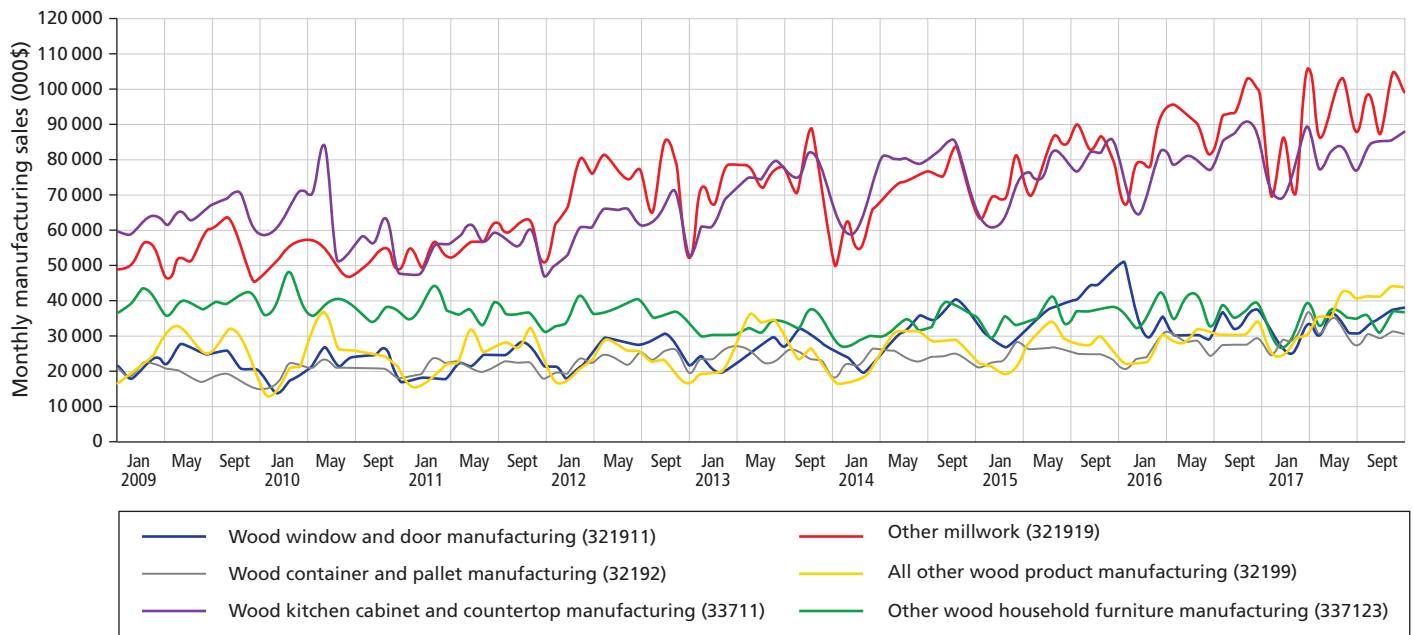


Figure A3. Monthly sales for select industry aggregates, 2009–2017. (source: Statistic Canada 2018a).

Table A2 illustrates the correspondence between business types used in this survey report and the Harmonized System of traded products used internationally and by Statistics Canada. Using these correspondence, export and import trade data of secondary wood products to and from Ontario is illustrated in A4.

Table A2. Harmonized System for traded products code, description and correspondence to business types

Business type used in study	HS code	Product description
Other	HS 440131	Sawdust, wood waste and scrap w/ or not agglomerated in logs, briquettes, pellets: wood pellet
Other	HS 440310	Wooden telephone poles, fence posts, other wood in rough – painted, stained or treated
Other	HS 4404	Hoopwood, split poles, piles, pickets and stake
Other	HS 440690	Cross-ties (sleepers) railway/tramway – wood – impregnated
Panelboard	HS 4408	Veneer/plywood sheets (thickness <6 mm)
Millwork	HS 4409	Wood (lumber) continuously shaped
Panelboard	HS 4410	Particle board of wood or other ligneous material
Panelboard	HS 4411	Fibreboard
Panelboard	HS 4412	Plywood (plies <6 mm thick) and veneered or laminated panel
Other	HS 4413	Densified wood – in blocks, plates, strips or profile shape
Other	HS 4414	Wooden frames
Pallets and containers	HS 4415	Cases, boxes, crates, drums, pallets, load boards and similar packing articles of wood
Other	HS 4417	Tools (bodies and handles), broom/brush bodies, footwear parts of wood
Millwork	HS 4418	Windows, doors, shingles and shakes, panels and other builders, joiners and carpentry of wood
Other	HS 4419	Tableware and kitchenware of wood
Other	HS 4420	Wood statuettes, ornaments, caskets, cases; wood marquetry and inlaid wood
Other	HS 4421	Other articles of wood
Furniture	HS 940161	Seats with wooden frames – upholstered
Furniture	HS 940169	Seats with wooden frames – not upholstered
Furniture	HS 940330	Wooden furniture for office use
Furniture	HS 940340	Wooden furniture for kitchen use
Furniture	HS 940350	Wooden furniture for bedroom use
Furniture	HS 940360	Wooden furniture for other use
Buildings – engineered wood products	HS 940600	Prefabricated buildings ("industrialized buildings")

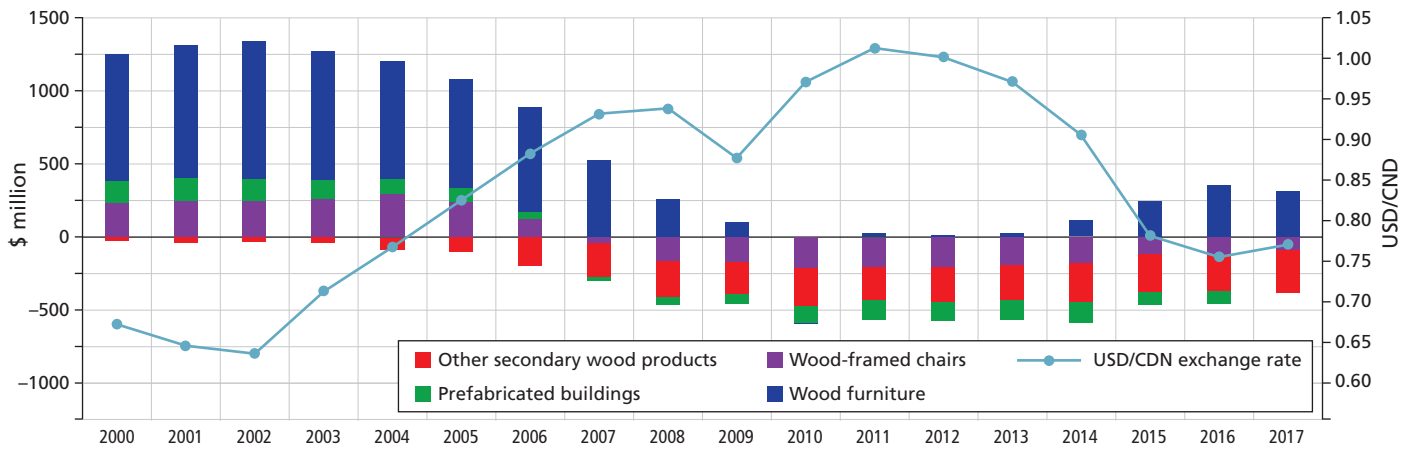


Figure A4. Aggregate exports (X) and imports (M) for NAICS 6-digit industries, excluding panelboards (NAICS 321211, 321212, 321217) (source: Trade Data Online website).³

Foreign trade of secondary wood products to and from Ontario has dramatically changed since 2000. Ontario shifted from being a significant net exporter in 2000 to a net importer by 2016 (Figure A4). The growth in exports between 2000 and 2002 was consistent with the overall growth in the sector (Figures A1 and A2). Net exports peaked in 2003 and fell slowly over the next few years declining even more quickly beginning in 2006. Decreased export demand due to the recession and increased import competition were likely behind the reduced overall sales and employment over this period. Although it is difficult to determine which factors contributed to these trends, the overall trade balance trend tracks changes in the US–Canadian dollar exchange rate, suggesting loss of competitiveness related to the strengthening Canadian dollar in between the period of 2003 and 2011 (Figure A4).

A detailed look at Ontario’s furniture trade uncovers two key trends since 2000 (Figure A5):

1. a dramatic decrease in non-office wood furniture exports; and
2. a dramatic increase in imports of all non-office wood furniture.

Between 2000 and 2017 between 95–99% of Ontario’s furniture exports were to the US. As such, it is not surprising that trends in Ontario exports (blue bars in Figure A5) line up with the US–Canada exchange rate trends as shown in Figure A4 and general economic activity in the US. Furniture imports, on the other hand, did not solely come from the US. Moreover, the US share of Ontario imports decreased from 58% in 2002 to 35% in 2017. The shift in shares was due to a steady increase in exports from countries such as China and Vietnam over this same period.

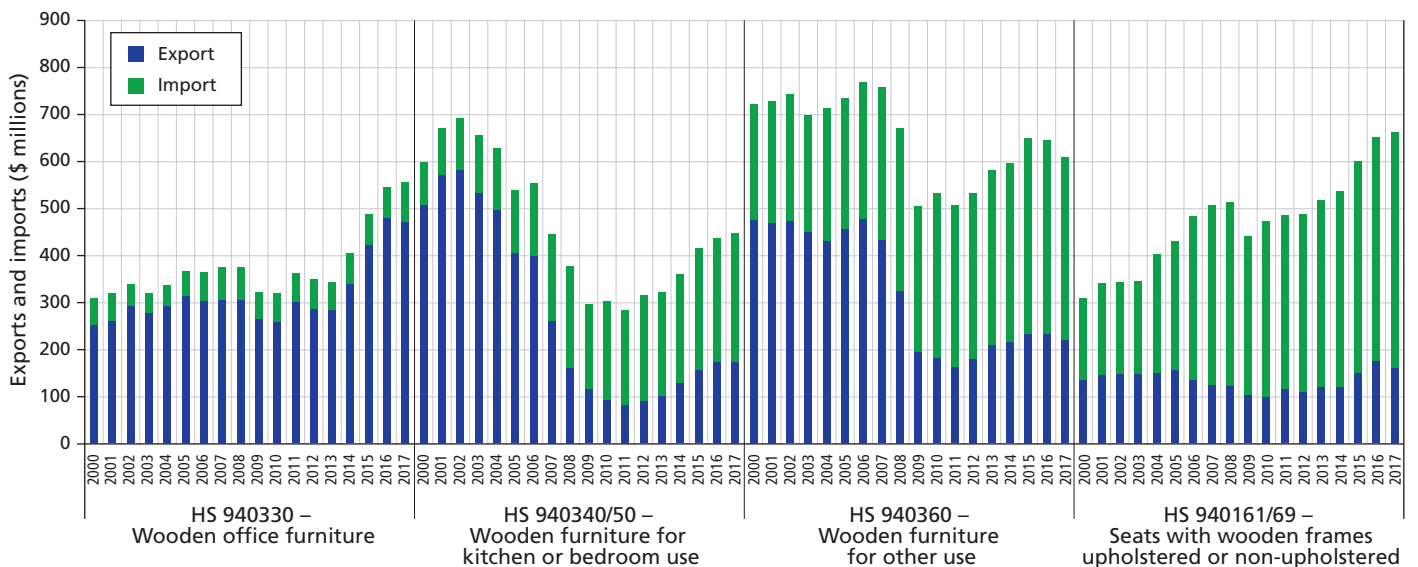


Figure A5. Ontario’s wood furniture imports and exports, 2000–2017 (source: Statistics Canada 2018b).

³ See Innovation, Science and Economic Development Canada’s “Trade Data Online” (TDO) website at: <https://www.ic.gc.ca/eic/site/tdo-dcd.nsf/eng/home>.

Although panelboard mills are technically classified as secondary manufacturing mills because of the large average size of mills and the scale of the industry, they are sometimes treated as a primary industry. In this study, we recognized panelboards as part of the secondary wood manufacturing sector but excluded them from the survey analysis owing to confidentiality issues and low survey response rate. Here we provide a cursory overview of the industry trends and current state using data available from Statistics Canada and Innovation, Science and Economic Development Canada.

In 2016, the veneer, plywood and engineered wood product industry group (NAICS 3219) had sales of \$1.25 billion and employed over 3,500 people (Figure A6; Statistics Canada 2017). Between 1990 and 2004, the industry expanded considerably with employment and revenues peaking in the mid-2000s. After a significant decline during the US housing slump beginning in 2006 and the subsequent Great Recession of 2008–2009, the industry grew between 2011 and 2016.

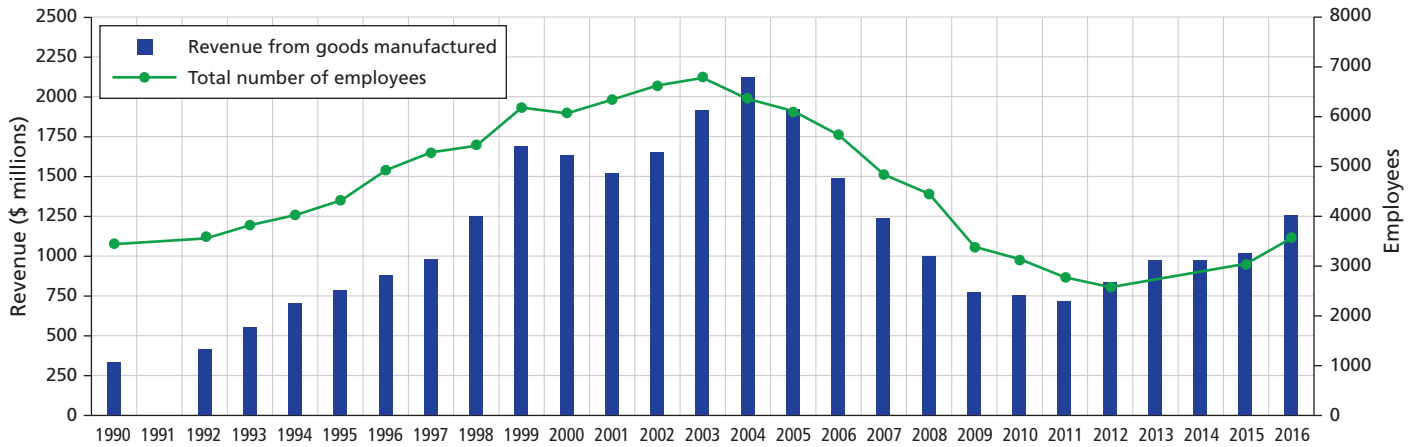


Figure A6. Manufacturing sales revenue and total number of employees for Ontario veneer, plywood, and engineered wood product manufacturing (NAICS 3212) 1990–2016 (source: Statistics Canada 2005, Statistics Canada 2014, and Statistics Canada 2017).

In 2017, Ontario’s exports of panelboard products reached \$640 million after hitting a low of \$237 million in 2011 in the aftermath of the Great Recession (Figure A7). At the time of this study, nearly all of Ontario’s waferboard, fibreboard, and plywood exports were shipped to the US, with the province’s panel industry fueled by demand for waferboard (orientated strand board) in US housing construction (Figure A7). After reaching a low point for exports in 2011, exports of waferboard to the US reached \$400 million in 2017 as the US housing market continued to grow. Ontario’s exports of fibreboard and plywood were also volatile hitting below \$100 million in sales in 2011 although they have rebounded since then, though still below highs reached in the early 2000s at the time of this study. Recently, imports of fibreboard and plywood have been growing with China as the dominant supplier. With growing imports and declining exports, Ontario’s balance of trade was negative for fibreboard and plywoods in 2017.

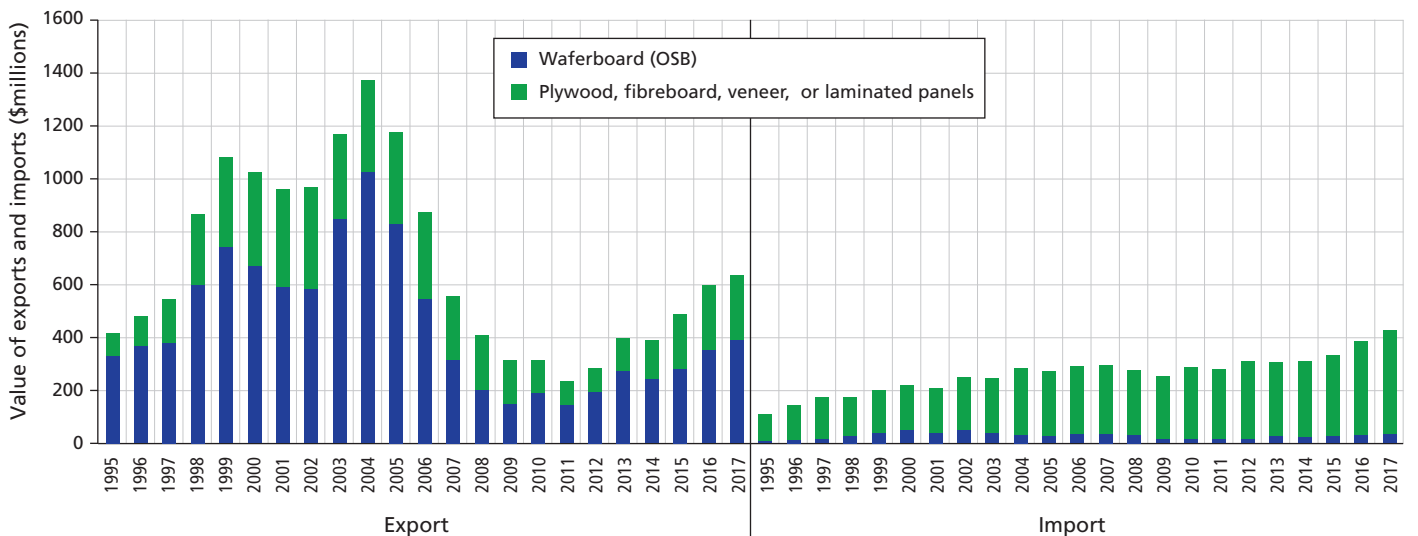


Figure A7. Value of exports and imports of waferboard (oriented strand board), fibreboard, and plywood, 1995–2017.⁴

4 Ibid.

Since 1992, the industries associated with secondary wood product manufacturing have grown considerably, although most of this growth occurred in the 1990s (Figure A8). Real manufacturing sales measured in 2016 dollars for “secondary wood manufacturing” (NAICS 3219, 3371, 3372, ex. 3212) grew 66% from \$4.2 billion in 1992 to over \$7 billion in 2016, with peak sales occurring in 2002. In comparison, over similar periods, real manufacturing sales decreased 33% for pulp and paper (1992–2013), increased 38% and 140% for sawmilling and panelboards, respectively. Since the 2009 recession, however, secondary manufacturing growth (9%) has not kept pace with the growth of sawmilling (90%) and panelboards (76%). At the end of 2016, secondary manufacturing was the second largest forest industry group in sales, although if panelboards were included, it would be the largest forest industry grouping in Ontario.

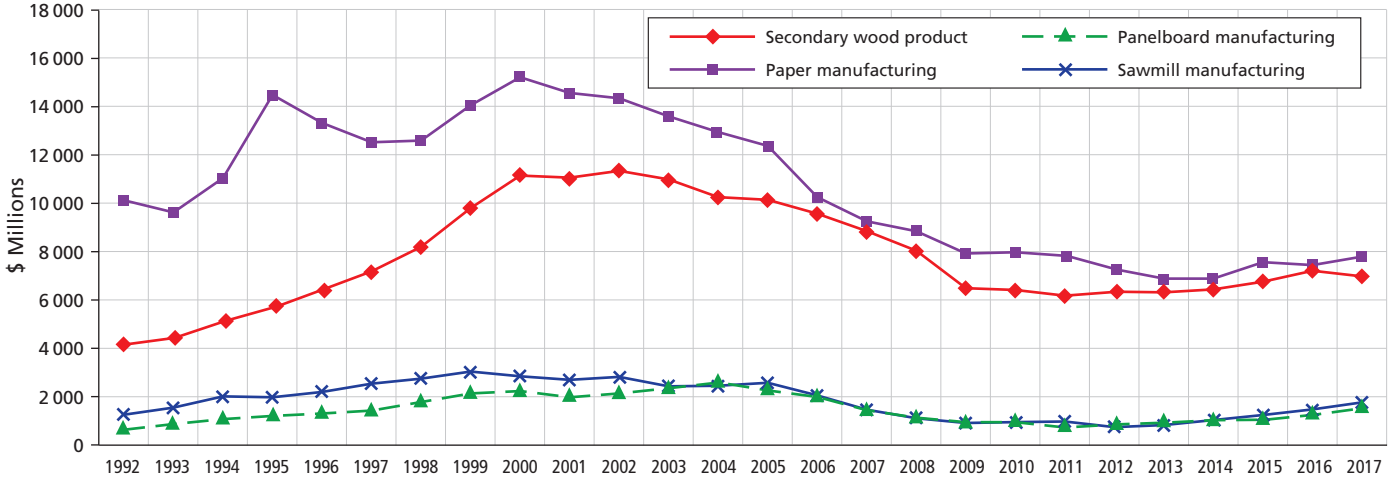


Figure A8. Real sales from manufacturing (2016 constant dollars), 1992–2017. Note: Data unavailable for some years. Engineering wood product components included in “panelboard manufacturing” and not all furniture included in “secondary wood manufacturing” is wood furniture (source: Statistics Canada 2018a and Statistics Canada 2018c).

Appendix 2: Taxonomy of secondary manufactured wood products

This taxonomy is based on Wilson and Ennis (1993).

Log products	Wood products		
	Primary ^a	Intermediate	Final
Chopsticks	Boards	Building/home	Boxes, bins, and crates
Firewood	Cants	Components	Cabinets
House logs	Chips	Cutstock	Coffins
Pilings	Flitches	Door stock	Countertops
Poles	Lumber/Industrial timber	Edge-glued components	Decking
Posts	Treated timber	Finger-jointed stock	Fencing
Log homes	Veneer	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/RTA
		Pallet, crating stock	Garden buildings/products
		Medium-density fibreboard	Laminated veneer lumber
		Particleboard	Millwork/architectural, custom
		Pattern stock	Medium-density fibreboard
		Sawmill specialty products	Mouldings
		Staircase components	MSR lumber
		Turning squares	Oriented strandboard
		Window stock	Pallets
			Paneling
			Plywood
			Prefab buildings and manufactured homes
			Oil and gas drill rig mats
			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 was inserted to provide a more complete taxonomy.

Appendix 3: Wood products by business type

Remanufactured Products

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

Engineered Wood Products

- Laminated beams
- Trusses
- Treated wood
- Laminated veneer lumber
- Cross-laminated timber

Engineered Wood Products: Buildings

- Log homes
- Prefab buildings

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

Panelboards

- Plywood
- Oriented strand board
- Particleboard
- Medium-density fibreboard

Other Wood Products

- Poles and posts
- Wood novelties
- Veneer
- Woodcrafts
- Instruments
- Fuelwood pellets
- Oil and gas drill rig mats

Appendix 4: 2017 Survey of Ontario Wood Product Secondary Manufacturing

Survey purpose

This survey collects manufacturing and related information on the Ontario secondary wood manufacturing sector. Natural Resources Canada has been doing similar surveys since 1990 in BC and this is the first for Ontario. This information will provide an accurate information base to describe the structure, performance and needs of the secondary manufacturing sector in Ontario. This will be a key source of information on the sector that will be used by policy makers in Ontario and we hope will be useful for forest industry associations. These data are used for statistical analyses and to produce published reports and presentations on the state of the industry.

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. We define a mill as a specific facility or area where manufacturing occurs such as a shop, planer mill etc.

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 **2017** 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 **2017**.

Note: m³=cubic meters; mbf=thousand board feet; msf= 1,000 square feet 3/8" basis; odt=oven-dried metric tonnes

Type of Raw Wood Material	Volume	Units of Measure
Logs		<input type="checkbox"/> m ³ <input type="checkbox"/> mbf <input type="checkbox"/> other _____
Lumber		<input type="checkbox"/> m ³ <input type="checkbox"/> mbf <input type="checkbox"/> other _____
Plywood		<input type="checkbox"/> m ³ <input type="checkbox"/> msf <input type="checkbox"/> other _____
Veneer		<input type="checkbox"/> m ³ <input type="checkbox"/> msf <input type="checkbox"/> other _____
Oriented Strand Board (OSB)		<input type="checkbox"/> m ³ <input type="checkbox"/> msf <input type="checkbox"/> other _____
Medium-density fibreboard (MDF)		<input type="checkbox"/> m ³ <input type="checkbox"/> msf <input type="checkbox"/> other _____
Wood residues		<input type="checkbox"/> m ³ <input type="checkbox"/> odt <input type="checkbox"/> other _____
Other wood material (please specify):		
		<input type="checkbox"/> m ³ <input type="checkbox"/> mbf <input type="checkbox"/> msf <input type="checkbox"/> other _____
		<input type="checkbox"/> m ³ <input type="checkbox"/> mbf <input type="checkbox"/> msf <input type="checkbox"/> other _____

5b. Please provide the sources of raw wood material used by your mill in **2017** (provide best estimate):

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

5c. If you sourced wood material from outside Ontario in **2017**, please indicate where you sourced these raw materials from. Please check all that apply.

Quebec	<input type="checkbox"/>	Europe	<input type="checkbox"/>
Atlantic Canada	<input type="checkbox"/>	Japan	<input type="checkbox"/>
Western Canada	<input type="checkbox"/>	China	<input type="checkbox"/>
US West	<input type="checkbox"/>	Korea	<input type="checkbox"/>
US South	<input type="checkbox"/>	Other Asia	<input type="checkbox"/>
US Midwest	<input type="checkbox"/>	Latin America	<input type="checkbox"/>
US Northeast	<input type="checkbox"/>	Africa	<input type="checkbox"/>
		Australia/New Zealand	<input type="checkbox"/>

6. Please provide an estimate of the wood species used by your mill by **percentage** of total volume in **2017**.

Softwood	Jack pine	
	Red/White pine	
	Spruce	
Other softwoods (please specify):		
Hardwoods	Maple	
	Oak	
	Birch	
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 **2017**. (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 **2017**.
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 2017? _____%

9b. On average how many 8- to 10-hour shifts were running in 2017?

- 1
- 2
- More than 2

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

_____ % Unknown/unsure

9d. Does your business plan to expand manufacturing capacity over the three-year period 2018–2020?

- Yes
- No
- Don't know

If you responded yes, please continue to question 9e otherwise go to question 10a.

9e. By what percentage does your business plan to expand capacity over the three-year period of 2018–2020?

_____ %

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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Labour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Management Capacity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation/Distribution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

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 have a website?

- Yes
- No
- Don't know

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

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

- Yes
- No
- Don't know

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

- Yes
- No
- Don't know

11h. 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
- In process of adopting
- Other (please specify) _____

If you answered no to 11g please go to question 12a, otherwise continue to 11i.

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

- Yes
- No
- Don't know

11l. 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) _____

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

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

Markets

12a. What was the percentage breakdown of sales and revenues from the following markets in 2017?

Ontario	
Quebec	
Atlantic provinces	
Western 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.

- Ontario
- Quebec
- Atlantic provinces
- Western 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 Ontario 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 Ontario wood industry associations
- Other _____
- Don't know/unsure

Sales Revenue

13a. Please indicate this mill's **2017** gross revenue (to the nearest dollar). **(Free On Board at mill – C\$).**

Gross 2017 revenue: _____

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

Gross 2016 revenue: _____

13c. Please estimate the **expected 2018** gross revenue (to the nearest dollar). **(Free On Board at mill – C\$).**

Expected gross 2018 revenue: _____

13d. Please indicate the **percentage** of your mill's 2017 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 2017 revenue: _____

Products

14a. Please list up to **4** of the top grossing products manufactured at this mill and indicate approximate percentage of **2017** total sales revenue reported in question 14a.

Main products	% of 2017 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	<input type="checkbox"/>	Marketing	<input type="checkbox"/>
Kiln Drying	<input type="checkbox"/>	Distribution	<input type="checkbox"/>
Resawing	<input type="checkbox"/>	Logistics	<input type="checkbox"/>
Other (specify): _____	<input type="checkbox"/>	Other (specify): _____	<input type="checkbox"/>

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	<input type="checkbox"/>	Marketing	<input type="checkbox"/>
Kiln Drying	<input type="checkbox"/>	Distribution	<input type="checkbox"/>
Resawing	<input type="checkbox"/>	Logistics	<input type="checkbox"/>
Other (specify): _____	<input type="checkbox"/>	Other (specify): _____	<input type="checkbox"/>

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	<input type="checkbox"/>	Marketing	<input type="checkbox"/>
Kiln Drying	<input type="checkbox"/>	Distribution	<input type="checkbox"/>
Resawing	<input type="checkbox"/>	Logistics	<input type="checkbox"/>
Other (specify): _____	<input type="checkbox"/>	Other (specify): _____	<input type="checkbox"/>

15h. And if yes, what percentage of the volume of logs or lumber used by your business in 2017 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 will publish a directory of Ontario 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 industry organizations. 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 Ontario 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 5: Non-response bias tests

Table A3. Chi-squared test for goodness-of-fit between population and sample distributions

Business type	Population	Observed (o)	Expected (e)	$o - e$ (d)	$(d)^2$	$(d)^2/e$
Cabinets	504	98	125	-27	732.9	5.9
Millwork	318	78	79	-1	0.8	0.0
Furniture	136	37	34	3	10.6	0.3
Pallets and containers	90	29	22	7	44.4	2.0
Engineered wood products	88	31	22	9	83.9	3.8
Other wood products	41	19	10	9	77.9	7.7
Reman and panelboards	44	11	11	0	0.0	0.0
Total						19.7

Chi-square value is 19.7, which is greater than the chi-square statistic for 6 degrees of freedom at 5% level of significance (12.592). Hypothesis that both distributions were the same was rejected.

Table A4. Chi-squared test for goodness-of-fit between early and late respondents on company employment size

Company size	Early response	Late response	Expected (e)	$o - e$ (d)	$(d)^2$	$(d)^2/e$
1-4	399	85	97.71	-12.71	161.48	1.65
5-9	270	63	66.12	-3.12	9.72	0.15
10-19	218	63	53.38	9.62	92.47	1.73
20-49	200	60	48.98	11.02	121.52	2.48
50-99	69	13	16.90	-3.90	15.19	0.90
>100	65	15	15.92	-0.92	0.84	0.05
Total						6.96

Chi-square value is 6.96, which is less than the chi-square statistic for 4 degree of freedom at 5% (11.07) level of significance. Hypothesis that both distributions were the same was not rejected.

For more information about the Canadian Forest Service, visit our website at nrcan.gc.ca/forests or contact any of the following Canadian Forest Service establishments

nrcan.gc.ca/forests



Canadian Forest Service Contacts

- 1** Atlantic Forestry Centre
P.O. Box 4000
Fredericton, NB E3B 5P7
Tel.: (506) 452-3500 Fax: (506) 452-3525
nrcan.gc.ca/forests/research-centres/afc/13447

Atlantic Forestry Centre – District Office
Sir Wilfred Grenfell College Forestry Centre
University Drive
Corner Brook, NF A2H 6P9
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