



Natural Resources
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Forest Fact Book 2016–2017





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Preface

The purpose of the *Forest Fact Book* is to provide key information related to Canada's forest industry and forest products in a format that is easy to consult.

The data and information in this edition cover the 2015 calendar year except where noted otherwise. Historical trend information is also included. All data are subject to revisions by statistical sources. In some instances, more than one source may be available and discrepancies in numbers may occur because of conceptual or methodological differences. In addition, some numbers may not add correctly because of rounding.

Data from Statistics Canada's new Natural Resources Satellite Account (NRSA) are a key source of information on the economic contribution of the forest sector in Canada and will be included in future releases of the *Forest Fact Book*. The NRSA is the result of collaboration between NRCan and Statistics Canada.

This publication was assembled by the Canadian Forest Service of Natural Resources Canada.

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Key Facts and Figures

WORLD FORESTS

Canada has the **third-largest forest area in the world.**

1st RUSSIA
2nd BRAZIL
3rd CANADA
4th USA
5th CHINA



PUBLIC LAND

All public lands

harvested must be regenerated.

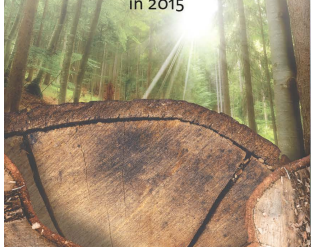
Over **540 million seedlings**
planted in 2014



GROSS DOMESTIC PRODUCT

\$22.1 billion

from the forest industry
in 2015



FOREST INDUSTRY EMPLOYMENT

201,645 jobs

including

9,500 jobs

in **Indigenous communities**
in 2015



EXPORTS

Nearly **7%** of all Canadian exports are from the forest industry.

top 3 forest product export destinations
(billion \$ in 2015)



USA
\$22.1



China
\$5



Japan
\$1.4



GREENHOUSE GAS EMISSIONS

The forest industry reduced direct carbon emissions by

44%

by substantially cutting fossil fuel use between 2000 and 2013.

Forests remove

1/4

of all emissions from fossil fuel use every year.

Bioenergy from forest biomass produces

42% to 52%

less greenhouse gas emissions than is produced by energy from traditional fossil fuels.



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Sources: See "Sources" for more detail.

Forest Industry – National Picture

Market Dynamics

Industry

Canada's forest sector is a major source of wealth for Canadians from coast-to-coast. The sector has weathered a number of challenges over the past decade (e.g., collapse of the United States housing market, structural decline in newsprint and graphic paper) that resulted in many mill closures and thousands of jobs lost. The forest industry responded to these challenges in traditional markets by developing new and innovative products, materials, and services, and by diversifying its international markets.

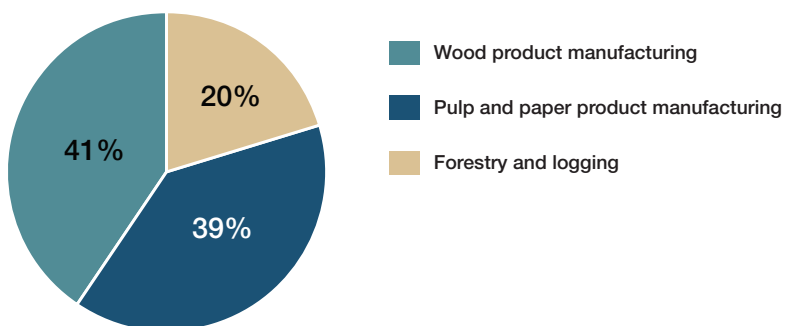
Some of the ongoing challenges the industry faces today include:

- structural shifts in demand for traditional products (e.g., collapse in demand for newsprint);
- the emergence of competitive producers in Asia, South America, and the U.S. South;
- the infestation of mountain pine beetle (MPB) in Western Canada and the emergence of spruce budworm (SBW) in Ontario, Quebec, and Eastern Canada; and
- trade agreements and relations.

Market Structure

The forest industry is traditionally classified into three categories: forestry and logging, pulp and paper, and solid wood product manufacturing. Because they are the three largest and best-tracked segments of the forest sector, most data presented will be based on this traditional definition. Forest sector activity in non-traditional markets such as biofuels and bioproducts will not be reported, as data on these newer products is difficult to obtain.

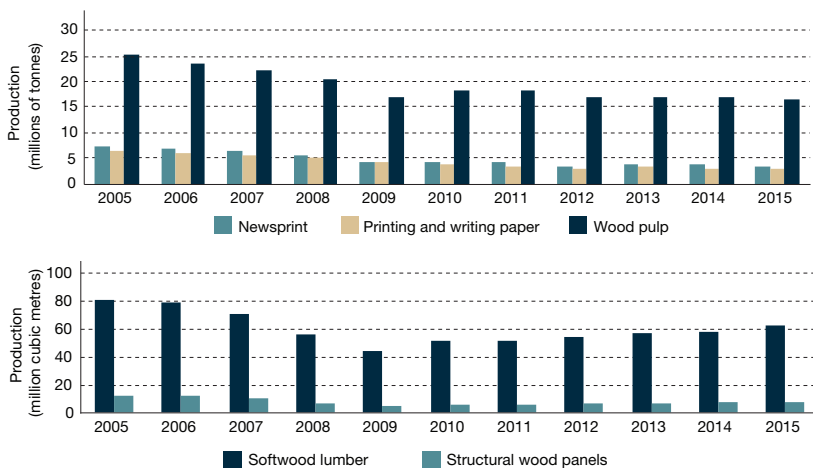
Nominal Gross Domestic Product by industry sub-sector



Sources: Natural Resources Canada-Canadian Forest Service's calculations based on Statistics Canada's CANSIM Table 379-0031: Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS).

Production

Production of Canadian forest products, 2005–2015

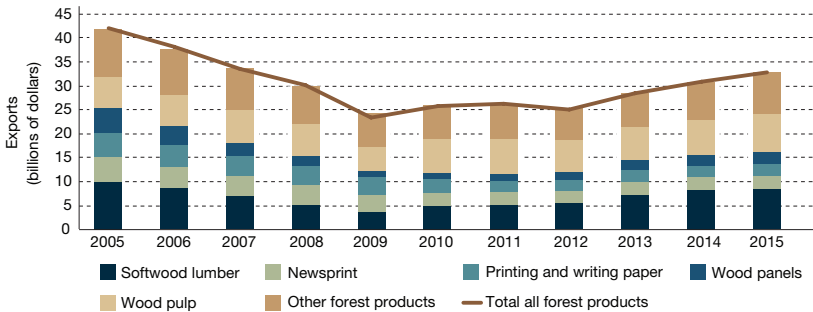


Sources: Lumber – Statistics Canada; panels – APA, The Engineered Wood Association; pulp and paper products – Pulp and Paper Products Council. See “Sources” for more detail.

- Canada is the world’s largest newsprint producer, the largest producer of northern bleached softwood kraft pulp, and the second-largest softwood lumber producer.
- Thanks to the recovery of the U.S. housing sector, production levels of softwood lumber and structural panels continued to increase in 2015, by 8% and 4%, respectively, reaching their highest levels since the 2008 financial crisis.
- However, pulp and paper production declined across the board, with production of wood pulp down by 2%, printing and writing paper down 7%, and newsprint production down 13%. The benefit gained by producers from a weaker Canadian dollar against the U.S. dollar was negated by declining market demand.

Exports

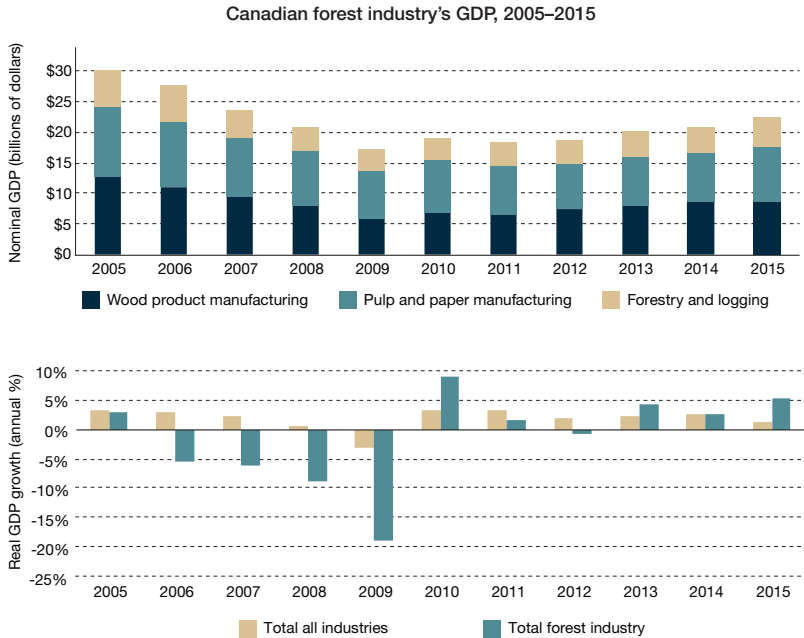
Exports of Canadian forest products, 2005–2015



Source: Statistics Canada. See “Sources” for more detail.

- In 2015, the value of Canada’s forest product exports increased by 6.3% over 2014, rising to \$32.7 billion from \$30.8 billion.
- On the wood product side, the U.S. housing recovery continued to drive Canadian softwood lumber exports. In 2015, softwood lumber exports totaled \$8.6 billion, a 3% increase over 2014. The value of wood panel exports increased by 18%, to \$2.68 billion, with significant increases in all panel types, especially plywood (29%) and fibreboard (28%).
- As for pulp and paper, wood pulp exports increased 6.5% over 2014 levels, to \$7.7 billion. In 2015, exports of printing and writing paper barely grew (by 1%), while newsprint exports fell 10% from the previous year.

Gross Domestic Product

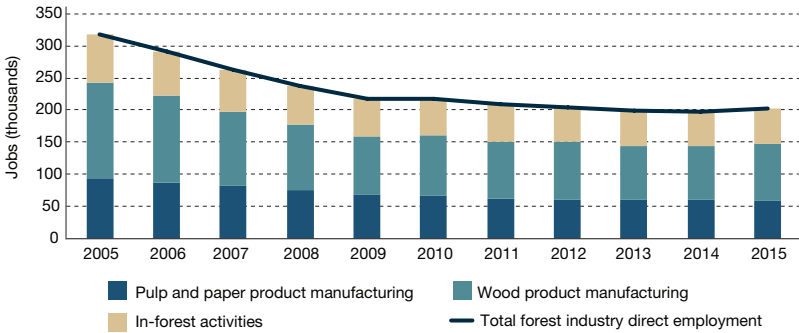


Source: Statistics Canada. See “Sources” for more detail.

- The forest industry contributed \$22.1 billion – or 1.2% – to nominal gross domestic product (GDP) in 2015. Based on current trends in related data, this figure is expected to rise slightly for 2016. The forest industry outperformed the Canadian economy in 2015 in real terms: the forest industry’s real GDP grew by 5% from 2014 to 2015, while the Canadian economy grew by only 1%.
- The forest sector continues to recover from the U.S. housing crash and the financial crisis. As a result, forest industry growth has tracked Canadian GDP in the past few years and has consistently accounted for approximately 1.2% of the total Canadian GDP. However, growth within sub-sectors has been variable in the past decade and has been mainly concentrated in forestry and logging, as well as in wood products.

Employment

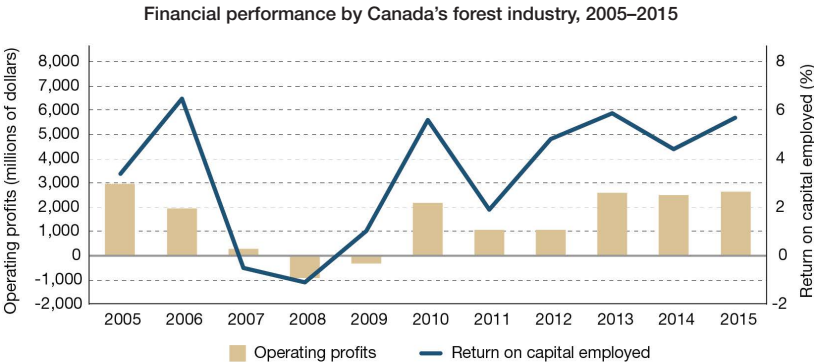
Forest industry direct employment, 2005–2015



Source: Statistics Canada, System of National Accounts. See “Sources” for more detail.

- In 2015, direct employment in the Canadian forest industry, as measured by Statistics Canada’s System of National Accounts, increased by 1.5% from 2014 levels, to 201,645 jobs. The job gains are in line with other positive indicators, such as increasing forest sector contribution to Canada’s GDP and financial metrics.
- But employment did not improve in all forest sub-sectors: employment in the pulp and paper sector decreased because of poor market conditions for newsprint and other paper products, which has caused several mill closures.
- Within Canada, wood product manufacturing and forestry and logging employment is concentrated in British Columbia and Quebec, while employment in pulp and paper product manufacturing is highest in Ontario.

Financial Performance

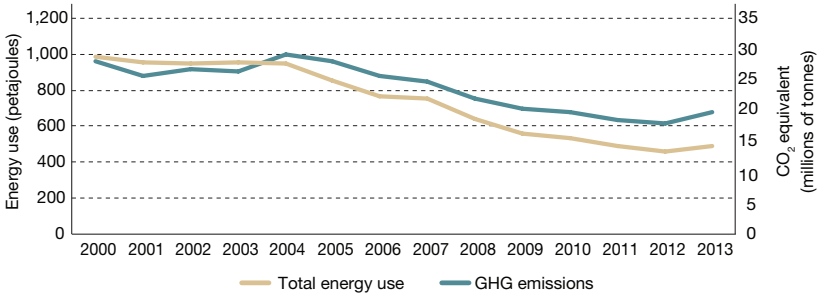


Source: Statistics Canada, Quarterly financial statistics for enterprises. See “Sources” for more detail.

- The Canadian forest industry’s financial performance remained solid in 2015, with operating profit standing at \$2.6 billion, up 5% over 2014. This is the highest operating profit since 2005, representing a significant improvement on the weak financial performance of 2011 and 2012.
- Similarly, the return on capital employed increased to 5.7% in 2015, compared with 4.4% in 2014. This is well above the long-term average of the past 10 years (3.5%).
- The fourth quarter of 2015 was the 16th consecutive quarter with positive operating profits for the Canadian forest industry. The highest operating profits since 2005 were also recorded in 2015.

Carbon Emissions

Fossil fuel greenhouse gas (GHG) emissions and total energy use in
Canada's forest industry, 2000–2013



Source: Statistics Canada. See “Sources” for more detail.

- A changing energy mix, greater energy efficiency and the decline in the Canadian pulp and paper-manufacturing sub-sector have clearly reduced energy use and GHG emissions in the forest industry. The forest industry’s substantial cut in fossil fuel-use between 2000 and 2013 helped reduce direct emissions by 44% and total energy use by 29%.
- The forest sector’s ability to generate its own electricity, largely from bioenergy, has reduced its reliance on fossil fuels. The sector’s overall decrease in GHG emissions resulted from its ability to change fuels as needed, along with increased energy efficiency and reduced energy use during the global economic recession.
- Bioenergy accounted for 60% of forest industry energy use in 2013, up from 49% in 2000. The forest industry’s reduced use of refined petroleum products and natural gas between 2000 and 2013 accounted for 95% of its reduction in direct emissions over the same period.

Forest Products

Softwood Lumber

Dimension lumber is softwood lumber that is nominally 2 inches thick and of various lengths and widths. It is the structural softwood lumber used in most wood-based housing construction (2x4 platform-frame construction) in North America.

Machine stress rated (MSR) lumber is softwood dimension lumber that has had its strength predicted by mechanical means rather than by relying on visual indicators. MSR lumber has traditionally been used for producing engineered wood products such as roof trusses and is now also commonly used in producing glue-laminated (glulam) beams, cords for wood I-beams and webs in stressed-skin panels.

Softwood boards are non-structural lumber produced with a nominal thickness of 1 inch. Boards are used for a range of decorative applications where visual appearance is important and also for end uses in which lower-quality lumber is acceptable. They are used in industrial applications to manufacture value-added wood products and in the do-it-yourself (DIY) market.

Timber is oversized structural softwood lumber that is 6 inches or more in its smallest cross-sectional dimension. Timbers are used predominantly as large, visible supports in construction, with both structural and aesthetic functions. Construction with timber is an alternative to the more common 2x4 construction, with the timbers supplying some of the structural support for the building.

Canada and world economic indicators (2015)

Softwood lumber	Canada	World
Production (cubic metres)	62,974,400	321,437,563
Consumption (cubic metres)	24,617,991	314,635,686
Domestic Exports (dollars)	8,598,948,344 (CAD)	23,320,411,000 (USD)
Domestic Exports (cubic metres)	42,029,658	113,013,064
Imports (dollars)	263,189,796 (CAD)	23,873,041,000 (USD)
Imports (cubic metres)	3,673,249	106,211,187

Sources: Statistics Canada, Natural Resources Canada, and FAOSTAT. See “Sources” for details.

Top export markets – Softwood lumber (CAD, 2015)

United States	5,933,971,240
China	1,122,771,021
Japan	794,280,497
Philippines	98,458,077
Taiwan	94,172,011

Source: Statistics Canada. See “Sources” for more detail.

International ranking – World Softwood lumber production (2015)

United States	1
Canada	2
China	3
Russia	4
Germany	5

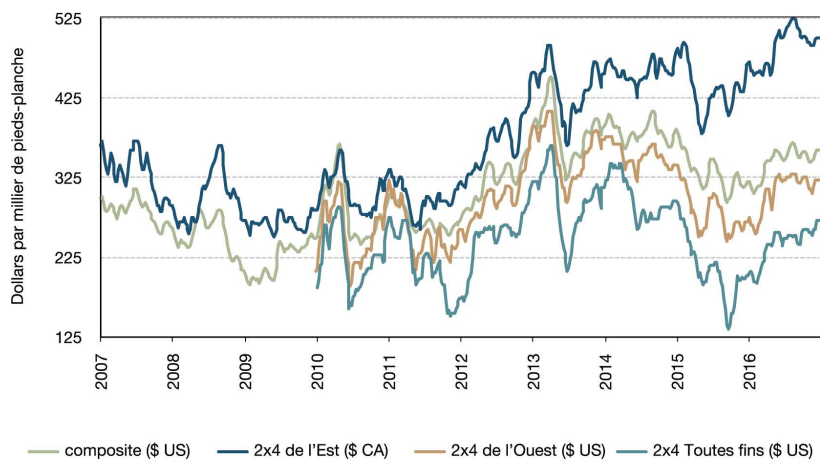
Source: FAOSTAT. See “Sources” for more detail.

**Top export markets by province (ranked by export market value) –
Softwood lumber (CAD, 2015)**

British Columbia	United States	3,311,254,236
	China	1,119,954,934
	Japan	759,915,067
Alberta	United States	600,493,202
	Japan	32,801,092
	Philippines	5,694,225
Saskatchewan	United States	70,018,995
	Mexico	202,263
	Japan	28,629
Manitoba	United States	4,090,948
	Malaysia	330,511
	Japan	190,846
Ontario	United States	398,309,698
	Trinidad and Tobago	1,196,086
	China	994,037
Quebec	United States	1,056,530,883
	Mexico	5,905,646
	Saudi Arabia	5,855,590
New Brunswick	United States	403,202,672
	Iraq	1,208,957
	Pakistan	117,902
Nova Scotia	United States	85,605,124
	Germany	583,990
	Netherlands	543,865
Newfoundland and Labrador	United States	4,465,482
	France	9,580

Source: Statistics Canada. See “Sources” for more detail.

Weekly lumber prices in North America (2007–2016)



Note: Eastern spruce-pine-fir 2x4 #2 and better, Random Lengths composite prices and western spruce-pine-fir 2x4 #2 and better, kiln dried

Sources: Random Lengths and Madison's Lumber Reporter, used with permission granted by the publisher.

Wood Pulp

Pulp is a fibrous material made by breaking down wood with mechanical force or chemicals. It is an intermediate product used to produce paper and other materials. Overall, the quality of wood pulp depends on how much of the lignin and hemicellulose is removed, or in other words, the purity of the cellulose.

Pulp is predominantly used to produce paper, packaging and hygiene products. Some wood pulp is used to produce non-paper materials including rayon fabric and biochemicals such as food thickeners and paint additives. Ongoing research continues to expand the uses of wood pulp, including developing nanomaterials and bioplastics.

Canada and world economic indicators (2015)

Wood Pulp	Canada*	World
Production (tonnes)	16,841,000	175,622,061
Consumption (tonnes)	7,341,670	175,265,638
Exports (dollars)	7,667,550,444 (CAD)	34,696,353,000 (USD)
Exports (tonnes)	9,913,636	59,069,422
Imports (dollars)	271,724,898 (CAD)	38,339,717,000 (USD)
Imports (tonnes)	414,306	58,712,999

***Note:** Canadian values are in air-dry metric tonnes.

Sources: Statistics Canada, Natural Resources Canada, and FAOSTAT. See "Sources" for details.

Top export markets – Wood pulp (CAD, 2015)

China	3,159,490,087
United States	2,618,460,541
Japan	362,829,713
Indonesia	312,176,496
South Korea	267,375,851

Source: Statistics Canada. See "Sources" for more detail.

International ranking – World wood pulp production (2015)

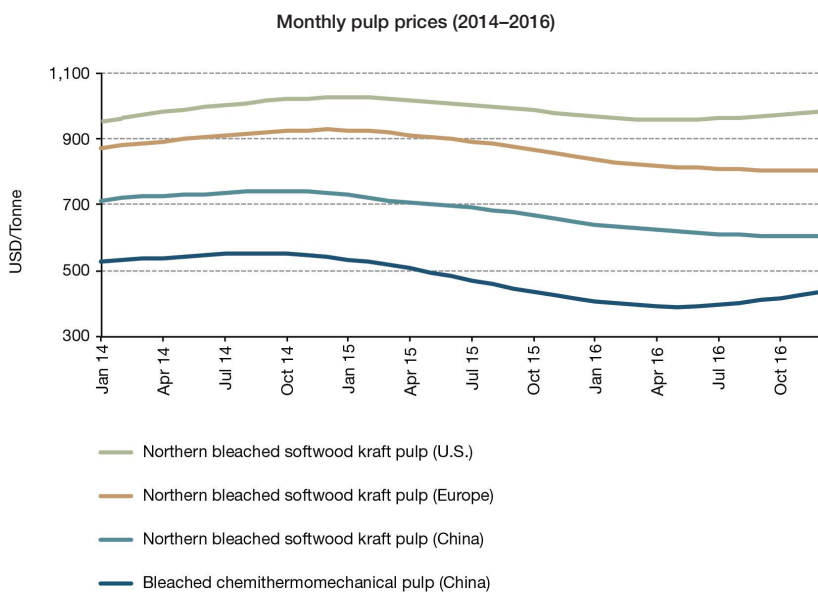
United States	1
Brazil	2
Canada	3
Sweden	4
Finland	5

Source: FAOSTAT. See "Sources" for more detail.

Top export markets by province – Wood pulp (CAD, 2015)

British Columbia	China	2,075,944,953
	United States	427,464,545
	Japan	187,512,003
Alberta	United States	805,628,970
	China	487,633,407
	Japan	168,777,157
Saskatchewan	China	137,557,123
	Indonesia	22,692,995
	United States	2,617,060
Manitoba	India	491,614
Ontario	United States	423,594,574
	Mexico	38,857,927
	China	8,241,087
Quebec	United States	741,201,707
	China	243,585,604
	South Korea	54,750,591
New Brunswick	United States	212,778,111
	India	106,541,430
	Indonesia	70,634,186
Nova Scotia	China	145,536,281
	Turkey	48,967,163
	Indonesia	24,384,519

Source: Statistics Canada. See “Sources” for more detail.



Source: Brian McClay & Associés inc., used with permission granted by the publisher.

Newsprint

Newsprint is a relatively low-cost paper product made from thermo-mechanical pulp. It is predominately used in newspapers and sometimes in flyers and catalogues. A variety of softwood species (such as black spruce and balsam fir) are used to make pulp for newsprint.

Newsprint is best suited for low-cost short-life applications such as newspapers. Newsprint yellows quickly when exposed to light. It is not very strong, especially when exposed to water. Newsprint is normally produced in integrated facilities that produce both the pulp and newsprint at the same site.

Canada and world economic indicators (2015)

Newsprint	Canada	World
Production (tonnes)	3,500,000	24,857,459
Consumption (tonnes)	249,669	24,965,336
Exports (dollars)	2,332,177,423 (CAD)	5,588,683,000 (USD)
Exports (tonnes)	3,310,181	10,947,894
Imports (dollars)	49,168,724 (CAD)	6,125,267,000 (USD)
Imports (tonnes)	59,850	11,055,771

Sources: Statistics Canada, Natural Resources Canada, and FAOSTAT. See “Sources” for details.

Top export markets – Newsprint (CAD, 2015)

United States	1,427,928,838
India	256,615,379
Brazil	134,599,549
United Kingdom	97,598,544
Colombia	42,390,886

Source: Statistics Canada. See “Sources” for more detail.

International ranking – World newsprint production (2015)

Canada	1
Japan	2
China	3
Germany	4
United States	5

Source: FAOSTAT. See “Sources” for more detail.

Top export markets by province – Newsprint (CAD, 2015)

British Columbia	United States	103,253,123
	Taiwan	34,873,792
	India	16,660,371
Alberta	United States	123,062,820
	Taiwan	814,852
	China	14,877
Manitoba	United States	10,183
Ontario	United States	288,449,717
	Brazil	7,722,775
	India	5,996,275
Quebec	United States	823,186,971
	India	225,132,115
	Brazil	103,402,575
New Brunswick	United States	93,417
Nova Scotia	United Arab Emirates	995,597
	Saudi Arabia	361,532
	Colombia	59,168
Newfoundland and Labrador	United States	89,857,227
	Brazil	18,222,969
	Israel	17,458,647

Source: Statistics Canada. See "Sources" for more detail.

Printing and Writing Paper

Printing and writing paper is used to produce a wide variety of office papers for printers and copiers, bond and writing paper, envelopes, forms, pads of paper, and offset printing paper.

Canada and world economic indicators (2015)

Printing and Writing Paper	Canada	World
Production (tonnes)	3,041,000	103,188,098
Consumption (tonnes)	1,093,000	99,714,953
Exports (tonnes)	2,519,000	36,330,869
Imports (tonnes)	571,000	39,762,396

Sources: Statistics Canada, Natural Resources Canada, and FAOSTAT. See “Sources” for details.

Top export markets – Printing and writing paper (CAD, 2015)

United States	2,391,112,557
Germany	35,262,247
Mexico	22,957,968
Colombia	16,343,908
Saudi Arabia	9,085,362

Source: Statistics Canada. See “Sources” for more detail.

International ranking – World printing and writing paper production (2015)

China	1
United States	2
Japan	3
Germany	4
Finland	5

Note: Canada ranks 8th.

Source: FAOSTAT. See “Sources” for more detail.

Top export markets by province – Printing and writing paper production
(CAD, 2015)

British Columbia	United States	470,652,966
	Colombia	9,614,492
	Mexico	9,590,434
Alberta	United States	117,695
	Cuba	637
	South Sudan	231
Saskatchewan	United States	112,946
Manitoba	United States	9,136
Ontario	United States	151,729,980
	Mexico	2,114,327
	Dominican Republic	270,780
Quebec	United States	1,185,839,801
	Germany	33,491,229
	Mexico	9,295,047
New Brunswick	United States	345,726,566
	Mexico	1,426,325
	Dominican Republic	401,342
Nova Scotia	United States	236,923,467
	Brazil	2,424,821
	Colombia	574,520
Newfoundland and Labrador	Saint-Pierre and Miquelon	846

Source: Statistics Canada. See “Sources” for more detail.

Wood Panels

Oriented strand board (OSB) is an engineered structural panel composed of strands of wood cut from small logs. It is used primarily as a load-bearing component in platform-frame-constructed buildings such as single-family and multi-family housing. It is used in wall sheathing, flooring and roofing applications. It is also used as a component in the manufacture of other products, including furniture and engineered wood products.

Plywood is a structural panel composed of multiple layers of thinner veneers of wood. It is used primarily as a load-bearing component of platform-frame-constructed buildings such as single-family and multi-family housing. It is used in wall sheathing, flooring and roofing applications. Particularly thick plywood with a special surface treatment is also used to line concrete forms in concrete-based construction.

Canada and world economic indicators (2015)

Wood Panels (plywood and OSB)	Canada	World
Production (cubic metres)	7,966,755	183,490,731
Consumption (cubic metres)	7,521,365	179,917,332
Exports (dollars)	1,637,073,121 (CAD)	16,435,265,000 (USD)
Exports (cubic metres)	5,329,543	37,806,628
Imports (dollars)	439,050,431 (CAD)	16,327,568,000(USD)
Imports (cubic metres)	4,884,153	34,233,229

Sources: Statistics Canada, Natural Resources Canada, and FAOSTAT. See “Sources” for details.

Top export markets – Wood panels (CAD, 2015)

United States	1,523,346,247
Japan	48,685,233
United Kingdom	13,243,460
Australia	12,584,520
China	12,321,058

Source: Statistics Canada. See “Sources” for more detail.

International ranking – World wood panel production (2015)

China	1
United States	2
Canada	3
Indonesia	4
Russia	5

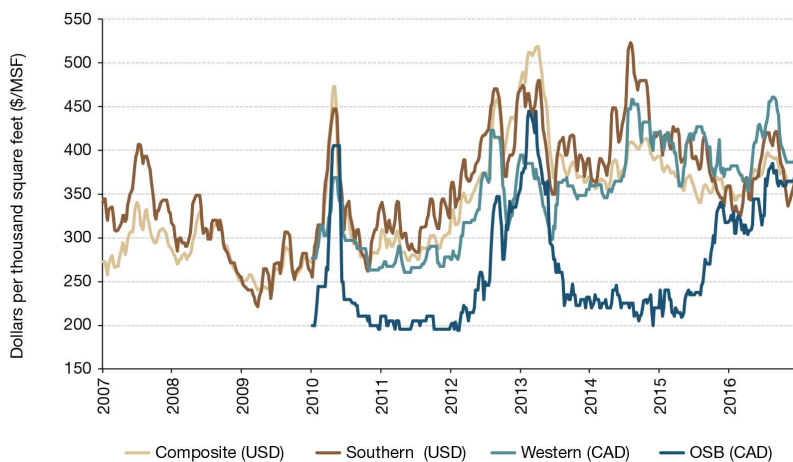
Source: FAOSTAT. See “Sources” for more detail.

Top export markets by province – Wood panels (CAD, 2015)

British Columbia	United States	457,000,740
	Japan	44,279,455
	United Kingdom	13,196,083
Alberta	United States	337,348,419
	South Korea	628,882
	Mexico	437,317
Saskatchewan	United States	184,031,657
	Japan	4,388,786
	South Korea	611,770
Manitoba	United States	45,024,255
	Mexico	27,612
Ontario	United States	306,112,572
	Mexico	153,608
	Bermuda	136,763
Quebec	United States	193,126,668
	China	1,967,527
	Mexico	1,303,142
New Brunswick	United States	637,298
	Malaysia	120
	Saint Lucia	27
Nova Scotia	Netherlands	633,935
	France	173,989
	United States	49,250
Newfoundland and Labrador	United States	15,388

Source: Statistics Canada. See “Sources” for more detail.

Weekly panel prices in North America (2007–2016)



Note: Random Lengths structural panels composite prices, 15/32" 3-ply exterior southern, 1/2" 4-ply exterior western and 7/16" oriented strand board (north central)

Sources: Random Lengths and Madison's Lumber Reporter, used with permission granted by the publisher.

Bioenergy

- The Canadian forest industry has a long history of using wood residues as a renewable energy source. First used mainly for facility heating, mill and forest residues such as bark, sawdust, wood chips, branches, and tree tops have become feedstocks for sophisticated steam and electricity cogeneration facilities, lumber drying kilns, and new bioenergy products such as wood pellets, syngas, cellulosic ethanol, biodiesel, bio-oil, biocarbon, and much more.¹
- A recent study found that creating biofuels from sustainably sourced biomass such as sawmill or harvest residues, and using them to displace fossil fuels for heat and power production, could reduce life-cycle greenhouse gas emissions by between 42 and 52% on average across Canada.²
- Canada's bioeconomy has some 900 companies, sustains over 2 million jobs and generates over \$300 billion in total revenue.³
- Over the past decade, Canada has experienced a growth spurt in bioenergy exports. Leading the way have been solid biofuels with pellet exports being 71% higher in 2016 than in 2012. Over half of Canadian pellet production ships to Europe. In 2015, pellet exports were valued at CAD\$285 million.⁴
- Over the past 10 years, Canada's bioenergy sector has started to realize its potential with 150 community heat projects in 2014 using only biomass (up from 5 projects in 2000), 39 pulp and paper mills operating cogeneration facilities in 2014, 29 independent heat and power producers in 2014, and 77 operating biogas installations in 2013 (from 43 operations in 2012). Renewable fuel consumption doubled between 2010 and 2014.⁵

Sources: See the Bioenergy section in "Sources" for more details on 1, 2, 3, 4, and 5.

Sources

Key Facts

Forest area, by country

- Food and Agriculture Organization of the United Nations. 2016. Global Forest Resources Assessment 2015 – How are the World's Forests Changing? 2nd Ed. Rome, Italy. www.fao.org/3/a-i4793e.pdf (February 6, 2017)

Seedlings planted

- National Forestry Database. Silviculture – National Tables, Table 6.8, Number of seedlings planted by ownership, species and province/territory. http://nfdp.ccfm.org/silviculture/national_e.php (February 6, 2017)

GDP

- Natural Resources Canada-Canadian Forest Service's calculations based on Statistics Canada's Table 379-0031: GDP in 2007 constant prices, and estimated from industry price deflators.
- Statistics Canada. CANSIM Table 379-0031: Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS). www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=3790031&paSer=&pattern=&stByVal=1&p1=1&p2=1&tabMode=dataTable&csid (April 21, 2016)

Employment

- Statistics Canada. CANSIM Table 383-0031: Labour statistics consistent with the System of National Accounts (SNA), by province and territory, job category and North American Industry Classification System (NAICS). www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=3830031&paSer=&pattern=&stByVal=1&p1=1&p2=50&tabMode=dataTable&csid (June 17, 2016)

Indigenous employment

- Statistics Canada, Labour Force Survey, custom tabulation. Forest industry Aboriginal employment five-year moving average (2011–2015).

Canadian exports by product

- Statistics Canada. Merchandise trade data. (April 20, 2016)

Forest product exports by destination

- Statistics Canada. Merchandise trade data. (April 20, 2016)

Forest industry direct carbon emissions

- Natural Resources Canada. Comprehensive energy use database. http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/menus/trends/comprehensive_tables/list.cfm (April 26, 2016)

Forests remove ¼ of all emissions from fossil fuel-use every year

- Pan, Y., et al. 2011. A Large and Persistent Carbon Sink in the World's Forests. *Science* 333, 988-993. <http://science.sciencemag.org/content/333/6045/988>
- Le Quéré, C., et al. 2014. Global carbon budget 2013. *Earth System Science Data* 6,235-263. www.earth-syst-sci-data.net/6/235/2014/

Bioenergy versus traditional fossil fuel GHG emissions

- Smyth, C., Stinson, G., et al. 2014. Quantifying the biophysical climate change mitigation potential of Canada's forest sector. *Biogeosciences* 11, 3515-3529. http://cfs.nrcan.gc.ca/publications?id=35590&lang=en_CA
- Smyth, C., Kurz, W. A., et al. 2016. Climate change mitigation potential of local use of harvest residues for bioenergy in Canada. *GCB Bioenergy*. <http://onlinelibrary.wiley.com/doi/10.1111/gcbb.12387/full>

Forest Industry

Market Structure

- Natural Resources Canada-Canadian Forest Service's calculations based on Statistics Canada's CANSIM Table 379-0031: Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS).

Production

- Production figures for newsprint, printing and writing paper, and wood pulp are based on Pulp and Paper Products Council data.
- Production data of structural panels (plywood and oriented strand board) are from APA – The Engineered Wood Association.
- Production for softwood lumber: Statistics Canada. CANSIM Table 303-0064: Lumber production, shipments and stocks, by Canada and provinces. www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=3030064&paSer=&patt ern=&stByVal=1&p1=1&p2=-1&tabMode=dataTable&csid (March 7, 2016).

Exports

- Statistics Canada. Merchandise trade data (April 20, 2016). "Total all forest products" comprises only HS Codes 44, 47 and 48.

Gross domestic product

- Natural Resources Canada-Canadian Forest Service's calculations based on Statistics Canada's Table 379-0031: GDP in 2007 constant prices and estimated industry price deflators.

- Statistics Canada. CANSIM Table 379-0031: Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS). www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=3790031&paSer=&pattern=&stByVal=1&p1=1&p2=1&tabMode=dataTable&csid (April 21, 2016).
- Statistics Canada. Table 379-0029: Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS). www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=3790029&pattern=&stByVal=1&p1=1&p2=-1&tabMode=dataTable&csid (April 21, 2016).
- Statistics Canada. Table 379-0023: Gross domestic product (GDP) at basic price in current dollars, System of National Accounts (SNA) benchmark values, by North American Industry Classification System (NAICS). www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=3790023&pattern=&stByVal=1&p1=1&p2=-1&tabMode=dataTable&csid (April 21, 2016).
- Statistics Canada. Table 379-0024: Gross domestic product (GDP) at basic price in current dollars, System of National Accounts (SNA) benchmark values, special industry aggregations based on the North American Industry Classification System (NAICS). www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=3790024&pattern=&stByVal=1&p1=1&p2=-1&tabMode=dataTable&csid (April 21, 2016).

Note: CANSIM tables 379-0023 and 379-0024 were terminated and replaced by CANSIM Table 379-0029. The data are based on 2007 constant prices.

Employment

- Statistics Canada. CANSIM Table 383-0031: Labour statistics consistent with the System of National Accounts (SNA), by province and territory, job category and North American Industry Classification System (NAICS). www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=3830031&paSer=&pattern=&stByVal=1&p1=1&p2=50&tabMode=dataTable&csid (June 17, 2016).

Note: The System of National Accounts (SNA) is the official source of employment data for Natural Resources Canada.

Financial performance

- Statistics Canada. Quarterly financial statistics for enterprises (61-008-X) (special extraction).

Forest industry carbon emissions

- Natural Resources Canada. Comprehensive energy use database. http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/menus/trends/comprehensive_tables/list.cfm (April 26, 2016).
- Statistics Canada. *Report on Energy Supply and Demand in Canada* (2014 preliminary). www.statcan.gc.ca/pub/57-003-x/57-003-x2016002-eng.htm (April 22, 2016).

Note: The methodology for estimating the amount of primary energy attributed to wood and spent pulping liquor in the pulp and paper manufacturing sub-sector was updated in 2015, causing changes in the data series between 1995 and 2002. In addition, from 1990 to 2010, wood waste and spent pulping liquor were incorrectly included in other fuels when estimating electricity

generation in the *Report on Energy Supply and Demand in Canada*. This has now been corrected for the 2011, 2012 and 2013 data points, but will not be corrected for prior years. These changes have directly affected the estimates for industrial energy use and electricity generation and indirectly affected the emissions estimates. The time series data for 1990–2013 may therefore not be completely consistent with data for earlier years.

Forest Products

Production (national)

- Softwood lumber: CANSIM Table 303-0064: Lumber production, shipments and stocks, by Canada and provinces. www5.statcan.gc.ca/cansim/a26?lang=eng&id=3030064
- Wood pulp, newsprint, and printing & writing paper: Pulp and Paper Product Council.
- Wood Panels: APA – The Engineered Wood Association.

Consumption (national)

- Consumption figures for a range of products, calculated by Natural Resources Canada.

Trade (national)

- Statistics Canada. Merchandise trade data (special extraction), monthly data (February 15, 2017)

International production, consumption, and trade

- FAOSTAT: www.fao.org/faostat/en/#data/FO , (February 15, 2017) Regional aggregation used: World + (total)

Top export markets

- Statistics Canada. Merchandise trade data (special extraction), monthly data, (February 15, 2017)

International competition

- FAOSTAT: www.fao.org/faostat/en/#data/FO, (February 15, 2017)

Bioenergy

1. www.sfmcanada.org/images/Publications/EN/Bioenergy_EN.pdf, (February 7, 2017)
2. Smyth, C., Stinson, G., et al. 2014. Quantifying the biophysical climate change mitigation potential of Canada's forest sector. *Biogeosciences* 11, 3515-3529. cfs.nrcan.gc.ca/publications?id=35590&lang=en_CA.
Smyth, C., Kurz, W. A., et al. 2016. Climate change mitigation potential of local use of harvest residues for bioenergy in Canada. *GCB Bioenergy*. <http://onlinelibrary.wiley.com/doi/10.1111/gcbb.12387/full>

3. As estimated by FPAC, based on consultation with the Bioeconomy Network (BEN) and external stakeholders from diverse industries related to the bioeconomy)
4. Statistics Canada Trade data (internal service purchased by NRCan, January 2017)
Note: Comparison of the first 11 months in 2012 vs. 2016.
5. Biofuels: 23 Facilities (commercial operations: 14 Ethanol and 9 Biodiesel;
Capacity: 1.8 BL ethanol, 725 ML biodiesel)

Biogas Heat, Power & RNG Statistics: Landfills, Wastewater Treatment Plants, On-farm Anaerobic Digesters: 152 MW electrical capacity, 124 MW thermal capacity
(Source: CIEEDAC Renewable Energy Database, 2015)

Agriculture and Agri-Food: 19 MW electrical capacity (55 facilities), 160,000 GJ/yr
Renewable Natural Gas (Source: Canadian Biogas Association, 2015)