

New Brunswick Sector Profile: **Value-added Wood**



March 2014

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(Funded by the Government of Canada and the Province of New Brunswick through the Canada-New Brunswick Labour Market Development Agreements)

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- Framed building – New Brunswick Forest Products Association
- Paper rolls - New Brunswick Forest Products Association
- Kitchen - PRsarahevens

1 Executive Summary

The value-added wood sector was one of six strategic sectors identified in the Government of New Brunswick's 2012 economic development action plan. The mandate established for this study was to develop a detailed profile of the sector with a focus on the labour force. Based mainly on secondary research and a limited number of key informant interviews, this document serves as a snapshot of the current state of the sector.

Canada is a forest nation endowed with 10% of the world's forests, and is the second largest exporter of primary forest products in the world. The forest resource is also very important to New Brunswick as a key input for a number of companies that significantly contribute to the Province's economy. Although the Province is small, New Brunswick ranks 5th in terms of roundwood production behind British Columbia, Alberta, Quebec, and Ontario. About 85% of the Province is blanketed with forests that are owned by a diverse mixture of stakeholders: Crown (47%), private (34%), industrial freehold (17%), and Federal (2%).

The value-added wood sector is broadly defined by three segments: primary manufacturing, secondary manufacturing, and emerging bio-products. Front-end forestry, logging, and silviculture activities are excluded from the scope of study. These exclusions are what differentiate the sector from other studies related to the more broadly defined forestry/forest-products sectors. For comparative purposes the "Value-added Wood Sector" would roughly represent 19% of the establishments and 75% of employment in the forestry/forest-products sectors.

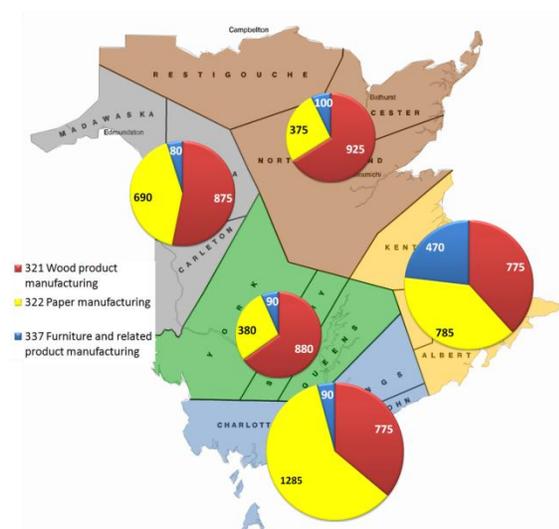
Economic Profile

The collapse of the US housing market, the global financial crisis, and the rising Canadian dollar hit both the Canadian and New Brunswick value-added wood sector hard. In the decade spanning from 2002 to 2012, the sector saw a decrease of 36% in Canadian employment, and 52% in New Brunswick employment. In 2012 the NB sector was made up of approximately 300 companies employing 7,340-9,690 workers which represented 3.5% of total provincial employment. Approximately 50% of the companies had 5 employees or less and 90% had 100 employees or less.

Sector revenues approached \$1.95 billion in 2012, with approximately 75% coming from export sales. The \$1.45 billion in sector exports represented 10% of total NB exports. In fact, on a per capita basis, New Brunswick value-added wood exports were on par with British Columbia, both of which significantly exceed all other provinces.

Value-added wood companies operate throughout the Province and have a significant rural presence. In terms of total sector employment, the "Moncton-Richibucto" and "Saint John-St. Stephen" economic regions were the largest regional employers. However, each region had a different composition. The "Edmundston – Woodstock" region was shown to be the most intensive, where 4.6% of all individuals employed in the region worked for a value-added wood company. The "Saint John-St. Stephen" region was most intensive in the pulp and paper sub-sector. The "Moncton-

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Richibucto" region was most intensive in furniture and related product manufacturing. In fact, this region employed more people in the sub-sector than all other regions combined. The "Campbellton-Miramichi" region was most intensive in the wood product manufacturing sub-sector.

Three key economic indicators were identified as being important to the sector. The growth rate in gross domestic product (GDP) and housing starts in both Canada and the United States were shown to have a close correlation to the performance of the value-added wood sector. Short term

forecasts for both indicators were seen to be positive. Being an export intensive sector, the third economic indicator identified was the strength of the Canadian dollar relative to the currency of the export destinations.

Key trends in the sector included:

- Technology adoption is primarily driven by the need for companies to increase competitiveness. Successful adoption can depend on a number of factors including access to workers with the requisite skills and knowledge that the technology demands. Ironically, the adoption of technology creates a lower labour demand for higher skilled workers.
- Sustainable business practices continue to gain momentum in all industries, and third party certification is perhaps the most effective means for a company to be differentiated in the eyes of consumers. The three major forest sustainability certification programs used in Canada are: Canadian Standards Association (CSA), Forest Stewardship Council (FSC) and Sustainable Forestry Initiative (SFI). According to the Forest Products Association of Canada (FPAC), Canada is a leader in forest sustainability and accounts for over 42% of all certified forests in the world.
- The emerging bio-products segment of the value-added wood sector is based on numerous viable options that exist today to convert wood fibre to new bio-products (ex. bio-energy/bio-fuels and bio-chemicals/ bio-materials). These options were shown by industry experts to be most viable by integrating their production within the "traditional" industry.

Challenges facing the sector include:

- Recognizing that not all segments share the same issues – The greatest divide is between the primary and secondary segments where the issues of the primary segment have historically overshadowed those of the secondary segment. Paradoxically, the primary sector may feel that too much attention is focused on building secondary sector capacity in recent years.
- The fall-out effects from the recession – The closure of a number of mills have created a supply side strain for those that continue to operate. Many of the independent harvesting contractors have left the business and financial

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institutions are hesitant to finance new companies due to the historical performance of the sector.

- The cost structure – The cost of the resource (crown stumpage rates in comparison to other provinces), power, and wages were identified as challenges. Each cost category had different domestic and global (particularly low-cost regions) implications.
- Wood supply – The competing interests of industry, private woodlot owners, ecological protection, and government (who has a stewardship as well as an economic development role) in a small province with a finite resource has been, and will continue to be a challenge.

Human Resources Profile

Of the 150 different occupations in the value-added wood sector, 32 were determined to be core occupations in NB. The primary basis for determination was having at least 20% of the total New Brunswick workforce for that occupation employed in the sector. Using the 2006 National Occupational Classification (NOC), the 32 core occupations include:

NOC	Description	Employ	% of NB	Training Interest	Sector Interest
0911	Manufacturing managers	290	28%		Yes*
2122	Forestry professionals	42	21%	Yes	
2223	Forestry technologists and technicians	70	21%	Yes	Yes
2233	Industrial engineering and manufacturing technologists/technicians	31	27%	Yes	
2243	Industrial instrument technicians and mechanics	58	22%	Yes	
7242	Industrial electricians	232	42%	Yes	Yes
7271	Carpenters	110	3%	Yes	
7272	Cabinetmakers	276	77%	Yes	Yes
7311	Construction millwrights/industrial mechanics (except textile)	448	31%	Yes	Yes
7351	Stationary engineers and auxiliary equipment operators	213	35%	Yes	
7383	Other trades and related occupations	59	29%		
7421	Heavy equipment operators (except crane)	297	11%	Yes	
7452	Material handlers	293	10%		
9215	Supervisors, forest products processing	378	96%		Yes*
9224	Supervisors, furniture and fixtures manufacturing	65	87%		Yes*
9227	Supervisors, other products manufacturing and assembly	21	24%		Yes*
9233	Pulping control operators	23	56%		Yes†
9234	Papermaking and coating control operators	151	93%		Yes†
9431	Sawmill machine operators	494	90%		Yes†
9432	Pulp mill machine operators	136	98%		Yes†
9433	Papermaking and finishing machine operators	132	100%		Yes†
9434	Other wood processing machine operators	197	82%		Yes†
9435	Paper converting machine operators	128	88%		Yes†
9436	Lumber graders/other wood processing inspectors/graders	261	86%	Yes	Yes
9471	Printing machine operators	23	28%		Yes†
9473	Binding and finishing machine operators	8	26%		
9492	Furniture and fixture assemblers and inspectors	295	75%		Yes‡
9493	Other wood products assemblers and inspectors	250	65%		Yes‡

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NOC	Description	Employ	% of NB	Training Interest	Sector Interest
9494	Furniture finishers and refinishers	61	87%		Yes
9513	Woodworking machine operators	205	85%		Yes†
9614	Labourers in wood, pulp and paper processing	1534	98%		
9619	Other labourers in processing, manufacturing and utilities	97	17%		

These core occupations represented over 70% of total employment in the sector. In the above table “Training Interest” refers to those occupations that have academic or formal training requirements. “Sector Interest” refers to those occupations having some relevance to recruitment, retention and training as identified by various sector stakeholders (where the symbols signify common occupation types – i.e. managers/supervisors*, operators†, and assemblers‡).

In terms of worker demographics, over 93% of New Brunswick workers employed in the 32 core occupations in 2011 were male despite the fact women made up 44% of the general workforce. New Brunswick has one of the oldest workforces in Canada, and five of the core occupations exhibited an even older age profile (see NOCs 7311, 9471, 9492, 9493, and 9513 above table). Eight however, had younger age profiles (NOCs 2122, 2223, 2233, 9215, 9432, 9434, 9436, and 9494). The construction millwrights and industrial mechanics occupation (NOC 7311) has an older age profile and is therefore of particular concern for two reasons. First, they work in the sector in large numbers and represent a sizeable portion of the New Brunswick workforce. Second, and more importantly, the training and apprenticeship period is relatively long - usually five to six years.

Wage data suggested that wages earned for the 32 core occupations in New Brunswick are in the range of 13% less than the Canadian average. In addition, commentary from key informants suggested that the sector is not competitive from a wage perspective compared to some other sectors in the Province. This impacts directly on the sector's ability to recruit and retain workers. In a 2012 report by the Wood Manufacturing Council, they concluded this same issue hindered most Canadian secondary value-added wood manufacturers.

Many key informants felt there was a negative perception about the opportunities and the skills required to work in the sector, and all agreed that the industry had room to improve its image in the labour market. Some individual companies have already embarked on recruitment campaigns to address this issue, while national and provincial industry associations are also attempting to deal with the issue.

Educational Capacity and Capability

New Brunswick educational institutions offer no less than 25 programs that support ten of the 11 core occupations listed as “yes” in the “Training Interest column above (the exception being lumber graders). The training of lumber graders is provided by the Maritime Lumber Bureau in Amherst, Nova Scotia. The remaining 21 core occupations are not normally associated with specific or specialized academic training.

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Three New Brunswick programs supporting the sector have been permanently closed or suspended. The two most relevant are the former sawmill operator training programs that were delivered by the Maritime Forest Ranger School and the BSc. in Forest Engineering program at the University of New Brunswick. Lack of support from industry and low enrolment numbers were cited as the cause of termination of these programs.

Some key informants identified concerns with the current training opportunities in New Brunswick. The declining enrolment in the CCNB Campbellton English and French cabinetmaking programs was a source of concern. This program was once the flagship woodworking training program in the Province and has now declined to just 11 graduates last year. The location of the program in relation to the employment opportunities was believed to be a factor contributing to the lack of success of the program. The economic regions of Campbellton-Miramichi and Edmundston-Woodstock combined employ 16% of all Cabinetmakers in the Province.

Other provinces offer a wide spectrum of training in trades and professional occupations that support sector core occupations. Six noteworthy programs were identified because of their unique nature or because key informants considered the programs to produce quality results. They range from a selection of short courses, trade programs, degree programs and post graduate degrees.

Significant research activities were identified at three locations including the Wood Science and Technology Centre and the Limerick Pulp and Paper Centre, both in Fredericton. FP Innovations in Quebec and a number of academic institutions in other provinces also have research programs or projects underway.

2 Introduction

2.1 Purpose and Scope

As one of the identified strategic sectors in New Brunswick[1], the Department of Post-Secondary Education, Training and Labour (PETL) has commissioned InPro Solutions to undertake a study to create a fact-based profile of the sector with a focus on the labour force. It is intended to provide information to stakeholders, policy makers and training institutions to help formulate strategy in pursuit of their respective goals and objectives.

The scope of the study was limited to companies participating in the value-added wood sector as explicitly defined in Section 4. In addition, analysis was confined to the geography and issues faced by the sector in the Province of New Brunswick.

One final constraint imposed on the scope of the project was that the study was to be based on secondary research with a limited number of key informant interviews.

2.2 Objectives

The overall objective of the study was to develop a detailed profile of the value-added wood sector in New Brunswick with a focus on the labour market. Specific sub-objectives included:

1. To develop a clear definition of the sector, including sub-sector groupings and occupational classifications;
2. To develop a concise profile of the sector which includes both an economic profile as well as a human resources profile;
3. To identify the post-secondary educational capacity for skills related to this sector in the Province, and in a less comprehensive manner, the rest of Canada; and
4. To determine if gaps exist between education/skills demand and supply within the New Brunswick sector.

3 Methodology

Unlike previous sector profiles created by InPro Solutions¹, where primary research was the focus of the study, the methodology for this study was based almost exclusively on secondary research activities. The rationale was based on insight from the provincial Value-added Wood Development Committee which indicated that the sector had already been extensively surveyed. However, some primary research efforts were undertaken in the form of key informant interviews with some Development Committee members.

Numerous secondary sources were accessed and are appropriately referenced in Appendix 1: Bibliography, and throughout this document. Secondary research activities included:

- A literature search of related studies;
- General internet searches for sector information, industry directories, etc.;
- A review of value-added wood company websites;
- A review of provincial, national, and international value-added wood association websites;
- Reviews of Statistics Canada data sources; and
- Reviews of Industry Canada data sources.

¹ “New Brunswick Sector Profile: Industrial Fabrication”, InPro Solutions & New Brunswick Career Development Action Group, 2012.

“New Brunswick Sector Profile: Aerospace and Defence”, InPro Solutions & New Brunswick Career Development Action Group, May 2013.

4 Sector Definition

The sector definition that forms the basis for this study originates from that articulated in the New Brunswick Value-added Wood Sector Strategy[2]:

“The value-added wood sector includes companies which add value to hardwood or softwood by further manufacturing or processing. This includes lumber, pulp and paper, tissue, re-manufactured products, engineered products, appearance products, and products derived from wood biomass.”

In general terms, the value-added wood sector is comprised of enterprises involved in the conversion of solid wood to a more highly manufactured product. While “value-added” occurs along the continuum of conversion, the sector is generally grouped into two major segments: primary-processed and secondary-processed wood products.

Primary wood products are generally traded on the open market with little differentiation by buyers. They include, but are not limited to, items such as:

- Pulp and paper;
- Sawn lumber;
- Treated wood;
- Hardwood or softwood veneer and plywood; and
- Composites (ex. particle board (PB), medium density fibreboard (MDF), and oriented strand board (OSB)).

Secondary wood products are generally not traded on the open market, and are usually sold directly to users. They include, but are not limited to, items such as:

- Appearance products;
 - Windows and doors
 - Flooring
 - Cabinets and countertops
 - Furniture (household and office)
 - Millwork (ex. mouldings and turned products)
 - Siding, shakes, and shingles
- Structural products;
 - Engineered wood products (ex. trusses and laminated beams)
 - Prefabricated building panels (ex. walls and floors)
 - Prefabricated buildings (including log homes)
- Remanufactured products;
 - Modified lumber (ex. re-sawn, tongue and groove, and special grades)
 - Other sawmill specialty products
- Containers and pallets (ex. shipping crates); and
- Other wood products (ex. cookware, toys, artwork, musical instruments).

A relatively new but emerging segment is bio-products from wood.

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Bio-products from wood are a diverse range of products derived from wood biomass residue most of which is created from traditional wood processing (both primary and secondary). Many bio-products are integrated into the value stream of traditional wood processing operations. They include, but are not limited to, items such as:

- Bio-energy/Bio-fuels:
 - In situ processes to produce electricity, heat, and cogeneration
 - Solid products such as wood pellets and briquettes
 - Liquid products such as ethanol and biodiesel
 - Gaseous products such as syngas and biogas
- Bio-chemicals/Bio-materials:
 - Wood fibres used in composites (plastics, cement, etc.)
 - Lignin, cellulosic materials (nanocrystalline cellulose (NCC) and cellulose filaments (CF)), and other components used to produce an array of products such as: carbon black, phenol formaldehyde resins, carbon fibre, bio-plastics, and bio-pharmaceuticals

Areas specifically excluded from the sector profile include:

Upstream “forestry” activities that include: silviculture, timber tract operations, forest nurseries, gathering of forest products, tree harvesting/logging, blocked firewood, and Christmas tree production (i.e. items generally classified in the North American Industry Classification System (NAICS) 111 and 113).

Tertiary activities related to the sector such as equipment supply, consulting, transport and distribution, as well as the economics of research and education.

4.1 North American Industry Classification System (NAICS 2012)

Statistical information gathered to support this study is based on the 2012 North American Industry Classification System (NAICS 2012). The structure of NAICS is hierarchical, and based on the following format:

- Sector = 2-digit code
- Sub-sectors = 3-digit code
- Industry Groups = 4-digit code
- Industry = 5-digit code

The NAICS 2012 sub-sectors and industry groups that define the value-added wood sector in New Brunswick include²:

- **321 - Wood product manufacturing**
 - 3211 - Sawmills and wood preservation
 - 3212 - Veneer, plywood and engineered wood product manufacturing
 - 3219 - Other wood product manufacturing

² See Appendix 3 for expansion to 6-digit NAICS.

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- **322 - Paper manufacturing**
 - 3221 - Pulp, paper and paperboard mills
 - 3222 - Converted paper product manufacturing
- **337 - Furniture and related product manufacturing**
 - 3371 - Household and institutional furniture and kitchen cabinet manufacturing
 - 3372 - Office furniture (including fixtures) manufacturing
 - 3379 - Other furniture-related product manufacturing

4.2 Core Occupations Associated with the Sector

The value-added wood sector in New Brunswick employs people in approximately 150 different occupations³ as detailed in Appendix 4. Occupations considered to be core to the sector and profiled in the study to varying degrees of detail include:

Table 1 : Core Occupations in NB Value-added Wood Sector

	NOC	Description
1	0911	Manufacturing managers
2	2122	Forestry professionals
3	2223	Forestry technologists and technicians
4	2233	Industrial engineering and manufacturing technologists and technicians
5	2243	Industrial instrument technicians and mechanics
6	7242	Industrial electricians
7	7271	Carpenters
8	7272	Cabinetmakers
9	7311	Construction millwrights and industrial mechanics (except textile)
10	7351	Stationary engineers and auxiliary equipment operators
11	7383	Other trades and related occupations
12	7421	Heavy equipment operators (except crane)
13	7452	Material handlers
14	9215	Supervisors, forest products processing
15	9224	Supervisors, furniture and fixtures manufacturing
16	9227	Supervisors, other products manufacturing and assembly
17	9233	Pulping control operators
18	9234	Papermaking and coating control operators
19	9431	Sawmill machine operators
20	9432	Pulp mill machine operators
21	9433	Papermaking and finishing machine operators
22	9434	Other wood processing machine operators
23	9435	Paper converting machine operators
24	9436	Lumber graders and other wood processing inspectors and graders
25	9471	Printing machine operators
26	9473	Binding and finishing machine operators

³ As defined by the 2006 National Occupational Classification schema (NOC 2006).

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	NOC	Description
27	9492	Furniture and fixture assemblers and inspectors
28	9493	Other wood products assemblers and inspectors
29	9494	Furniture finishers and refinishers
30	9513	Woodworking machine operators
31	9614	Labourers in wood, pulp and paper processing
32	9619	Other labourers in processing, manufacturing and utilities

These 32 occupations were determined to be statistically significant based on the following selection criteria:

- 1) Any occupation where this sector employs at least 20% of total New Brunswick employment for the occupation; and
- 2) Any occupation that represents 3% or more of total sector (NAICS 321+322+337), or single sub-sector (321 or 322 or 337) employment.

The **highlights** in the table indicate occupations that typically required specialized trade or professional training.

5 Economic Profile

5.1 Natural Resource Context

As with all economic sectors, the value-added wood sector does not exist in isolation. It interacts with many other sectors within the interdependent and complex global economy. The definition provided in Section 4 clearly articulates the boundaries within which the sector is profiled in this report. However, it is important to understand that this goods-producing manufacturing sector is highly dependent upon the natural resource that supplies it. This section is intended to first outline the importance of the forest resource to the sector in both Canada and New Brunswick, and second to differentiate it from the silviculture and logging activities that are frequently bundled with this sector and frequently referred to as the Forestry sector.

5.1.1 Canada as a Forest Nation

Canada is home to ten percent (10%) of the world's forests. Of the country's 738.5 million hectares (ha) of total surface area inventoried, 53.8% (397.3 million ha) are comprised of forests and other land with tree cover⁴. Figure 1⁵ shows the forest area and type of coverage across Canada.

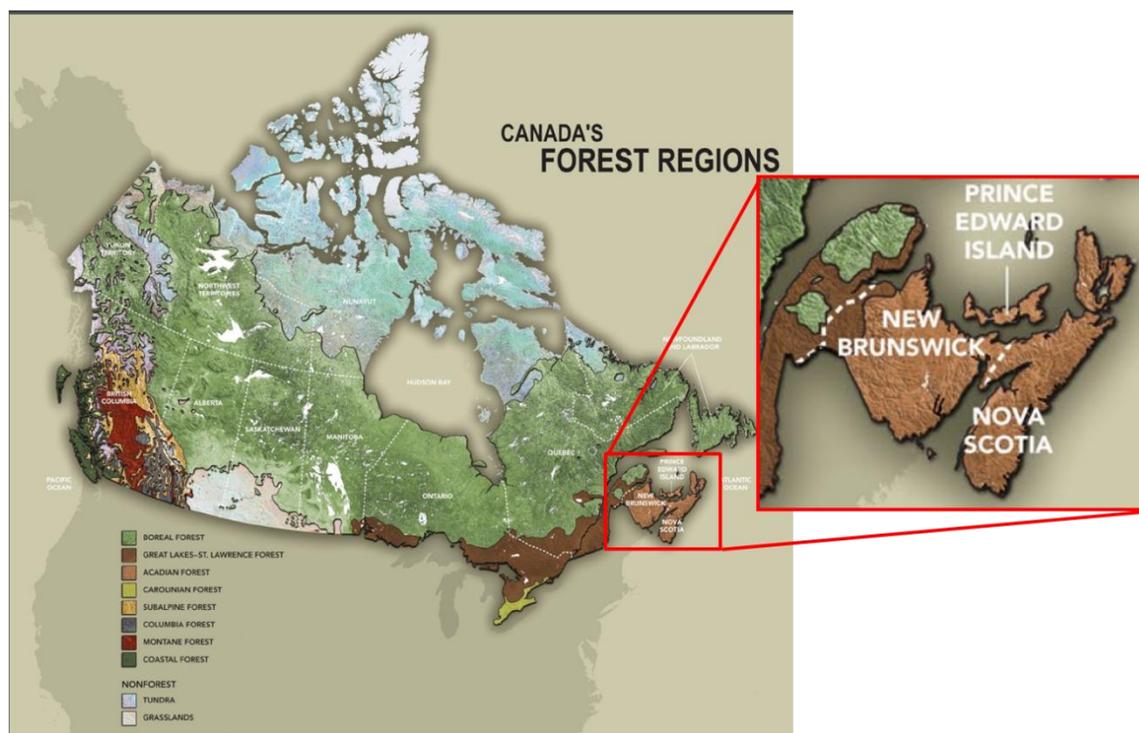


Figure 1: Canada's Forest Regions

⁴ <http://www.nrcan.gc.ca/publications/statistics-facts/1241>.

⁵ <http://www.nrcan.gc.ca/forests/canada/classification/13179>.

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National revenue from goods manufactured from this resource was estimated at \$50.8 billion in 2009. In terms of trade, Canada is the second largest exporter of primary forest products in the world, after the United States (US). The forest sector is among the top five contributors to Canada's net trade⁶.

5.1.2 New Brunswick as a Forest Province

Forests blanket 6.1 million hectares or 85% of the New Brunswick landscape. This is a greater proportion of forested area than any other jurisdiction in Canada [3]. The forest resource in New Brunswick is owned by a mix of Crown, Federal, private and industrial interests as shown in Figure 2 [4].

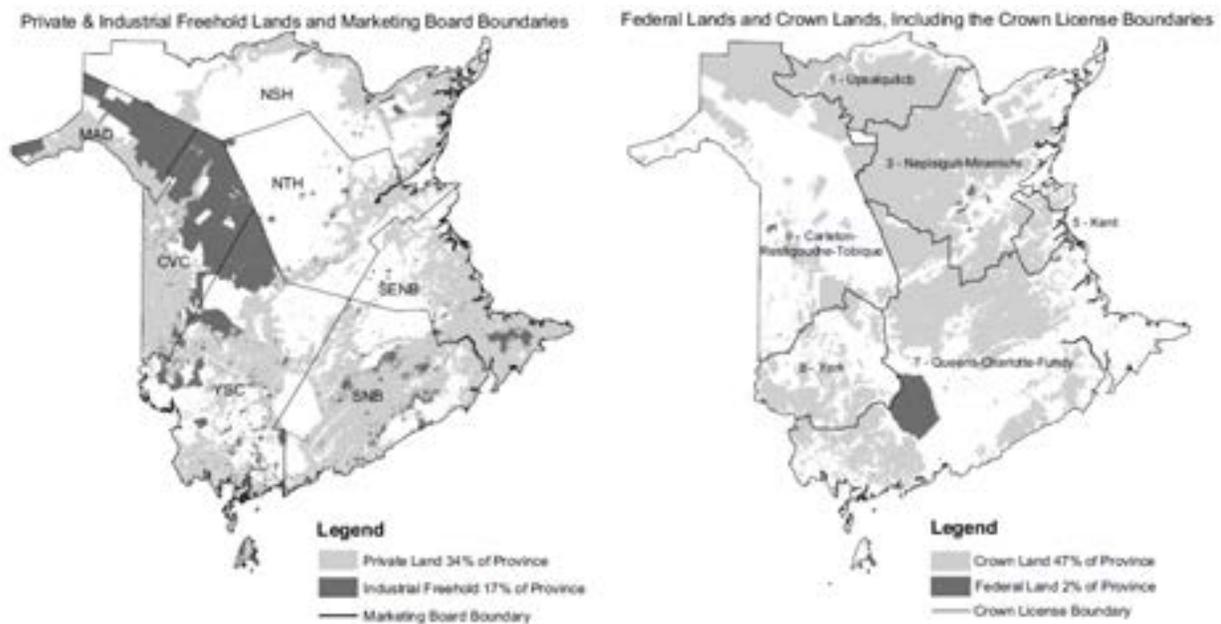


Figure 2: Forest Land Ownership in New Brunswick

New Brunswick's public forests are divided into ten timber licence areas. Each is leased to a large forest-based company (called a licensee) under a 25-year agreement. Each has an assigned number of sub-licensees. The licensee manages the public forest following guidelines set by the provincial Department of Natural Resources. Harvest volumes and royalties are defined, and performance is monitored regularly and evaluated every five years. The Crown Licensees at time of writing are shown in Table 2⁷.

⁶ <http://cfs.nrcan.gc.ca/pages/52>, accessed December 2013.

⁷ http://www2.gnb.ca/content/gnb/en/departments/natural_resources/ForestsCrownLands/content/TimberHarvestingScaling/TimberLicensees.html, accessed December 2013.

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Table 2: Crown Licensees

Company	Licence	Administrative unit	Area (ha)
AV Cell Inc.	1 Upsalquitch	1 Upsalquitch	421,350
Fornebu Lumber Company Inc.	2 Nepisiguit	3 Nepisiguit-Miramichi	257,024
	3 Lower Miramichi		310,599
	4 Upper Miramichi		381,293
DNR - Kent License Management Team	5 Kent	5 Kent	70,815
J.D. Irving Ltd.	6 Queens-Charlotte	7 Queens-Charlotte-Fundy	622,332
	7 Fundy		424,308
AV Nackawic Inc.	8 York	8 York	257,605
Twin Rivers Paper Company	9 Carleton	9 Carleton-Restigouche-Tobique	130,896
	10 Restigouche-Tobique		396,283
Total area			3,272,505

For privately owned forest lands, woodlot owners have a collective voice through the New Brunswick Federation of Woodlot owners⁸. The Federation acts as the umbrella organization for the seven regional marketing boards which include:

1. Carleton-Victoria Forest Products Marketing Board
2. Madawaska Forest Products Marketing Board
3. North Shore Forest Products Marketing Board
4. Northumberland County Forest Products Marketing Board
5. South East New Brunswick Forest Products Marketing Board
6. Southern New Brunswick Forest Products Marketing Board
7. York Sunbury Charlotte Forest Products Marketing Board

To gain an understanding of where New Brunswick stands in relation to the other provinces and territories, it is useful to look at the total amount of roundwood harvested annually. As shown in Figure 3⁹, New Brunswick ranks 5th in terms of production volume behind British Columbia, Alberta, Quebec, and Ontario.

⁸ www.nbwoodlotowners.ca.

⁹ Created from data taken from the National Forestry Database: http://nfdp.ccfm.org/data/compendium/html/comp_51e.html.

New Brunswick Sector Profile: Value-added Wood

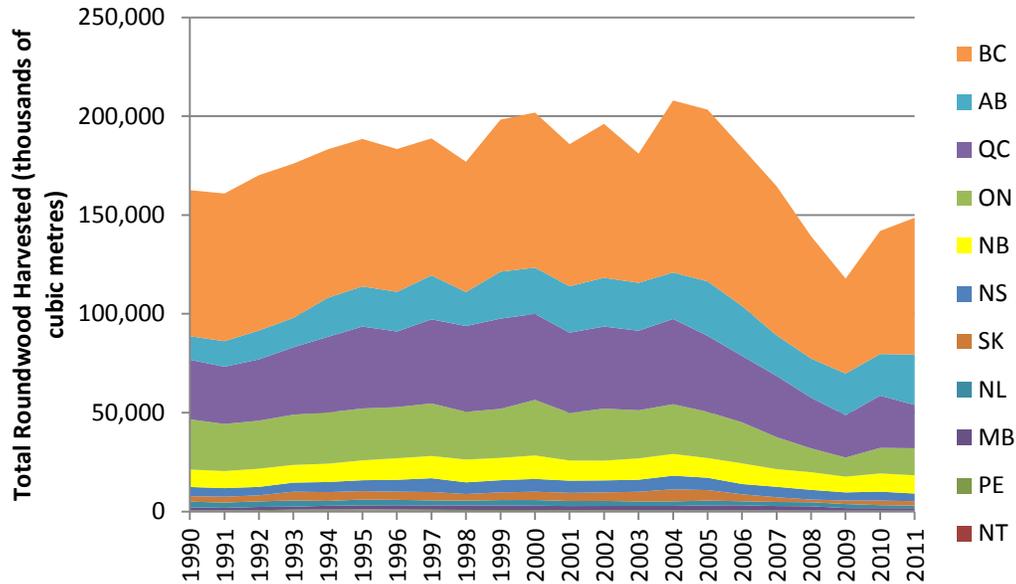


Figure 3: History of Total Roundwood Harvested in Canada (by Province)

Insight into provincial utilization of the resource is shown in Figure 4¹⁰ which shows a breakdown by ownership source of harvested roundwood plotted against potential harvest targets for 2011.

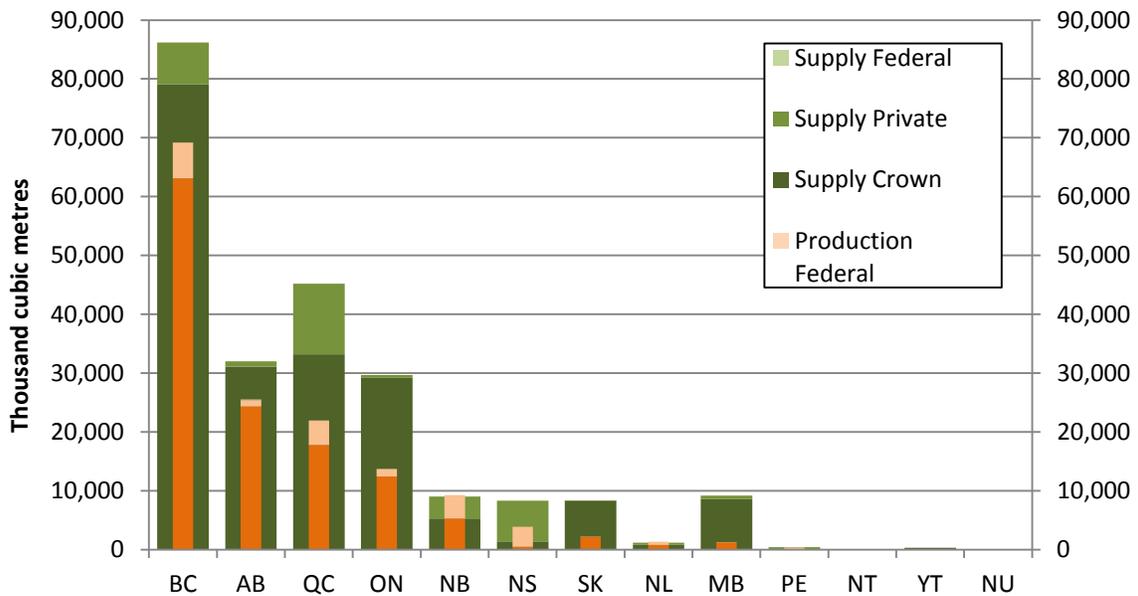


Figure 4: Annual Wood Supply and Production in Canada (2011)

In 2011 New Brunswick had planned harvest targets similar in size to Manitoba, Saskatchewan, and Nova Scotia, yet harvested significantly more roundwood than its

¹⁰ Produced from data taken from the National Forestry Database:
http://nfdp.ccfm.org/products/quick_facts_e.php and
http://nfdp.ccfm.org/data/graphs/graph_21_b_e.php.

New Brunswick Sector Profile: Value-added Wood

fellow provinces indicating that New Brunswick maximizes its harvesting opportunity. New Brunswick harvested just over 100% of the planned harvest in contrast to the national average of 65%. British Columbia and Alberta harvested approximately 80% while Quebec, Ontario, and Nova Scotia harvested under 50%.

5.1.3 Value-added Wood Sector versus the Forestry Sector

When comparing the information presented in this study to other studies or sources, the reader is cautioned to remain aware of the scope of coverage of the respective reports¹¹.

Other studies will often include silviculture, wood harvesting, trucking and construction activities and are typically labeled as: the Forestry Sector, the Forest Industry, the Forest Products Industry, etc. These activities are very important to the rural economy of New Brunswick but are not by definition part of the value-added wood sector. Many studies tend to cast as wide a net as possible to emphasize the value of the forestry sector. Almost all capture front-end activities such as silviculture and logging, and many frequently capture other activities much further down the supply chain such as trucking and wholesale sales.

Given variances in scope, and sometimes unclear definitions, it is impossible to comment on absolute differences between data presented in this study and data presented in others. To aid the reader in gaining an appreciation of what order of magnitude these differences can be, Table 3 shows a comparison of two key variables reported in this study juxtaposed to data recently reported by the New Brunswick Forest Products Association (NBFPA) for the Forest Products Industry [5].

Table 3: Comparison of "Forestry Products Industry" to this Study

NBFPA Variable	NBFPA (2010)	This Study (2012)	Comments
Establishments:	1,616	310	<ul style="list-style-type: none"> Removing segments that are excluded from the sector definition of this study (grey) results in 303 establishments reported by NBFPA as being active in 2010 compared to the 310 reported in this study for 2012.
Logging	709	N/A	
Forest product trucking firms	288	N/A	
Nurseries, timber tract, other	255	N/A	
Sawmills	91	82	
Wood furniture	77	100	
Wood-related wholesalers	53	N/A	
Other wood product manufacturing	48	89	
Windows, containers, pallets	31	(included in above)	
Wood buildings and homes	12	above)	
Veneer, plywood, eng. wood prod.	17	18	
Pulp, paper and paperboard	15	10	
Converted paper	12	11	
Paper industry machine mfg.	8	N/A	
Net Value-added Wood:	303	310	

¹¹ The scope of coverage in this study is clearly defined in Section 4.

New Brunswick Sector Profile: Value-added Wood

NBFPA Variable	NBFPA (2010)	This Study (2012)	Comments
Employment:	11,654	7,340-9,600¹²	<ul style="list-style-type: none"> Removing segments that are excluded from the sector definition of this study (grey) results in 8,736 people reported by NBFPA as being employed in 2010 compared to the 7,341 to 9,692 reported by sources referenced in this study for 2012. Extracting data for 2010 from this same source showed exactly the same number of people (8,736) as being employed in 2010 (see Figure 10, Section 5.4).
Forestry and logging	2,324	N/A	
Support activities for forestry	594	N/A	
Paper manufacturing	2,992	2,590-2,974	
Wood product manufacturing	4,872	3,842-5,556	
Furniture manufacturing	872	909-1,162	
Net Value-added Wood:	8,373	8,517 (mean)	

Applying the definition of the sector used in this study to the NBFPA data shows that in 2010, the “Value-added Wood Sector” represented 19% (303/1,616) of the “Forest Products Industry” establishments, and 75% (8,736/11,654) of the “Forest Products Industry” employment.

It should also be noted that other studies may employ a narrower scope than what has been dictated and defined for this study. It is not uncommon for value-added wood studies produced in other jurisdictions to cover only “Secondary Wood Products” (i.e. commodity/primary wood products are excluded).

5.2 A Highly Integrated Value Chain

As noted in Section 4, value-added occurs along the continuum of conversion. In practice this continuum is not linear, but is rather highly integrated. Figure 5¹³ attempts to illustrate this high degree of integration.

¹² Range reflects employment levels reported by different data sources. See Section 5.4.

¹³ The illustration is intended for conceptual purposes only and does not attempt to represent all linkages. It is not to be interpreted literally.

New Brunswick Sector Profile: Value-added Wood

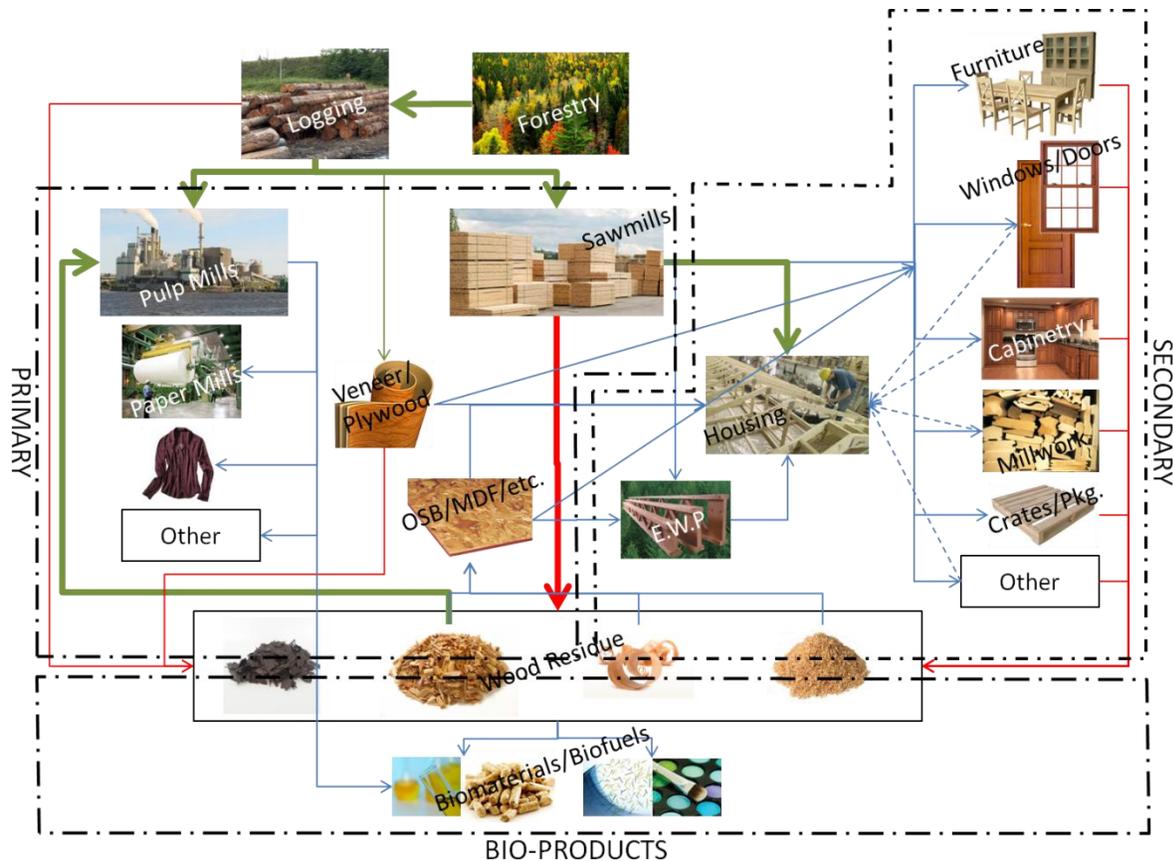


Figure 5: A Highly Integrated Value Chain

The strength of the linkages can vary between segments within the sector, and between activities within a given segment. For example, the linkages within the primary segment are quite strong. To illustrate, Figure 6¹⁴ shows the mass flow of hardwood, softwood, and residue to sawmills and pulp mills from resources originating from within New Brunswick as well as those imported. One area of interest is the significant flow (approximately 2,296 m³ in 2011) of residue from sawmilling operations to support pulp mill operations (right side of figure). This interconnection between sawmills and pulp mills underlines the highly integrated nature of the sector.

¹⁴ Created from data presented in the 2011 New Brunswick Timber Utilization Report [2].

New Brunswick Sector Profile: Value-added Wood

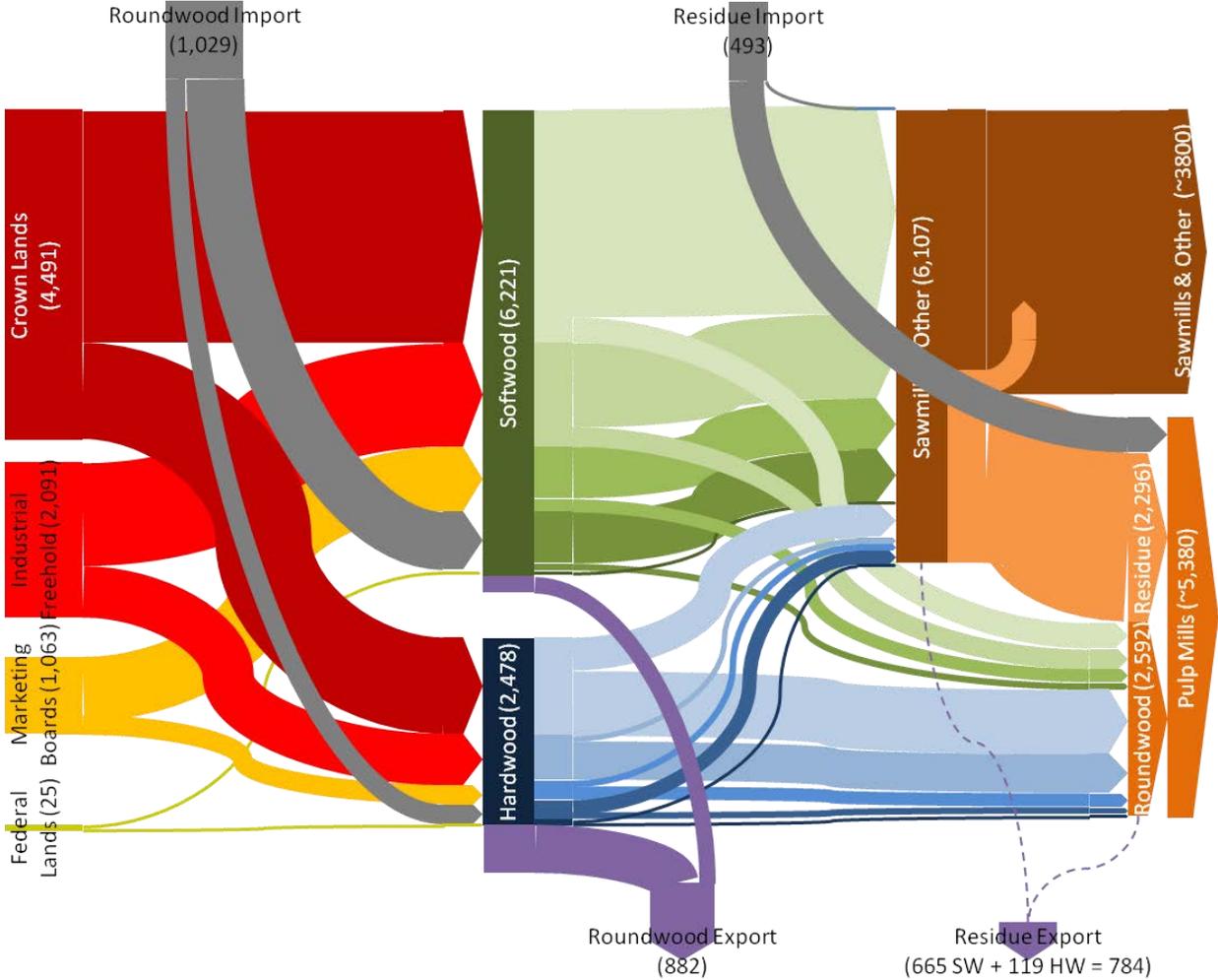


Figure 6: Mass flow (thousand cubic metres) of Wood Fibre in Primary Segment in 2011

However, the linkages between enterprises in the primary and secondary segments are not always as strong. For example, cabinetry manufacturers typically purchase raw materials from brokers/wholesalers who may or may not source lumber from within New Brunswick. The origin of wood from outside of New Brunswick may be obvious for non-native species such as mahogany and teak. However, even when a New Brunswick manufactured product uses a native species, the origin of the raw material is generally unknown.

While it is possible to track the origin of wood through sustainability initiatives (see section 5.8), the nature of the supply chain is not necessarily built around maximizing local economic benefits. It is built around business practices generally geared toward profit. For example, the origin of the birch wood used in a cabinet manufactured by a New Brunswick manufacturer may originate from any economical source (ex. from Quebec, Eastern USA, New Brunswick, or any other location) which is ultimately determined by the wood broker/wholesaler who procures, then sells the raw product to that manufacturer.

New Brunswick Sector Profile: Value-added Wood

Transportation costs are a less significant proportion of the total cost of the product once some value has been added along the supply chain. Conversely, key informants indicated transportation costs from the forest to the mill were a highly significant factor in being profitable.

Exceptions can occur among vertically integrated value-added wood companies such as JD Irving Ltd., Groupe Savoie, Marwood, and others who run sawmills, but also have additional value-added manufacturing facilities. It is worth noting that even vertically integrated manufacturers may still import wood for use in their value-added products – sometimes as much as 40% as noted by one key informant.

5.3 Establishments

A historical look at the establishment count of the New Brunswick value-added wood sector by industry group (four-digit NAICS) is shown in Figure 7¹⁵. Where:

- 3211 = Sawmills and wood preservation
- 3212 = Veneer, plywood and engineered wood product manufacturing
- 3219 = Other wood product manufacturing
- 3221 = Pulp, paper and paperboard mills
- 3222 = Converted paper product manufacturing
- 3371 = Household and institutional furniture and kitchen cabinet manufacturing
- 3372 = Office furniture (including fixtures) manufacturing
- 3379 = Other furniture-related product manufacturing

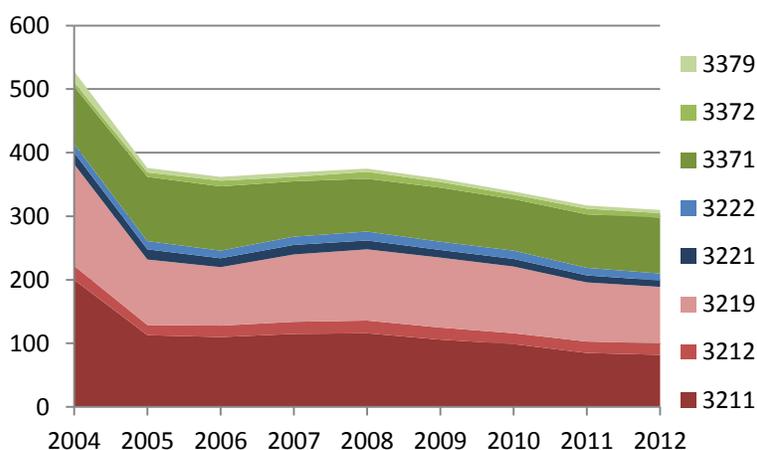


Figure 7: Historical Establishment Count (2004-2012)

There has been an overall decline from 528 active establishments reported in 2004 to 310 reported as being active in 2012. A closer look at the establishment count by industry group is shown in Figure 8.

¹⁵ Created from data found in Statistics Canada Annual Survey of Manufactures and Logging, CANSIM table 301-0006.

New Brunswick Sector Profile: Value-added Wood

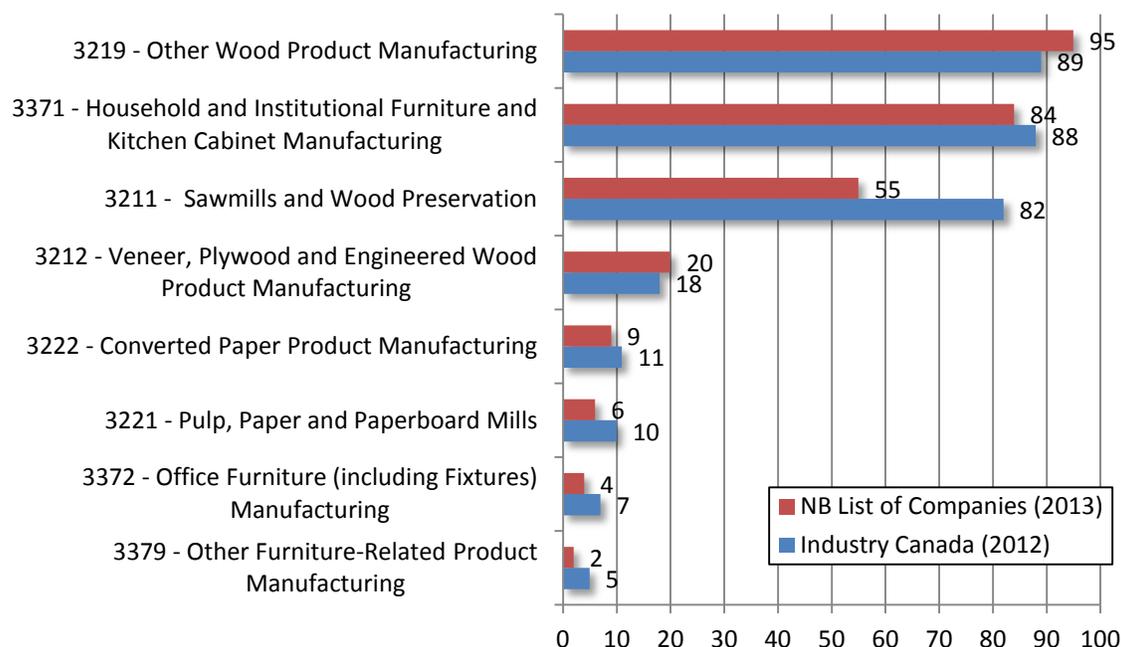


Figure 8: NB Value-added Wood Establishment Count by Industry Group

The blue bars show data from the Canadian Industry Statistics (CIS) website of Industry Canada¹⁶, which is consistent with the data reported in Figure 7. The red bars show the categorized counts of companies identified by name in a master list of companies (275 companies) which was compiled from numerous sources and provided to stakeholders as part of this project. As can be seen, there is a close correlation.

Insight into the relative size of the 310 active establishments in 2012 is shown in Table 4¹⁶.

Table 4: NB Value-added Wood Establishments by Size Category (2012)

	Employers					Non-Employers	TOTAL
	Micro 1-4	Small 5-99	Medium 100-499	Large 500+	Subtotal		
321	47	80	13	0	140	49	189
3211	23	31	5	0	59	23	82
3212	3	13	2	0	18	0	18
3219	21	36	6	0	63	26	89
	34%	57%	9%	0%			
322	1	8	11	1	21	0	21
3221	0	1	8	1	10	0	10
3222	1	7	3	0	11	0	11
	5%	38%	52%	5%			
337	30	38	3	0	71	29	100

¹⁶ Source : Statistics Canada, Canadian Business Patterns Database, December 2012. Retrieved from Canadian Industry Statistics (CIS), www.ic.gc.ca.

New Brunswick Sector Profile: Value-added Wood

	Employers					Non-Employers	TOTAL
	Micro 1-4	Small 5-99	Medium 100-499	Large 500+	Subtotal		
3371	29	31	3	0	63	25	88
3372	1	3	0	0	4	3	7
3379	0	4	0	0	4	1	5
	42%	54%	4%	0%			
Total	78	127	28	1	232	78	310
	25%	41%	9%	0%	75%	25%	100%

Of the 310 organizations active in the sector, approximately 230 (75%) were employers. The remaining 25% were considered non-employers¹⁷ meaning that they operate a business but do not carry a payroll (i.e. most are self-employed).

Approximately 50% of companies had fewer than 5 employees (non-employers and micro-enterprises combined). Overall, approximately 90% of the firms employed fewer than 100 people, and only one employer in the "Pulp, paper and paperboard mills (3221)" industry group employed more than 500 people.

5.4 Employment

Recent data regarding employment levels for the New Brunswick value-added wood sector is available from two sources:

1. The Stokes Occupational Forecast Estimates (SOFE), a model managed by the New Brunswick Department of Post-Secondary Education, Training and Labour (PETL), which estimated employment in 2012 to be 9,692; and
2. The Statistics Canada Survey of Employment, Payrolls and Hours (SEPH) which estimated the total workforce at 7,342 in 2012.

Given the fairly significant variance between the two sources, a custom tabulation using data from the 2011 National Household Survey (NHS) was purchased from Statistics Canada for comparative purposes. To compare the three data sets on an equal footing, employment values for the year 2011 were taken from SOFE and SEPH data sets. Table 5 shows total sector employment, as well as sub-sector employment, from the three available data sources. As can be seen, the NHS estimates fall between the SOFE and SEPH estimates.

¹⁷ Non-employers are in effect owner operated and the owners do not pay wages or salaries to themselves as an employee of the company. Even though some establishments do not maintain employee payrolls, they may have work forces, which may consist of contracted workers, part-time employees, family members or business owners.

New Brunswick Sector Profile: Value-added Wood

Table 5: Direct Employment in the Value-added Wood Sector from Various Sources

Industry	Stokes Occupational Forecast Estimates (SOFE) ¹⁸		National Household Survey (NHS) ¹⁹		Survey of Employment, Payrolls and Hours (SEPH) ²⁰	
	2011	2012	2011	2012	2011	2012
Wood product manufacturing [NAICS 321]	5,995	5,556	4,230	N/A	4,214	3,842
Paper manufacturing [NAICS 322]	3,285	2,974	3,510	N/A	2,492	2,590
Furniture and related product manufacturing [NAICS 337]	1,307	1,162	840	N/A	858	909
Total Sector Employment	10,587	9,692	8,580	N/A	7,564	7,342

The disparity is due to different approaches and the different data sets used to produce the estimates. The following brief and simplified explanation is offered²¹. The SEPH essentially provides an enterprise perspective using business survey results as well as CRA administrative data filed by businesses. SOFE is a model developed specifically for New Brunswick and is based on Census (now NHS) and Labour Force Survey (LFS) data. Both NHS and LFS are household surveys which more closely reflect the individual perspective. While there are many other sources of variance, one significant source relates to the difference in how employment is defined. Both the LFS and NHS include unincorporated self-employed workers, unpaid family workers, workers absent without pay, etc. while the SEPH does not.

Based on the above, employment in the value-added wood sector in 2012 was estimated to be in the range of 7,342 to 9,692 - depending upon the source of data.

A historical view of employment in the value-added wood sector over the last decade, using employer data (SEPH), is shown in Figure 9²². The three sub-sectors (three-digit NAICS) for both Canada and New Brunswick are shown for comparative purposes.

¹⁸ Stokes Occupational Forecast Estimates (SOFE), New Brunswick Base Case Winter 2012 4-Digit Occupation by Industry Outlook, provided by PETL.

¹⁹ Special tabulation purchased from Statistics Canada.

²⁰ Annual average employment calculated from monthly data found in Statistics Canada CANSIM table 281-0023.

²¹ Readers interested in a more comprehensive discussion are encouraged to visit: <http://www.statcan.gc.ca/pub/72-203-g/2013001/part-partie8-eng.htm>.

²² Created from data found in Statistics Canada Survey of Employment, Payrolls and Hours (SEPH), CANSIM table 281-0023.

New Brunswick Sector Profile: Value-added Wood

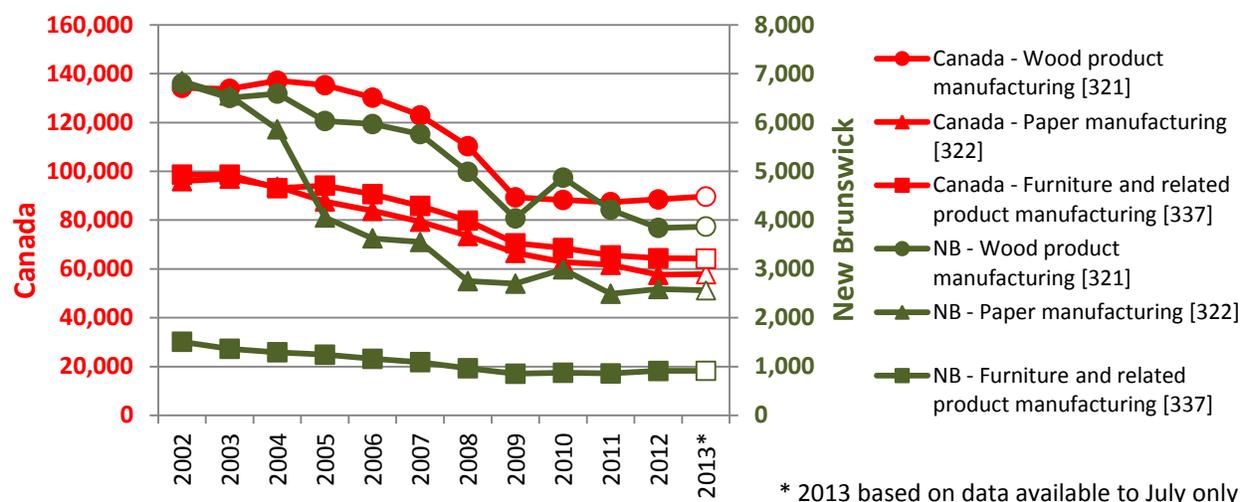


Figure 9: Value-added Wood Sector Average Annual Employment History (2002-2013)

As can be seen, the sector has experienced a significant decline in employment with some sub-sectors impacted more than others. Overall, the decline began well before, and leading up to, the global recession of 2009. However, levels appear to have stabilized in the last three years.

A comparison and analysis of 2002 employment to 2012 employment from this same data set is shown in Table 6²².

Table 6: Employment Analysis, 2002-2012

		2002	Segment %	2012	Segment %	% Change 2002-12
Canada	Paper manufacturing [322]	95,981	29%	57,592	27%	-40%
	Wood product manufacturing [321]	134,227	41%	88,496	42%	-34%
	Furniture and related product manufacturing [337]	98,648	30%	64,381	31%	-35%
	Total Sector Employment	328,856	100%	210,469	100%	-36%
NB	Paper manufacturing [322]	6,848	45%	2,590	35%	-62%
	Wood product manufacturing [321]	6,801	45%	3,842	52%	-43%
	Furniture and related product manufacturing [337]	1,508	10%	909	12%	-40%
	Total Sector Employment	15,157	100%	7,342	100%	-52%
Analysis	NB Percentage of Canadian Sector Employment	4.6%		3.5%		-24%
	Total Employment – Canada	15,297,900		17,507,700		+14%
	Sector Percentage of Total Employment - Canada	2.1%		1.2%		-44%
	Total Employment – NB	342,500		351,400		+3%
	Sector Percentage of Total Employment – NB	4.4%		2.1%		-53%

New Brunswick Sector Profile: Value-added Wood

In 2012 the sector employed 7,340 New Brunswickers representing 2.1% of total NB employment, and almost 25% of all manufacturing employment²³. This employment level was down considerably (52%) from 2002 where 15,160 sector employees represented 4.4% of total NB employment, and almost 38% of all manufacturing employment²³. This is in comparison to all of Canada where in 2012 the sector employed 210,470 individuals representing 1.2% of total Canadian employment. In 2002 the sector employed 328,860 individuals representing 2.1% of all national employment. Despite the New Brunswick value-added wood sector being hit harder than the Canadian average over the last decade, its relative importance to provincial employment remained greater compared to the rest of Canada.

Examining data within the value-added wood sector only, New Brunswick made up 4.6% of national sector employment in 2002. While employment in the entire sector dropped from 2002 to 2012, the decrease in NB was greater and reduced its proportional share of Canadian employment to 3.5% in 2012, a drop of 24%.

An overall view of the New Brunswick sector is shown in the stacked area chart of Figure 10 which more clearly illustrates the relative magnitudes of employment in each sub-sector over the years.

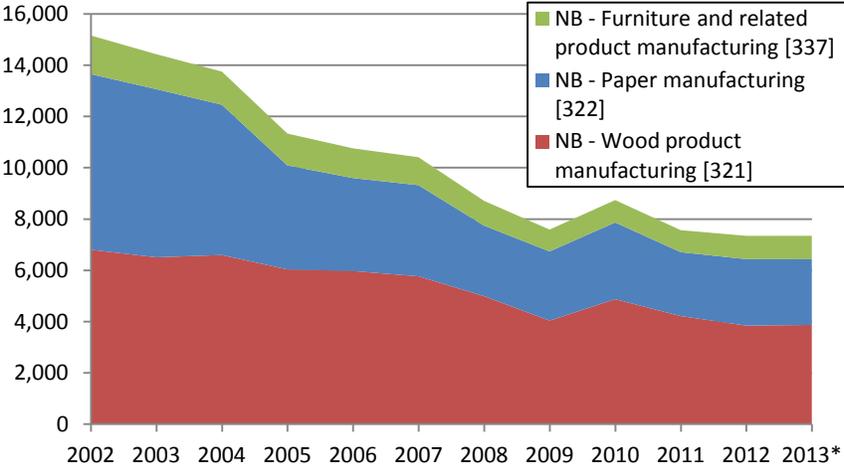


Figure 10: New Brunswick Value-added Wood Sector Employment History (2002-13)

Further examining each sub-sector (three-digit NAICS) at the industry group level (four-digit NAICS) as shown in Figure 11 provides additional insight into the employment history of the sector.

²³ New Brunswick employment for NAICS 31-33 in 2012 was 29,633, and in 2002 was 40,099 (Statistics Canada CANSIM table 281-0023).

New Brunswick Sector Profile: Value-added Wood

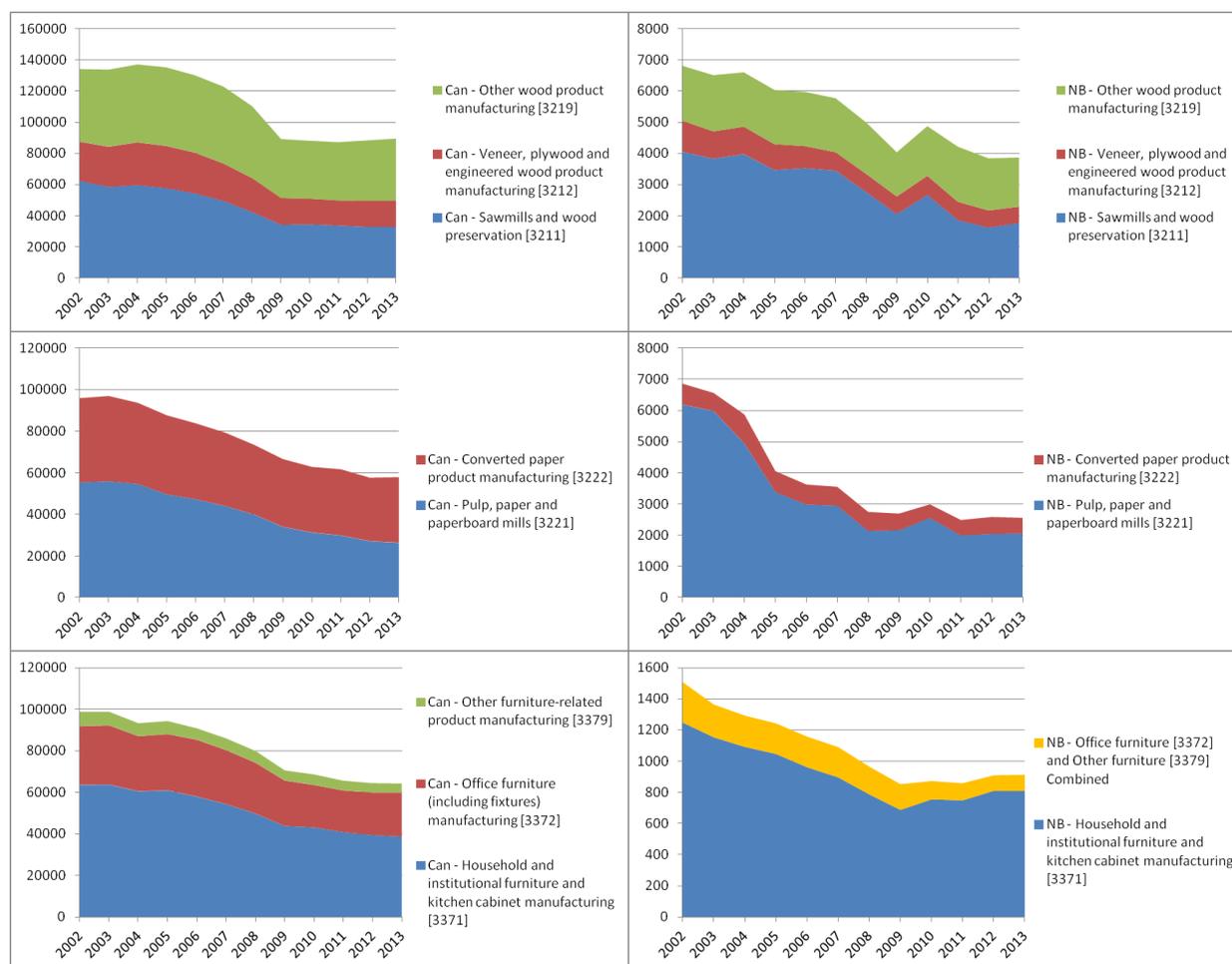


Figure 11: Historical Employment by Industry Group (Canada on left, NB on right)

As shown, the pulp and paper sub-sector (NAICS 322) has been impacted the greatest, both in Canada (a 40% decline in employment from 2002-2013), and in New Brunswick (a 62% decline). The bulk of the employment loss was borne by the pulp, paper and paperboard mills industry group (NAICS 3221). Pulp and paper mills are generally large employers, and the loss of one enterprise can have a significant impact on the communities in which they reside. Unfortunately these are frequently rural cornerstone employers.

5.5 A Regional View

In order to gain an appreciation of the regional impact of the value-added wood sector in New Brunswick, it is first useful to understand the size and composition of the New Brunswick labour force as a whole. In 2012, New Brunswick's population was estimated to be 755,950²⁴ with 620,300²⁵ individuals aged 15 and older making up the

²⁴ Source: Statistics Canada, CANSIM, table 051-0001, modified: 2012-09-26 (accessed: 2013-03-07).

²⁵ Source: Statistics Canada. Table 282-0055 - Labour Force Survey estimates (LFS), by provinces, territories and economic regions, modified 2012-01-04 (accessed: 2013-03-06).

New Brunswick Sector Profile: Value-added Wood

working age population. The total labour force was comprised of 391,300 individuals with 351,300 employed and approximately 40,000 unemployed.

In New Brunswick, value-added wood companies operate throughout the Province and have a significant rural presence. Figure 12²⁶ provides a visual approximation of active company locations in 2013.

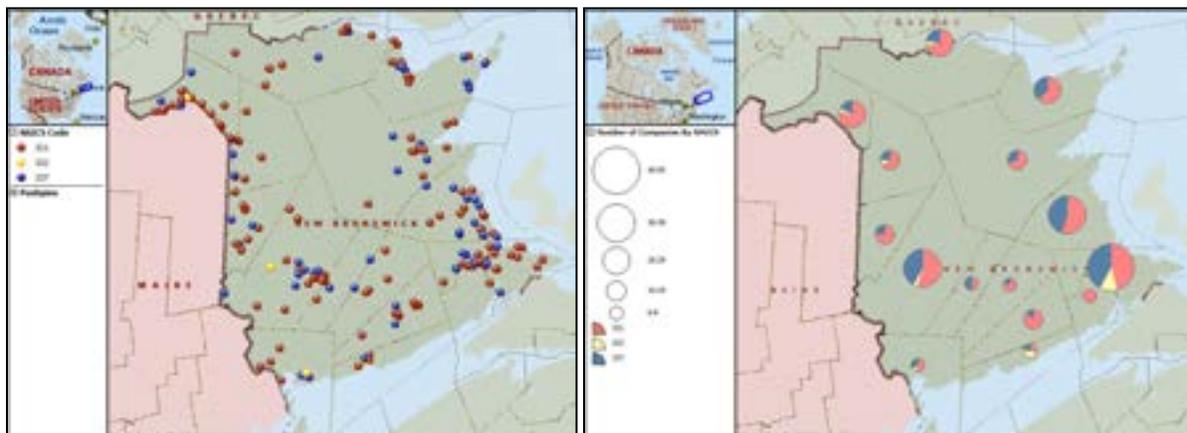


Figure 12: Regional Distribution of NB Value-added Wood Establishments

To gain an appreciation of regional employment impact, Figure 13²⁷ shows employment distribution (2011) throughout the Province for total employment (upper pie chart), and for value-added wood sector employment (lower pie chart).

²⁶ Plotted from the master list of value-added wood companies compiled and provided to stakeholders as part of this project.

²⁷ Produced from data purchased from Statistics Canada under a custom tabulation of the 2011 National Household survey.

New Brunswick Sector Profile: Value-added Wood

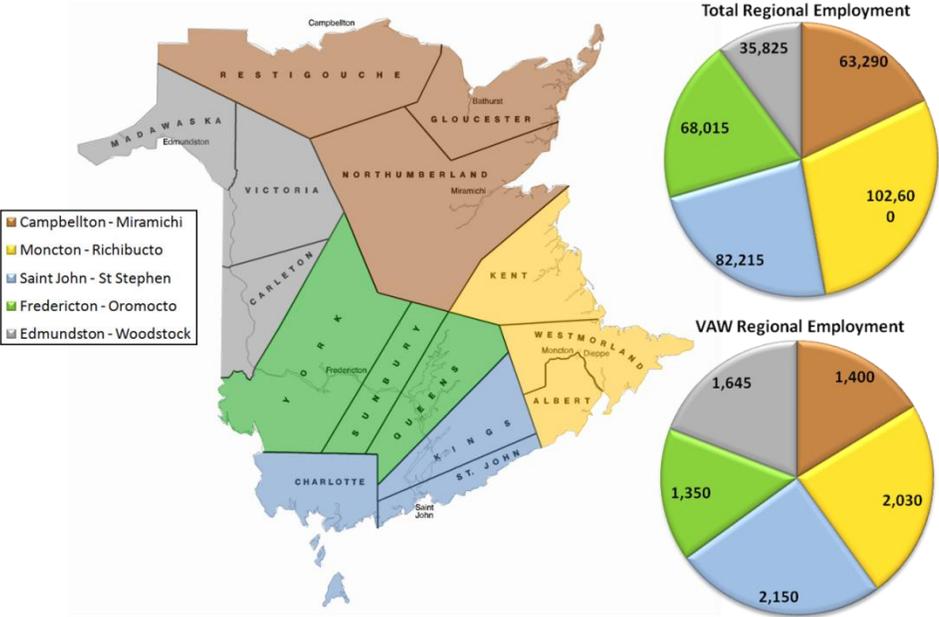


Figure 13: Regional Employment (by Economic Region)

Overall, the value-added wood sector employed 8,580 New Brunswickers in 2011 (according to this data set). The relative intensity of the sector (sector employment as a percentage of total employment in the region) for the five economic regions in New Brunswick is shown in Figure 14.

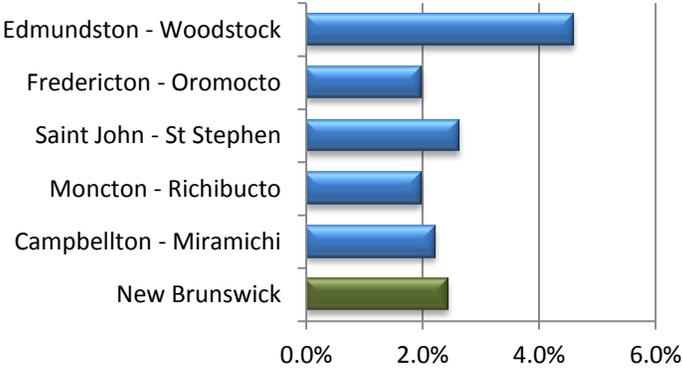


Figure 14: Regional Intensity of Value-added Wood Sector Employment

The Edmundston - Woodstock region was most intensive, where 4.6% of all individuals employed in the region worked for a value-added wood company.

A more holistic view of regional employment is shown in Figure 15. The graphic depicts the magnitude of overall employment in each economic region by the size of a pie chart that is divided according to the proportion of employment from each sub-sector.

New Brunswick Sector Profile: Value-added Wood

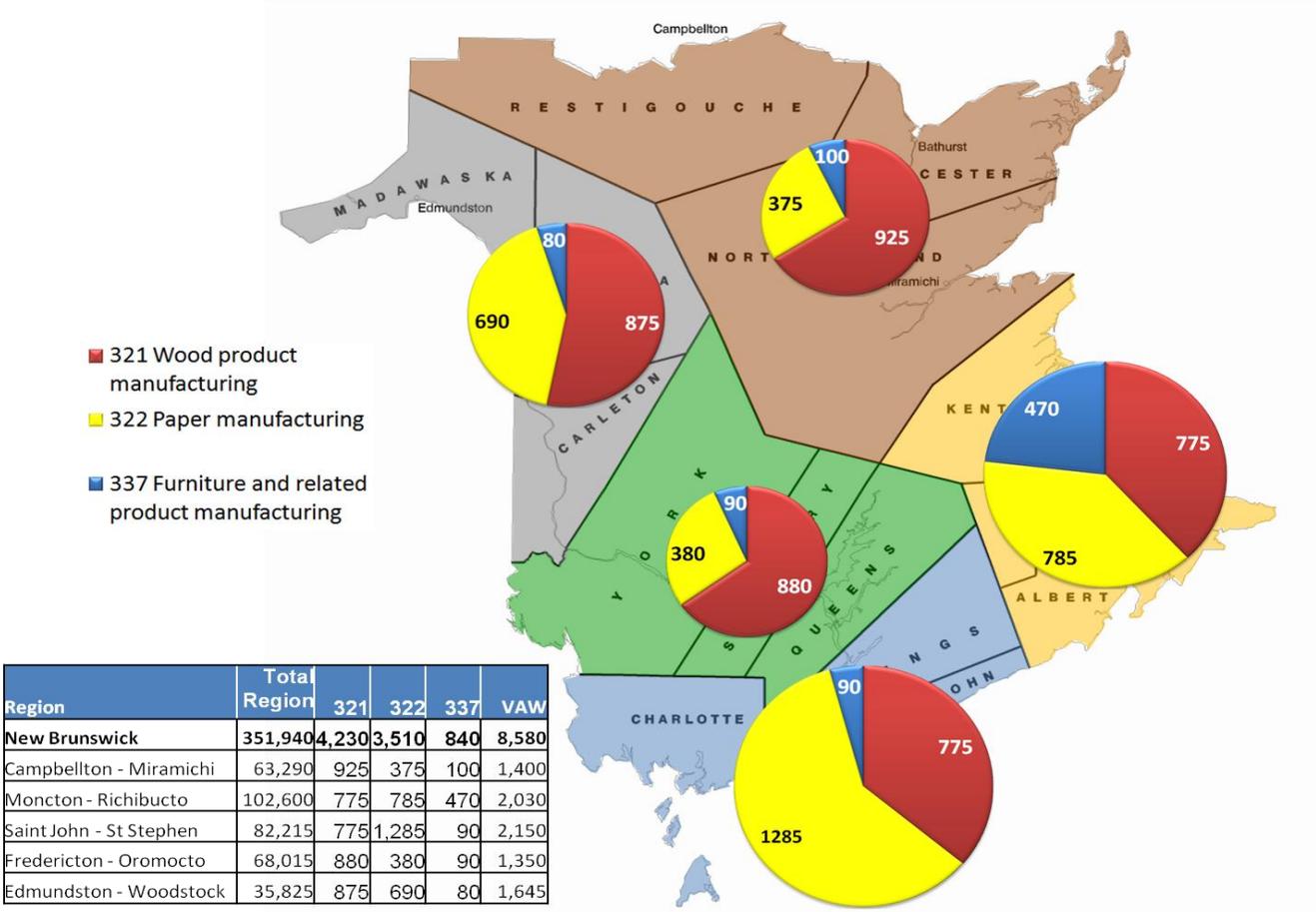


Figure 15: Regional Employment by Economic Region and Sub-sector (2011)

In terms of total sector employment, Moncton-Richibucto and Saint John-St. Stephen are the largest regional employers. Each region however has a different composition:

- The Saint John-St. Stephen region is most intensive in the pulp and paper sub-sector (NAICS 321);
- The Moncton-Richibucto region is most intensive in furniture and related product manufacturing (NAICS 337). In fact, this region employs more people in this sub-sector than all other regions combined; and
- The Campbellton-Miramichi region is most intensive in the wood product manufacturing sub-sector (NAICS 321).

Comparing Figure 15 to Figure 12 it is also evident that pulp and paper establishments (NAICS 322), while few in number, are large employers that significantly contribute to regional employment. Conversely, furniture and related product manufacturing establishments (NAICS 337) are much greater in number, but are generally significantly smaller in size.

5.6 Revenue

Figure 16 provides an approximation of the total revenue generated by the New Brunswick value-added wood sector from 2002 to 2011. The plot is based on data from the Annual Survey of Manufactures (ASM) from Statistics Canada²⁸.

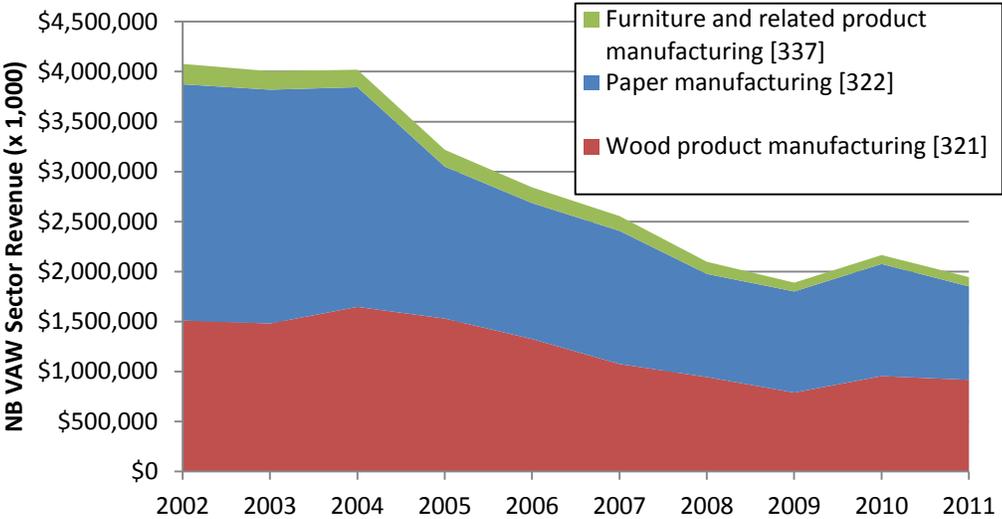


Figure 16: Revenue Generation in the NB Value-added Wood Sector (2002-2011)

Total revenue generated by the sector in 2011 was just under \$2 billion, which represented approximately 10% of all manufacturing (NAICS 31-33) revenue in the Province at that time (\$20.4 billion). This was down considerably from 2002 levels where the sector generated just over \$4 billion, or approximately 32% of total revenue generated by the entire manufacturing sector in New Brunswick at that time (\$12.6 billion).

It is not surprising that there is a close correlation between sector employment and sector revenue, as can be seen in a comparison between Figure 10 and Figure 16.

5.7 International Trade

5.7.1 Net Trade

Approximately 72% of all revenue generated in the New Brunswick value-added wood sector in 2012 came from exports. With exports valued at \$1.45 billion, the sector represented approximately 10% of all New Brunswick industry exports (\$14.81 billion). The United States was the top destination for value-added wood products.

In absolute terms, New Brunswick was the 5th largest exporter of value-added wood products in the country in 2012, behind British Columbia, Quebec, Ontario and Alberta. Approximately 71% of export value was attributed to the pulp and paper sub-sector

²⁸ CANSIM tables 301-0003 and 301-0006. However, due to data suppression for New Brunswick, data points for NAICS 322 from 2004-2011 and NAICS 337 from 2002-2007 had to be estimated using an average revenue/employee metric as a proxy for calculation.

New Brunswick Sector Profile: Value-added Wood

(NAICS 322), approximately 28% to the wood product manufacturing sub-sector (NAICS 321), and the balance to the furniture and related product manufacturing sub-sector (NAICS 337).

On a per capita basis, the New Brunswick value-added wood sector was, by a significant margin, one of the most export intensive provinces (on par with British Columbia), generating over \$1900 in export revenue per citizen.

Figure 17²⁹ shows the absolute, as well as the per capita, value of exports for the New Brunswick value-added wood sector in 2012.

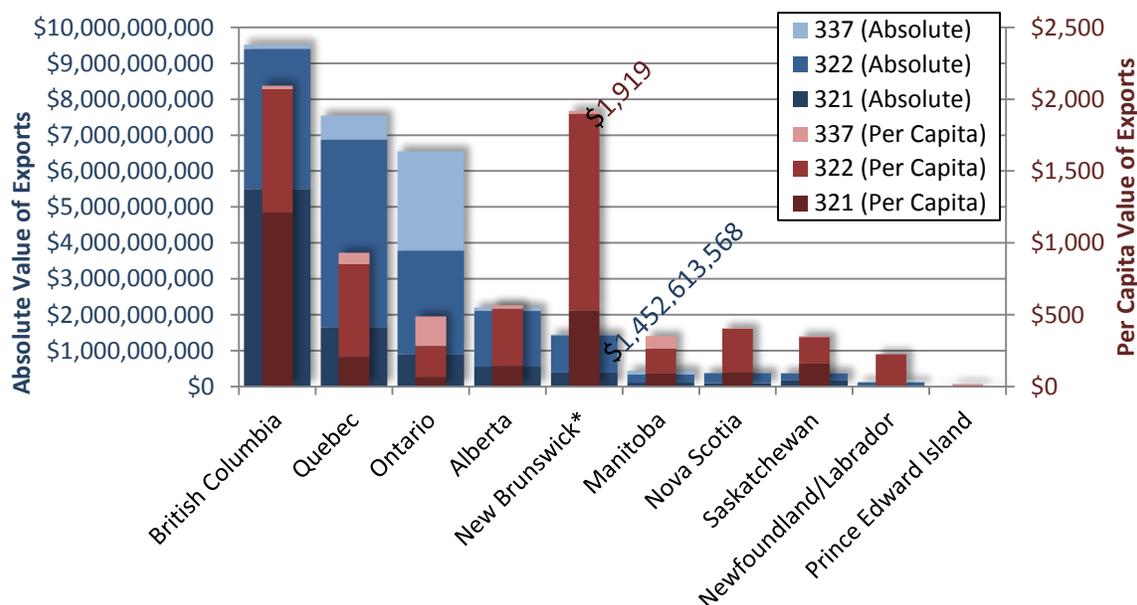


Figure 17: Value-added Wood Sector Provincial Exports (2012)

As shown in Figure 18, New Brunswick value-added wood sector imports were valued at \$217 million in 2012, or \$287 per citizen on a per capita basis.

²⁹ Created from data made available through Industry Canada's Trade Data Online website: <http://www.ic.gc.ca/eic/site/tdo-dcd.nsf/eng/Home>.

New Brunswick Sector Profile: Value-added Wood

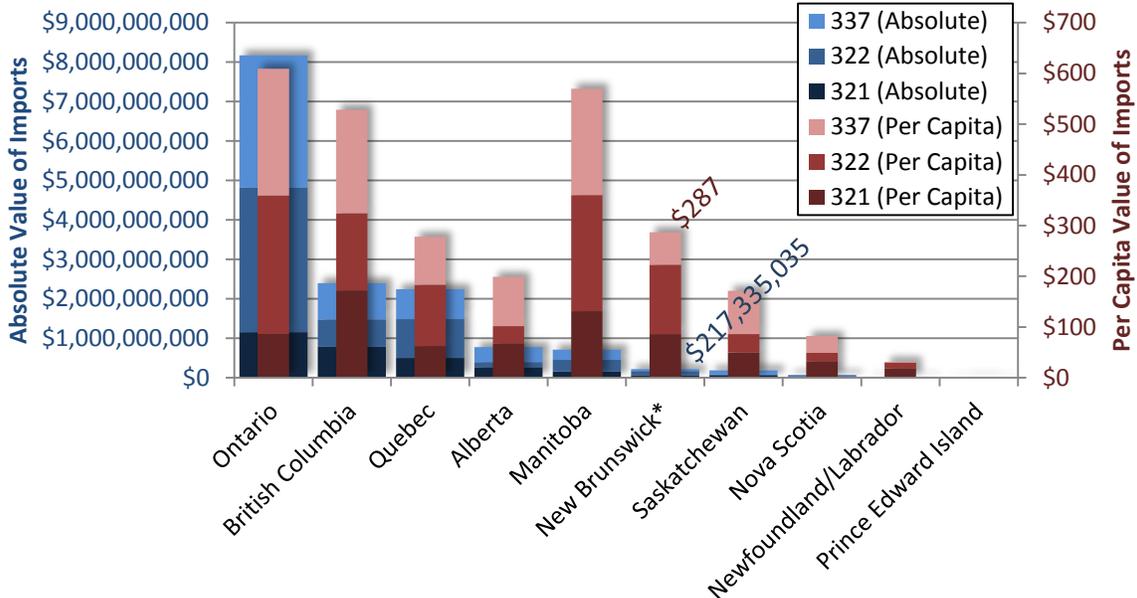


Figure 18: Value-added Wood Sector Provincial Imports (2012)

Figure 19 shows the net trade balance for the New Brunswick sector in comparison to all provinces.

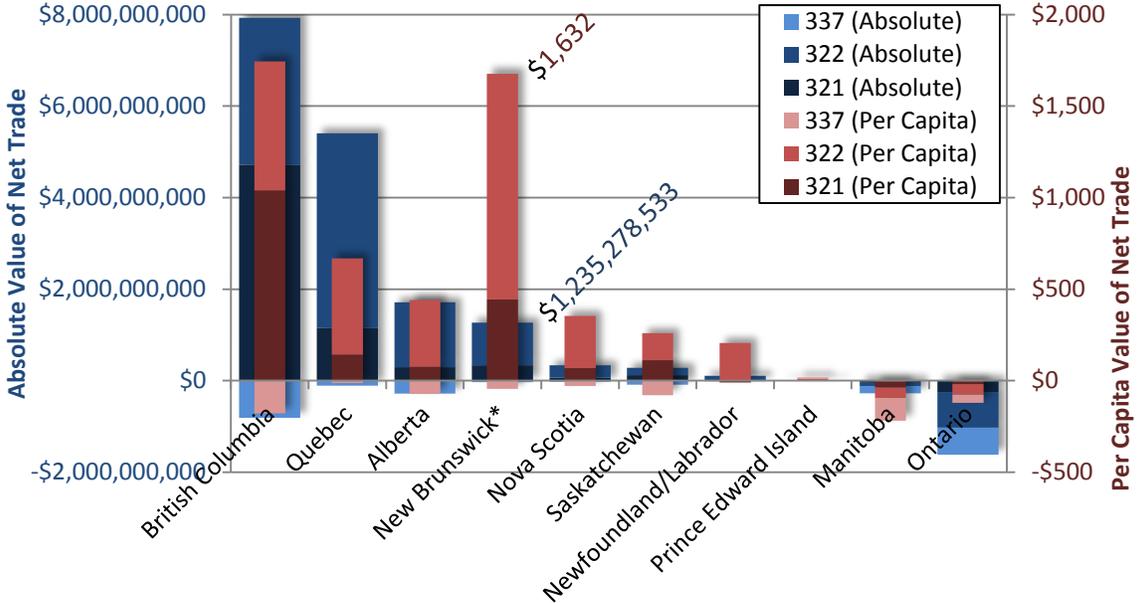


Figure 19: Net Trade Balance of Value-added Wood Sector by Province (2012)

5.7.2 International Trade Agreements

There are two international trade agreements that are of particular interest to the New Brunswick value-added wood industry: the Canada/US Softwood Lumber Agreement (SLA) and the Comprehensive Economic and Trade Agreement (CETA) being negotiated between Canada and the European Union.

New Brunswick Sector Profile: Value-added Wood

5.7.2.1 Softwood Lumber Agreement (SLA)³⁰

The Canada/US Softwood Lumber Agreement (SLA) was drafted in response to allegations made by the United States lumber industry that Canadian softwood lumber imports were unfairly subsidized. For over 25 years, prior to the agreement, the US imposed import duties on Canadian softwood lumber. While Canada successfully challenged these actions through the dispute resolution processes of the World Trade Organization (WTO) and the North American Free Trade Agreement (NAFTA), the SLA appeared to be the most expedient means by which to move forward. The agreement was signed in September 2006 and came into effect October 2006 for an initial seven-year term. A two-year extension, to October 2015, was ratified in April 2012.

The essence of the agreement was based on the Government of Canada collecting an export charge from certain Canadian softwood lumber producers when the price of lumber is at or below US\$355 per thousand board feet (MBF). The export charge revenues collected are distributed to the provinces, minus the cost associated with SLA administration.

There were two "Border Measures" that a region was invited to choose from:

1. Option A: an export charge, with the charge varying with the "prevailing monthly price" as prescribed in the SLA. If a region under this option exceeds its export volume threshold by more than 1 % in any given month, all exports in that month are subject to a retroactive additional export charge, equal to 50% of that month's export charge rate (the "surge mechanism").
2. Option B: an export charge that is lower than the Option A charge and is combined with a volume restraint ("quota"), where both the rate and the volume restraint vary with the prevailing monthly price.

Table 7: Softwood Lumber Agreement Border Measures

Prevailing monthly price per thousand board feet (MBF)	Option A – Export Charge (%)	Option B – Export Charge plus Volume Restraint
Over US \$355	0	0
US \$336-355	5	2.5% + regional share of 34% of US Consumption
US \$316-335	10	3% + regional share of 32% of US Consumption
US \$315 or under	15	5% + regional share of 30% of US Consumption

The BC Coast, BC Interior and Alberta initially chose Option A, while Saskatchewan, Manitoba, Ontario, and Quebec chose Option B. Despite each region having the

³⁰ This section provides only a high-level overview of the SLA with most information derived from http://www.international.gc.ca/controls-controles/softwood-bois_oeuvre/background-generalites.aspx?lang=eng.

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opportunity to switch options every three years, to date, all regions have retained their original options.

There are **exclusions** to the agreement. Border measures do not apply to softwood lumber exports that are:

- produced in the Atlantic Provinces from logs harvested in **New Brunswick**, Nova Scotia, Prince Edward Island, Newfoundland or the State of Maine, the origin of which is certified under the Maritime Lumber Bureau Certificate of Origin;
- from logs harvested and produced in the Yukon, Northwest Territories or Nunavut; and
- from 32 companies previously found by US authorities not to benefit from alleged subsidies (three Ontario companies and 29 Quebec companies).

If the view is taken that the SLA essentially levels the playing field amongst Canadian exporters by primarily adjusting for stumpage rates for crown wood in various jurisdictions, then it can be said the New Brunswick producers pay more for access to Crown wood than most other jurisdictions³¹. As the prevailing price of softwood lumber exceeds \$316/MBF, the effects of this "adjustment" are reduced until it reaches zero at \$355/MBF and above. At these levels, NB exporters are essentially at a competitive disadvantage compared to exporters in other provinces (granted at these price levels the impact of stumpage fees is somewhat diminished). As shown in Figure 20³² this has been the situation in recent times. This compounds the sector's recovery efforts from a significant and prolonged downturn.

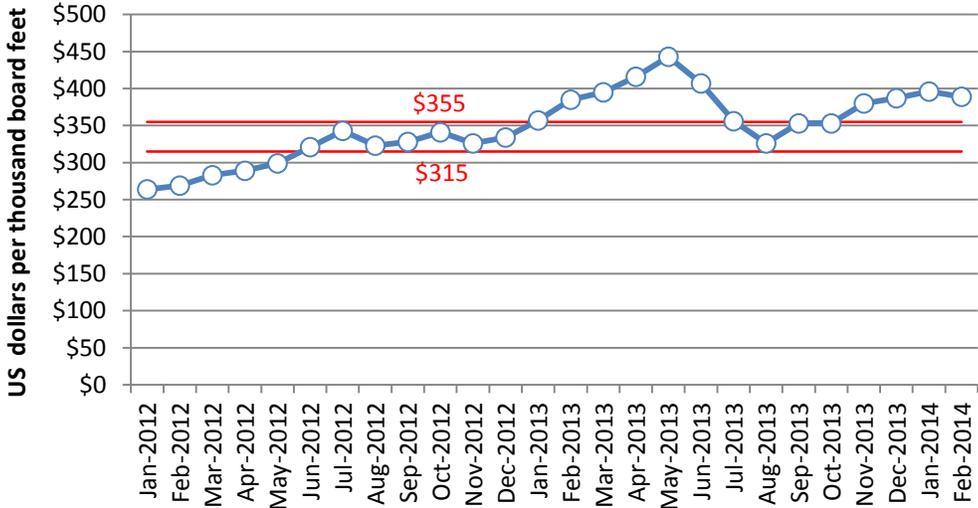


Figure 20: Softwood Lumber Agreement Prevailing Monthly Price

³¹ One key informant noted that stumpage rates in New Brunswick are in the range of \$20/m³ compared to British Columbia which can be as low as \$0.25/m³ because of the pine beetle situation.

³² Produced from data published by Foreign Affairs, Trade and Development Canada available at http://www.international.gc.ca/controls-controles/softwood-bois_oeuvre/index.aspx?lang=eng.

5.7.2.2 Comprehensive Economic and Trade Agreement (CETA)

On October 18, 2013, it was announced that Canada and the European Union (EU) had reached an agreement in principle on a Comprehensive Economic and Trade Agreement (CETA) intended to boost commercial ties between the two partners. The “Forest and value-added wood products” sector was identified as one of the sectors that stood to gain from the agreement. Specifically the announcement³³ indicated that:

“Canada is the world's leading exporter of softwood lumber, newsprint and wood pulp, and the fifth largest exporter of wood panels. The industry represents a significant component of the Canadian economy, contributing \$20.2 billion to Canada's GDP in 2012 and employing roughly 235,000 Canadians.

From 2010 to 2012, Canadian exports of forest products to the EU were worth an average of \$1.2 billion annually. These exports face average tariffs of 1.2%, with peaks of 10%.

Upon entry into force, CETA will immediately eliminate existing tariffs on all forest products, including those on plywood (7% -10%), prefabricated wooded buildings (2.7%), and particle board and oriented strand board panels (7%). These and other tariff reductions in the forest products sector will be of greatest benefit to British Columbia, Alberta, Manitoba, Ontario, Québec, Nova Scotia and New Brunswick.”

5.8 Certifications

There are a number of certifications and standards that can come into play for companies active in the value-added wood sector. However, many are very specific and apply only to certain segments along the value chain. This report does not provide a comprehensive list and review of all certification programs, but rather aims to provide an overview to the major certification programs applicable to the sector.

In general terms, there are two major types of certification programs related to the value-added wood sector: those related to sustainability (which are discussed below), and specific programs related to individual manufacturing segments (which are listed in Appendix 5).

The three major forest sustainability certification programs used in Canada are: Canadian Standards Association (CSA), Forest Stewardship Council (FSC) and Sustainable Forestry Initiative (SFI). They apply to public and private lands, can be used for both large and small forest areas, and include environmental objectives and performance measures.³⁴

³³ <http://www.actionplan.gc.ca/en/news/ceta-aecg/canada-reaches-historic-trade-agreement-european>.

³⁴ Most of the information presented on CSA, FSC, and SFI is taken from reference [6].

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Canada has almost half of the world's Programme for the Endorsement of Forest Certification Schemes (PEFC) endorsed certifications and almost a third of the world's FSC certifications.³⁵

The Canadian Standards Association (CSA)



The CSA is Canada's oldest and largest standards development organization, a not-for-profit membership-based organization founded in 1919. The CSA Sustainable Forest Management Standard (CAN/CSA-Z809-08), Canada's national standard for sustainable forest management, was released in 1996 and last revised in 2008. It uses a definition of sustainable forest management developed by the Canadian Council of Forest Ministers (CCFM) from the Montreal Process, an inter-governmental process for developing global criteria and indicators for sustainable management of the world's temperate and boreal forests.

A standard specifically for woodlots and other small area forests, CAN/CSA Z804, was released in 2008. The CSA program was endorsed by the international Programme for the Endorsement of Forest Certification Schemes (PEFC) in 2005.

The Forest Stewardship Council (FSC) Canada



FSC Canada was constituted in 1998 and operates under FSC International. It is a registered charity governed by a board of directors representing a balance of interests. It has developed three regional (sub-national) standards for Canada that include and build on the principles and criteria of the FSC international standard for responsible forest management. These have been accredited by FSC International and are: the Maritimes Standard (released 1999, last revised 2008), the British Columbia Standard (released 2003, revised 2005), and the National Boreal Standard (2004). A draft standard for the Great Lakes-St. Lawrence region was field-tested in 2007.

There are also streamlined requirements for Small and Low Intensity Managed Forests (SLIMF).

The Sustainable Forestry Initiative (SFI)



SFI Inc. is an independent, non-profit charitable organization with a forest management standard developed specifically for North American forests. The SFI standard (first released in 1998, last revised in 2010) is applied across forests in both Canada and the United States, and is based on sustainability principles and measures that include both land management and fiber sourcing objectives. SFI Inc. is governed by a three chamber Board of Directors representing environmental, social and economic sectors equally.

The SFI Standard is applied to larger forest operations and SFI Inc. recognizes PEFC endorsed systems in North America, such as the American Tree Farm System in the US, for certification of family forest ownerships. In addition, the SFI program was endorsed by PEFC in 2005.

³⁵ <http://www.nrcan.gc.ca/forests/canada/sustainable-forest-management/13211>.

Chain-of-Custody

Chain of custody is not a certification standard per se, but is rather a set of requirements built into existing forest certification programs. A chain-of-custody is a set of chain-wide administrative and technical requirements for traceability. The chain might run from the forest to the first mill that receives it (a “forest” chain-of-custody) or from the forest through all stages of production to the end consumer (a “product” chain-of-custody). The traceability mechanisms to be used are established in the chain-of-custody standard of the relevant forest certification program (e.g. CSA, FSC, SFI) and audited by independent third parties.

Chain-of-custody certification complements forest management certification by verifying the link between the certified forest and the product, enabling the product to be sold as certified. Both FSC and SFI have developed program-specific chain-of-custody standards whereas the CSA program uses the PEFC international chain-of-custody standard [6].

ISO 14001



Many wood producing companies are also certified to the ISO 14001 Environmental Management System (EMS) Standard, which provides a solid management system for meeting goals and then improving on them. The forestry-specific standards (CSA, FSC, SFI) can be built on top of ISO 14001 which provides a foundation for continual improvement.

5.9 Value-added

In contrast to the measure of manufacturing revenues (Section 5.6), value-added provides some insight into the degree of transformation which occurs within industries. Value-added is a measure of net output which is calculated as gross output less purchased inputs (such as the cost of materials and supplies and of energy, water and vehicle fuel), all of which have been embodied in the value of the product³⁶. Simply put:

$$\text{Value-added} = (\text{gross output}) - (\text{purchased inputs})$$

Shown in Figure 21 is the relative ranking of Canadian average value-added/employee for the six-digit NAICS industries that make up the value-added wood sector.

³⁶ <http://www.ic.gc.ca/cis-sic/cis-sic.nsf/IDE/cis-sic31-33prde.html#prd4> , accessed Jan/2014.

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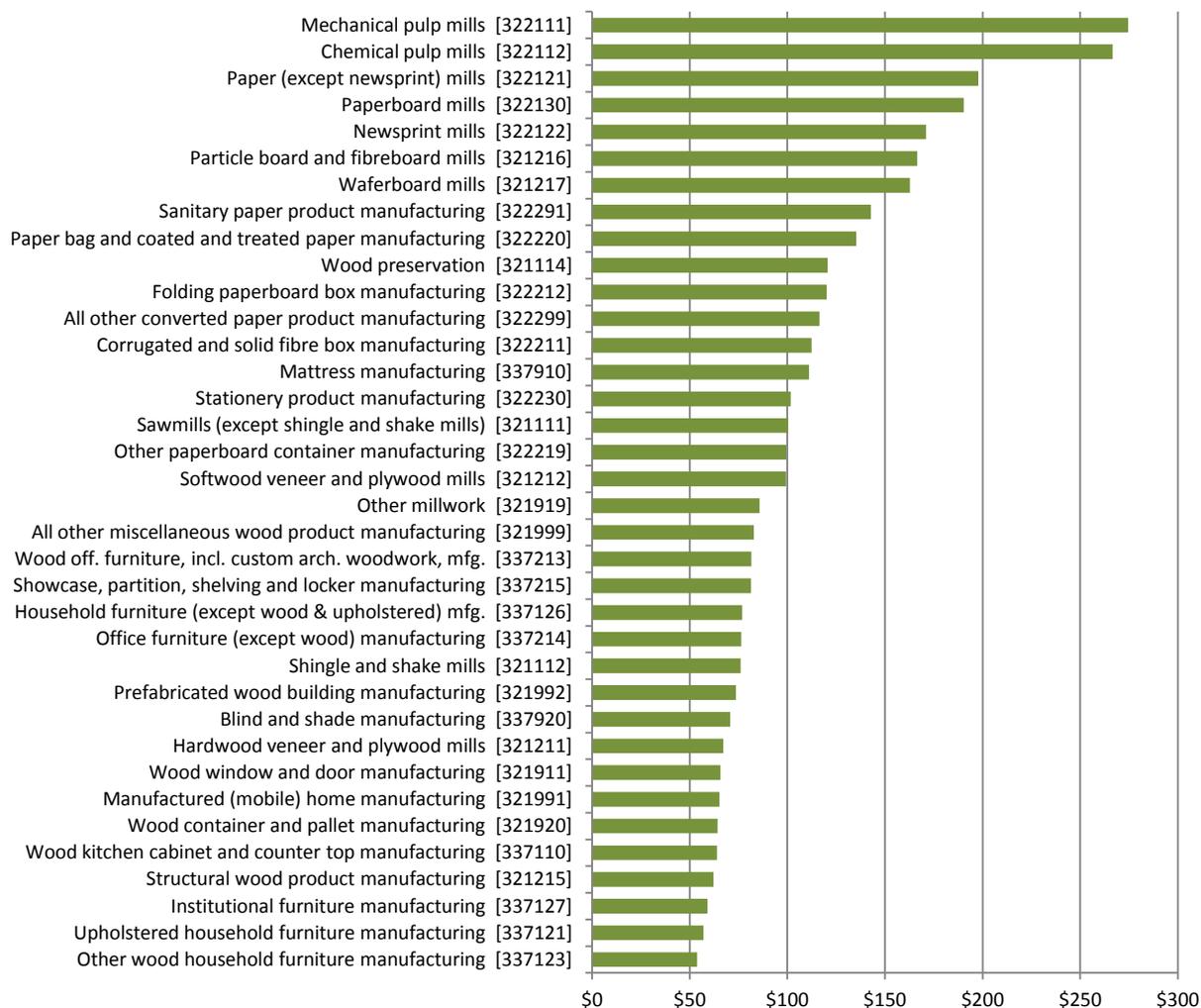


Figure 21: Manufacturing Value-add/Employee of Specific Industries (Canada 2010)

By this measure, many of the primary manufacturing industries rank higher than the secondary manufacturing industries.

Another means of examining value-add that is unique to the sector is to consider the number of jobs created per volume of wood consumed. Unfortunately, there is not a considerable amount of literature available to draw from on this subject – particularly in Canada. However, a few studies have been produced. One 1996 study in Ontario [7], while not scientific in nature, looked at a number of individual companies to calculate the metric of “Jobs per thousand cubic meters (Jobs/'000 m³)”. The findings are shown in Figure 22.

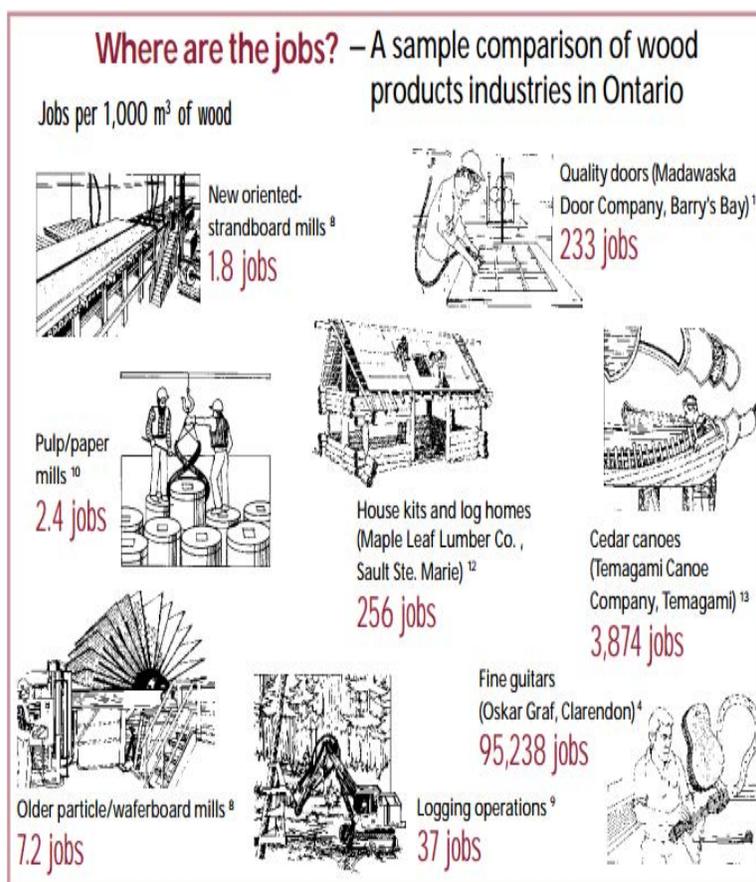


Figure 22: Jobs per 1,000 m³ of Wood (Ontario 1996)

In a number of studies spanning from 1999 to 2008 looking at secondary wood manufacturing in British Columbia [8] [9] [10], the authors (Stennes et al.) regularly cited jobs per thousand cubic meters of wood created for various business types. The data from all three studies are consolidated into Table 8.

Table 8: Jobs per 1,000 m³ of Wood (British Columbia 1999, 2005, and 2008)

Business Type	Jobs/'000 m ³		
	1999	2005	2008
Cabinets	10.33	23.29	-
Furniture	7.66	6.19	-
Cabinets and furniture	-	-	8.05
Millwork	1.75	2.75	7.60
Log homes and timber frames	-	-	3.03
Other wood products	0.70	0.41	1.01
Engineered wood products	1.84	1.03	0.80
Shakes and shingles	0.96	-	0.78
Remanufactured products	0.50	0.41	0.51
Pallets and containers	0.82	0.64	0.43
Panelboard products	0.75	-	-

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The data shows average values by business type and is significantly more conservative than that shown in Figure 22. The table also indicates that even for the same jurisdiction, there is relative volatility of the metric over time. The data does however provide an overall indication of the business types that are likely to produce greater levels of employment per unit of fiber. In this case, the cabinet/furniture grouping and millwork demonstrate the highest coefficients for the measure.

It should be noted that in the majority of cases these value-added secondary jobs are incremental to those created by woodlands and primary operations – since they typically utilize output from mills as their raw material. Based on data from Natural Resources Canada [11], the New Brunswick woodlands and primary segment generated 1.29 jobs per 1,000 m³ (based on employment numbers from the Labour Force Survey), and 0.97 jobs per 1,000 m³ (based on the Survey of Employment, Payrolls and Hours).

While not a specific measure of value-added, another interesting and related metric is the number of jobs that are created as a result of increased output (i.e. sales). Figure 23³⁷ shows the number of jobs created for every \$1 million of increased output for some of the key segments related to the value-added wood sector in New Brunswick.

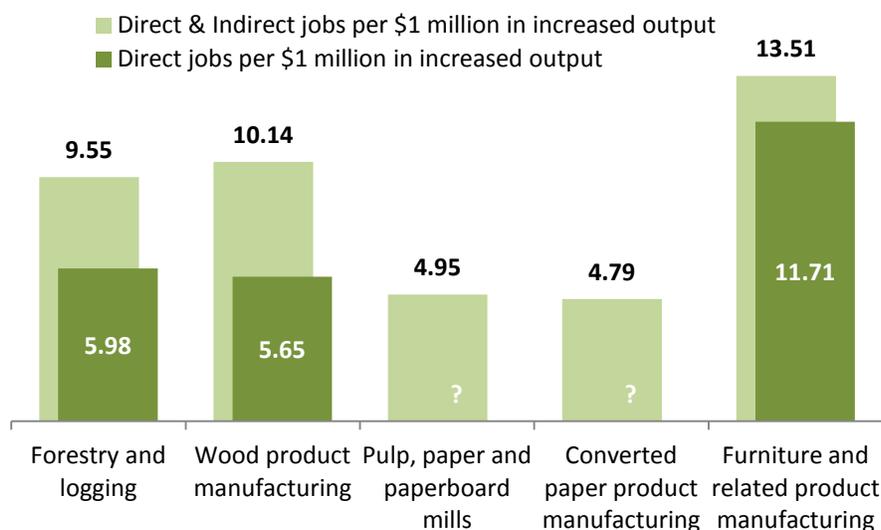


Figure 23: Jobs Created as a Result of \$1 Million in Increased Output (2009)

5.10 Key Economic Indicators

As previously noted, the New Brunswick value-added wood sector does not operate in isolation. It is interconnected not only with the Canadian economy, but due to its strong export focus, also with the global economy – particularly that of the United States.

As with all sectors of the economy there are a number of indicators and influences that can affect performance of the value-added wood sector. However, three that are of

³⁷ Created from data published in the Provincial Input-Output Multipliers, 2009, made available by the Industry Accounts Division of Statistics Canada.

New Brunswick Sector Profile: Value-added Wood

primary importance include: the change in Gross Domestic Product (GDP – in both Canada and the US), the Canada/US exchange rate, and housing starts (in both Canada and the US).

5.10.1 Change in Gross Domestic Product (GDP)

The change in Gross Domestic Product (GDP) is an important indicator of a region's economic performance. Figure 24³⁸ shows short term historical GDP annual growth rates for selected global economies. The correlation of the Canadian and United States charts demonstrate the well known interconnectedness of the two economies.

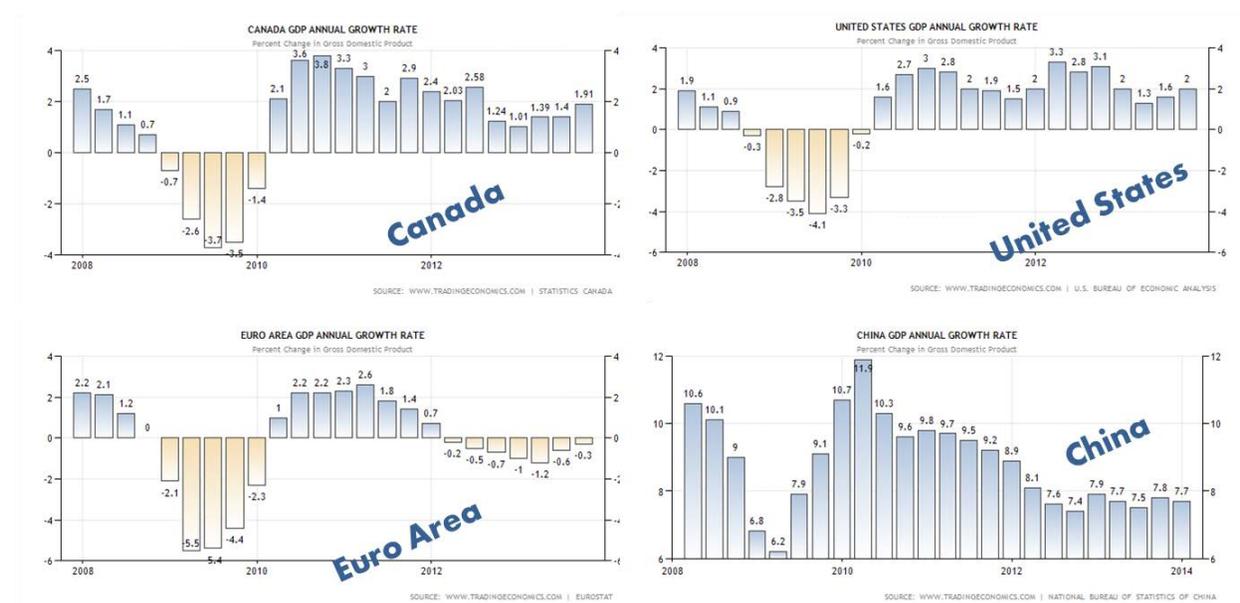


Figure 24: GDP Annual Growth Rate for Selected Global Economies

A comparison of the historical performance of the value-added wood sector (see Figure 10 and Figure 16) shows a close correlation to the GDP growth rates of both Canada and the United States. The impact that the 2009 recession has had on the value added-wood sector has reinforced the need to reduce dependency on both the domestic and the United States markets, and the need to diversify into other jurisdictions. Anecdotal comments from key informants have indicated that some companies have already initiated diversification efforts.

As an indicator, GDP growth projections are signalling a positive environment for the value-added wood sector moving forward. In North America, the last two to three years have shown modest, but positive growth and the International Monetary Fund (IMF) generally sees the short term world economic outlook as being positive. They see "Advanced Economies" collectively showing a 2.2% and 2.3% change in output in 2014 and 2015 respectively (where Canada = 2.2%/2.4%, United States = 2.8%/3.0%, and the EU = 1.0%/1.4%)³⁹. The collective outlook for "Developing Economies" is even more

³⁸ <http://www.tradingeconomics.com/>, accessed January 2014.

³⁹ <http://www.imf.org/external/pubs/ft/weo/2014/update/01/>, accessed February 2014.

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positive with growth projected at 5.1% and 5.4% for 2014 and 215 respectively (where China = 7.5%/7.3%, Mexico = 3.0%/3.5%, and India = 5.4%/6.4%).

5.10.2 Housing Starts

When viewing the linkages between segments and activities within the value-added wood sector as shown in Figure 5 of Section 5.2, it is very evident that many products are ultimately destined for the housing market. Lumber, panels, engineered wood products, flooring, doors and windows, siding etc. are all used in the construction of housing. Furniture, cabinets, and other wood products are used to furnish and decorate housing. The only sub-sector that does not have a strong linkage to the housing market is pulp and paper manufacturing (NAICS 322).

For comparative purposes, historical housing start data for both Canada and the United States is shown in Figure 25⁴⁰. As can be seen, the housing market in the United States has declined significantly more than in Canada since 2005, and the recovery has been slower and less robust.

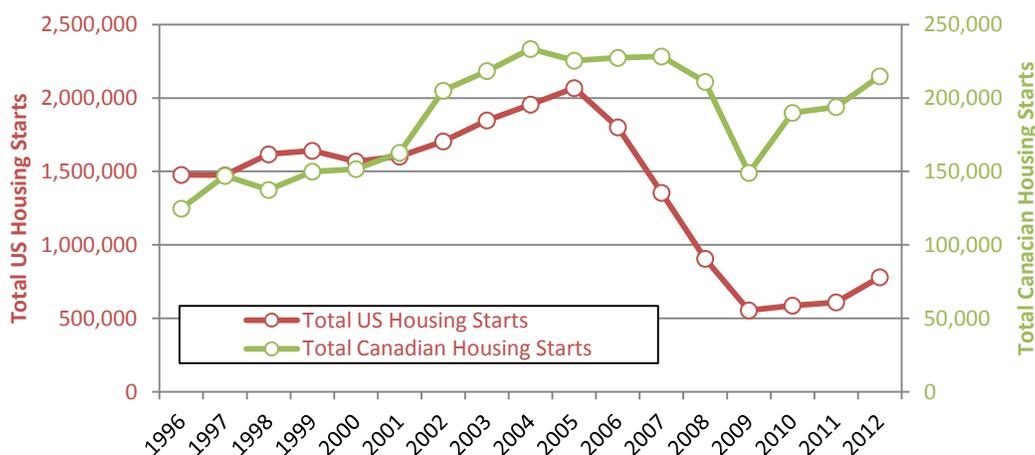


Figure 25: Canada and United States Historical Housing Starts (1996-2012)

To examine the strength of the correlation, historical housing starts were plotted against employment levels for the wood product manufacturing (NAICS 321) and furniture and related product manufacturing (NAICS 337) sub-sectors for the same period. Figure 26 shows how closely both Canadian and United States housing starts compare to the combined sub-sector employment levels (321 and 337) for both Canada and New Brunswick. A slightly closer correlation appears to exist with the US housing market.

⁴⁰ Created from data made available by the Canada Mortgage and Housing Corporation (CMHC) [42] and United States Census Bureau - New Residential Construction http://www.census.gov/construction/nrc/historical_data/, accessed January 2014.

New Brunswick Sector Profile: Value-added Wood

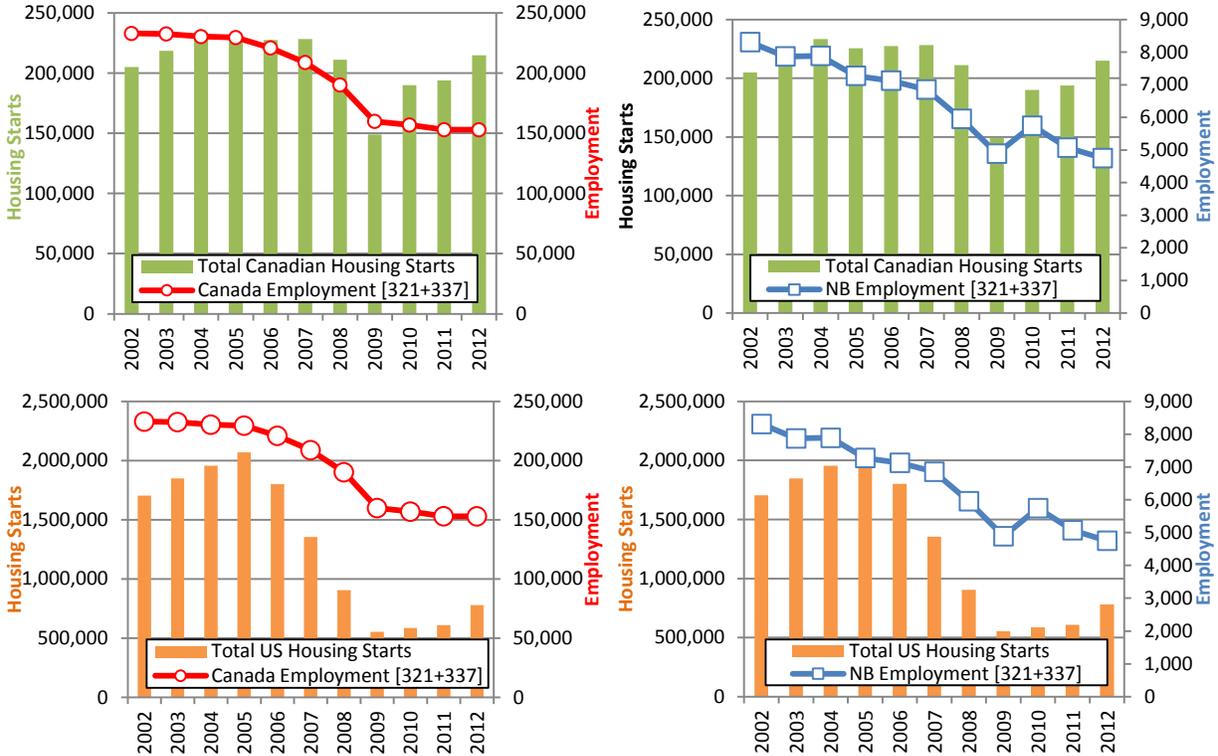


Figure 26: Value-added Wood Sub-sector Employment and Housing Starts

Annual housing starts in both Canada and the United States are expected to experience continued growth in the short term. The Canada Mortgage and Housing Corporation (CMHC) predicts that total housing starts in Canada are expected to remain mostly unchanged in 2014, reaching 187,300 units, before moderating to 184,900 units in 2015⁴¹. In the United States forecasting experts are expecting modest growth to continue with housing starts in 2014 reaching 1.1 million units⁴².

5.10.3 Currency Exchange Rates

The New Brunswick value-added wood sector, as described in Section 5.7, is an export intensive sector. The strength of the Canadian dollar relative to the currency of the export destinations can have a significant impact on success. Generally, the stronger the Canadian dollar, the less competitive value-added wood products will appear.

Figure 27⁴³ shows the recent historical value of the Canadian dollar against the United States dollar (USD), the European Euro (EUR), and the Chinese Yuan Renminbi (CNY).

⁴¹ CMHC Housing Market Outlook - Quarter 2014.
⁴² <http://online.wsj.com/news/articles/SB10001424052702304773104579266230593471534> , accessed January 2014.
⁴³ Produced from data made available by the Bank of Canada: <http://www.bankofcanada.ca/rates/exchange/10-year-converter/>, accessed January 2014.

New Brunswick Sector Profile: Value-added Wood

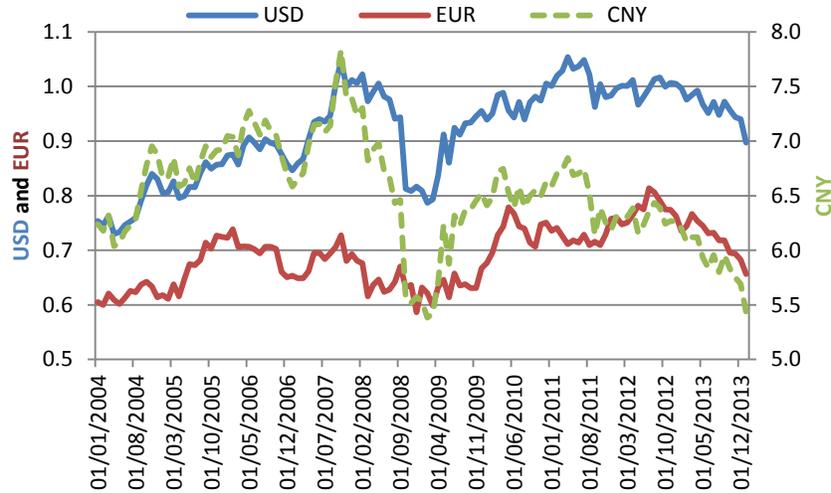


Figure 27: Value of the Canadian Dollar against the USD, EUR, and CNY (2004-2013)

5.11 Trends

5.11.1 Technology Adoption

The increase in technology adoption within the primary, secondary, and evolving bio-products segments was a prevailing theme encountered in the literature review as well as in key informant interviews.

One of the most insightful visuals on the subject has been put forward by wood product manufacturing consulting firm Lignum Consulting and is shown in Figure 28⁴⁴.

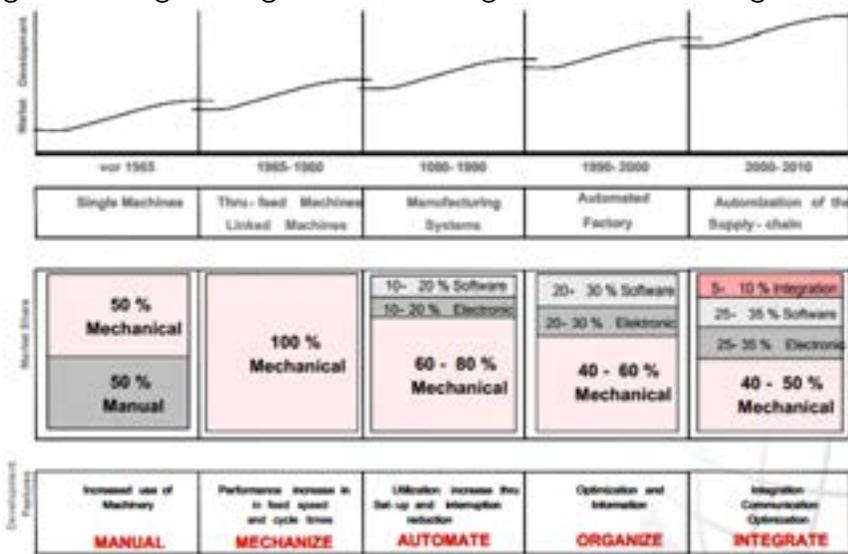


Figure 28: Lignum Consulting Technology Migration Model

The impetus to adopt new technology is driven by market pressures where companies must continuously strive to increase their competitiveness. Often this is achieved through productivity improvements that frequently involve automation and other

⁴⁴ http://www.lignum-consulting.net/pdf/Technological_Innovation_WMS_2007.pdf.

technology adoption practices. Technology adoption can sometimes be very costly and involve significant disruption to current practices. The risks associated with adoption (ex. investment cost, adoption hurdles, etc.) must be weighed against the risks associated with the status quo (ex. relative competitiveness, quality, etc. compared to competitors).

Both the Forest Products Association of Canada (FPAC) and the Wood Manufacturing Council (WMC) have noted the prevalence of technology adoption. One example in the primary segment is the use of optimizers to "read" a log to determine exactly how and where to cut. The latest in computer technology can help maximize the yield from every log sawn, and greatly improve recovery and competitiveness [12]. In the secondary segment, computer numerical control (CNC), robotic equipment and other technologies are gaining ever wider adoption to increase cost-effectiveness, lower cycle times, and produce higher levels of quality [13] [14].

On a cautionary note, while technology can do much to automate processes, it does not eliminate the need for skilled workers. In reality, a move to automation is dependent on having access to workers with the requisite skills and knowledge that the technology demands. Some key informants noted that when new technology was adopted to improve productivity and reduce labour they were faced with recruitment challenges in finding higher skilled employees to operate the new more sophisticated equipment.

5.11.2 Sustainability

Sustainability is an issue that continues to gain attention in all industries as consumers increasingly make choices that are biased toward products produced by environmentally responsible companies. With the value-added wood sector being so closely tied to the forest resource sustainability holds even greater prominence. While most forestry and value-added wood companies conduct themselves in a responsible manner, they are not immune to being grouped with other companies, some who actually partake in negligent environmental practices. Third party certifications are perhaps the most effective means for a company to be differentiated in the eyes of consumers. It also actually helps improve sustainability practices. Brief descriptions of the major sustainability certifications adopted in Canada are given in Section 5.8.

Canada is one of the world leaders in forest management practices. Canada's forestry regulations and laws were cited in a study from Yale University as being among the most stringent in the world. Globally, Canada accounts for over 42% of all certified forests [6], and in 2010 forest companies and environmental organizations in Canada came together to create the Canadian Boreal Forest Agreement⁴⁵.

A possible trend that may arise in New Brunswick is the use of wood in public buildings. In 2010 the New Brunswick Forest Products Association published a report [15] making the case for wood to be used in public buildings. The paper states that wood is not seen as a traditional building material for non-residential construction markets despite meeting many requirements of the national building code. It also points out that wood is a greener choice compared other building materials in terms of overall environmental

⁴⁵ <http://www.canadianborealforestagreement.com/>.

impact. The lobbying efforts appear to have made inroads. One of the strategic objectives identified in the Province's 2012 value-added wood sector strategy [2] is to "Pursue development of a Provincial *Wood in Public Buildings Policy* based on carbon footprint targets". Industry, through the Maritime Lumber Bureau, has created Atlantic WoodWORKS⁴⁶. The initiative provides education, training and technical expertise to building and design professionals involved with commercial, institutional and industrial construction projects. Advances in engineered wood products and changes to the building code are opening the possibility of wood being used as the major structural material for the construction of high rise buildings [16].

5.11.3 A Sector in Transition – The Emerging Bio-products Segment

Economic conditions, competition from low cost labour jurisdictions, and technological change are among the many pressures being faced by the value-added wood companies. These pressures have initiated a structural transition within the sector.

The pulp and paper segment for example has experienced a significant structural decline. Newsprint, once the centrepiece of the industry, has seen demand consistently fall due to many factors, not the least of which is the global movement to the online world. This is compounded with recent competition from South America where wood fibre grows faster, labour is less costly, and there are expansive virgin forests. From 2002 to 2012 South America doubled its share of pulp production in the world pulp market to where it provides three out of every ten tons of bleached market pulp [17].

The remaining mills in New Brunswick now focus on specialty markets such as high grade paper, tissue, converted paper products, and fibre for the textile industry that are generally more resilient to fluctuating market conditions.

Perhaps the greatest change is still to come with the emergence of the bio segment within the sector. While important efficiency improvements and product innovation will continue in the "traditional" segments, the options available in the bio-products segments (bio-energy/bio-fuels and bio-chemicals/ bio-materials) have transformative potential.

The "Bio-pathways Project" led by the Forest Products Association of Canada (FPAC) in collaboration with FPInnovations and Natural Resources Canada (NRCan) showed that numerous viable options exist to convert wood fibre to new bio-products. More importantly, they found these options are best achieved by integrating their production within the "traditional" industry [18].

Provincial strategies in other jurisdictions are adopting this integrated approach. British Columbia, for example, sees the development of "Next Generation" products (Bio-products) being carried out in conjunction with the "Commodity Sector" (Primary) and "Value-added Sector" (Secondary) [19].

⁴⁶ www.atlanticwoodworks.ca.

5.12 Challenges

The difficulty in identifying sector challenges⁴⁷ is maintaining relevance to the scope of the study. The broad definition chosen for the sector covers businesses operating in very different environments, and therefore businesses that experience very different challenges. For example, the challenges faced by a 30 person cabinet manufacturer can be significantly different than those faced by a chemical pulping mill employing more than 300 people. It is not the intent of this report to outline the myriad of challenges faced by the many different businesses that fall within scope. That is a subject to be covered by studies focussed on specific businesses types, many of which have been reviewed under this study and are referenced in Appendix 1. The intent is rather to highlight some of the macro issues that are common or significant to the sector as a whole.

5.12.1 Recognizing That Not All Segments Share the Same Issues

The comparative example of the cabinet manufacturer and the pulp mill cited in the previous paragraph illustrate how companies in the sector, and the respective business environments in which they work, can vary significantly. As such, adopting approaches in one segment of the sector can sometimes risk alienating companies in other segments.

Anecdotal comments from key informants suggest that historically when primary and secondary manufacturers are in the same room vying for attention from policy makers, the media or their own industry associations, the players from the primary segment usually overshadow those from the secondary segment. This is not hard to understand if one considers the relative weight that primary players can carry compared to the secondary players if the prevailing mindset is based on the importance of overall employment⁴⁸ as well as the once prestigious role of the primary sector in a small forestry rich province like New Brunswick. For example, while wood supply in the Province is an issue of paramount importance to primary manufacturers, and an important issue to the sector as a whole, it is likely not the most critical issue for furniture and cabinet manufacturers. Certain secondary manufacturers may feel indifferent to the issue as they face other issues more pressing to their business.

An understanding of the nature and strength of the value chain linkages within the sector can also be very beneficial. As noted in Section 5.2, the connection between the primary and secondary segments in New Brunswick is not necessarily strong by default. Wood used in a secondary manufactured product, even if it is a native species to New Brunswick, may not necessarily originate from New Brunswick⁴⁹. An even deeper

⁴⁷ This section addresses some of the challenges to the sector in the context of the economic profile. Challenges related to the labour force are addressed in Section 6.

⁴⁸ As implied in Section 5.4 the primary segment can employ in the range of 85% of the total sector employment in New Brunswick.

⁴⁹ Unfortunately, data pertaining to the flow/use of New Brunswick wood in the secondary segment is not available, and this premise is based on anecdotal commentary from key informants.

understanding is gained when the concept of value-added is considered (i.e. secondary manufacturing jobs are incremental to primary manufacturing jobs as described in Section 5.9). With such an understanding stakeholders may wish to consider exploring policies and practices that strengthen the linkages between the two segments. In doing so, the impact of upstream policies and practices may have a more profound impact on downstream activities.

5.12.2 Fall-out Effects from the Recession

The long gradual decline of output from the New Brunswick value-added wood sector which culminated with the global recession has had a lasting impact that is affecting recovery on two fronts. First, the historical performance has made commercial financial institutions hesitant to finance the sector. Frequently, government backing is a requirement for companies to receive financing.

Second, the closing, or indefinite shut-down, of mills has led to supply side strains that continue to be felt. Harvesting contractors, many of whom were older self-employed or small business owners, have been forced to exit the industry and many are not interested in getting back in. Younger entrepreneurs who may have interest in getting into the business are experiencing difficulties when financial institutions are hesitant to provide financing.

5.12.3 Cost Environment

The cost environment in New Brunswick was cited as an area of concern by a few key informants. The actual costs incurred by a business will vary considerably depending upon the specific equipment used and the activities carried out at a particular location. To provide a frame of reference for discussion, Figure 29⁵⁰ shows the Canadian average for major manufacturing cost categories in three representative value-added wood industries.

⁵⁰ Data source: Industry Canada, Canadian Industry Statistics (CIS), <https://www.ic.gc.ca/eic/site/cis-sic.nsf/eng/home> accessed January 2014.

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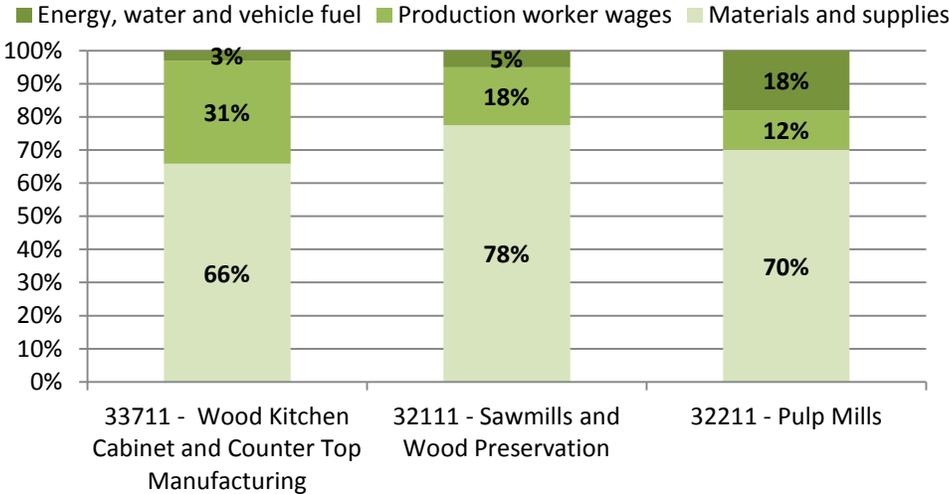


Figure 29: Comparison of Primary Manufacturing Cost Categories

Energy Costs

Power rates were identified as a particular concern by some key informants – mainly those in the primary segment. Figure 30⁵¹ shows a Hydro Quebec analysis of electricity prices in major North American cities for medium-sized power consumers. The main concern for the New Brunswick sector is the price paid for power in other jurisdictions where value-added wood is a significant industry - such as Quebec and British Columbia.

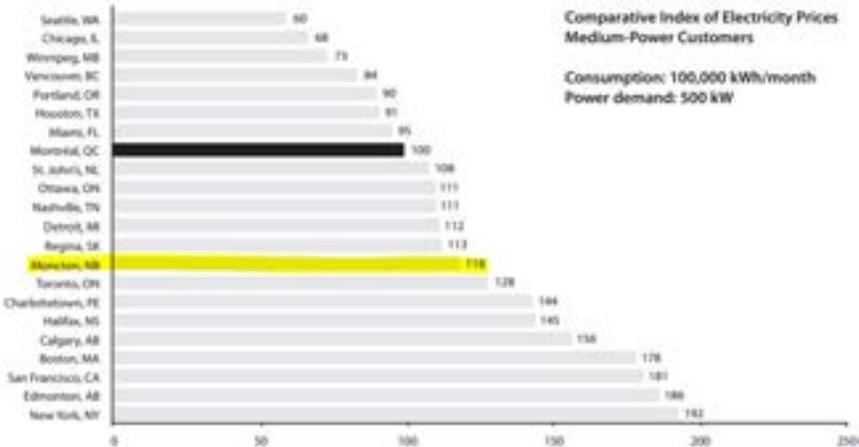


Figure 30: Comparison of Electricity Prices in Major North American Cities

According to KPMG's 2012 Competitive Alternatives study [20], Canada on average is competitive in terms of electricity costs paid globally, ranking 4th just behind Russia, France, and the United States. China for example is said to pay US\$0.120/kWh on average compared to the Canadian Average of US\$0.097/kWh.

⁵¹ Hydro Quebec, 2013 Comparison of Electricity Prices In Major North American Cities.

Production Wages

Challenges related to wages are a concern from two perspectives: competition amongst other jurisdictions, and competition amongst other industries.

In terms of jurisdictional competition, as discussed in Section 6.4, wages in New Brunswick are slightly less than the Canadian average. Domestically this puts the region at a cost advantage, but can negatively impact recruitment and retention as a portion of the workforce is drawn to other higher paying jurisdictions such as the oil and gas fields in Western Canada and Newfoundland and Labrador. From a global perspective New Brunswick and Canada are generally at a huge cost disadvantage compared to developing economies. Total labour costs in India and China for example are less than ¼ of total labour costs in Canada [20].

Lower wages from a pure cost perspective can be advantageous to the bottom line, but it can also create difficulties in recruiting and retaining skilled workers. Commentary from key informants provides anecdotal evidence that wages in the value-added wood sector in New Brunswick are somewhat lower than other industries competing for the same skilled workforce, and as such pose a challenge.

Material Costs

Similar to wages, challenges related to material costs are a concern from both the domestic and global perspectives. From the domestic perspective the comparative cost of materials is more of a concern to the primary segment – which mainly manifests in the form of stumpage rates paid for wood from Crown lands. As discussed in Section 5.7.2.1 New Brunswick generally pays higher Crown land stumpage rates than many other Canadian jurisdictions.

In the global arena Canada is competing with jurisdictions that are endowed with better growing climates and quicker growing species. However, the characteristics and quality of the wood resource frequently dictate the type of wood to be used in certain applications (ex. pulp, construction, furniture, etc.). Canadian Boreal and Acadian species will likely always be in demand for certain products. Despite this fact, it is important to recognize that almost all species of wood are beginning to be viewed as a commodity and backhaul shipping rates to low cost jurisdictions like China are relatively inexpensive. It is plausible that secondary value-added wood products made from New Brunswick wood can still be produced inexpensively there.

5.12.4 Wood Supply

The supply of wood in New Brunswick has historically been, and will likely continue to be, a challenge. This stems from the nature of resource ownership (i.e. Crown, Federal, private, and industrial freehold ownership as presented in Section 5.1.2) and is compounded with the frequently divergent interests of the numerous stakeholders that include but are not limited to:

- Industry wishing long-term secure access to large volumes of timber at the best price;

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- Private woodlot owners wanting to get the best price for their timber, and seeing Crown wood as a lower cost competitor;
- Environmental interest groups and individuals wishing to preserve the ecological value of the forest; and
- Government that has interests in economic development, but also has a stewardship responsibility to protect the forest on behalf of the people of New Brunswick.

There have been a number of studies and working groups formed over the years to address the issue (a few are referenced in Appendix 1 [3] [21] [22] [23] [24]). It is not the intent of this report to solve the issue, but rather identify it as one of the challenges facing the sector. The debate has been perpetuated for decades, and with the imminent release of the government's latest strategy for managing crown lands it is likely the debate will continue.

6 Human Resources Profile

6.1 Core Occupations

The value-added wood sector employs approximately 150 different occupations. Thirty-two (32) core occupations were identified through the use of an algorithm to determine which occupations were statistically significant to the sector⁵². Two criteria were considered in determining the core occupations:

1. Any occupation where the value-added wood sector (by NAICS definition) employs at least 20% of the total New Brunswick employment for that occupation:

Scenario A: Sector employment for some occupations in absolute terms may appear large, but in relative terms represent only a small percentage of total employment in that occupation. For example, the sector employed 129 janitors (NOC 6663) in 2012. This was only 2% of the total employment of janitors in New Brunswick so this occupation is not core to the sector.

Scenario B: In some cases, the sector employed only a small number of workers in an occupation. However, this represented a large percentage of total employed workers in the occupation. For example, there were 23 pulping control operators (NOC 9233) working in the sector in 2012. This represented 56% of total provincial employment for the sector. Therefore, pulping control operators are a core occupation to the sector.

Scenario C: There were a number of more obvious cases whereby there were a large number of workers in an occupation in the sector and a high percentage in the sector. For example, in 2012 there were 232 industrial electricians (NOC 7292) working in the sector representing 42% of the total employment. Industrial electricians are core to the sector.

2. Any occupation where the employment is 3% or more of the total sector employment or 3% or more of any sub-sector.

Scenario D: There were 38 carpenters (NOC 7271) working in the furniture and related product manufacturing (NAICS 337) sub-sector. This represented 3.3% of workers in that sub-sector, therefore, carpenters are a core occupation. This criterion applied only to carpenters, material handlers and heavy equipment operators. Note these occupations are not as statistically significant compared to the other 29 core occupations because they are found in relatively low numbers.

Table 9⁵² lists the 32 core occupations in the sector, as well as the breakdown by sub-sector, and the proportional employment of each occupation in relation to total provincial employment. Figure 31 shows the regional employment distribution, among the five economic regions, for the 32 core occupations.

⁵² Source: Stokes Occupational Forecast Estimates (SOFE), Winter 2012 base case, provided by Post-Secondary Education, Training and Labour (PETL).

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Table 9: Core Occupations in the New Brunswick Value-added Wood Sector (2012)

NOC	Description	All NB	Wood product mfg.	Paper mfg.	Furniture and related mfg.	VAW Sector	VAW as % of All
0911	Manufacturing managers	1047	161	110	19	290	28%
2122	Forestry professionals	203	34	8		42	21%
2223	Forestry technologists and technicians	333	51	19		70	21%
2233	Industrial engineering and manufacturing technologists and technicians	113	8	23		31	27%
2243	Industrial instrument technicians and mechanics	258	17	41		58	22%
7242	Industrial electricians	556	89	143		232	42%
7271	Carpenters	4275	64	8	38	110	3%
7272	Cabinetmakers	360	13		263	276	77%
7311	Construction millwrights and industrial mechanics (except textile)	1426	233	215		448	31%
7351	Stationary engineers and auxiliary equipment operators	605	59	154		213	35%
7383	Other trades and related occupations	203	59			59	29%
7421	Heavy equipment operators (except crane)	2786	233	56	8	297	11%
7452	Material handlers	2914	203	79	11	293	10%
9215	Supervisors, forest products processing	395	233	145		378	96%
9224	Supervisors, furniture and fixtures manufacturing	75	8		57	65	87%
9227	Supervisors, other products manufacturing and assembly	87	13	8		21	24%
9233	Pulping control operators	41		23		23	56%
9234	Papermaking and coating control operators	163		151		151	93%
9431	Sawmill machine operators	547	475	11	8	494	90%
9432	Pulp mill machine operators	139		136		136	98%
9433	Papermaking and finishing machine operators	132		132		132	100%
9434	Other wood processing machine operators	241	182	15		197	82%
9435	Paper converting machine operators	145		128		128	88%
9436	Lumber graders and other wood processing inspectors and graders	303	246	15		261	86%
9471	Printing machine operators	83		23		23	28%
9473	Binding and finishing machine operators	31		8		8	26%
9492	Furniture and fixture assemblers and inspectors	392	55		240	295	75%
9493	Other wood products assemblers and inspectors	384	250			250	65%
9494	Furniture finishers and refinishers	70	8		53	61	87%
9513	Woodworking machine operators	242	136	8	61	205	85%
9614	Labourers in wood, pulp and paper processing	1568	1229	305		1534	98%
9619	Other labourers in processing, manufacturing and utilities	572	21	19	57	97	17%
Totals:		20689	4080	1983	815	6878	
Percentages:			20%	10%	4%	33%	

New Brunswick Sector Profile: Value-added Wood



Figure 31: Regional Employment Distribution of Core Occupations

New Brunswick Sector Profile: Value-added Wood

While all data is subject to reporting errors and interpretation, the occupations identified with an asterisk (*) in Figure 31 should be viewed with additional caution since the percentage error between regional employment counts and total provincial employment counts for the occupation exceeded 20% (i.e. NOC 9227= 31%, NOC 9473=69%, NOC 9494=35%, and NOC 9513=29%).

6.2 Occupations of Interest

A number of sources identified in the literature review made reference to occupations within the sector that had some relevance to recruitment, retention and training. In addition, a number of key informants identified occupations they viewed as being important to the sector. Table 10 summarizes this information, and forms the basis for identifying occupations that are of special interest in the sector. The sources referenced in the table include:

- Wood Manufacturing Council (WMC)⁵³ [25]
- New Brunswick Forest Products Association (NBFPA) [26]
- Forest Products Sector Council (FPSC) [27]

Table 10: Value-added Wood Occupations of Interest

		Source			Interviews (# of mentions)	Core Occup.
		WMC	NBFPA	FPSC		
Occupation						
		Primary	Pipe-fitters		X	
Chemical technologists			X		0	
Lumber graders					1	Yes
Welders					1	
Stationary engineers				X	1	
PLC programmers					1	
Sawfilers				X	0	
Primary and Secondary	Industrial electricians	X	X	X	5	Yes
	Millwrights and industrial mechanics	X	X	X	3	Yes
	Machine operators (pulp, paper, sawmill and woodworking)	X		X	7	Yes
	Forestry technicians			X	1	Yes
	Supervisors and managers (incl. operations)	X		X	5	Yes
	Mechanical technicians				1	
Secondary	CNC machine operators	X			2	Yes
	Finishers	X			2	Yes
	Assemblers	X			2	Yes
	Product designers	X			2	Yes
	Cabinetmakers	X			0	Yes

⁵³ Also includes information from <http://www.careersinwood.ca/occupational-profiles>.

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It should be noted that some of these occupations are not “core” because they did not meet the statistical requirements defined in Section 6.1. In addition, occupations such as truck drivers, harvesting equipment operators, and others may have been mentioned in a particular source, but were omitted since they fell outside the scope of the value-added wood sector definition.

6.3 Demographics

6.3.1 Age

6.3.1.1 G8 Countries, Canada and New Brunswick

Figure 32⁵⁴ shows the percentage of the population over the age of 65 for Canada and the Canadian provinces in relation to the G8 countries.

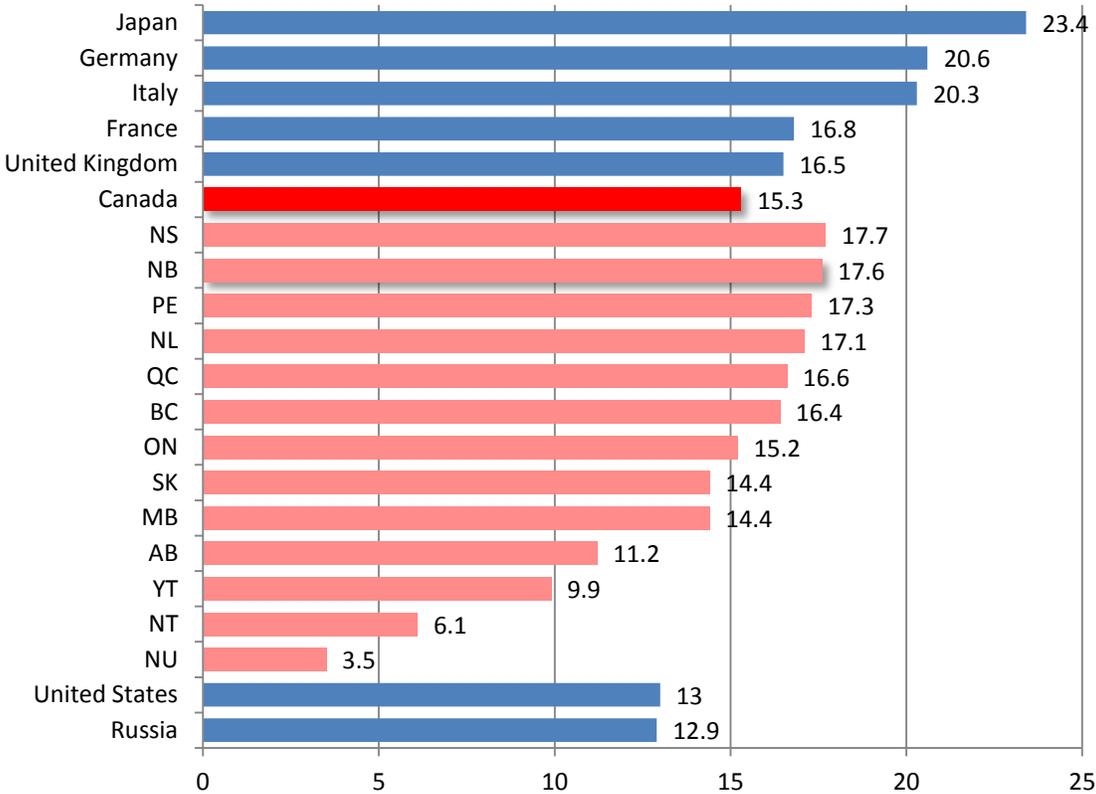


Figure 32: Percentage of Population over Age 65

Among the G8 countries, only Russia and the United States have fewer citizens over the age of 65 than Canada. Within Canada, New Brunswick has more people over the age of 65 than any province except Nova Scotia. In fact, New Brunswick has more people

⁵⁴ **Sources:** Statistics Canada, censuses of population, 2006 and 2011; US Census Bureau, 2006 and 2010; National Institute of Statistics (Italy), 2006 and 2011; National Institute of Statistics and Economic Studies (France), 2006 and 2011; Statistics Bureau of Japan, 2006 and 2011; Russian Federation Federal State Statistics Service, 2006 and 2010; and Human Mortality Database for Germany, 2006 and 2010, and for United Kingdom, 2006 and 2010.

New Brunswick Sector Profile: Value-added Wood

over the age of 65 than many G8 countries even though Canada is a relatively young nation.

Figure 33⁵⁵ shows that workers in Canada and New Brunswick generally have similar age profiles, but the New Brunswick workforce is slightly skewed toward the older side. While the percentage of workers over the age of 54 was essentially the same in both jurisdictions (19%), the percentage of New Brunswick workers choosing to remain in the workforce after age 65 is less. This will potentially affect all industries as older experienced workers retire from the workforce.

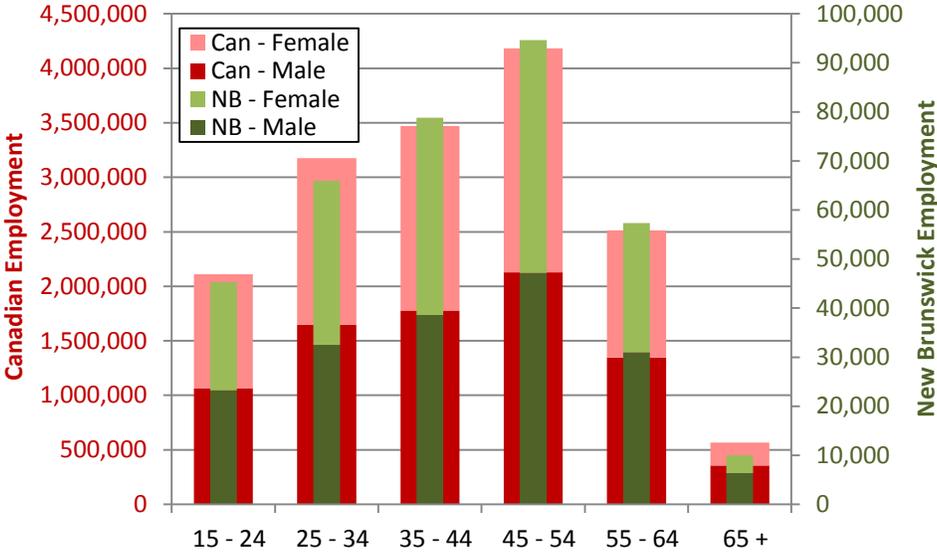


Figure 33: Age Distribution of Canadian and New Brunswick Workers

6.3.1.2 Age and Core Occupations

Appendix 6 contains age profile charts similar to Figure 33 for each of the 32 core occupations. The largest age demographic in the New Brunswick workforce, as shown in Figure 33, is 45 to 54 years of age. Using this as the benchmark, the core occupations shown in Table 11 generally employ workers younger than the reference age demographic.

Table 11: Core Occupations Generally Younger than the New Brunswick Average

Occupation	Number of Workers in Sector*
Forestry professionals	42 (21%)
Forestry technicians and technologists	70 (21%)
Industrial engineering and manufacturing technicians and technologists	31 (27%)
Supervisors, forest products processing	378 (96%)
Pulp mill machine operators	136 (98%)
Other wood machine processing operators	197 (82%)

⁵⁵ Source: Statistics Canada, 2011 National Household Survey.

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Lumber graders and other wood processing inspectors and graders	261 (86%)
Furniture finishers and refinishers	61 (87%)
* values in () indicate employment in sector as a percentage of total employment in NB, 2012 ⁵²	

Older workers (i.e. with a greater percentage in the 45 to 54 and older categories) are generally employed in the core occupations shown in Table 12.

Table 12: Core Occupations Generally Older than the New Brunswick Average

Occupation	Number of Workers in Sector
Construction millwrights and industrial mechanics	448 (31%)
Printing machine operators	23 (28%)
Furniture and fixture assemblers and inspectors	295 (75%)
Other wood product assemblers and inspectors	250 (65%)
Wood working machine operators	205 (85%)
* values in () indicate employment in sector as a percentage of total employment in NB, 2012 ⁵²	

In the remaining 19 core occupations, the workers have a similar age profile to the New Brunswick workforce.

Industry should be concerned with occupations made up of an older workforce if:

- There was a large number of workers in a particular aging core occupation; and
- The training and apprenticeship period is long.

Of the five such core occupations in Table 12, only one meets both criteria. Construction millwrights and industrial mechanics (NOC 7311) work in the sector in large numbers and represent a sizeable portion of the New Brunswick workforce. The training and apprenticeship period is usually five to six years. The other four occupations generally do not require academic training or apprenticeship and are often trained on the job by the employer on an as-required basis. Employers who rely heavily on millwrights and industrial mechanics may have concerns about the pending retirement of workers in the occupation.

6.3.2 Gender

Over 93% of New Brunswick workers employed in the 32 core occupations in all sectors are male. Women are underrepresented in just about all 32 core occupations even though women make up 44 percent of the general workforce. Appendix 6 contains graphics showing the gender composition by age category of the New Brunswick workforce for each core occupation.

6.3.3 Education

The educational profile of the 32 core occupations is shown in Figure 34⁵⁶.

⁵⁶ Source: Statistics Canada, 2011 National Household Survey

New Brunswick Sector Profile: Value-added Wood

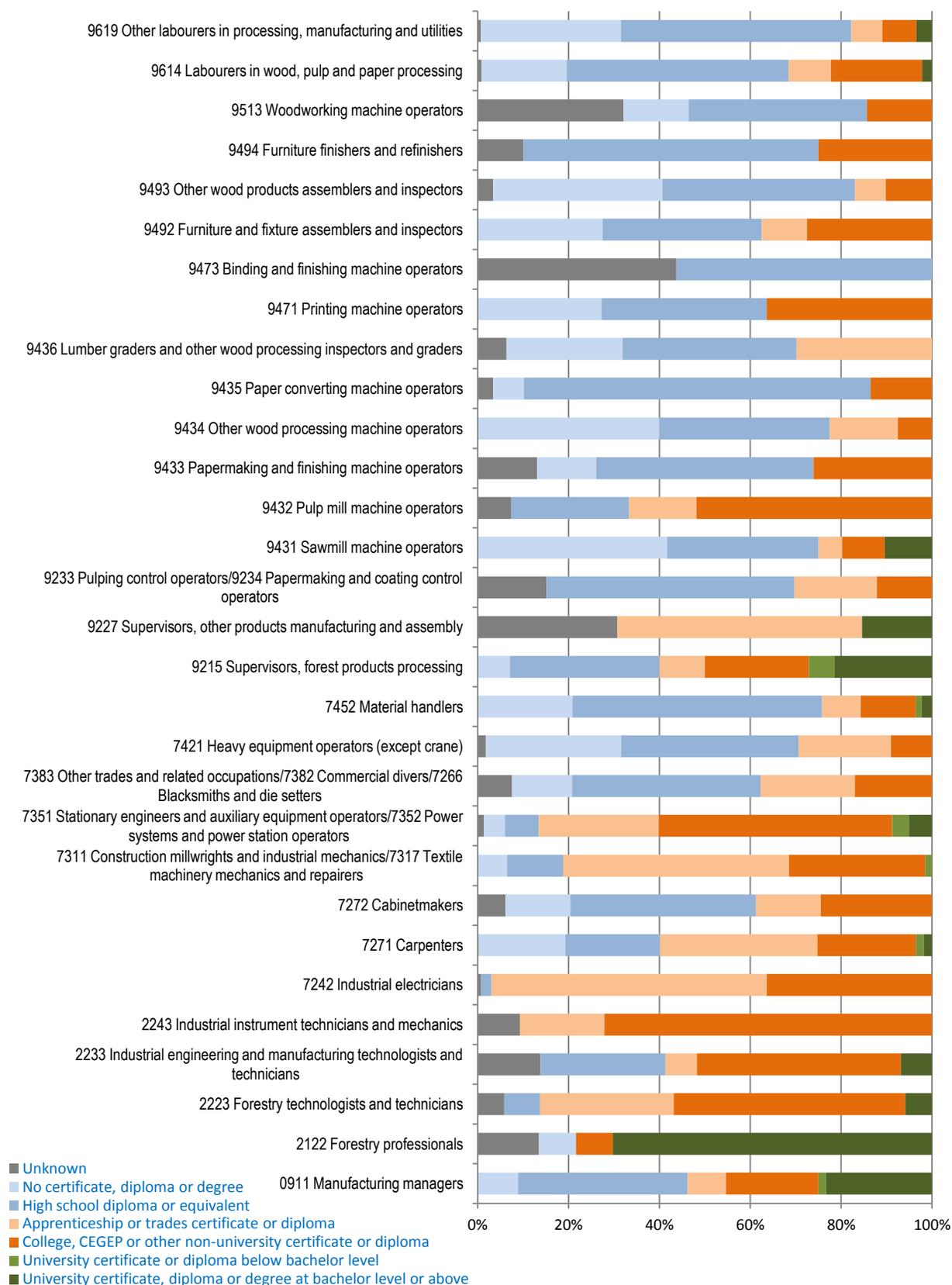


Figure 34: Educational Profile of Core Occupations

6.4 Wages

Table 13 summarizes published wage data collected and synthesized from the following sources:

- New Brunswick Community College (NBCC) / Collège communautaire du Nouveau-Brunswick (CCNB)
 - Data extracted from the 2012 survey of 2011 New Brunswick Community College / Collège communautaire du Nouveau-Brunswick graduates
- NHS - National Household Survey (2011)
 - Annual salary converted to dollars per hour⁵⁷
- Working in Canada (WIC) (2013)
 - Data is combined from a number of sources including Statistics Canada Labour Force Survey, Employment Insurance, provincial statistics, collective agreements, job postings and others
 - Annual survey converted to dollars per hour⁵⁷

Table 13: Published Wage data for Core Occupations (\$/hr)

NOC	Occupation	NBCC/ CCNB (Mean)	NHS (NB Median)	WIC (NB Mean)	WIC (Canada Mean)
0911	Manufacturing manager	NA	\$31.06	\$33.65	\$35.00
2122	Forestry professionals	NA	\$31.16	\$22.61	\$31.73
2223	Forestry technologists and technicians	NA	\$26.63	\$21.91	\$23.57
2233	Industrial engineering and manufacturing technologists and technicians	\$12.93	\$21.87	\$24.00	\$25.00
2243	Industrial instrument technicians and mechanics	\$26.05	\$34.53	\$28.87	\$35.76
7242	Industrial electricians	\$11.33	\$35.15	\$25.90	\$30.00
7271	Carpenters	\$12.60	\$15.56	\$17.00	\$23.00
7272	Cabinetmakers	\$12.60	\$15.70	\$15.25	\$17.50
7311	Construction millwrights and industrial mechanics (except textile)	\$22.00	\$28.05	\$22.99	\$27.00
7351	Stationary engineers and auxiliary equipment operators	\$35.63	\$36.82	\$22.00	\$28.00
7383	Other trades and related occupations	NA	\$17.66	\$17.00	\$18.20
7421	Heavy equipment operators (except crane)	NA	\$22.07	\$17.50	\$24.45
7452	Material handlers	NA	\$15.04	\$14.28	\$15.73
9215	Supervisors, forest products processing	NA	\$33.82	\$17.50	\$23.22
9224	Supervisors, furniture and fixtures manufacturing	NA	NA	\$14.75	\$19.05
9227	Supervisors, other products manufacturing and assembly	NA	\$28.36	\$17.41	\$21.15
9233	Pulping control operators	NA	\$42.50	\$18.16	\$28.85
9234	Papermaking and coating control operators	NA	\$42.50	\$33.78	\$25.00
9431	Sawmill machine operators	NA	\$19.00	\$17.00	\$22.00

⁵⁷ Based on an individual working 2000 hours per year.

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NOC	Occupation	NBCC/ CCNB (Mean)	NHS (NB Median)	WIC (NB Mean)	WIC (Canada Mean)
9432	Pulp mill machine operators	NA	\$38.44	\$25.01	\$27.00
9433	Papermaking and finishing machine operators	NA	\$42.52	\$29.00	\$28.00
9434	Other wood processing machine operators	NA	\$17.97	\$18.64	\$19.00
9435	Paper converting machine operators	NA	\$19.91	\$20.17	\$21.00
9436	Lumber graders and other wood processing inspectors and graders	NA	\$20.01	\$16.51	\$20.00
9471	Printing machine operators	NA	\$17.24	\$14.20	\$18.00
9473	Binding and finishing machine operators	NA	\$11.07	\$10.99	\$15.00
9492	Furniture and fixture assemblers and inspectors	NA	\$14.38	\$14.58	\$15.10
9493	Other wood products assemblers and inspectors	NA	\$15.35	\$14.58	\$15.10
9494	Furniture finishers and refinishers	NA	\$9.40	\$14.58	\$15.00
9513	Woodworking machine operators	NA	\$15.72	\$14.58	\$16.00
9614	Labourers in wood, pulp and paper processing	NA	\$17.90	\$16.00	\$19.00
9619	Other labourers in processing, manufacturing and utilities	NA	\$11.78	\$12.80	\$12.50
	AVERAGE		\$24.14	\$19.48	\$22.34

The table has been constructed and presented with the intent of offering insight into the relative magnitude of wages for various occupations in New Brunswick and Canada. Using the WIC data as a common source for comparative purposes indicates (based on the calculated average for all 32 occupations, i.e. NB=\$19.48/hr and Canada=\$22.34/hr) that New Brunswick workers are paid about 13% less than the national average.

6.5 Human Resources Practices

Secondary research and key informant interviews suggested that the industry is diversified in its composition, products and its human resource practices. There are a number of companies with less than five employees, as well as a number of non-employers in the sector. Many of these tend to be companies involved in specialty wood and furniture manufacturing practices. These small companies have considerably different human resource practices than large vertically integrated companies that may have hundreds of employees. Table 4 shows that approximately 90% of companies had less than 100 employees in 2012. The remaining 10% were comprised of 29 large companies that are likely to have the capabilities to maintain a modern responsive human resources department.

Secondary data sources pertaining to human resource practices are not plentiful. Most companies do not publish this sort of data. However, there are some public sources of industry data to consider. The Wood Manufacturing Council for example has created and maintains a repository of information and services for the value-added wood sector. The Council is an information source for both workers and employers. It is the

only national level human resources organization that provides support specifically to secondary manufacturers in the sector. Among other resources it offers:

- National occupational standards (i.e. skills profile) for eight sector occupations;
- A “Virtual HR Department” for small and medium enterprises; and
- A number of training programs unique to the sector (see Section 7.3), some in partnerships with accredited post secondary educational institutions.

The Wood Products Group (WPG) of New Brunswick was a provincial level industry association with similar scope. Unfortunately it is no longer in operation.

6.5.1 Recruitment

Key informants with first-hand experience in the sector agreed there were significant issues with hiring, retaining and training skilled, semi-skilled and unskilled labour. One industry thought leader characterized the challenge as:

“The cultural mentality that dominates the mindset of potential employees is that the industry is an employer of last choice.”

Many felt there was a negative perception about the opportunities and the skills required to work in a mill or a factory. Another interview subject said:

“I spend a lot of my time in classrooms trying to dispel the myth that if you do poorly in school you will end up working in the mill. I tell them if you do well in school you may have a chance to work in a mill.”

All key informants agreed the industry has room to improve its image in the labour market.

One key informant suggested that one way to improve the image of working in the sector and to attract more and better qualified individuals may be through the prestige of recognized inter-provincial credentials like Red Seal. As an example, some jobs in the secondary processing sector could be based upon the Wood Manufacturing Council's National Occupational Standards. The cautionary note was added that not all employers would necessarily see this as a positive step since employees may feel they possessed greater value which could adversely affect mobility.

One current example of a company that is tackling the recruitment issue head on is J.D. Irving Ltd. The company has initiated an integrated and comprehensive campaign that covers TV, web, social media, and print. Billboards are installed along New Brunswick highways, and the landing page of the company's website (www.jdirving.ca) is dedicated to career choices, and much of the content relates to value-added wood career opportunities. The company recently reported that it plans to hire as many as 7000 new recruits over the next two years in all of its business sectors (many are likely attributed to the pending shipbuilding contract in Halifax).

Some key informants also raised the issue of the lack of training opportunities in their geographic area. Companies train many of their employees internally to supplement the skills that new recruits bring to the job.

6.5.2 Retention

A 2012 report by the Wood Manufacturing Council [28] states that Canadian secondary manufacturing companies are losing 30 percent of their employees in the first year. The report indicates employees are leaving because of dissatisfaction with compensation and for opportunities in other sectors.

Key informants echoed the same message that worker turnover was an issue and low wages combined with out-migration of workers to Western Canada were potential causes. One employer reported that recent changes in the administration of the Employment Insurance program had at least a short-term positive impact upon the recruitment and retention of workers. No informants pointed to plans or strategies to address retention issues.

7 Educational and Research Capacity and Capability

Educational capacity refers to the number of new entrants that the educational system is able to supply for the given occupations and its ability to respond to and support the sector's needs for specific skill-sets.

7.1 Programs Supporting Core Occupations

Eleven of the 32 core occupations are directly associated with academic or formal training. These are shown in Table 14.

Table 14: Core Occupations with Academic or Formal Training Needs

NOC	Occupation
2122	Forestry professionals
2223	Forestry technologists and technicians
2233	Industrial engineering and manufacturing technologists and technicians
2243	Industrial instrument technicians and mechanics
7242	Industrial electricians
7271	Carpenters
7272	Cabinetmakers
7311	Construction millwrights and industrial mechanics (except textile)
7351	Stationary engineers and auxiliary equipment operators
7421	Heavy equipment operators (except crane)
9436	Lumber graders and other wood processing inspectors and graders

The remaining occupations are not directly associated with a particular training program for a number of reasons, including:

- The occupational training requirements may be generic in nature (such as supervisors or managers);
- The skill requirements for the occupation are very specialized and not associated with a particular training program or institution. The training is often provided by the employer and/or the equipment manufacturer (such as machine operators); or
- The occupation may not require extensive training beyond workplace orientation and industrial safety training common to all employees (such as labourers and material handlers).

7.2 Educational Capacity within New Brunswick

Table 15 summarizes the institutions and programs that offer training directly related to core occupations within the scope of this analysis. Not included are extension courses, seminars and custom designed / delivered programs.

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Table 15: Educational Programs in Support of the Value-added Wood Sector

NOC: Occupation	Institution	Program	Years	# of Grads Male / Female	% employed in field
2122: Forestry professional	UNB	BSc. Forestry	4		
	UNB	BSc. Environment and Natural Resources	4		
	UNB	MSc. Forest Engineering	2		
	U de M	Sciences forestières (Edmundston)	4		
	U de M	Maîtrise ès sciences forestières (Edmundston)	1 minimum		
2223: Forestry technologists and technicians	MCFT	Diploma in Forest Technology	2		
	MCFT	Advanced Diploma in Forest and Fish and Wildlife Technology	3		
2233: Industrial engineering and manufacturing technologists and technicians	NBCC	CNC Machining (Moncton)	2	7 M / 2 F	84%
	CCNB	Technologie du génie industriel (Bathurst)	2	8 M / 0 F	73%
2243: Industrial instrument technicians and mechanics	NBCC	Industrial Control Technology (Saint John)	3	16 M / 3 F	96%
	NBCC	Process Control Technician (Saint John)	2	8 M / 1 F	83 %
7242: Industrial electricians	NBCC	Electrical: Industrial (St. Andrews)	1	16 M / 1 F	31 %
7271: Carpenters	NBCC	Carpentry (Moncton, Miramichi, St. Andrews, Woodstock)	1	67 M / 5 F	86%
	BayTech	Carpentry	0.3		
7272: Cabinetmakers	NBCC	Carpentry (Moncton, Miramichi, St. Andrews, Woodstock)	1	67M / 5F	86%
	CCNB	Ébénisterie et bois ouvré (Campbellton)	1	4 M / 1 F	64%
	CCNB	Wood Working and Cabinetmaking (Campbellton)- English	1	5 M / 1 F	64 %
	CCNB	Gestion de la production en bois ouvré (Campbellton)		No post grad survey data.	
7311: Construction millwrights and industrial mechanics (except textile)	NBCC	Industrial Mechanics (Saint John, Miramichi)	1	41 M / 0 F	62%
	NBCC	Mechanical Technician (Saint John)	2	15 M / 0 F	90%
	CCNB	Mécanique industrielle (Bathurst)	1	No post grad survey data.	
	CCNB	Techniques d'entretien industriel (Bathurst)	1	No post grad survey data.	
7351: Stationary engineers and auxiliary equipment operators	NBCC	Power Engineering (Saint John)	2	16 M / 6 F	85 %
7421: Heavy equipment operators (except crane)	OETINB	Heavy Equipment Operation Training Program	12 weeks	10 M / 0 F	75%
	ECR	Heavy Equipment and Construction Course	1.5 - 4 weeks	NA	NA
9436: Lumber graders and other wood processing inspectors and graders	MLB	Lumber Grading (Amherst or on site)	1-2 weeks	60 Region / 35 NB	100%

The abbreviations in the "Institution" column above signify:

- BayTech = BayTech College
- CCNB⁵⁸ = Collège communautaire du Nouveau-Brunswick

⁵⁸ In the case of NBCC and CCNB, the institution identified the National Occupational Classifications (NOC) groupings in which graduates might expect to gain employment.

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- ECR = ECR (East Coast Regional) Heavy Equipment and Construction Training
- MCFT = Maritime College of Forest Technology
- MLB = Maritime Lumber Bureau
- NBCC⁵⁸ = New Brunswick Community College
- OETINB = Operating Engineers Training Institute of New Brunswick Inc.
- U de M = Université de Moncton
- UNB = University of New Brunswick

New Brunswick educational institutions offer no less than 25 programs that support ten of the eleven (excluding lumber graders) core occupations listed in Table 14. As discussed in Section 7.4 three programs of direct relevance to the value-added wood sector have been permanently closed or suspended, indicating some transition in training demand. The CCNB wood programs in Campbellton were noted as a concern by some key informants who agreed that the program delivered strong results for industry in the past. However, enrolments have dropped in recent years, producing only 11 graduates in both the English and French programs combined last year. Some suggest that location may be a potential cause for low enrolment. The authors of this report neither support nor deny this hypothesis but data indicates that the two economic regions of Campbellton-Miramichi and Edmundston-Woodstock combined employ 16% of all cabinetmakers in the Province.

7.3 Noteworthy Educational Programs Outside New Brunswick

The criteria used for being identified as a noteworthy educational program related to value-added wood products are:

- The program is delivered inside Canada but outside of New Brunswick;
- It is directly related to one or more of the 32 identified core occupations;
- The graduates are predominately found in value-added wood industries and are not broadly distributed across many other industries (ex. carpenters, power engineers, industrial electricians, etc.); and
- The program offers something unique when compared to other programs of similar scope. That is, it is not a “standard” training program (ex. Bachelor in Forestry, or pre-employment/ apprenticeship training for the cabinetmaker trade).

While numerous forestry, cabinetmaking, and woodworking programs were identified in practically all provinces across Canada, very few were seen as unique. Table 16 lists the programs that were identified as being noteworthy.

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Table 16: Noteworthy Educational Programs Outside of New Brunswick

School (Province)	Program	Description (extracted from institution websites)	Duration (years)
University of British Columbia (BC)	BSc. Wood Products Processing	An award-winning program that is a fusion of science, engineering, and business to prepare students for a career in the wood products sector and related fields. Students gain a comprehensive understanding of wood material science, advanced manufacturing, and business operations. The Centre for Advanced Wood Processing features a \$2-million wood products manufacturing facility.	4
Université Laval (QC)	BSc. Wood Engineering	Students acquire the knowledge to optimize and improve wood products such as building materials that are used in the design of green buildings and other uses. Students participate in the design of engineered wood products useful in everyday life (carpentry, flooring, furniture, doors, windows, composite wood-based) and the development of innovative applications of wood as energy sources or green products from a bio-refinery.	4
Université Laval (QC)	PhD. Wood Sciences	This program allows students to deepen their knowledge of wood science and perform original independent research. Students have access to the Centre for Research on Wood where they meet professors and researchers who have achieved worldwide fame. Students' research may focus on different areas such as wood quality, composites, drying and preservation, machining, chemicals extracted from forest products, glues and varnishes, nano-particles, wooden frames and more. This program is intended primarily for graduates of Wood Science and holders of an equivalent degree in a related discipline.	1+
Conestoga College (ON)	Woodworking Manufacturing Management (Graduate Certificate)	Students who have completed the woodworking technician program and have industry experience or have equivalent experience in the woodworking industry may be eligible to take this graduate program. Students gain understanding and applied skills in the areas of work measurement, methods analysis, plant layout and support systems, material handling, quality control, cost estimating and manufacturing management techniques such as production planning and scheduling, personnel management and supervision, including practice in supervision for full-time students.	1
École Nationale du Meuble et de l'ébénisterie de Montréal (QC)	Techniques du meuble et d'ébénisterie (Woodworking and Cabinetry Technology)	Students learn to design and draw the furniture and woodwork for prestigious buildings, restaurants, boat interiors and business aircraft. Students plan and oversee the industrial production of furniture and woodwork and program CNC machine tools. Students produce shop drawings from architects' plans and prepare bids. Students participate in the management of production operations. Students learn woodworking using conventional tools and high tech machine tools.	3

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School (Province)	Program	Description (extracted from institution websites)	Duration (years)
British Columbia Institute of Technology (BC)	Wood Products Manufacturing	A selection of part-time courses offered to obtain the Associate Certificate in Wood Products Manufacturing Technology (primary and secondary manufacturing).	NA

7.4 Value-added Wood Programs Now Closed or Suspended

Table 17 lists a number of training programs of direct relevance to the value-added wood sector that have been discontinued or suspended. This is not meant to be a comprehensive list.

Table 17: Closed or Suspended Value-added Wood Training Programs

School	Program	Description	Duration (years)
University of New Brunswick (NB)	BSc. Forest Engineering	Forest engineering is now only offered as a Master's level program. University staff report the program was discontinued due to low enrolment. Some of the program's content was placed in other programs including BSc. Environment and Natural Resources and MSc. Forest Engineering.	4-5
New Brunswick Community College (NB)	Pulp and Paper Operator	This was a co-operative program that combined technical and practical training to prepare students for careers in the pulp and paper industry as process operators. The program included a 4-month work term that offered participants hands-on industrial experience in a state-of-the-art mill.	NA
Maritime Forest Ranger School (NB)	Saw Mill Equipment Operator	Sawyer, edger and kiln operator training programs ran from about 1979 to 2000. It was reported that lack of industry support may have been one cause for closure.	>1
Canadara College (ON)	Wood Products Manufacturing Technology – Certificate	This former program provided students with the knowledge and skills needed to manufacture home and office furniture, store fixtures, cabinetry, architectural millwork and other associated wood products.	0.6
	Wood Products Manufacturing Technology – Diploma	This former program provided students with the knowledge and skills needed to manufacture home and office furniture, store fixtures, cabinetry, architectural millwork and other associated wood products.	1
Sheridan College (ON)	Crafts and Design – Furniture	NA	NA
Cegep de Sainte-Foy (QC)	Technologie de la transformation des produits forestiers	NA	1

7.5 Non-Academic Research Capacity

The research organizations shown in Table 18 offer research either through endowments or fee-for-service business models. The table is not meant to be exhaustive, but is intended to highlight some of the higher profile organizations in the sector.

Table 18: Non-academic Research Institutions

Institution	Location (HQ)	Strategic Focus
Wood Science and Technology Centre	Fredericton	It is a centre of excellence dedicated to research, development, education and technical support for the wood products industries. It includes three business lines: 1. engineered wood products; 2. solid biomass; and 3. non-timber products from the forest.
FP Innovations	Pointe-Claire (QC)	Activities are grouped into six programs. Three programs focus on forestry operations, while three programs support value-added wood sector activities: 1. primary wood products; 2. secondary wood products; and 3. advanced building systems.
Limerick Pulp and Paper Centre	UNB Fredericton	The Centre has expertise in wood pulping, pulp bleaching, secondary fiber processing and papermaking. It collaborates with several companies on research and development projects and provides distance education to mill personnel. It has capabilities for testing, technical and library services in areas of interest to the pulp and paper industry.

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Appendix 2: Acronyms

CCFM	Canadian Council of Forest Ministers
CDGHCP	Canadian Debarking and Grub Hole Control Program
CETA	Comprehensive Economic and Trade Agreement
CF	Cellulose Filaments
CFIA	Canadian Food Inspection Agency
CHTWPCP	Canadian Heat Treated Wood Products Certification Program
CKCA	Canadian Kitchen Cabinet Association
CLSAB	Canadian Lumber Standards Accreditation Board
CMHC	Canada Mortgage and Housing Corporation
CNC	Computer Numerical Control
CNY	Chinese Yuan Renminbi (currency)
CSA	Canadian Standards Association
CWPCP	Canadian Wood Packaging Certification Program
EMS	Environmental Management System
EU	European Union
EUR	Euro (currently of European Union)
EWP	Engineered Wood Products
FSC	Forest Stewardship Council
GDP	Gross Domestic Product
IMF	International Monetary Fund
MBF	thousand board feet
MDF	Medium Density Fibreboard
MEL	Machine Evaluated Lumber (lumber grade)
MLB	Maritime Lumber Bureau
MSR	Machine Stress Rated (lumber grade)
NAICS	North American Industry Classification System
NAFTA	North American Free Trade Agreement
NB	New Brunswick
NCC	Nanocrystalline Cellulose
NHS	National Household Survey
NLGA	National Lumber Grades Authority
NOC	National Occupational Classification
NRCan	Natural Resource Canada
OSB	Oriented Strand Board
PEFC	Programme for the Endorsement of Forest Certification Schemes
PETL	Post-Secondary Education, Training and Labour
SEPH	Survey of Employment, Payrolls and Hours
SFI	Sustainable Forestry Initiative
SLA	Softwood Lumber Agreement
SLIMF	Small and Low Intensity Managed Forests
SOFE	Stokes Occupational Forecast Estimates
US	United States
USD	United States Dollars (currency)
VAW	Value-added Wood
WPAC	Wood Pellets Association of Canada
WTO	World Trade Organization

Appendix 3: Value-added Wood Sector - NAICS (2012) Expansion

321 Wood product manufacturing

- 3211 Sawmills and wood preservation
 - 32111 Sawmills and wood preservation
 - 321111 Sawmills (except shingle and shake mills)^{MEX}
 - 321112 Shingle and shake mills^{MEX}
 - 321114 Wood preservation^{US}
 - 3212 Veneer, plywood and engineered wood product manufacturing
 - 32121 Veneer, plywood and engineered wood product manufacturing
 - 321211 Hardwood veneer and plywood mills^{US}
 - 321212 Softwood veneer and plywood mills^{US}
 - 321215 Structural wood product manufacturing^{CAN}
 - 321216 Particle board and fibreboard mills^{CAN}
 - 321217 Waferboard mills^{CAN}
 - 3219 Other wood product manufacturing
 - 32191 Millwork
 - 321911 Wood window and door manufacturing^{US}
 - 321919 Other millwork^{CAN}
 - 32192 Wood container and pallet manufacturing
 - 321920 Wood container and pallet manufacturing
 - 32199 All other wood product manufacturing
 - 321991 Manufactured (mobile) home manufacturing^{US}
 - 321992 Prefabricated wood building manufacturing^{US}
 - 321999 All other miscellaneous wood product manufacturing^{US}

322 Paper manufacturing

- 3221 Pulp, paper and paperboard mills
 - 32211 Pulp mills
 - 322111 Mechanical pulp mills^{CAN}
 - 322112 Chemical pulp mills^{CAN}
 - 32212 Paper mills
 - 322121 Paper (except newsprint) mills^{US}
 - 322122 Newsprint mills^{US}
 - 32213 Paperboard mills
 - 322130 Paperboard mills^{US}
- 3222 Converted paper product manufacturing

337 Furniture and related product manufacturing⁵⁹

- 3371 Household and institutional furniture and kitchen cabinet manufacturing
 - 33711 Wood kitchen cabinet and counter top manufacturing
 - 337110 Wood kitchen cabinet and counter top manufacturing
 - 33712 Household and institutional furniture manufacturing
 - 337121 Upholstered household furniture manufacturing^{US}

⁵⁹ Highlighted areas identify likely out-of-scope segments that may not be able to be separated from statistical data

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- 337123 Other wood household furniture manufacturing^{CAN}
- 337126 Household furniture (except wood and upholstered) manufacturing^{CAN}
- 337127 Institutional furniture manufacturing^{US}
- 3372 Office furniture (including fixtures) manufacturing
 - 33721 Office furniture (including fixtures) manufacturing
 - 337213 Wood office furniture, including custom architectural woodwork, manufacturing^{CAN}
 - 337214 Office furniture (except wood) manufacturing^{US}
 - 337215 Showcase, partition, shelving and locker manufacturing^{US}
 - 3379 Other furniture-related product manufacturing
 - 33791 Mattress manufacturing
 - 337910 Mattress manufacturing
 - 33792 Blind and shade manufacturing
 - 337920 Blind and shade manufacturing

Appendix 4: Occupations employed in NAICS 321, 322, and 327 in New Brunswick

Occupations listed below (NOC - 2006) were derived from a Stokes Occupational Forecast Estimates (SOFE) database query for New Brunswick Base Case Winter 2012, Four-Digit Occupation by Industry Outlook.

- 1) 0016 Senior managers - goods production, utilities, transportation and construction
- 2) 0111 Financial managers
- 3) 0112 Human resources managers
- 4) 0113 Purchasing managers
- 5) 0213 Computer and information systems managers
- 6) 0611 Sales, marketing and advertising managers
- 7) 0621 Retail trade managers
- 8) 0642 Fire chiefs and senior fire-fighting officers
- 9) 0711 Construction managers
- 10) 0713 Transportation managers
- 11) 0721 Facility operation and maintenance managers
- 12) 0811 Primary production managers (except agriculture)
- 13) 0911 Manufacturing managers
- 14) 1111 Financial auditors and accountants
- 15) 1112 Financial and investment analysts
- 16) 1121 Specialists in human resources
- 17) 1211 Supervisors, general office and administrative support clerks
- 18) 1213 Supervisors, library, correspondence and related information clerks
- 19) 1215 Supervisors, recording, distributing and scheduling occupations
- 20) 1221 Administrative officers
- 21) 1222 Executive assistants
- 22) 1223 Personnel and recruitment officers
- 23) 1224 Property administrators
- 24) 1225 Purchasing agents and officers
- 25) 1231 Bookkeepers
- 26) 1236 Customs, ship and other brokers
- 27) 1241 Secretaries (except legal and medical)
- 28) 1242 Legal secretaries
- 29) 1411 General office clerks
- 30) 1422 Data entry clerks
- 31) 1431 Accounting and related clerks
- 32) 1432 Payroll clerks
- 33) 1435 Collectors
- 34) 1441 Administrative clerks
- 35) 1453 Customer service, information and related clerks
- 36) 1461 Mail, postal and related clerks
- 37) 1463 Couriers, messengers and door-to-door distributors
- 38) 1471 Shippers and receivers
- 39) 1472 Storekeepers and parts clerks
- 40) 1473 Production clerks

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- 41) 1474 Purchasing and inventory clerks
- 42) 1476 Transportation route and crew schedulers
- 43) 2112 Chemists
- 44) 2122 Forestry professionals
- 45) 2131 Civil engineers
- 46) 2132 Mechanical engineers
- 47) 2133 Electrical and electronics engineers
- 48) 2141 Industrial and manufacturing engineers
- 49) 2147 Computer engineers (except software engineers)
- 50) 2171 Information systems analysts and consultants
- 51) 2174 Computer programmers and interactive media developers
- 52) 2211 Chemical technologists and technicians
- 53) 2221 Biological technologists and technicians
- 54) 2223 Forestry technologists and technicians
- 55) 2231 Civil engineering technologists and technicians
- 56) 2232 Mechanical engineering technologists and technicians
- 57) 2233 Industrial engineering and manufacturing technologists and technicians
- 58) 2241 Electrical and electronics engineering technologists and technicians
- 59) 2243 Industrial instrument technicians and mechanics
- 60) 2253 Drafting technologists and technicians
- 61) 2263 Inspectors in public and environmental health and occupational health and safety
- 62) 4112 Lawyers and Québec notaries
- 63) 4131 College and other vocational instructors
- 64) 5123 Journalists
- 65) 5124 Professional occupations in public relations and communications
- 66) 5125 Translators, terminologists and interpreters
- 67) 5241 Graphic designers and illustrators
- 68) 5242 Interior designers
- 69) 5244 Artisans and craftspersons
- 70) 6215 Cleaning supervisors
- 71) 6221 Technical sales specialists, wholesale trade
- 72) 6411 Sales representatives, wholesale trade (non-technical)
- 73) 6421 Retail salespersons and sales clerks
- 74) 6622 Grocery clerks and store shelf stockers
- 75) 6641 Food counter attendants, kitchen helpers and related occupations
- 76) 6651 Security guards and related occupations
- 77) 6661 Light duty cleaners
- 78) 6663 Janitors, caretakers and building superintendents
- 79) 6683 Other elemental service occupations
- 80) 7212 Contractors and supervisors, electrical trades and telecommunications occupations
- 81) 7215 Contractors and supervisors, carpentry trades
- 82) 7216 Contractors and supervisors, mechanic trades
- 83) 7231 Machinists and machining and tooling inspectors
- 84) 7232 Tool and die makers
- 85) 7241 Electricians (except industrial and power system)
- 86) 7242 Industrial electricians

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- 87) 7252 Steamfitters, pipefitters and sprinkler system installers
- 88) 7265 Welders and related machine operators
- 89) 7271 Carpenters
- 90) 7272 Cabinetmakers
- 91) 7284 Plasterers, drywall installers and finishers, and lathers
- 92) 7291 Roofers and shinglers
- 93) 7294 Painters and decorators
- 94) 7311 Construction millwrights and industrial mechanics (except textile)
- 95) 7312 Heavy-duty equipment mechanics
- 96) 7313 Refrigeration and air conditioning mechanics
- 97) 7341 Upholsterers
- 98) 7343 Shoe repairers and shoemakers
- 99) 7351 Stationary engineers and auxiliary equipment operators
- 100) 7352 Power systems and power station operators
- 101) 7371 Crane operators
- 102) 7381 Printing press operators
- 103) 7383 Other trades and related occupations
- 104) 7411 Truck drivers
- 105) 7414 Delivery and courier service drivers
- 106) 7421 Heavy equipment operators (except crane)
- 107) 7441 Residential and commercial installers and servicers
- 108) 7443 Automotive mechanical installers and servicers
- 109) 7451 Longshore workers
- 110) 7452 Material handlers
- 111) 7611 Construction trades helpers and labourers
- 112) 7621 Public works and maintenance labourers
- 113) 8211 Supervisors, logging and forestry
- 114) 8241 Logging machinery operators
- 115) 8421 Chain-saw and skidder operators
- 116) 8431 General farm workers
- 117) 8612 Landscaping and grounds maintenance labourers
- 118) 8616 Logging and forestry labourers
- 119) 9211 Supervisors, mineral and metal processing
- 120) 9212 Supervisors, petroleum, gas and chemical processing and utilities
- 121) 9215 Supervisors, forest products processing
- 122) 9224 Supervisors, furniture and fixtures manufacturing
- 123) 9227 Supervisors, other products manufacturing and assembly
- 124) 9233 Pulp control operators
- 125) 9234 Papermaking and coating control operators
- 126) 9413 Glass forming and finishing machine operators and glass cutters
- 127) 9431 Sawmill machine operators
- 128) 9432 Pulp mill machine operators
- 129) 9433 Papermaking and finishing machine operators
- 130) 9434 Other wood processing machine operators
- 131) 9435 Paper converting machine operators
- 132) 9436 Lumber graders and other wood processing inspectors and graders
- 133) 9451 Sewing machine operators
- 134) 9454 Inspectors and testers, fabric, fur and leather products manufacturing

New Brunswick Sector Profile: Value-added Wood

- 135) 9462 Industrial butchers and meat cutters, poultry preparers and related workers
- 136) 9471 Printing machine operators
- 137) 9472 Camera, platemaking and other pre-press occupations
- 138) 9473 Binding and finishing machine operators
- 139) 9492 Furniture and fixture assemblers and inspectors
- 140) 9493 Other wood products assemblers and inspectors
- 141) 9494 Furniture finishers and refinishers
- 142) 9495 Plastic products assemblers, finishers and inspectors
- 143) 9496 Painters and coaters, industrial
- 144) 9498 Other assemblers and inspectors
- 145) 9513 Woodworking machine operators
- 146) 9611 Labourers in mineral and metal processing
- 147) 9613 Labourers in chemical products processing and utilities
- 148) 9614 Labourers in wood, pulp and paper processing
- 149) 9616 Labourers in textile processing
- 150) 9619 Other labourers in processing, manufacturing and utilities

Appendix 5: Manufacturing and Product Certification Programs

Canadian Food Inspection Agency (CFIA) Certification Programs

Canadian Heat Treated Wood Products Certification Program (CHTWPCP)

The Canadian Heat Treated Wood Products Certification Program (CHTWPCP) is an official certification system for the export of wood products to countries requiring heat treatment prior to entry, including member countries of the European Union, New Zealand and the Republic of Korea.

The Canadian Food Inspection Agency (CFIA) is the certification body for CHTWPCP. Participants in the program include lumber kilns, lumber mills, prefabricated and log home manufacturers, brokers, shippers of forest products, wood packaging producers, wood packaging heat treatment facilities and other treatment facilities.

According to the CFIA website⁶⁰ there were 23 active New Brunswick facilities certified to the CHTWPCP requirements.

Canadian Wood Packaging Certification Program (CWPCP)

The Canadian Wood Packaging Certification Program (CWPCP) is a quality management program designed to allow certified producers to construct wood packaging products to meet a phytosanitary standard. The CFIA certifies wood packaging producers only after approving the elements of a producer's quality management plan and verifying that the wood packaging facility is capable of meeting the phytosanitary standard (ISPM No. 15)

Heat treated wood from the Canadian Heat Treated Wood Products Certification Program (CHTWPCP) provides certified wood products used in the Canadian Wood Packaging Certification Program (CWPCP).

According to the CFIA website⁶¹ there were 14 active New Brunswick facilities certified to the CWPCP requirements.

Canadian Debarking and Grub Hole Control Program (CDGHCP)

The Canadian Debarking and Grub Hole Control Program (CDGHCP) summarizes the phytosanitary certification requirements for the export of untreated cedar products, including lumber, logs, pre-fabricated buildings, and log houses made with cedar (*Thuja sp.*) wood products to the European Union. The program is administered by the CFIA and no New Brunswick companies were listed as being certified at time of writing.

⁶⁰ <http://www.inspection.gc.ca/plants/forestry/exports/chtwpcp/registered-participants/eng/1350324151113/1350324274009> , accessed Jan/2014.

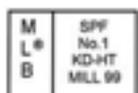
⁶¹ <http://www.inspection.gc.ca/plants/forestry/exports/cwpcp/registered-participants/eng/1350500818302/1350500993366>, accessed Jan/2014.

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Segment: Lumber

The Canadian Lumber Standards Accreditation Board (CLSAB) is responsible for accrediting all Canadian Lumber Grading Agencies. An Agency may be accredited to supervise and grade stamp in one or more of the following categories:

- visually graded lumber
- agency certified lumber
- machine stress rated (MSR) lumber and Machine evaluated lumber (MEL)
- fingerjoined lumber
- Heat Treatment (HT)
- Canadian Heat Treated Wood Products Certification Program (CHTWPCP)



The Maritime Lumber Bureau (MLB) is the primary grading agency for New Brunswick. Canadian Lumber grading rules and standards are established by the National Lumber Grades Authority (NLGA). NLGA is the only recognized rules writing body for lumber grades and standards in Canada. The NLGA Grade Rule is approved and enforced by the Canadian Lumber Standards Accreditation Board (CLSAB).

Segment: Panels

Plywood



The CANPLY⁶² "Mark of Excellence" assures consumers that plywood bearing the mark meets high quality standards established by the industry. Only plywood manufactured by member companies of CANPLY are licensed to use the stamp. At time of writing only five companies (seven mills), all from British Columbia and Alberta, were CANPLY members.

Eco-Certified Composite (ECC)



The Eco-Certified Composite(TM) (ECC) Standard (CPA 4-11) is a voluntary industry standard developed by the Composite Panel Association (CPA)⁶³ for composite wood or agrifiber-based panels, as well as finished products (including components and laminated panels) made with particleboard, medium density fiberboard (MDF), hardboard, engineered wood siding and engineered wood trim.

Segment: Doors and Windows

There are a number of standards/certifications applicable to the window and door segment. Some can be very specific for example CAN/CGSB 12.8 sets performance limits on the durability of window edge seals. The following are the primary product standards applicable to the segment.

CSA A440 Series

Canadian Standards Association (CSA) CSA-A440 standard is called an omnibus standard because it applies to windows constructed from diverse materials. It describes how to measure and rate a window's airtightness, watertightness, wind

⁶² <http://www.canply.org/>.

⁶³ <http://www.compositepanel.org/cpa-green/>.

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resistance, condensation resistance, forced entry resistance, ease of operation, and other requirements.

CSA A453 Series

Canadian Standards Association (CSA) CSA-A453 series of standards is similar in nature to CSA-A440 series for windows, but is related doors.

National Fenestration Rating Council (NFRC)



The US National Fenestration Rating Council (NFRC) has developed a labeling system for windows, doors and skylights. It publishes a number of technical publications including:

- NFRC 100: Procedure for Determining Fenestration Product U-factors;
- NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; and
- NFRC 400: Procedure for Determining Fenestration Product Air Leakage.

Energy Star



The ENERGY STAR name and symbol are administered and promoted in Canada by Natural Resources Canada and are registered in Canada by the United States Environmental Protection Agency. Natural Resources Canada – Office of Energy Efficiency documents specific criteria in: “Qualifying Criteria for Residential Windows, Doors and Skylights Sold in Canada”⁶⁴. The document utilizes criteria set out in: CSA A440, CSA A453, NFRC 100, NFRC 200, and CGBS 82.

Segment: Manufactured Housing

In addition to provincial/territorial/municipal building code requirements, there are three CSA standards that apply primarily to factory-constructed buildings in Canada:

CAN/CSA A277, Procedure for Factory Certification of Buildings

The CAN/CSA A277 Standard is a factory certification procedure that defines the quality-control procedures and staff that a plant must have in place to ensure that the buildings it produces are built properly and in accordance with the relevant standards and codes. The A277 Standard involves both the manufacturing plant and the buildings. The A277 Standard covers the procedure for certification of “manufactured”, “modular” and “panelized” buildings, providing for the certification of the plant quality program and the product built, auditing of the plant quality program, and in-plant inspection of the product built.

CAN/CSA Z240 MH Series, Manufactured Homes

The CAN/CSA Z240 MH Series Standard sets out requirements for the construction of manufactured homes specifically, related to structure, plumbing, electrical and heating service, as well as vehicular requirements for running gear.

⁶⁴ <http://oee.nrcan.gc.ca/energystar/english/pdf/tech-spec-manufacturers.pdf>.

CAN/CSA Z240.10.1, Site Preparation, Foundation and Anchorage of Manufactured Homes

CAN/CSA Z240.10.1, Site Preparation, Foundation and Anchorage of Manufactured Homes, details the construction of a surface-mount foundation and the installation of the home. The standard is applicable to any home that incorporates an integrated frame providing sufficient rigidity to protect the home from damage due to minor movements in the foundation.

Segment: Kitchen Cabinets

CKCA Certification Testing Program



The Canadian Kitchen Cabinet Association (CKCA) has developed national standards for Cabinetmakers across the country. The new Construction and Material Testing Standard for Kitchen Cabinets and Vanities is available to all active CKCA members in Canada. It was developed as a means to differentiate Canadian-made cabinets from imported cabinetry. According to the CKCA⁶⁵ website, of the 12 certified firms, three were from New Brunswick (all part of the Triangle Group of companies in Moncton).

Segment: Furniture

Wood furniture manufacturers can be subjected to numerous certification standards depending upon the type of furniture being produced. This includes standards set by organizations such as the Business and Institutional Furniture Manufacturers Association (BIFMA) who collaborate with American National Standards Institute (ANSI) to produce standards for a plethora of products (ex. seating products, desk products, storage products, pane systems, etc.). BIFMA/ANSI standards have been adopted in Canada as well as complimentary standards set by the Canadian General Standard Board (CGSB) – generally found in the 44 series of standards.

Segment: Biofuels/Wood Pellets

Wood pellet producers in Canada have access to ENplus and CANplus certification through Wood Pellets Association of Canada (WPAC).⁶⁶

ENplus



To ensure uniform and consistent wood pellet quality for both producers and industry, ENplus certification was launched in 2011. Initially driven by the European market, producers and traders are now certified across the world and the validity of certification is borderless.

CANplus

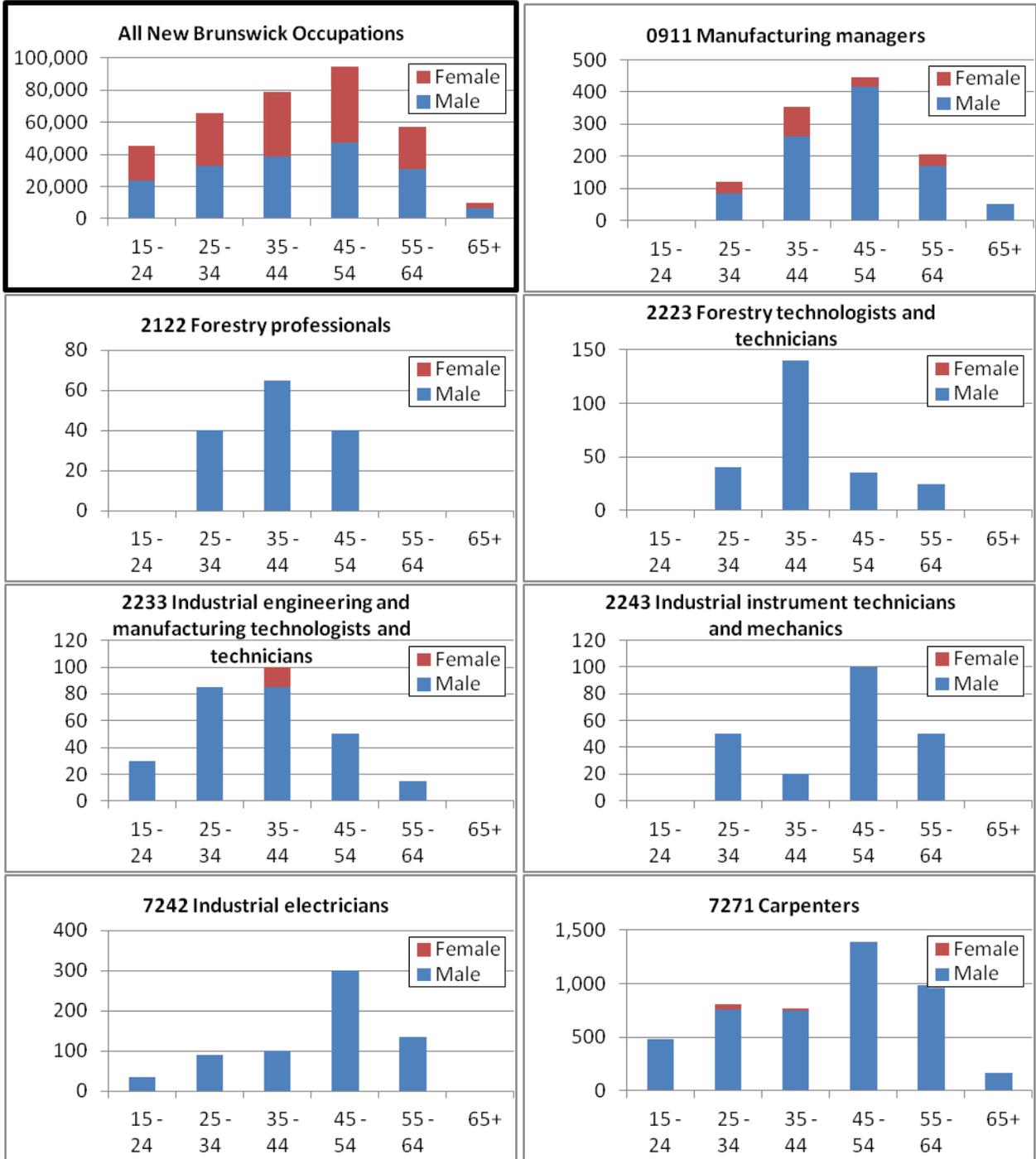


The CANplus certification responds to the degree and level of standardization that is currently desired by the Canadian wood pellet industry and is aimed at ensuring quality pellets for Canadian consumers. The CANplus seal was introduced in late 2013 and can be expected to be seen on wood pellets produced, distributed, and/or sold in Canada in the near future.

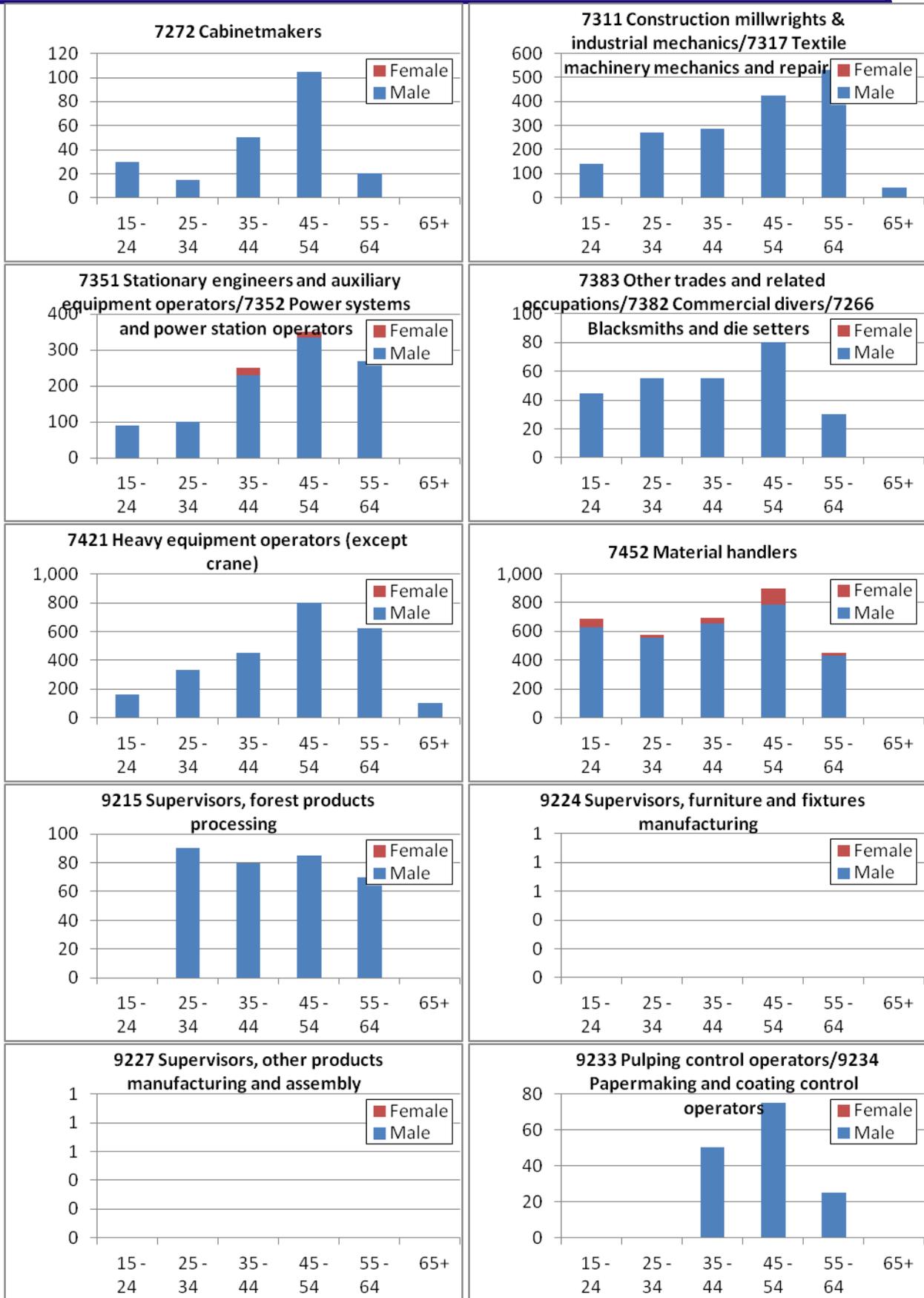
⁶⁵ <http://www.ckca.ca/certification/certified-products.html> , accessed Jan/2014.

⁶⁶ <http://www.pellet.org/wpac-news/wpac-offers-enplus-and-canplus-certification>.

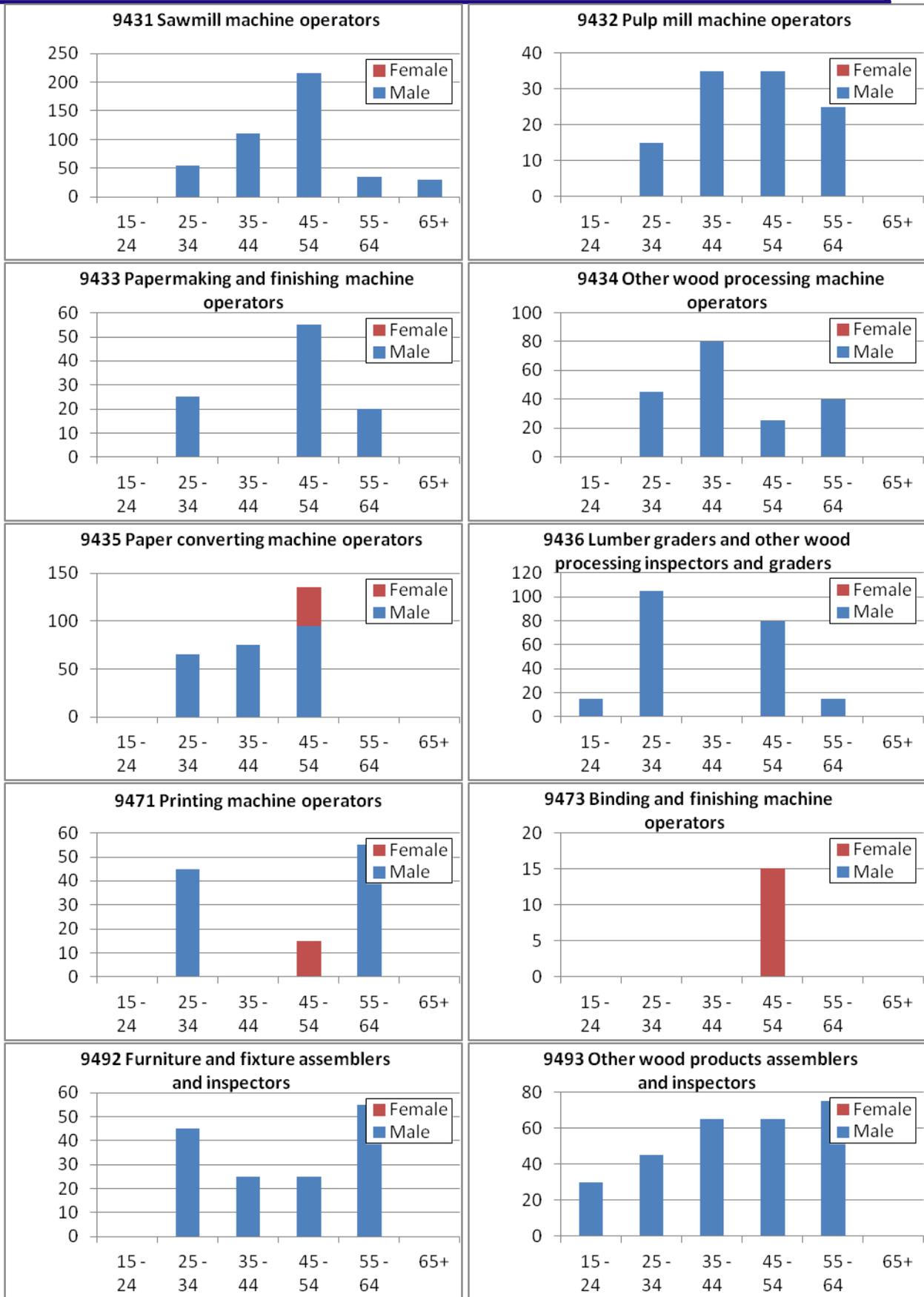
Appendix 6: Demographic Profiles of Core Occupations



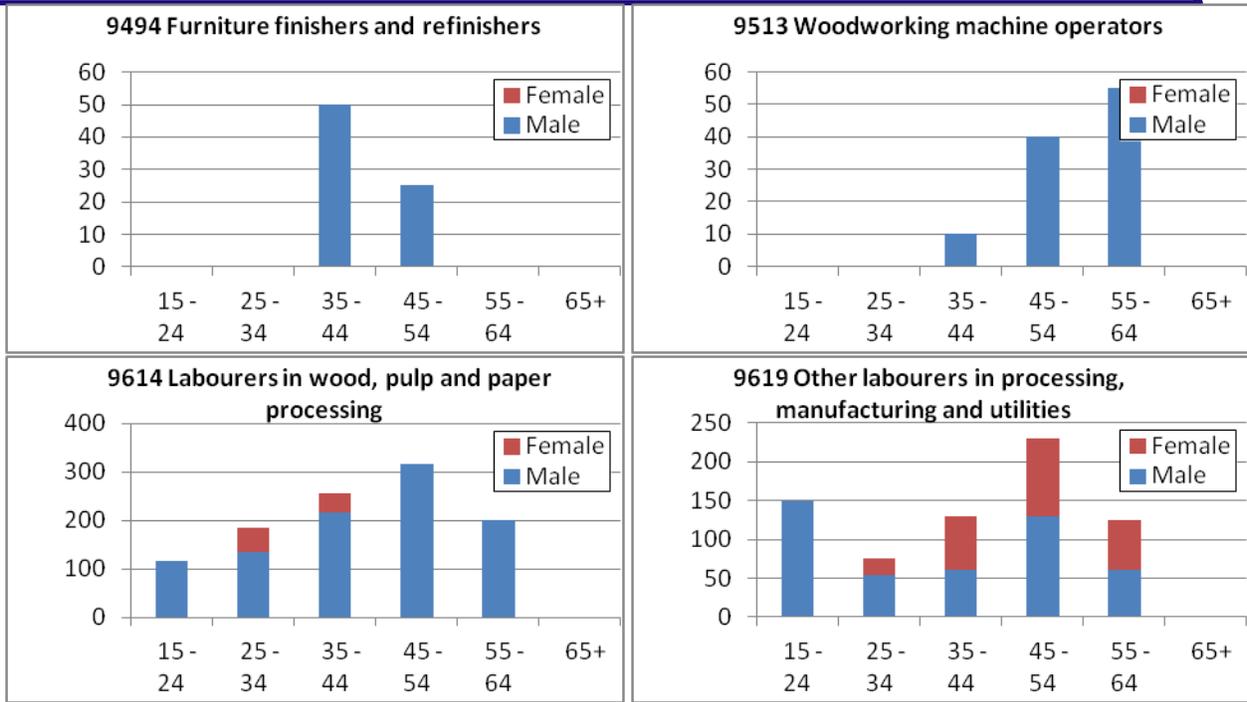
New Brunswick Sector Profile: Value-added Wood



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New Brunswick Sector Profile: Value-added Wood



Appendix 7: Associations

Jurisdiction	Association Name	Website
NB	Marketing Board: Carleton-Victoria Forest Products	www.cvwpa.ca
NB	Marketing Board: Madawaska Forest Products	
NB	Marketing Board: North Shore Forest Products	www.forestrysyndicate.com
NB	Marketing Board: Northumberland County Forest Products	
NB	Marketing Board: South East New Brunswick Forest Products	
NB	Marketing Board: Southern New Brunswick Forest Products	www.snbwc.ca
NB	Marketing Board: York Sunbury Charlotte Forest Products	www.ysc.nb.ca
NB	Maritime Lumber Bureau (MLB)	www.mlb.ca
NB	New Brunswick Forest Products Association (NBFPA)	www.nbforestry.com
NB	New Brunswick Sustainable Forestry Initiative® (SFI) Implementation Committee	www.nbsfi.ca
Atlantic	Manufactured Housing Association of Atlantic Canada (MHAAC)	http://mhaac.ca
Canada	Architectural Woodwork Manufacturers Association of Canada (AWMAC)	www.awmac.com
Canada	Canada Wood	www.canadawood.org
Canada	Canadian Hardwood Plywood and Veneer Association (CHPVA)	www.chpva.com
Canada	Canadian Kitchen Cabinet Association (CKCA)	www.ckca.ca
Canada	Canadian Lumber Standards Accreditation Board (CLSAB)	www.clsab.ca
Canada	Canadian Manufactured Housing Institute (CMHI)	www.cmhi.ca
Canada	Canadian Pallet Council (CPC)	http://cpcpallet.com
Canada	Canadian Plywood (CANPLY)	www.canply.org
Canada	Canadian Wood Council (CWC)	www.cwc.ca
Canada	Canadian Wood Pallet and Container Association (CWPCA)	www.canadianpallets.com
Canada	Canadian Wood Preservation Association	www.cwpa.ca
Canada	Canadian Wood Truss Association (CWTA)	www.cwta.net
Canada	Forest Products Association of Canada (FPAC)	www.fpac.ca
Canada	Forest Stewardship Council Canada (FSC-CA)	https://ca.fsc.org
Canada	FPIInnovations	www.fpinnovations.ca
Canada	National Lumber Grades Authority (NLGA)	http://nlga.org
Canada	Pulp and Paper Technical Association of Canada	www.paptac.ca
Canada	Wood Manufacturing Council (WMC)	http://wmc-cfb.ca
Canada	Wood Pellet Association of Canada (WPAC)	www.pellet.org
Canada	Wood Preservation Canada (WPC)	www.woodpreservation.ca