Alberta Forest Products

Industry Profile September 2015

The Northern Alberta Development Council (NADC) and the Alberta Forest Products Association (AFPA) have joined together for this industry profile to highlight industry initiatives for environmental sustainability and economic innovation and to increase awareness of the economic value and contribution of the forestry products industry to the economic diversity of the province.

AFPA
ALBERTA FOREST PRODUCTS ASSOCIATION

Northern Alberta Development Council

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Overview

Executive Summary

The forest products industry is an essential component of the province's diverse and resource-based economy. The industry plays a key role in the sustainable utilization of the province's forest and forest lands for the production of a range of valued products destined for domestic and international markets—the United States, Europe and Asia-Pacific.

Alberta's land is 58% forested with deciduous (trees that lose their leaves seasonally) and coniferous (cone-bearing) trees. About 60% of the forested area is suitable for harvest. Wood species include White Birch, Jack Pine, Lodgepole Pine, Aspen Poplar, Balsam Poplar, Black Spruce, and White Spruce.

The harvesting of trees is sustained through the allocation to forest tenure holders, a mix of short-term (1-5 years) permits and long-term (20 years) permits in the form of timber quotas, and Forest Management Agreements (FMA). Some tenure types require an annual operating plan, reforestation, payment for forest protection, and public consultation.

The industry produces three product categories, namely: panel and engineered wood products, pulp and newsprint, and sawn wood products. Plywood, oriented strand board (OSB), medium density fibreboard (MDF), engineered lumber, and glue laminated timber are panel and engineered wood products.

Sawn wood products include commodity lumber, decking/fencing, posts/poles, timber, pellets, shavings, and treated wood products.

Pulp is either deciduous or coniferous kraft or high yield bleached chemi-thermo-mechanical pulp.

In addition, bio products for electrical energy and transportation fuel such as biodiesel and ethanol, materials such as textile and bio-composite plastics, and chemicals such as resins/glues, soil additives, and artificial sweeteners have the potential to diversify and position the forest products industry for future economic growth and development.

Companies in the industry vary in size from *micro* establishments that employ fewer than five people, to *large* establishments that employ 500 or more people. Industry activity is dispersed across the province and impacts about 50 communities through direct employment, and other indirect and induced economic effects.

AFPA-member companies in the forest products industry contribute substantially to the province's annual production volumes of lumber, pulp, and panel board. Production from AFPA-member companies accounted for 90% of the province's lumber production, 60% of the province's pulp production, and 50% of the province's panel board production.

The economic performance of the forest products industry is impacted by a number of socio-economic factors such as the availability of skilled labour, operating costs such as electricity, the value of the Canadian dollar relative to the US dollar, new free trade agreements, demand for housing construction—domestic and international, particularly in the U.S., retail demand for paper products, and the rising use of digital communications among consumers.

Natural forces such as forest fires and defoliation by insects also come into play which impact the industry's economic performance. For instance, in 2013, the province had 1,264 forest fires which burned an area of 22,627 hectares.

Forested areas may be defoliated by more than one insect. Some of these insects include spruce budworm, forest tent caterpillar, bruce spanworm, large aspen tortrix, and aspen two-leaf tier.

Considering that the forested area in the province is 42% pine, there are about six million hectares of susceptible pine. Since 2006, 1.54 million hectares have sustained damage from the mountain pine beetle. Damage ranges from a small patch of trees within a stand, to over 80% pine mortality within a stand.

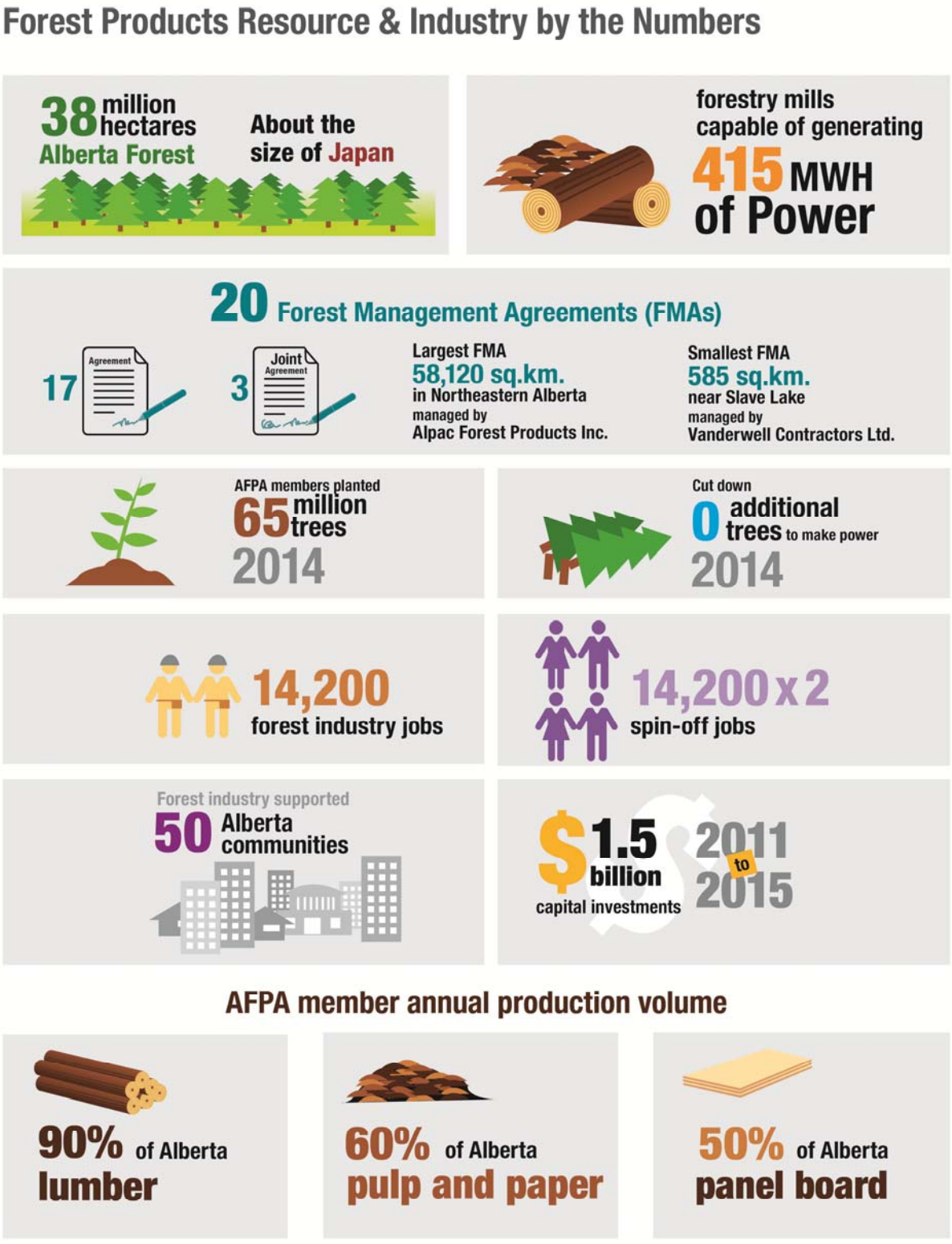
Forest regeneration is essential not only to recover from damage brought about by natural forces but also to replenish harvested trees for long-term sustainability of the forest products industry. In 2014, AFPA-members planted 65 million seedlings.

Industry initiatives have also been implemented to address challenges and respond to opportunities. Featured in this profile is the Work Wild program, which is aimed at addressing the skilled labour needs of the industry; the generation of energy from waste products at West Fraser's Slake Lake pulp mill; the Ecosystem Management Emulating Natural Disturbance (EMEND) research project; and how producers discover opportunities to diversify their market.

In the short-term, the prospects of the forest products industry are promising, with key economic figures expected to generally increase annually until 2019. Production is forecasted to be modest to strong with improving profits.

Overview

Forest Products Resource and Industry
(Ref. Alberta Environment and Parks, AFPA)



Production Figures and Values

AFPA member establishments (Ref. AFPA)

During the period 2009-2014, annual production volumes fluctuated year to year, though were largely upswings, particularly in lumber and panel board production. Annual lumber production increased consistently year after year in the last four years of the period. Similar trends occurred in the panel board production in the last three years of the period. Fluctuations in pulp and paper were largely downswings.

Year	Production	Lumber (mmfbm)	Panel board (mm sq. ft.)	Pulp and Paper ('000 air dried metric tonnes)
2009	Volume	2,586.2	1,131.2	1,566.8
	Cdn (000,000)	$519.8	$279.7	$1,055.0
2010	Volume	2,833.3	1,102.1	1,500.4
	Cdn (000,000)	$739.7	$303.5	$1,268.3
2011	Volume	2,786.4	1,117.9	1,479.1
	Cdn (000,000)	$702.4	$268.1	$1,188.8
2012	Volume	2,980.2	1,109.7	1,526.2
	Cdn (000,000)	$906.0	$340.7	$1,096.4
2013	Volume	3,207.5	1,127.2	1,492.8
	Cdn (000,000)	$1,170.0	$362.1	$1,146.3
2014	Volume	3,308.6	1,131.6	1,484.7
	Cdn (000,000)	$1,304.9	$361.4	$1,220.2

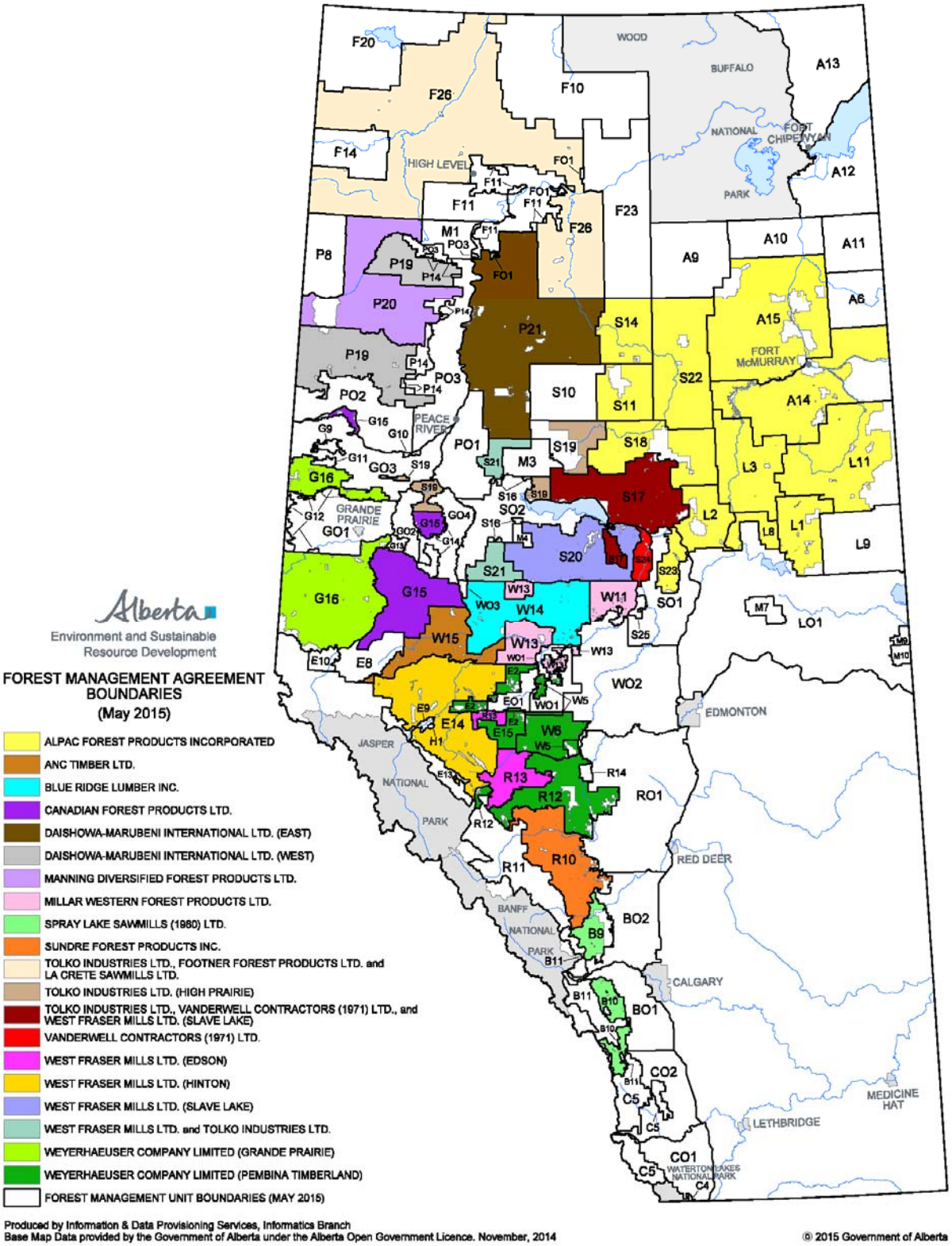
The total average annual value of production during the period was Cdn. $2.4 billion — $890.47 million from lumber, $319.25 million from panel board, and $1.1625 billion from pulp and paper.

Since at least half of the panel board production and most of the lumber and pulp and paper production were from AFPA members, provincial production figures are substantially impacted by production activities from this industry group.

Average annual production for the province during the period was 3,278.20 mmfbm of lumber, 2,240.0 mm sq. ft. of panel board, and 2,513.9 thousand air dried metric tonnes of pulp and paper.

Overview

Forest Management Agreement Boundaries



Major Mills in Alberta

Sector Initiatives

Forestry Workforce: Finding the Next Generation

Alberta's forest products industry has faced a substantial labour shortage over the past few years. The industry needs skilled labour to grow and develop innovative products. Persistent challenges to acquire skilled labour could force some operations to close and existing jobs could be threatened.

In partnership with the Government of Alberta, the Alberta Forest Products Association (AFPA) launched the Work Wild program in January 2011. The program is designed to educate youth in Alberta's forest communities about the variety of careers available in the forest products industry and the high quality of life that a career in the industry can provide. Work Wild uses an innovative website, social media, advertising, and personal communication in high schools, job fairs, and at community events to reach youth and job-seekers.

In the five years since its inception, Work Wild has expanded its reach to urban and First Nations communities. As of 2015, the program is jointly funded by the AFPA and the Forest Resource Improvement Association of Alberta (FRIAA).

Visit **http://www.workwild.ca** for more information.

Highlights

- **16,000 students** from **126 Alberta schools** have seen the Work Wild presentation.
- Work Wild has reached over **100,000 students, teachers, and community members** at job fairs, conferences, and other events in **74 Alberta communities**.
- Since 2011, NAIT's forest technology program **applications have more than doubled** and the University of Alberta's forest management program **enrollment has increased nearly threefold**.
- Alberta's forest products industry **employs over 15,000 Albertans** and **contributes over $4 billion** to the provincial economy.
- The industry will need **up to 7,000 new workers by 2020** to keep up with retirements and industry growth.

Diversifying Markets: The Case for Taller Wood

Diversifying markets have long been a dilemma for Alberta's forest products industry. With over half of the industry's lumber and a significant portion of pulp and paper production destined for consumers south of the border, the US is a large and geographically close market. The downside is that producers are exposed to downturns in the US economy. In 2009, the impact of overreliance on one market became readily apparent. US housing starts fell from a high of over 2.5 million in 2006 to just 500,000 in 2009. Alberta producers were left reeling and searching for solutions to diversify their markets.

Fortunately, producers have discovered a solution in their own backyard – taller wood buildings. As Canada's urban areas grow, demand for building solutions that increase density has risen steadily. Taller buildings allow developers to maximize the value of real estate and allow municipalities to deliver services in a cost-efficient manner.

Building taller with wood has its advantages. Wood is locally sourced and fully renewable. It has a far lower carbon footprint, requires less transportation, and is less expensive to build with than other materials. Wood production supports economic growth and development in communities throughout northern Alberta.

Alberta recently changed its building code to allow wood buildings as high as six storeys – an increase of two storeys from previous legislation. The legislation followed a recommendation in the National Building Code to allow wood buildings to reach six storeys. Since similar legislation was passed in British Columbia in 2006, over 300 projects have been completed or planned. Each project has an average of one million board feet of lumber, worth approximately Cdn. $250,000.

The industry is also working to sell more of its products in Asia and to conduct research in the use of wood in buildings that are even taller.

Highlights

- Depending on building design, wood is **12-20% less expensive** to build with than other building materials.
- A mid-rise building has approximately **$250,000** worth of lumber in it.
- A wood building must meet the **same safety and fire code provisions** as other buildings. The National Building Code mandates sprinkler systems, fire walls, and other safety features to keep buildings safe.
- A mid-rise wood building stores enough carbon to take **672 cars** off the road for one year.

Sector Initiatives

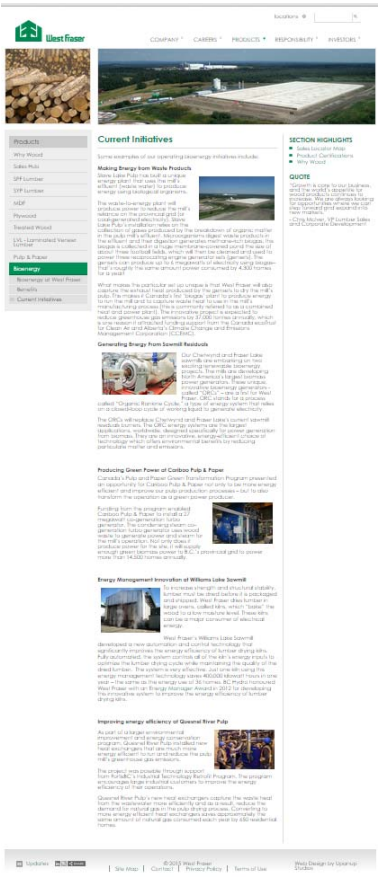
Making Energy from Waste Products

West Fraser's Slave Lake pulp mill is creating electricity and helping the environment by harnessing the potential of the mill's waste water. How are they doing this? By creating Canada's first 'biogas' plant that produces electricity to run the mill and captures waste heat to run the mill's manufacturing processes.

The project uses unique and innovative technology that relies on microorganisms to digest waste products from the pulp manufacturing process. Their digestion process generates methane-rich gas, which is collected in a massive membrane-covered pond that is roughly the size of three football fields. Once the gas is cleaned, it is ready to be used in three reciprocating engine generator sets. The sets produce electricity and heat which are utilized by the mill.

The project, which received support from Canada's ecoTrust for Clean Air and Alberta's Climate Change and Emissions Management Corporation (CCEMC), is a prime example of technologies that are good for the environment and the economy. This project helps the mill to remain competitive by reducing input costs and getting maximum value from the forest resource.

Visit **http://www.westfraser.com/products/bioenergy/current-initiatives** for more information.



Highlights

- The facility is capable of generating **6 megawatts** of electricity.
- The electricity generated could power **4,300 homes**.
- This project will reduce greenhouse gas emissions by **37,000 tonnes** annually.
- Since mill waste product is used, **zero additional trees** are harvested.

Ecosystem Management Emulating Natural Disturbance

The health of Alberta's forests and our forest industry are inextricably linked. The industry has operated on our landscapes for several generations and knows that operating into the future requires sustainably managed forests.

How do we manage our forests in a way that is sustainable and compatible with natural processes? How do we use forest management tools to replicate what nature does through fire and other natural disturbances? The Ecosystem Management Emulating Natural Disturbance (EMEND) project has been working to answer these questions since 1998. EMEND is a collaboration between the forest industry, academia, and government.

At its site northwest of Peace River, researchers from the University of Alberta and visiting academics from around the world have access to a research facility and an experimental boreal forest site. The site allows researchers to examine the impact of different forest management techniques and harvesting practices on biodiversity, water quality, forest regeneration, species recovery, and overall forest health. Specific techniques that are tested include prescribed burn treatments, range of retention levels, and silviculture (tree planting).

Since its inception, the forest industry has been closely involved in EMEND. Canfor and Daishowa-Marubeni International (DMI) are founding project partners, while other companies have contributed in-kind services. Close involvement allows the industry to incorporate the results of EMEND's projects into operations. For example, when EMEND found that leaving retention stands (small stands of trees) in cutblocks increased species recovery, the industry was able to modify how harvesting operations are carried out.

Ongoing research at EMEND will help to support the project's ultimate goal of forest management that is sustainable and allows the forest industry to remain healthy for generations to come.

Highlights

- EMEND has been continuously operational for **17 years**.
- **45 graduate students** have completed studies at EMEND.
- **160 students** have worked at the Peace River site.
- **8 new species** have been discovered through the project.

Industry Structure and Performance

Establishments

(Ref. CANSIM 552-0001, 553-0001)

Companies in the industry vary in size according to the number of its employed labour. They are either classified as *micro*, *small*, *medium*, or *large*.

62.3% of employers in the forestry and logging sector were considered *micro* (employing fewer than 5 people). 36.9% were considered *small* (employing five to fewer than 100 people). 0.8% were considered *medium* (employing 100 to fewer than 500 people).

In the wood product manufacturing sector, 56.7% of employers were classified as *small*. 31.0% were classified as *micro* and 12.2% were classified as *medium*.

44.0% of employers in the paper manufacturing sector were classified as *medium*. 32.0% were classified as *small,* 16% were classified as *micro,* and 8% were classified as *large* (employing 500 or more people).

Number of Establishments, Alberta, 2014	Employers	Non-Employers	Total	National
Forestry and Logging	371	428	799	7.2%
Wood Product Manufacturing	319	228	547	8.5%
Paper Manufacturing	25	6	31	3.7%

Gross Domestic Product (GDP)

(Ref. CANSIM 379-0030, 379-0028)

At basic prices (in chained 2007 dollars), the total value-added for paper and wood product manufacturing in 2014 was $565 million and $1,360.1 million, respectively. Forestry and logging had a total value-added of $422.9 million.

In 2014, GDP in wood product manufacturing, and forestry and logging increased by 43.1% and 29.8% respectively from 2010. While GDP in paper manufacturing decreased by 3.7% in the same period (2010-2014).

The manufacturing sector, which includes paper and wood product manufacturing, accounted for 6.87% of the province's total GDP (at basic prices) in 2014. The agriculture, forestry, fishing and hunting sector, which includes forestry and logging, accounted for 1.46% of total GDP. Both sectors were overshadowed by other sectors such as the construction sector, mining, quarrying, and oil and gas extraction sector, and real estate and rental and leasing sector, but were, nonetheless, significant contributors to a diversified economy.

Salaries and Wages
(Ref. Labour Force Survey, 2014)

In 2014, the labour force in the forestry and logging, wood products, and paper industries combined accounted for 0.63% of the 2.4 million labour force in the province. Wood products manufacturing had a labour force of 10,300—the most among the three. Paper manufacturing, and forestry and logging industries had a labour force of 2,800 and 1,800, respectively.

During the period 2010-2014, the average annual labour force estimates in the forestry and logging industry was about 1,700, while wood products manufacturing was about 11,300 and paper manufacturing was about 3,600.

Most of the labour force in these industries were employed. During the same period, estimates of average annual employment for forestry and logging was about 1,600. Wood products manufacturing was about 10,900 and paper manufacturing was about 3,500.

Average hourly wage rate, Alberta, annual average, dollars Both sexes, age 15 years and over Special grouping of forestry and logging, wood, paper and allied industries					
Educational Level	2010	2011	2012	2013	2014
Less than high school	24.92	19.30	25.04	22.74	24.47
High school graduate or some post-secondary	24.93	24.79	24.36	25.05	24.42
Post-secondary certificate or diploma	28.81	29.38	28.12	30.74	29.73
University degree	30.74	38.28	30.05	35.31	37.73

Generally, for the period 2010-2014, the average hourly wage rate in Alberta across educational levels was relatively higher than in other regions or provinces.

Among employees with a university degree, the average hourly wage rate increased substantially by 22.7% in 2014 from 2010. Those with post-secondary certificate or diploma had a 3.2% increase and the rest remained relatively stable.

Average weekly wage rate (year average) in Alberta for this industry grouping increased marginally by 0.9% from $1,141.46 in 2010 to $1,151.94 in 2014.

During the period 2010-2014, Alberta's average weekly wage rate (year average) for this industry grouping was the highest among provinces except in 2012 and 2014 where Alberta was second to British Columbia.

Industry Structure and Performance

Forest Management

(Ref. National Forestry Database)

Harvesting in Alberta's provincial crown lands

2011-13 wood supply

Softwood		Hardwood		Net merchantable
19.1 million cubic metres	+	12.1 million cubic metres	=	31.2 million cubic metres

2013 Total area harvested

87,578 hectares

2050 annual wood supply projection

Softwood		Hardwood		Annual projection
13.6 million cubic metres	+	10.4 million cubic metres	=	24.0 million cubic metres

REGENERATION preliminary figures 2013

area of site preparation
23,093 hectares

area of scarification
9,724 hectares

Total area of stand tending
30,939 hectares

Number of seedlings planted industrywide
93.8 million

Total area planted
70,016 hectares

pine	35,864
spruce	34,096
misc. hardwood	52
unspecified species	4

DISTURBANCE preliminary figures 2013

burnt by forest fire
22,627 hectares

Number of forest fire
1,264

Defoliation by major insects

spruce budworm
37,076 hectares

forest tent caterpillar
6.5M hectares

bruce spanworm
5,061 hectares

large aspen tortrix
1,820 hectares

aspen twoleaf tier
2.1M hectares

others
69,461 hectares

Industry Outlook

(Ref. Canada Mortgage and Housing Corporation (CMHC), Freddie Mac , Conference Board of Canada)

Housing, Canada

- CMHC forecasted annual housing starts in Canada to be in the range of 166,540 to 188,580 units in 2015 and 162,840 to 190,830 units in 2016. Housing starts are expected to decline in 2015 from 2014 by 4.1%.
- In Alberta, single-detached starts are forecasted to be in the range of 16,400 to 18,500 units in 2015 and 15,700 to 18,300 units in 2016. Multi-unit construction is forecasted to be in the range of 15,500 to 18,000 units in 2015 and 12,000 to 15,000 units in 2016. Housing starts are expected to decline in 2015 from 19,563 single-detached units and 21,027 multi-family units in 2014.

Housing, US

- US Freddie Mac forecasted quarterly average of housing starts to be 1.14 million in 2015 and 1.40 million in 2016. Housing starts are expected to increase in 2015 from 1.00 million units in 2014.

Wood Products Industry, Canada

- The Conference Board of Canada's short-term forecast trend indicated strong production, modest prices, and improving profits.
- Real GDP (in 2007 dollars) is expected to increase by 6% in 2015 to $9,881 million, and increasing annually to $10,889 million in 2019.
- Revenues are expected to increase by 8.2% in 2015 to $27,037 million, and increasing annually to $31,849 million in 2019.
- Cost is, likewise, expected to increase by 8.7% in 2015 to $25,610 million, and increasing annually to $29,897 million in 2019.
- Profits in 2015 are expected to marginally decline by 0.2% to $1,427 million but expected to increase annually to $1,952 million in 2019.

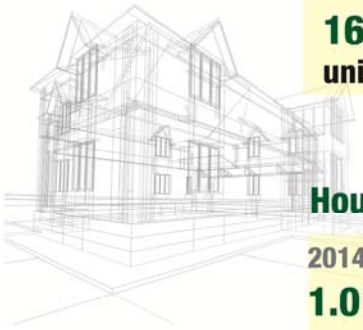
Paper Products Industry, Canada

- The Conference Board of Canada's short-term forecast trend indicated modest production, improving prices and profits.
- Real GDP (in 2007 dollars) is expected to increase by 2.2% in 2015 to $7,264 million, and increasing annually to $7,632 million in 2019.
- Revenues are expected to increase by 5.3% in 2015 to $26,401 million, and increasing annually to $28,359 million in 2019.
- Cost is, likewise, expected to increase by 4.4% in 2015 to $26,396 million, and increasing annually to $27,859 million in 2019.
- Profits in 2015 are expected to be positive at $4 million and increasing annually to $500 million in 2019.

Industry Structure and Performance

Industry Outlook

Housing, Canada (CMHC forecast)



2015 housing starts	2016 housing starts
166,540 to 188,580 units	162,840 to 190,830 units

Housing, US (US Freedie Mac Forecast)

2014 housing starts	2015 housing starts	2016 housing starts
1.0M units	1.14M units	1.40M units

Wood Products Industry, Canada

Conference Board of Canada's short-term forecast

- strong production
- modest prices
- improving profits

Real GDP (2007 $)	REVENUES	COST	PROFITS
6% $9,881M 2015	8.2% $27,037M 2015	8.7% $25,610M 2015	0.2% $1,427M 2015

Paper Products Industry, Canada

Conference Board of Canada's short-term forecast

- modest production
- improving prices
- improving profits

Real GDP (2007 $)	REVENUES	COST	PROFITS
2.2% $7,264M 2015	5.3% $26,401M 2015	4.4% $26,396M 2015	$4M 2015

Reference

- Alberta Environment and Parks, Lands & Forests
- Alberta Environment and Parks, Mapping Section, Informatics Branch, Information & Data Provisioning Services
- Alberta Forest Products Association (AFPA)
- Alberta Innovation and Advanced Education, Highlights of the Alberta Economy 2015
- Canada Mortgage and Housing Corporation (CMHC), Q2 2015 Housing Market Outlook
- Conference Board of Canada, Canadian Industrial Outlook Spring 2015, Canada's Wood Products Industry and Canada's Paper Products Industry
- Freddie Mac, July 2015 Economic and Housing Market Outlook
- Canadian Forest Service (CFS), Natural Resources Canada, National Forestry Database
- Statistics Canada, CANSIM database
- Statistics Canada, Labour Force Survey 2014

For more information:

Product information — http://www.albertawoodproducts.ca

Industry contact information by product line — http://aep.alberta.ca/lands-forests/forest-business/documents/AlbertaForestProductsSector-OverviewAndContacts-Sep2012.pdf

Industry association in Alberta — http://aep.alberta.ca/lands-forests/forest-business/documents/AlbertaForestIndustry-AssociationsAndInstitutes-Sep2012.pdf

Trade agreements — http://aep.alberta.ca/lands-forests/forest-business/trade-imports-exports.aspx

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