

BUDGET 2016-2017



COMPETITIVENESS IN THE QUÉBEC FOREST INDUSTRY



Budget 2016-2017
Competitiveness in the Québec Forest Industry

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1. HIGHLIGHTS

Forests are an important resource for Québec as a whole. According to the latest available data, the forest industry accounts for 2% of Québec's GDP, with exports of approximately \$9 billion and some 60 000 direct jobs, often located in the regions.

On June 17, 2015, the government set up the Cellule d'intervention forestière to promote the development of the industry and to evaluate the cost of fibre and its supply in each of Québec's regions.

As part of its work, the Cellule d'intervention forestière carried out an analysis of supply costs and the various issues surrounding the competitiveness of Québec's forest industry based on:

- a Québec–Ontario comparative study of costs (supply and processing) for 2010, 2012 and 2014, by Del Degan, Massé et Associés Inc. (DDM);
- a financial model developed by the Ministère des Finances to evaluate, on a regional basis, the profitability of lumber softwood sawmills of fir, spruce, jack pine and larch (FSPL), for 2014.

□ Main findings regarding operating costs and issues of competitiveness in the forest industry

In Québec, the majority of commercially-exploitable forest zones are located on lands in the domain of the State (public forest). These zones primarily include FSPL timber, accounting for more than:

- 83% of the average volume of roundwood consumed by the entire wood processing industry that is sourced from public forests in Québec for 2010-2014;
- 87% of the roundwood supply for sawmills, which produce lumber and supply, among other things, Québec's paper and secondary processing plants.

■ Competitiveness of the sawmill industry

In summer 2015, the Ministère des Forêts, de la Faune et des Parcs (MFFP) and the Québec Forest Industry Council jointly mandated DDM to carry out a study to compare the operating cost (supplying and processing) of FSPL in Québec and Ontario and identify areas of improvement for Québec.

- The study was carried out using financial information disclosed by 3 companies operating 16 plants in Québec and 10 in Ontario.

An analysis of the study results reveals that:

- the operating cost for Québec's sawmills in 2010, 2012 and 2014 was on average about \$7.50 per cubic metre lower than the cost for sawmills in Ontario;
- despite increased operating cost efficiency, a relatively lower value in the product mix harms the profitability of Québec's sawmills;
- the increased load allowed for forest trucks during the frost period, the implementation of a forest roads funding program and the possibility of leaving small stems in the forest are potentially beneficial forestry practices to enhance the competitiveness of Québec's plants.

■ Profitability of the sawmill industry

The results of the financial model developed by the Ministère des Finances indicate that Québec's FSPL timber sawmill industry was profitable overall in 2014.

- For all the regions analyzed, the industry generated total revenues of \$2.05 billion and an estimated profit of \$95.12 million (after tax and depreciation), equal to a profit margin of \$5.11 per cubic metre of processed wood.

However, the overall profitability calculated for 2014 is a delicate balance, mainly due to favourable softwood lumber market conditions, with prices at a 10-year high.

■ Determinants of profitability

Many factors have an impact on Québec's sawmill revenues and expenses, and thus on profitability by region.

- These factors may primarily depend on market conditions and the business environment, the choice of company or even the normative framework established by the government.

In terms of revenues, the product mix and the price obtained for lumber and by-products (shavings, sawdust, etc.) are two factors that may explain, in part, the variation in profitability from one region to another. In general, we observed the following:

- a product mix lighter in lumber content is likely to negatively impact the profitability of a region's sawmills;
- a relatively low unit sales price for by-products may affect the ability of sawmills to enhance their production and cover their operating costs.

In terms of expenses, the cost variations attributed to the characteristics of resources (quality, accessibility, distance of transportation to the plant, etc.) are mitigated by the market value of standing timber (MVST) mechanism and thus have limited effect on profitability.

Cost variations attributed to a below average operating efficiency, as a result of, for example, production factors and the level of capacity utilization, are not mitigated by the MVST and directly affect sawmill profitability.

Indeed, the increased productivity of a plant, better capacity utilization that could be achieved through consolidation, as well as the adoption of more efficient forest practices, can help sawmills increase profitability and be more competitive.

■ Operating costs

To compare costs and revenues to evaluate the profitability of the sawmill industry, all the costs of harvesting roundwood at the stump through the transportation of finished goods to markets must be considered:

- the cost of fibre, which includes:
 - supply costs (harvest and purchase of timber);
 - government transfers, with royalties and the MVST;
- plant processing costs;
- sawmill overheads;
- transportation-to-market costs.

Based on the results of the Survey of operating costs carried out by DDM, the average cost of fibre in Québec for FSPL timber was \$65.95 per cubic metre for 2014.

- For reference purposes, the Québec–Ontario comparative study estimates, for the Ontario plants analyzed, fibre costs of \$59.16 per cubic metre for the same year.

According to the same sources, the average 2014 cost of operation in Québec was \$113.07 per cubic metre, compared with \$121.15 in Ontario.

■ The value of standing timber

The primary purpose of the new forest regime that came into effect on April 1, 2013 is to sell timber at its fair value.

Under this new regime, the MVST is determined based on the results of sales at auction in the open market, taking into consideration variables such as the characteristics of the resource and market conditions.

— An annual royalty for timber supply guarantee (SG) holders has been added to the MVST.

Historically, we note that the MVST in Québec:

— remained stable with respect to prices for finished products after the introduction of the new forest regime;

— is more sensitive to market conditions than in Ontario, and is therefore more representative of the conditions in which the sawmills operate.

In consideration for the revenues generated from the sale of timber, the government incurs the majority of the cost of forest planning and carrying out silviculture work.

■ Sawmill productivity

To improve their productivity in the long term, sawmills can turn to investment, innovation and human capital.

In this regard, certain issues persist, including:

— the decline in investment during the economic downturn, which may have hampered innovation in the wood processing sector;

— the significant decrease in forest potential in the last 10 years, resulting in the production capacity of several wood-processing plants to be underutilized, which, without consolidation, represents a challenge regarding the industry's ability to invest and turn in a profit;

— the lack of specialized labour, which could also stifle industry reinvestment.

■ Areas for improvement

The recovery of the markets and the emergence of a green economy suggest a good outlook for the forest industry. As such, since 2009, investment in the forest sector has recovered, reaching \$576 million in 2015, compared with \$303 million in 2009. Furthermore, the value of the sector's exports went from \$6.9 billion in 2012 to 9.4 billion in 2015.

Yet, the work carried out on the profitability and competitiveness of the sector shows that the Québec forest industry has relatively minimal flexibility to pursue modernization and restructuring efforts and be positioned to seize opportunities that would allow it to contribute further to collective wealth.

To encourage the industry to modernize and restructure, it would be important, in the coming years, to:

- reduce uncertainty related to timber supply of primary processing plants, particularly in a context of consolidation;
- adapt certain policies to allow companies to pursue efficiency gains in their forestry and plant operations;
- promote innovation through a collaborative long term vision to make the forest sector sustainable and to promote forest resources.

Mandate of the Cellule d'intervention forestière

On June 17, 2015, the Minister of Forests, Wildlife and Parks, the Minister of Economy, Innovation and Exports at the time, and the Minister of Finance announced the creation of the Cellule d'intervention forestière to promote the development of the forest industry and to evaluate the cost of fibre and supply in each region of Québec.

The mandates of the Cellule d'intervention forestière are to:

- review available data to provide an accurate picture of the business environment of wood processing plants, particularly with regard to questions related to the supply costs of both the government and the industry;
- create a governmental vision of the forest situation across all Québec regions;
- find adapted solutions to support the sector's development that take into account trade agreements in force.

As part of this work, the Cellule d'intervention forestière has mandated the Ministère des Finances to create and coordinate a working group responsible for analyzing supply costs and the various issues regarding the competitiveness of the forest industry in Québec regions.

This working group included representatives from the Ministère des Finances, the Ministère des Forêts, de la Faune et des Parcs as well as two outside experts:

- Mr. François Robichaud, Research Leader of Business Intelligence at FPIInnovations;
- Mr. Robert Beauregard, Dean of the forestry, geography and geomatics faculty at Université Laval.

Representatives from the Québec Forest Industry Council and certain businesses from the forest sector also contributed to carrying out this working group's mandate, particularly through discussions and validations of results and assumptions for the financial model developed by the Ministère des Finances.

2. FOREST INDUSTRY DEVELOPMENT AND OUTLOOK

2.1 Forests: an important resource for Québec

Québec's forests cover close to half of the province's territory, accounting for some 761 100 km² of a total surface area of nearly 1 700 000 km². As such, they represent nearly 25% of Canada's forests and nearly 2% of the world's forests.

The forest industry represented close to 2% of Québec's GDP in 2014, and reported some \$9 billion worth of exports in 2015, mostly to the United States. The industry accounts for nearly 60 000 direct jobs, including approximately 50 000 jobs relating to wood and paper product manufacturing.¹

The forest industry is an active presence in many rural communities and in several municipalities that depend directly on the forest. Harvesting and processing this resource are a key economic driver of Québec regions.

Furthermore, the forest industry supports various other sectors like hunting and tourism that likewise support regional economies.

Lastly, the forest industry has a ripple effect on other industries, including transport.

2.2 Main forest industry subsectors

The forest industry has three main subsectors:

- forestry and logging, which includes establishments primarily engaged in growing and harvesting timber²:
 - this subsector is part of the primary sector;
- wood product manufacturing, which includes establishments primarily engaged in manufacturing finished and semi-finished products from wood, including sawmills;
- paper manufacturing, which includes establishments primarily engaged in manufacturing pulp, paper and paper products:
 - these two subsectors are part of the manufacturing industry.

¹ This data is from Statistics Canada and the Institut de la statistique du Québec. Detailed data can be found in Appendices 1 and 2.

² Support activities for forestry is another forest industry subsector. However, only the GDP and employment statistics are available for this subsector; other data are confidential.

2.3 An industry grappling with certain challenges

For over a decade now, the forest industry has been subject to tremendous pressure.

Essentially, Québec's forest product exports had been declining until 2012 before rebounding recently.

- While Québec forest product exports were worth \$10.9 billion in 2006, they reached only \$6.9 billion in 2012.

Production, employment and investment showed similar patterns.

- After increasing at the end of the 1990s, forest industry production declined from 2002 to 2012.
- The Québec forest industry's share of direct employment also declined between 2001 and 2012. Accounting for 3.1% of total jobs in 2001, it had diminished to 1.8% by 2012.
- Forest industry investments, which had reached close to \$617 million in 2006, declined during the economic downturn to slightly less than \$303 million in 2009.

❑ Factors contributing to the forest industry's difficulties

The difficulties faced by the forest industry are mainly due to reduced demand for forest products during the first decade of the new millennium. Various factors account for this.

Firstly, cyclical factors limited the demand for Québec forest products.

- The Canadian dollar went from a low of US63.7 cents in 2002 to a high of US101.3 cents in 2011.
 - Since commodity prices are determined in U.S. dollars, any increase to the value of the Canadian dollar results in a price increase for Québec's forest products.
 - This relative price increase negatively impacts demand for Québec production and therefore harms Québec sawmills' profitability.

Secondly, the numerous softwood lumber disputes between Canada and the United States have also hurt Canadian exporters.

- While the Softwood Lumber Agreement put an end to the various actions over countervailing duties, Canada's provinces had to contend with some arbitration proceedings concerning the terms of the agreement.

The 2008-2009 economic downturn intensified the forest industry's challenges. The collapse of the U.S. housing market, long a key market for Québec lumber producers, further cut the demand for Québec forest products.

Lastly, certain structural changes disadvantaged Québec producers, resulting in a reduced demand for certain products.

- Technological advances brought about major changes to the demand for conventional products, particularly newsprint.
- Moreover, in terms of world supply, the growth of emerging pulp producers such as Chile, Brazil and Indonesia exerts downward pressure on the price of paper products.
 - In addition, producers in the United States are increasingly advantaged by the fact that plantations of southern yellow pine, an abundant resource that is more rapidly-renewed than in Québec, have reached maturity.
 - The ability to produce southern yellow pine timber at a lower cost than FSPL timber could prove a major issue for Québec sawmills.

The Softwood Lumber Agreement

The Softwood Lumber Agreement (SLA) between Canada and the United States was reached in the wake of a long dispute between the two countries regarding stumpage fees charged by Canadian provinces to companies that harvest timber from public land.

The SLA was in effect from October 12, 2006 to October 12, 2015. Under the agreement, Canada applied certain border measures on shipments of softwood lumber products to the United States. In this respect, the SLA provided for two options:

- the application of an export charge (maximum 15%) based on lumber export prices (option A);
- the application of a lower export charge (maximum 5%), accompanied by a volume limitation in the form of an export quota (option B). This is the option chosen by Québec.

During the term of the SLA and for 12 months after its expiry date, the United States must not impose countervailing⁽¹⁾ or anti-dumping⁽²⁾ duties on softwood lumber exports from Canada according to the general provisions of the North American Free Trade Agreement (NAFTA) and to the World Trade Organization (WTO).

The Canadian government and the provinces are currently renewing the SLA with the United States.

1 The term "countervailing duty" means a special duty levied for the purpose of offsetting any subsidy granted by a State to manufacture, produce or export a national product abroad.

2 Dumping is the act of selling products on the foreign market at prices below those on the domestic market for like products, or at prices below production costs. Anti-dumping duties are imposed upon individual producers and not all producers in the same country.

2.4 Forest industry recovery

The challenges faced by the forest industry prompted the various industry players to restructure their activities. Major changes were undertaken to modernize the sector and make it more competitive.

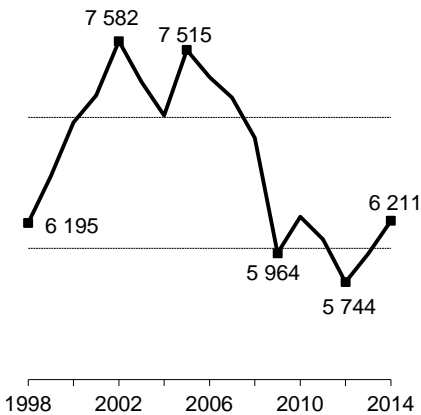
- Investment in the forest industry has recovered since the end of the 2008-2009 economic downturn. Investment in 2015 was at \$576 million, a significant increase over the \$303 million invested in 2009.

The upward trend since 2012 has been observed in production, investment and exports.

- Production underwent a rebound, increasing in real terms from \$5.7 billion in 2012 to \$6.2 billion in 2014.
- The export value of Québec forest products, which had been at \$6.9 billion in 2012, reached \$9.4 billion in 2015.

CHART 1

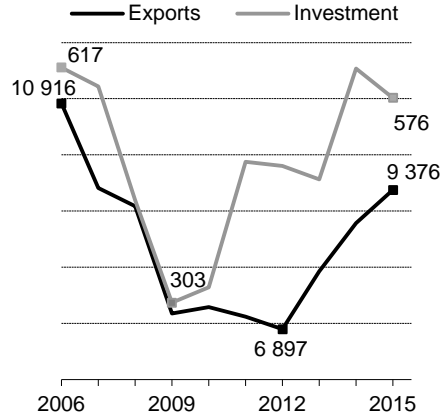
Production trends in Québec's forest industry (millions of real 2007 dollars)



Note: Includes the following subsectors: forestry and logging (NAICS 113), support activities for forestry (NAICS 1153), wood product manufacturing (NAICS 321) and paper manufacturing (NAICS 322).
Source: Statistics Canada.

CHART 2

Forest industry export and investment values (millions of nominal dollars)



Note: For exports, includes the following subsectors: forestry and logging (NAICS 113), wood product manufacturing (NAICS 321) and paper manufacturing (NAICS 322).

Sources: Institut de la statistique du Québec and Statistics Canada.

2.5 A more favourable outlook for the Québec forest industry

The forest industry must be encouraged to maintain its momentum and seize opportunities through which it can continue to contribute significantly to Québec's economy.

The recent recovery by the industry particularly reflects changes to the wood and paper products subsectors. These subsectors currently benefit from a favourable development outlook as well as from the emerging green economies in a number of countries, increasing the attractiveness of products made from renewable resources.

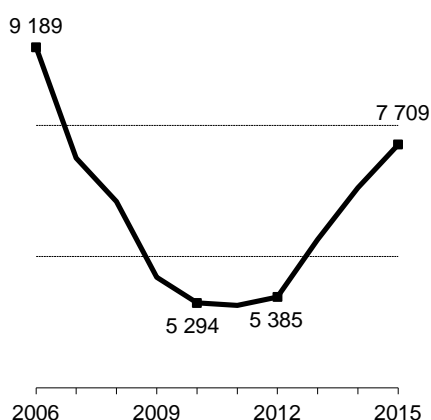
❑ The outlook for wood product manufacturing

The wood product manufacturing subsector is generally associated with softwood lumber. The Québec, Canadian and U.S. real estate markets are primarily at the basis of the demand for these products.

- The outlook for housing starts in the United States is positive. After dropping off significantly during the recession, the U.S. housing sector is regaining momentum.
- In Québec and Canada, housing starts should henceforth remain consistent with household formation rates. The high level of residential resale in recent years also points to a sustained demand for renovation materials.

CHART 3

Changes in Québec forest product exports to the United States (millions of dollars)



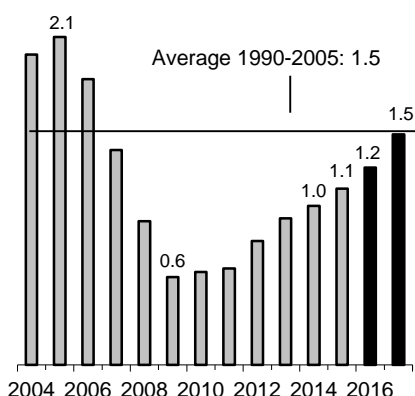
Note: Includes the following subsectors: forestry and logging (NAICS 113), wood product manufacturing (NAICS 321) and paper manufacturing (NAICS 322)

Source: Statistics Canada.

CHART 4

Changes in U.S. housing starts

(millions of units)



F: Forecasts.

Sources: IHS Global Insight and Ministère des Finances du Québec.

Lumber futures prices

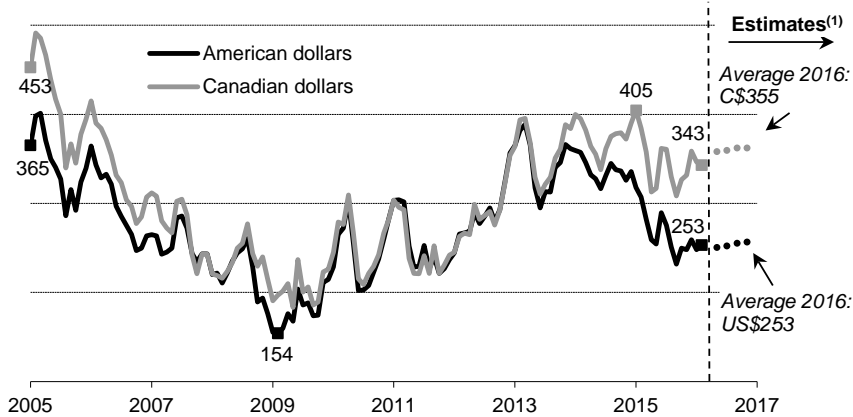
According to forecasts based on futures contracts in February 2016 on the Chicago Mercantile Exchange (CME), the price of lumber on the CME is expected to remain around US\$253 (CAN\$355) per thousand board foot measure on average in 2016.

Fears of lower global demand, arising in particular from a weaker Chinese demand in the residential construction sector, are possible factors contributing to the volatility of lumber prices. China constitutes a major U.S. export market and is an important market for British Columbia.

Furthermore, the weakening of the Canadian dollar against the U.S. dollar in 2015 limited the decline in the price of this raw material for Canadian exporters.

Futures prices for lumber on the Chicago Mercantile Exchange

(dollars per thousand board feet)



(1) Based on February 2016 futures and exchange rate forecasts against the U.S. dollar.

Sources: Bloomberg and IHS Global Insight. Compilation by the Ministère des Finances du Québec.

❑ New opportunities through innovation

Advances in research and innovation indicate that other sectors could benefit more from the opportunities offered by wood fibre. Such diversification would particularly reduce the industry's exposure to construction cycles. However, while the forest products industry has already begun diversifying into new products and toward new markets, the process calls for time as well as major investment.

Examples of future products

Structural engineered and appearance products

Marketing structural engineered and appearance products often poses a challenge. Developing new markets such as non-residential construction and multi-family housing will provide opportunities for increasing the use of conventional wood products while promoting the development of innovative products and building systems. Hybrid construction systems (wood with steel and/or concrete) can be developed with a view to using the right material in the right place, making construction projects more economical, sustainable and environmentally friendly. This avenue would also speed the development of both local expertise and a Québec construction industry able to more effectively serve internal and external markets as well as maximize the value of forest products.

Such initiatives are part of the Québec government's exemplary efforts with regard to lumber construction.

Wood fibre insulation materials

Insulation products made from wood fibre consist of flexible or rigid insulators (board-type, batts, etc.) used for thermal and sound insulation in walls, roofs and floors. These products are attracting growing interest, particularly in view of their insulating properties, affordability and environmental attributes. Developing this sector would offer avenues for increasing the value of chips and low-grade wood.

Reconstituted structural products

Many reconstituted structural products are currently on the market, some of which are produced in Québec (e.g. glued laminated timber,¹ laminated veneer lumber², floor trusses³ and cross-laminated lumber panels⁴).

- For example, one product in this branch, CLT (cross-laminated timber) panels, can replace steel or concrete in high-rise construction.

Given the recovery of the U.S. construction market, the demand for engineered structural materials manufactured from sawmill residues and small-sized wood pieces is expected to grow significantly in the coming years.

1 Glued laminated timber (glulam) is made from wooden slats purged of faults, butted and glued in parallel using structural adhesives.

2 Laminated veneer lumber is a layered composite of wood veneers engineered to bring out the natural features of wood. Layers are aligned following the same direction, then glued and pressed.

3 Floor trusses are triangular arrangements consisting of two parallel wooden chords purged of faults and butted, with a timber core composed of diagonal braces.

4 Cross-laminated timber (CLT) is the term used to describe multi-layered panels composed of at least three layers of wooden boards. Each layer consists of parallel slats glued cross-wise (i.e. at 90°) to the adjacent layer.

Examples of future products (cont.)

Green chemistry and energy products

Once extracted and refined, the various molecules that make up timber can be used to replace molecules derived from petroleum to manufacture a wide variety of industrial and consumer products such as paints, adhesives or plastics. They can also enable the development of new products like bioplastics (biodegradable plastics), stronger and lighter composite materials for use in construction and transportation, additives for concrete, lubricants or antioxidants and other pharmaceutical, cosmetic and food products.

Bioenergy includes products ranging from compressed wood (pellets and logs) to refined biofuels (cellulosic ethanol, biodiesel, etc.). Among these products, the wood pellet market is already well established; furthermore, efforts by various European countries to promote renewable energy will foster the growth of this market in the coming years. According to RISI,⁵ global consumption of wood pellets could increase from 23 million metric tons (mmt) in 2014 to over 50 mmt by 2024, for an average annual growth rate of over 8%.

The above branches are rich in potential for pulp and paper mills, since the technologies at play are of the same nature as those used in traditional paper production. Taking advantage of the chemical properties of timber, these advances expand the range of wood fibre products.

⁵ RISI is a firm that specializes in forest industry market analysis and forecasts.

Source: Ministère des Forêts, de la Faune et des Parcs.

3. FSPL TIMBER SUPPLY FOR PROCESSING PLANTS

In Québec, tallied and commercially operated forest zones represent nearly 3.8 billion cubic metres of timber (gross merchantable volume), including 82.4% that are part of the domain of the State (public forests³). FSPL timber constitutes the majority of the volumes of timber harvested and processed in Québec. This group is the basic supplier of sawmills that produce lumber and supply pulp and paper mills in Québec.

Public forest development and operations are managed by the State based on a forest regime, the principles of which are set out in the *Sustainable Forest Development Act* (SFDA) which has been in force since April 1, 2013.

The current forest regime was designed to increase competition and accelerate necessary structural changes, among other things. In this regard, it aims particularly to:

- implement sustainable forest development, particularly through ecosystem development⁴;
- ensure that area and resource management is integrated, regionalized and focused on the formulation of clear, consistent objectives for the achievement of measurable results and the accountability of managers and users of forest land;
- regulate the free-market sale of timber and other forest products at a price that reflects their market value while ensuring a stable timber mill supply at a market price determined by auction.

Limits of the former forest regime

The economic environment of the past few years raised an awareness of the limits inherent in the former forest regime. The green paper on forestry, *Forests: Building a Future for Québec*, a follow-up to the Commission d'étude sur la gestion de la forêt publique québécoise (Coulombe Commission) notably brought to light the rigidity of the regime as a cause of structural and organizational problems in the forest sector.

Under the former regime, timber was allocated through contracts for timber supply and forest management. All timber was allocated through these long term agreements, which left no leeway for firms wishing to increase their timber supply. This context made it more difficult to make the adjustments necessary for the transformation of the industry in the face of structural changes in the sector.

³ MINISTÈRE DES FORÊTS, DE LA FAUNE ET DES PARCS, *Ressources et industries forestières, portrait statistique*, 2015.

⁴ Ecosystem development aims to maintain the biological diversity and viability of ecosystems by maintaining forests in a state close to that of natural forests.

The forest regime allows the State to collect operating revenue from public forestry operations. Forestry companies must pay various fees, including the market value of standing timber (MVST) and a royalty, to have access to a public forest.

- Companies also contribute to the financing of the Société de protection des forêts contre les insectes et maladies (SOPFIM) and the Société de protection des forêts contre le feu (SOPFEU).

In addition, under the new SFDA, responsibility for planning forest development activities that are part of the domain of the State was transferred to the Ministère des Forêts, de la Faune et des Parcs (MFFP).⁵

- Thus, almost all revenue from the sale of timber and supply guarantees is reinvested in the sector by the government through investments in silvicultural work and government contributions to the financing of SOPFIM and SOPFEU.

To facilitate the transfer of responsibilities, a major change, the MFFP signed an agreement in 2013 with the Québec Forest Industry Council to share the roles and responsibilities of forestry operations planning activities.

- This agreement improved the implementation of the regime, while allowing the industry to remain an applicant for forest certification and optimize operational planning for harvesting activities.
- This agreement was adjusted in 2015, to further promote the integration, optimization and efficiency of short, medium and long term timber supply.

Finally, by implementing a free market for the sale of timber from public forests, the government can demonstrate that timber from Québec is sold at market price. This can constitute the basis for an argument against potential trade disputes such as those that led Canada to sign the Softwood Lumber Agreement with the United States in 2006.⁶

⁵ This planning is done through the preparation of forest plans integrated into each management unit.

⁶ The Softwood Lumber Agreement ended on October 12, 2015. Canada and the U.S. entered into a 12-month period during which the parties agreed not to institute proceedings.

Auctions in British Columbia

By gradually implementing a free market for timber in its public forests from 2011 to 2013, Québec fell into step with British Columbia.

Under the *Forestry Revitalisation Act* tabled in 2003, British Columbia auctions 20% (about 15 million cubic metres) of its allowable cut¹ while 80% of the volumes are awarded in various over-the-counter contracts. Most of these contracts involve the annual allowable cut in public forests and are awarded to lumber mills. Contracts may also be awarded to firms specialized in the harvesting of timber and resale of logs or to Aboriginal communities. In all cases, the holders of this type of rights must pay the current royalties based on the results of auction sales.

Auction sales in this province are run by a public organization (British Columbia Timber Sales) through territorial offices in each of the 12 public forest zones in British Columbia.

As in Québec, auction results are used to establish a market pricing system for the market value of timber harvested by forest licence holders.

Two rate models are used, one for the coastal regions and the other for the interior of the province.

¹ Annual maximum volume of timber harvest that ensures the resource's sustainability.

Source: Bureau de mise en marché des bois.

3.1 Resource availability

Several stakeholders are involved in implementing the current forest regime, particularly the Chief Forester, the MFFP, and the Bureau de mise en marché des bois (BMMB).⁷

The Chief Forester is essentially responsible for determining and updating the allowable annual cut every five years, that is, the maximum volume of timber that may be harvested annually to ensure resource sustainability.⁸ He also takes into account regional objectives for sustainable development. The allowable cut is determined for the various hardwood and softwood species in each of the 71 forest development units.⁹

The anticipated effects of natural disturbances such as fire, insect infestations and disease are considered in determining allowable cuts, which may lead to an adjustment of forest development strategies. Allowable cuts are also adjusted between periods of determination when major disturbances arise.

□ FSPL allowable cut and harvest

According to data from 2014-2015 forest surveys in Québec¹⁰, five regions, namely Saguenay–Lac-Saint-Jean, Mauricie, Abitibi-Témiscamingue, Côte-Nord and Nord-du-Québec, share about 80% of the allowable cut, allotments and harvests in FSPL roundwood group from public forests.

Conversely, the regions of Estrie, Chaudière-Appalaches and Lanaudière account for only about 2% of the allowable cut and harvests of FSPL in Québec public forests. The regions of Montérégie and Centre-du-Québec did not process FSPL timber from public forests in 2014.

In general, the volumes harvested are slightly lower than the volumes allocated. In certain cases, as in the Saguenay-Lac-Saint-Jean region in 2014-2015, the volumes harvested were higher than the volumes allocated.

- That happened particularly when volumes were not harvested in the previous year. These volumes may then be offered to the holders of supply guarantees (SG) that have the opportunity to purchase them and harvest more than their allotment for the current year.

⁷ The role of stakeholders is presented in Appendix 3.

⁸ Allowable cut is expressed in cubic metres of merchantable volume, that is, for timber that is 9 cm or more in diameter.

⁹ Land unit used to calculate allowable cut and plan forestry operations.

¹⁰ Data is presented in Appendix 4.

■ Decrease in allowable cut of FSPL timber in public forests since 2004-2005

Calculation of the allowable cut determines the annual timber quota for each of the regions in Québec. The allowable cut of FSPL timber in public forests decreased more than 30% between 2004-2005 and 2015-2016, particularly because of measures taken to foster the sustainable development of forests and respond to concerns related to nature conservation.

- For example, protected areas¹¹ occupy 8.96% of the land units, and an additional 0.83% might be recognized as protected areas in the medium or long term. According to the MFFP, current protected areas take away 3.5 million cubic metres from timber harvesting each year, or about 10% of the total allowable cut in public forests.
- Other factors such as ecosystem planning, certification and caribou protection measures may also affect allowable cut.

The impact of this decrease was mitigated by the significant reduction in harvests associated with the economic downturn starting in the early 2000s. However, since the low level observed in 2009-2010, the volumes harvested increased by 43%. This brought the volume harvested closer to the annual timber quota.

Findings on the processing capacity of sawmills in Québec and on timber supply and demand

In its report published in December 2014 as part of the Chantier sur les améliorations à apporter à la mise en œuvre du nouveau régime forestier, DDM found that:

- the annual allowable cut had decreased considerably in the past few years;
- with the recovery, timber would become increasingly scarce.

Since processing capacity currently exceeds what Québec forests can produce, competition in the timber business could become stronger in some regions.

Based on the content of this report, some businesses could run into trouble in a market where competition for roundwood is fiercer.

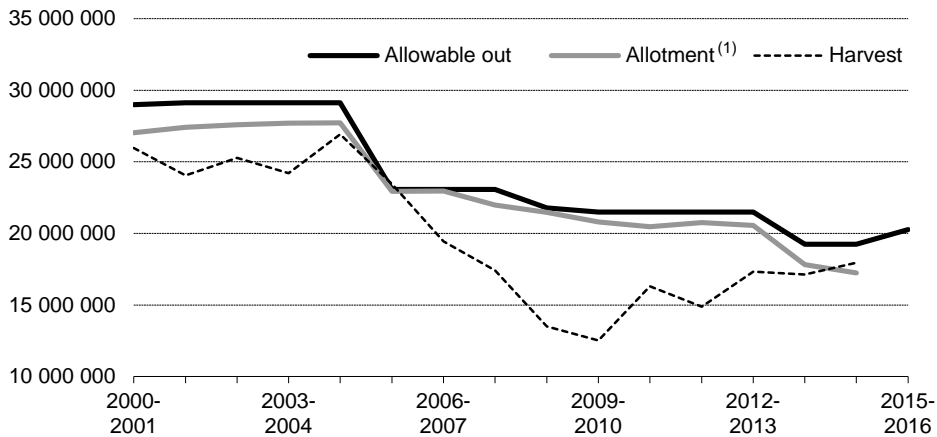
However, businesses that manage to survive the transition period, by counting on innovation, consolidation and productivity, will be ready to tackle foreign competition.

Source: DDM, Évaluation économique du nouveau régime forestier du Québec, December 2014.

¹¹ As of March 31, 2015, protected areas covered 9.16% of the land in Québec, or 4.25 percentage points more than in 2008, and the Québec Government is committed to achieving 17% of protected areas in 2020.

CHART 5

Changes in allowable cut, allotments and harvests of FSPL from public forests in Québec
(cubic metres net)



Note: Data on harvesting and allotments for 2015-2016 was not available at the time of publication.

(1) As of 2013, allotments include volumes reserved by the Bureau de mise en marché des bois.

Source: Ministère des Forêts, de la Faune et des Parcs.

This trend leaves little room for an increase in Québec sawmill production supplied by public forests and brings to light the importance for the government to:

- implement a wood production strategy aimed at maintaining, and even increasing, the allowable cut in the medium and long term. In this regard, the MFFP is currently involved in developing a national wood production strategy. This strategy will be based on strategies developed for each region and guided by three principles:
 - target the economic profitability of silvicultural operations to ensure a profitable return on investment,
 - provide for the implementation of a variety of actions to increase the robustness of the strategy in the face of uncertainty related to future market demand for wood products as well as climate change that will affect forest ecosystems,
 - rely on certain sure values that have and will allow Québec to stand out in wood product markets;
- increase the contribution of private forests to the industry's timber supply.

■ Private forests potential

Private forests contribute about 13% of the FSPL supply to Québec sawmills, and may represent a significant part of the FSPL supply to mills in certain regions.¹²

To sell their roundwood, private forest owners do business with unions and the offices of wood producers.

- These unions and offices may take on negotiations with mills, the organization of transport, timber payments, and increase awareness of wooden rod shaping which ensures a higher revenue for forest owners.

Although private forests are not covered by the mandate of the Cellule d'intervention forestière, they must be part of a solution to increase the available timber supply for processing plants.

Private forests actually represent an increasingly significant share of the allowable cut in Québec. According to a compilation by the MFFP and the Fédération des producteurs forestiers du Québec¹³, this share increased between 2008-2009 and 2015-2016, from:

- 17% to 20% for FSPL timber;

- 27% to 33% for all species.

In 2014-2015, 57% of the allowable cut in FSPL was harvested from private forests, which tends to demonstrate that not all private owners intend to use the forest for forestry operations.

In the context of reducing the allowable cut in public forests, the potential of private forests could be further developed. Over the next few years, efforts could be made to encourage the mobilization of timber from private forests.

¹² For example, according to Québec forest registers, private forests account for about 35% of the FSPL roundwood supply for sawmills in the Bas-Saint-Laurent and Capitale-Nationale regions in 2014.

¹³ Data compiled in August 2015.

3.2 Resource allotment and pricing

The MFFP is responsible for selling wood substances that are part of the domain of the State. Since April 1, 2013, timber available for harvesting on public lands is allotted in two ways.

- About 25% is sold by auction under the BMMB¹⁴ and is accessible to any person or business. The percentage of timber destined for auction constitutes a sufficient basis for reference to determine the applicable price of timber for holders of a SG.
- About 75% is allocated to SG holders¹⁵ in 13 regions of allotment.¹⁶
 - The SG gives the holder the right to purchase a predetermined annual volume of timber to supply its processing plant for a set period. This right is aimed at maintaining a stable supply.
 - Guaranteed volumes correspond to the needs of mills. However, subtracted from these volumes are the other possible sources of timber supply, such as private forests.¹⁷
 - Supply guarantees are currently offered to businesses for a five-year period and are renewable every five years subject to the holder's compliance with its obligations. However, the Minister of Forests, Wildlife and Parks may review the SG, for example, when the allowable cut is lowered.
 - These conditions can create uncertainty as to the volume of timber guaranteed in the long term and consequently adversely affect project financing by banking institutions.

Based on the value of timber guaranteed, SG holders must determine the volume that they agree to purchase. This agreement takes the form of a sales contract signed by the parties.

¹⁴ The auctioning of part of the timber from public forests began in 2011, but reached cruising speed with the entry of the new forest regime in 2013.

¹⁵ This volume also includes other types of more marginal agreements, such as the management delegation agreement in effect on Anticosti Island and the territory management agreement that is offered to certain local entities. It also includes permits to harvest timber to supply a wood processing plant.

¹⁶ These regions, whose borders coincide with the limits of management units, are comparable to administrative regions. The administrative regions of Montréal, Laval, Montérégie and Centre-du-Québec are not associated with any region of allotment since they do not include any management unit.

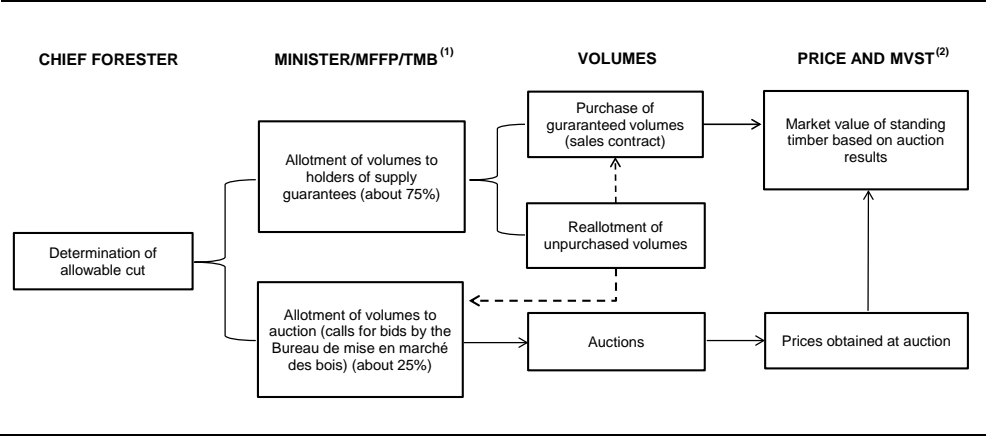
¹⁷ This process follows the principle of public forest residual volume under section 91 of the *Sustainable Forest Development Act* (SFDA, c. A-18.1).

Allotment of guaranteed volumes that are not purchased is at the discretion of the Minister of Forests, Wildlife and Parks. In most cases, these volumes of timber are sold to another SG holder. According to the provisions of the SFDA, the Minister may also put unsold timber to be sold by auction or leave it where it is.

In addition, resource rates are based on the results of free market sales. The free market allows the government to establish a market value of standing timber for all SG holders.

CHART 6

Illustration of public forest timber sales process



(1) MFFP: Ministère des Forêts, de la Faune et des Parcs.
 BMMB: Bureau de mise en marché des bois.
 (2) MVST: Market value of standing timber.

❑ Free market pricing

The BMMB conducts several free market sales annually. They follow strict auction protocol to obtain a baseline representative of market conditions. BMMB auction rules are based on recognized practices in several countries and jurisdictions as well as in the economic literature.¹⁸

Several sectors are identified, listed and described in the auction process prior to being entered in the call for bids on the BMMB website. These calls for bids follow the sealed first-price auction process. In other words, bids are confidential and the highest price for each sector¹⁹ wins the bid. However, there is a minimum reserve price for each sector. This price is kept confidential for the purposes of efficiency.

Successful bidders are required to harvest the timber and ensure the necessary forest roadwork for harvesting and transport.²⁰ The term of BMMB sales contracts is generally two years.

Different guarantees are put into place by the BMMB to ensure that bidders are serious, refrain from speculation and respect their contractual obligations as purchasers.

- First, the bidder is required to submit a bid guarantee at the time of the bid. This guarantee, varying from 5% to 10% of the estimated value of a sector, will be collected in the event of withdrawal after winning the bid.
- Next, the purchaser is required to submit a performance bond corresponding to 20%²¹ of the value of the contract at the time of signature. This bond ensures that contract requirements are met. The performance bond will also be collected in the event of withdrawal after signing the sales contract.

Introduction of the free market improves allotment by facilitating access to the resource. From 2011-2012 to 2014-2015, nearly half of the volumes were awarded to purchasers without a SG, including loggers and cooperatives.

¹⁸ Marketing mechanisms are set out in the marketing manual, *Manuel de mise en marché des bois*, available on the BMMB website.

¹⁹ Sectors are sold individually, but sometimes certain sectors that are geographically close could be included in a combined bid. Bidders can thus make a single bid for combined sectors or individual bids for the same sectors. If the highest bid for the combined sectors is higher than the sum of the highest individual bids, the sectors are judged as being combined. If not, they are considered individually.

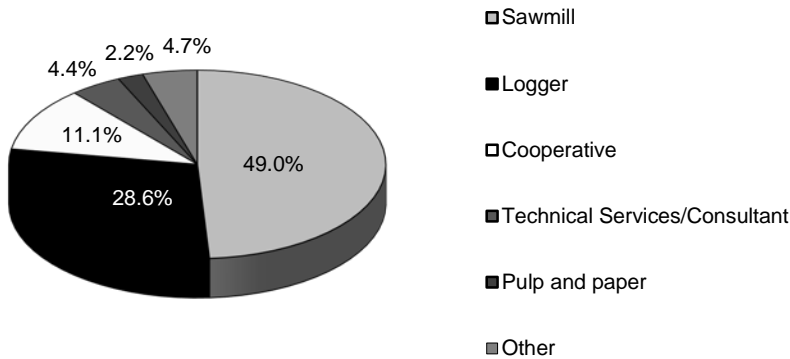
²⁰ Roadwork for a bidder normally includes the construction of sections of road in a logging camp, which sections are needed for harvesting. Maintenance, repair and construction of tertiary access roads may be at the purchaser's expense.

²¹ This bond is 10% for bidders who have demonstrated a history of respect for contractual requirements.

These businesses generally conduct forest operations and deliver to the end customers (processing plants) following negotiations on log prices and desired quality. These businesses have a positive impact on the supply chain since logs are sent to plants able to derive maximum benefit from processing.

CHART 7

**Distribution of volumes auctioned by type of business,
all species combined – 2011-2012 to 2014-2015**



Source: Ministère des Forêts, de la Faune et des Parcs.

❑ Supply guarantee rate determination

■ Calculation of the market value of guaranteed standing timber

There are 187 selling price zones, each with a value for each combination of species-quality on the price grid.²² Differences in MVST among zones arise from various factors, such as species, tree diameter and distance from sawmills.

Free market timber pricing has led to significant changes in the method for establishing guaranteed timber pricing.

- Under the former regime, a parity model was used. Prices from private forest surveys were adjusted based on differences in supply costs (forest model) and differences in processing costs and revenue (plant model). Both models used nearly 50 equations from different productivity studies.
- There was a transition period from April 1, 2013 to March 31, 2015: the parity model applied, but private forest prices were replaced by auction prices as a basis of reference.²³
 - According to a report prepared as part of the Chantier sur les améliorations à apporter à la mise en oeuvre du nouveau régime forestier, the consideration of auction prices was already [translation] “a considerable improvement since the volume of [public forest] timber transactions was 10 times larger than private forest timber transactions, particularly since it came from comparable stands”.²⁴
- Since April 1, 2015, MVST calculations have been based on an econometric transposition equation calibrated from auction transactions recorded since 2011 and information concerning supply and processing costs collected from plants as part of the five-year operating costs survey.²⁵

²² The pricing grid is available on the BMMB website.

²³ For the 2012–2013 fiscal year, the basis of reference consisted of private forest sales as well as public forest auctions. This is the last year for which the MFFP conducted a survey on private forest prices.

²⁴ DEL DEGAN, MASSÉ ET ASSOCIÉS INC. *Évaluation économique du nouveau régime forestier du Québec*, December 2014, p. 27.

²⁵ Details on the transposition equation are presented in Appendix 5.

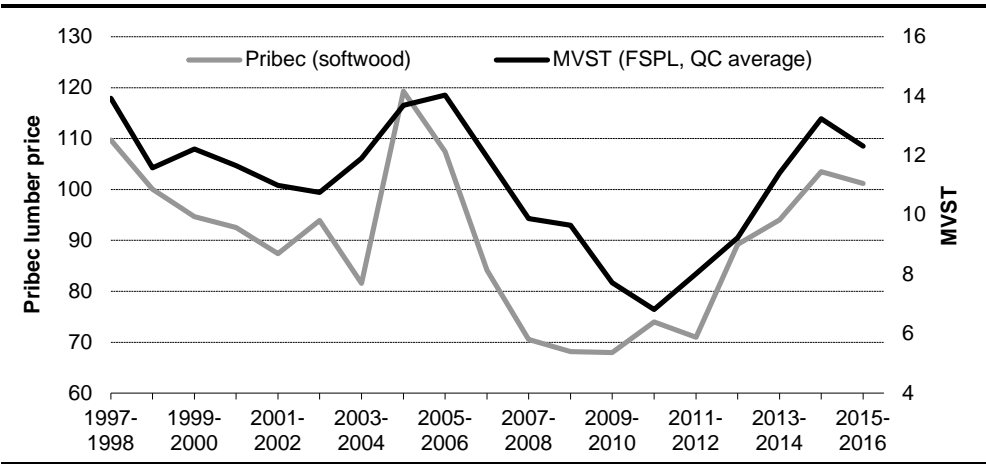
■ **Changes in market value in standing timber**

The MVST of FSPL timber has followed the same trend from the year that the new forest regime came into effect (2013–2014 to 2015–2016) as it did under the former regime (1997–1998 to 2012–2013). The following chart shows that historically MVST in Québec was strongly influenced by finished product prices. The MVST for Québec as a whole took a historic dip following the economic slowdown in 2008–2009 and subsequently rose again to the levels it was at prior to the economic slowdown.

— Based on the 2015-2016 rate model, for each \$1.00 variation in finished product prices per cubic metre, the corresponding variation in MVST is, on average, about \$0.15 per cubic metre.

CHART 8

Changes in the Pribec price index for softwood lumber and average MVST for FSPL timber in Québec
(dollars per cubic metre)



Note: Preliminary data for 2015–2016.
Sources: Ministère des Forêts, de la Faune et des Parcs and Québec Forest Industry Council (Pribec).

Pribec price index
<p>Pribec is a composite price index that has been published by the Québec Forest Industry Council for over 40 years.</p> <p>This index provides an evaluation of the market price for hardwood and softwood lumber on several Canadian and U.S. markets recognized as focal points for eastern lumber in North America.</p> <p>It is based on the selling price for several producers or purchase price (sawmill) for brokers, considering the volumes sold for the reported price, pallet composition and quality, sawmill location, and delivery time.</p>

A new pricing grid was published for 2015-2016 in August 2015. Changes in MVST calculation notably include the use of a new direct transposition model for auction prices.

The MVST results for the Québec timber market in 2015–2016 are about \$1 per cubic metre lower than those in 2014–2015, a drop of about 9% on average, given the market's current downward trend.

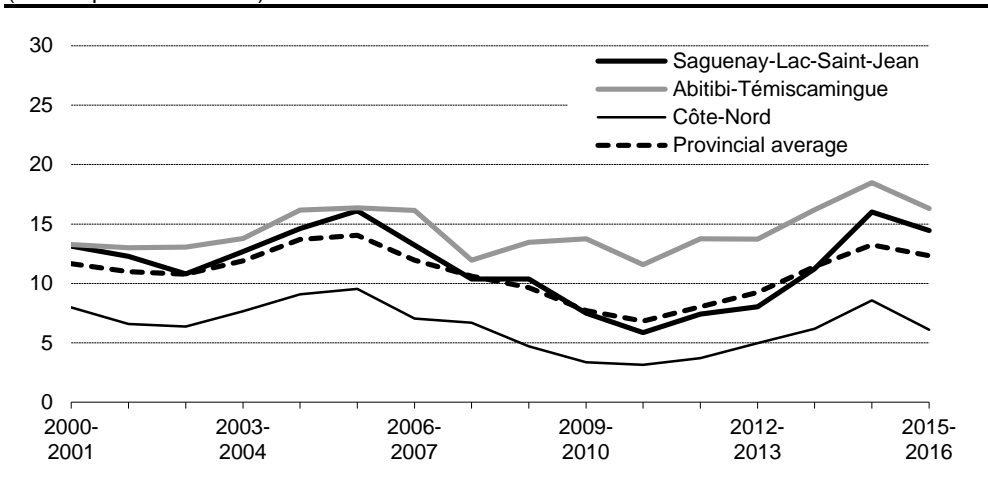
MVST varies noticeably from one region to another in Québec, based on differences in operating costs and resource characteristics.²⁶

— For example, Côte-Nord has historically had the lowest MVST for FSPL timber in the province and Abitibi-Témiscamingue the highest, while Saguenay–Lac-Saint-Jean is very close to the Québec average.

CHART 9

Changes in MVST for FSPL timber in certain regions

(dollars per cubic metre)



Note: Preliminary data for 2015-2016.

Source: Compilation by the Ministère des Forêts, de la Faune et des Parcs.

²⁶ Regional resource characteristics are presented in Appendix 6.

■ Calculation of royalty related to the supply guarantee

Since the new forest regime was implemented on April 1, 2013, SG holders must pay the government an annual royalty in return for their purchasing priority right. This royalty is currently set at 18% of the value of the timber guarantee based on the average price billed to the SG holder during a period of reference.

The value of the SG resides in the fact that it reduces the risk associated with a mill's timber supply, which has an intrinsic value for its holder. Royalties were established based on the estimated SG market value particularly from:

- the value assigned to the Timber Supply and Forest Management Agreements (TSFMA) during mill sales under the old regime;
- the cost of replacing a SG with the purchase of a forest property;
- the difference in financing rates obtained by those that hold a SG in comparison with those that do not.

For example, the average annual royalty for all species was \$1.65 per cubic metre in 2015–2016, and \$2.06 per cubic metre for FSPL timber.

It should be pointed out that the holder must pay the annual royalty whether timber is harvested or not.

3.3 Comparisons of Québec with other regions

A large part of Québec sawmill production is exported to foreign markets, primarily to the U.S. Differences between available forest resources and current regimes in Québec and other regions, primarily Ontario, may have a significant impact on sawmill competitiveness over time.

- Because of their climate, the species harvested as well as the quality of standards in British Columbia and the Southern U.S. are different from those found in Québec. These differences have an impact on the products sold, sawmill operating conditions and prices paid for the resource, making comparison difficult.
- It should also be pointed out that, depending on the state of their traditional markets, businesses located in these jurisdictions may have an interest in and the capacity to sell on the same markets as those historically served by Québec.

❑ Availability of forest resources

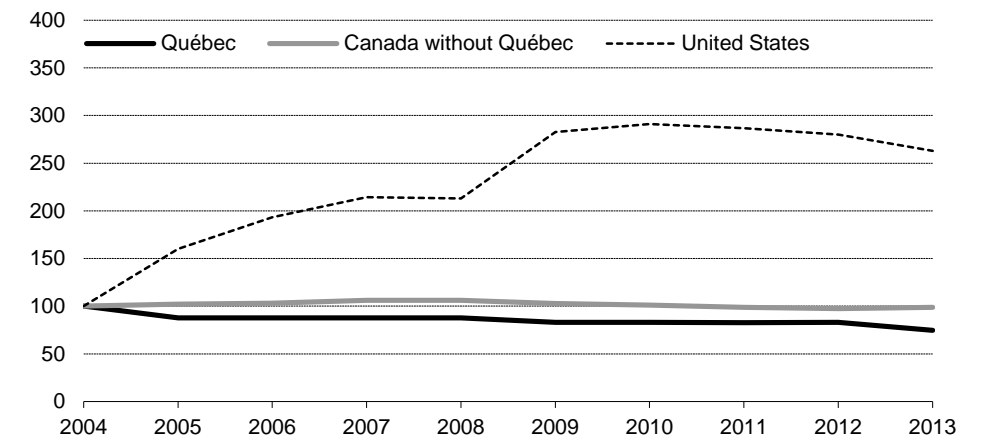
The decrease in the allowable cut over the past few years has been more significant in Québec than elsewhere in Canada. The volume of timber available for Québec mills dropped by more than 25% between 2004 and 2013, while it remained rather stable in the rest of the provinces.

In contrast, allowable cut increased by almost 163% in the U.S. during the same period.

— Most of this increase came from the Southern U.S. where allowable cut in plantations dominated by southern yellow pine has increased significantly since 2004.

CHART 10

Changes in total allowable cut in Québec, the rest of Canada and United States (index 2004 = 100)



Note: Allowable cut including all species for public and private forests.

Sources: National Forestry Database (Québec and Canada) and U.S. Department of Agriculture (United States).
Compilation by the Ministère des Forêts, de la Faune et des Parcs.

❑ **Resource pricing in other jurisdictions**

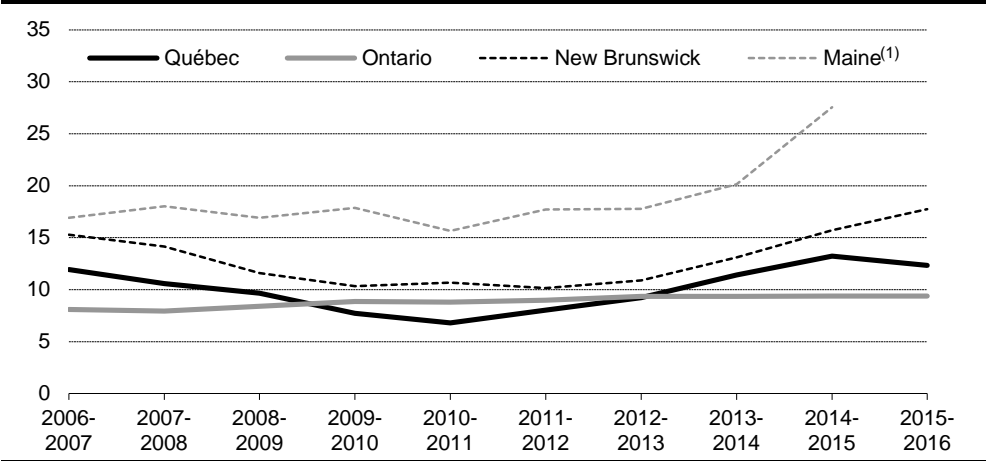
Ontario is the jurisdiction that has the most in common with Québec from the forestry point of view. The forests in both provinces are similar in composition, distance from markets, and type of tenure (proportion of forests under the State). However, forestry pricing in Ontario fluctuates much less with economic cycles than it does in Québec.

— At the lowest point of the economic downturn, FSPL market value was lower in Québec than Ontario.

Pricing related to public forests in New Brunswick is close to that of Québec, while it is higher in the forests of Maine which generally have better quality timber (larger stem diameter).

CHART 11

Comparison of the market value of FSPL timber in Québec and other jurisdictions
(dollars per cubic metre)



Note: Preliminary data in 2015-2016.

(1) Data for the state of Maine was not available for 2015–2016 at the time of publication.

Sources: Ontario Ministry of Natural Resources and Forestry, Maine Forest Service, Ministère des Ressources naturelles du Nouveau-Brunswick and Ministère des Forêts, de la Faune et des Parcs.

4. PROFITABILITY OF FSPL SAWMILLS IN QUÉBEC

The activities carried out by the Cellule d'intervention forestière, a team formed in June 2015, include an analysis of supply costs and of the various competitiveness issues facing the forest industry in Québec's regions. This analysis was particularly based on:

- a comparative study of supply and processing costs in Québec and Ontario (Québec–Ontario comparative study)²⁷ for 2010, 2012 and 2014 by Del Degan, Massé et Associés Inc. (DDM);
- a financial model developed by the Ministère des Finances to evaluate, on a regional basis, the profitability of lumber softwood sawmills of fir, spruce, jack pine and larch (FSPL), for 2014.

Two independent experts, along with representatives from the Québec Forest Industry Council and certain forest sector businesses, contributed to this analysis, particularly through discussions and validations of results and assumptions for the financial model developed by the Ministère des Finances.

4.1 Main findings of the comparative study of sawmill profitability in Québec and Ontario

In the summer of 2015, the Ministère des Forêts, de la Faune et des Parcs (MFFP) and the Québec Forest Industry Council mandated Groupe DDM to carry out a study to:

- compare the operating costs associated with FSPL softwood species in Québec and Ontario;
- present findings to be taken into consideration when evaluating various means of improving the situation in Québec.

The study was conducted based on the financial data shared by 3 companies operating a total of 16 plants in Québec and 10 in Ontario.

²⁷ DEL DEGAN, MASSÉ ET ASSOCIÉS INC., *Étude comparative des coûts d'approvisionnement et de transformation Québec-Ontario*, March 2016.

Operating cost components

The profitability of Québec's forest industry depends on operating costs as well as revenues from the sale of processed products.

In order to be compared with revenues and contribute to a comprehensive picture of the industry's profitability, all of the costs incurred, from harvesting roundwood at the stump to the transportation of finished goods to markets, must be taken into consideration:

- the cost of fibre, which includes:
 - supply costs (harvesting and purchase of timber),
 - transfers to the government (royalties, market value of standing timber (MVST), amounts earmarked for the Société de protection des forêts contre les insectes et maladies (SOPFIM) and the Société de protection des forêts contre le feu (SOPFEU));
- plant processing costs;
- sawmill overheads;
- transportation-to-market costs.

❑ Comparison of operating costs

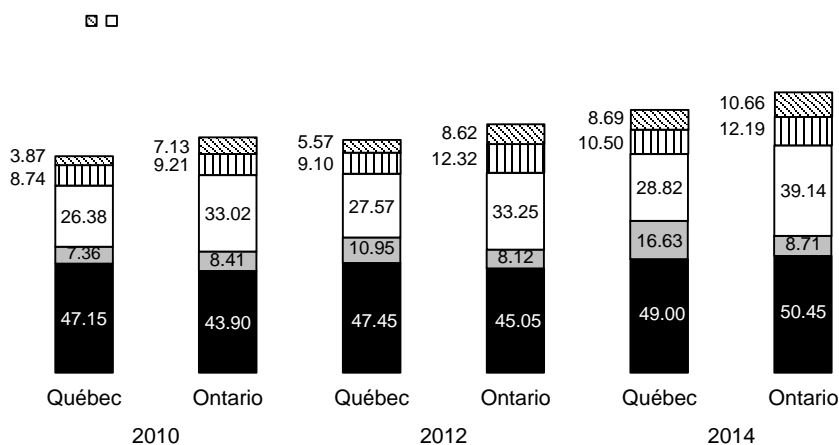
Comparative study results illustrate that in 2010, 2012 and 2014, Québec mills exerted greater control over their operating costs than their counterparts in Ontario.

— In fact, operating costs for the three years analyzed were on average about \$7.50 lower per cubic metre in Québec than in Ontario.

An analysis of the various cost components could provide a more detailed understanding of the overall results while defining possible areas for improvement in Québec.

CHART 12

Change in operating costs per province – 2010, 2012 and 2014 (dollars per cubic metre)



Source: Québec–Ontario comparative study.

■ Cost of forest operations

The cost of forest operations includes all of the expenses incurred by sawmills for the supply of roundwood, be it through harvesting or by purchasing wood from third parties.

In 2010 and 2012, these costs were higher for Québec sawmills than Ontario's, and this by an average of \$2.82 per cubic metre.

According to DDM, steeper costs in Québec could be explained by:

- higher harvesting costs, due to specific characteristics of the resource (smaller logs, territories where harvesting is more difficult, etc.) and the existing normative framework (obligation to harvest companion species, smaller harvesting areas, etc.);
- higher unit costs for transporting timber to mills, due to longer distances between forests and sawmills and lower allowable truckloads during the frost period than in Ontario.

From 2012 to 2014, the cost of forest operations in Ontario sawmills rose by 12.0% (versus 3.3% in Québec mills). In 2014, this increase translated into a cost per cubic metre of \$1.45 higher than in Québec.

■ Transfers to the government

In Québec, transfers to the government include royalties, the market value of standing timber (MVST) and contributions to the Société de protection des forêts contre les insectes et maladies (SOPFIM) and the Société de protection des forêts contre le feu (SOPFEU).

— In Ontario, these transfers include harvesting costs and dues to the Forestry Futures Trust and the Forest Renewal Trust.

In 2010, the value of transfers was lower in sawmills in Québec than in Ontario; however, value of transfers was higher for 2012 and 2014.

— The significant increase in Québec from 2010 to 2014 (from \$7.36 to \$16.63 per cubic metre) was due to the introduction of a royalty in April 2013 as well as the impact of softwood market conditions on the MVST.

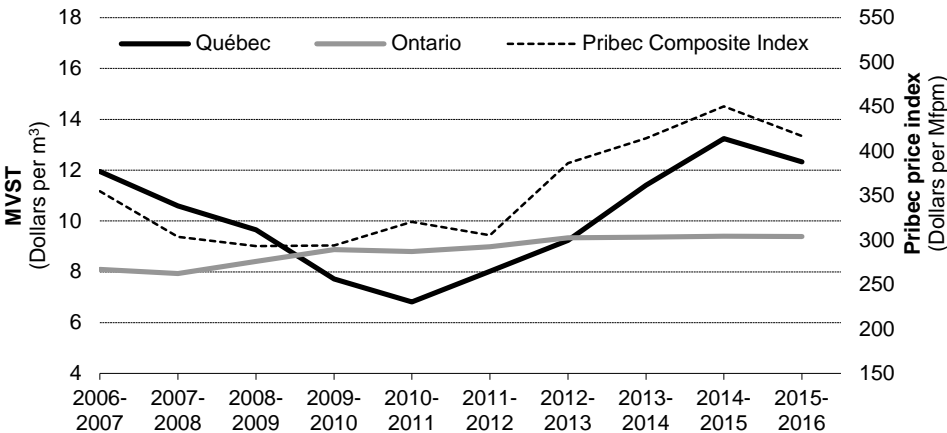
— In Ontario, transfers to the government remained relatively stable throughout the period (from \$8.12 to \$8.71 per cubic metre).

Historically, the MVST in Québec:

- remained stable with respect to prices for finished products after the introduction of the new forest regime;
- is more sensitive to market conditions than Ontario, making it more representative of the market conditions in which sawmills operate.

CHART 13

Comparison of the MVST in Québec and Ontario and the Pribec price index



Note: Preliminary data in 2015-2016.

Source: Compilation by the Ministère des Forêts, de la Faune et des Parcs and Québec Forest Industry Council (Pribec).

■ **Processing and transportation-to-market costs**

Processing costs include all of the expenses associated with processing the resource into a finished product and transporting it to markets.

For each of the three years considered, processing costs (fixed and variable) and transportation-to-market costs were, on average, respectively lower by \$9.34 and \$2.76 per cubic metre for Québec sawmills compared to mills in Ontario.

□ **Comparison of revenues and profitability**

Sawmill revenues arise mainly from the sale of lumber and by-products (wood chips, sawdust, etc.).

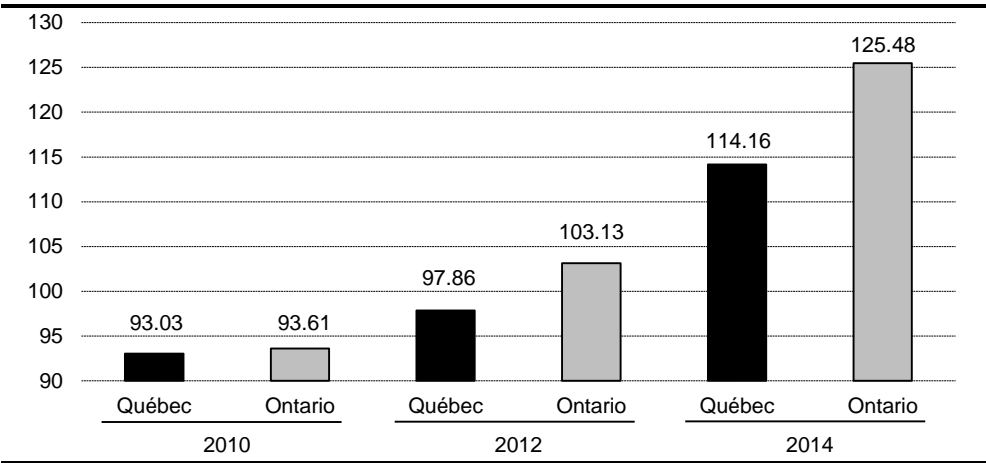
Results of the comparative study for the three years examined indicate that revenues of Québec mills were inferior to those of mills in Ontario. In 2014, the difference was \$11.32 per cubic metre.

According to DDM, this variance was mainly caused by Ontario having a product mix of greater value.

CHART 14

Change in sawmill revenues in Québec and Ontario

(dollars per cubic metre)



Source : Québec–Ontario comparative study.

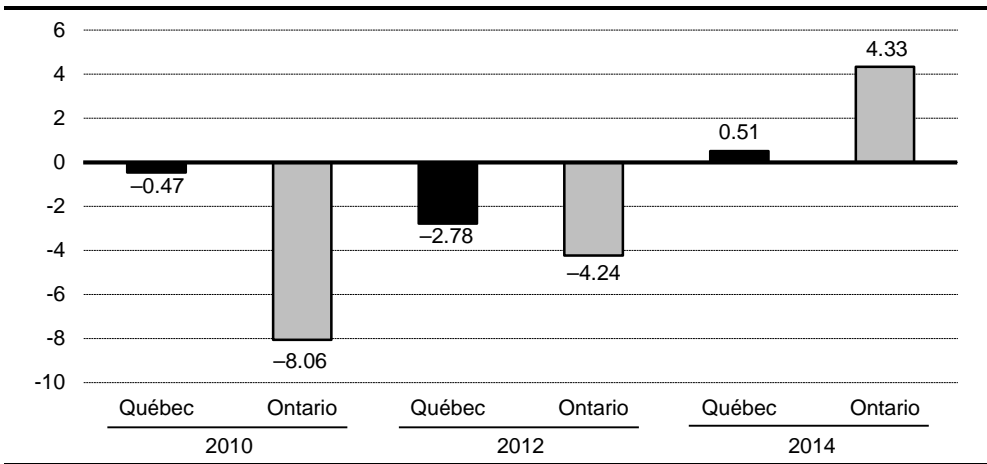
As regards profitability, the comparative study results showed that:

- Québec and Ontario sawmills recorded a deficit in 2010 and 2012:
 - in both years, the deficit of Québec mills was inferior to that of mills in Ontario;
- in 2014, sawmills in both provinces generated a profit. The profit in Ontario was greater, however, since the variance in the value of the production mix trumped Québec's advantage with regard to operating costs.

Thus, in spite of increased efficiency in terms of operating costs, a lower product mix value affects the profitability of Québec sawmills.

CHART 15

Change in the profitability of Québec and Ontario sawmills
(dollars per cubic metre)



Source : Québec–Ontario comparative study.

❑ Areas for improvement in light of the situation in Québec

An analysis of the results of the comparative study pointed to certain forest practices in Ontario which could be introduced in Québec as a means of improving sawmill profitability and efficiency.

A few of these areas for improvement are particularly worthy of note, namely:

- increase in the allowable truckloads for shipping forest products during the frost period;
- introduction of a funding program for logging roads;
- ability for businesses to leave smaller stems standing.

4.2 Financial picture of FSPL sawmill operations in Québec

As part of the mandate entrusted to it by the Cellule d'intervention forestière, the Ministère des Finances developed a financial model for evaluating, on a regional basis, the profitability of sawmill operations for FSPL softwood in 2014.

- The model was designed in conjunction with the MFFP and with the support of two independent experts asked to assist in the mandate's execution.

4.2.1 Methodology adopted to evaluate the profitability of sawmills in 2014

☐ Primary data sources used

Various data sources served to draw up the most accurate picture of the profitability of sawmill operations in Québec in 2014. The main ones were:

- The Survey of operating costs²⁸ and its complementary section on lumber revenues;
- Québec forest registers and the MFFP's MESUBOIS database.

Most of the data used are confidential, as they were obtained from business reports. For the purposes of this analysis, some data and results had to be grouped together to ensure the confidential nature of the information concerning sawmills.

²⁸ DEL DEGAN MASSÉ ET ASSOCIÉS INC., *Enquête 2013-2014 sur les coûts d'opération et les revenus liés au bois d'œuvre de l'industrie forestière du Québec*, March 2016.

Survey of operating costs

The Survey of operating costs offers a picture of the supply and processing costs of softwood species, poplars and hard hardwoods gathered in the public forests in Québec's various regions.

As regards the fir, spruce, jack pine and larch (FSPL) softwood species, the investigation's sampling included 33 respondents and addressed over 83% of the volume constituting the supply guarantee for 2013-2014. To be as representative as possible, the sampling was selected according to the following process:

- the largest (volume-wise) sawmills were selected (representing up to 75% of the total volume harvested);
- a random drawing was then carried out to select one out of every five remaining sawmills.

To ensure the reliability of the data gathered during the investigation, the information in question was validated from an accounting perspective, namely by verifying the financial statements of the businesses surveyed.

Complementary section on revenues

In 2016, a complementary section to the investigation was prepared to record lumber purchases and softwood revenues with regard to FSPL softwood.

- This study component made it possible to finalize, from a revenue perspective, the information concerning by-products already obtained.

❑ Scope of the analysis

The forest industry has access to a resource with varied characteristics and groups together businesses operating in different markets.

The wood fibre used by manufacturers can come from various species, either softwood or hardwood, and can be gathered from public or private forests, purchased outside the province of Québec, or obtained from processing sawmill waste or torn-down wood products.

The wood's characteristics, in fact, play a major role in the industrial structure.

- Hard hardwood is particularly used to manufacture wood flooring and other products where appearance plays a critical role such as furniture.
- Spruce fibre, a softwood species, is both long and resistant, making it an ideal wood for the production of softwood lumber and newsprint.

The issues related to profitability and competitiveness which the industry must cope with vary depending on the wood's origin and the species of the processed resource.

In order to put forth fair observations representative of the industry segment on which the investigation focused, the Cellule d'intervention forestière's analysis was limited to sawmills that:

- acquired their roundwood primarily from public forests;
- processed FSPL softwood.

■ FSPL softwood

FSPL softwood accounts for most of the wood harvested and consumed in Québec.

- On average from 2010 to 2014, over 83% of the timber volume coming from public land and used by the wood processing industry consisted of FSPL softwood.
- Furthermore, FSPL softwood represented 72% of the wood substances used in pulp and paper mills²⁹, mostly in the form of wood chips.

TABLE 1

Wood fibre consumption by industry category and type of wood supply – 2014 (per cent)

Category	Consumption by species		Type of wood supply		
	FSPL ⁽¹⁾	Other species ⁽²⁾	Round-wood	Wood chips	Other wood waste ⁽³⁾
Lumber	87.3	12.7	100.0	—	—
Pulp and paper	71.9	28.1	17.6	75.6	6.8
Veneers, plywood and boards	36.4	63.6	44.6	13.9	41.5
Cogeneration and energy products	63.2	36.8	1.5	1.3	97.2
ALL INDUSTRIES	75.3	24.7	N/A	N/A	N/A

N/A: Not applicable.

Note: Wood fibre consumption refers to the use of roundwood, wood chips, sawdust, wood shavings, bark, biomass and torn-down wood products.

(1) For the cogeneration and energy product sectors, this category includes all softwood.

(2) Hard hardwood, poplars and softwood species other than FSPL, except for the cogeneration and energy product sectors.

(3) Depending on industry categories, "Other wood waste" can include torn-down wood products, sawdust and wood shavings, bark and biomass.

Source: Ministère des Forêts, de la Faune et des Parcs.

²⁹ Excludes plants that use recycled paper fibre.

■ Sawmills at the heart of the industry's value chain

Sawmills are at the heart of the forest industry's value chain.

According to Statistics Canada data, in 2015 Québec sawmills (for softwood and hardwood) accounted for:

- approximately 25% of the value of shipments from all Canadian sawmills combined (\$3.0 billion in Québec and \$12.7 billion in Canada);
- 28% of all direct jobs in Canada's forest industry, i.e. 9 700 jobs in Québec, compared with 34 300 jobs for the entire country.

At the same time, sawmills consumed over 97% of the supply of FSPL roundwood group in Québec in 2014. These sawmills particularly:

- tend to harvest wood from public forests;
- operate upstream of businesses specialized in secondary and tertiary processing (e.g. engineered wood manufacturing).

TABLE 2

Origin of the supply of FSPL roundwood group by wood processing industry category – 2014

Category	Sawmills ⁽¹⁾ (number)	Public forests (Mm ³)	Private forests (Mm ³)	Outside of Québec (Mm ³)	Total	
					Mm ³	Portion (%)
Lumber	119	16.57	2.63	1.75	20.96	97.4
Pulp and paper	5	0.15	0.30	0.06	0.51	2.4
Other industries	9	0.01	0.04	0.00	0.05	0.2
Cogeneration and energy products	1	0.00	0.00	0.00	0.00	0.0
TOTAL	134	16.73	2.98	1.81	21.52	100.0

Note: The figures have been rounded off, so they may not add up to the total indicated.

(1) Represents all sawmills in Québec with FSPL softwood supplies, regardless of whether or not they enjoy a supply guarantee for public forests.

Source: Ministère des Forêts, de la Faune et des Parcs.

Definitions and examples of products generated from processed wood

Primary products include those products manufactured when an establishment makes a finished or semi-finished product by processing the raw material, be it roundwood, wood chips, sawdust, wood shavings, bark, or recycled wood and paper.

Secondary and tertiary products include those products manufactured when one or two establishments (other than those that produce primary products) make a finished or semi-finished product from a primary product.

Main products created through primary, secondary and tertiary wood processing

Wood industry	Pulp and paper, cardboard	Green chemistry and energy
Primary processing Shingles, softwood lumber, posts and boards.	Primary processing Newsprint, toilet paper, cardboard and specialty and fine paper.	Primary, secondary and tertiary processing Thermal power (cogeneration) and wood pellets.
Secondary and tertiary processing Engineered wood (for aesthetic or structural use), lumber, preserved wood, pallets and packing wood, bedframes, frames and mouldings, prefabricated structural components.	Secondary and tertiary processing Paper bags, stationery items, cardboard boxes and containers, packaging, finished products such as toilet paper.	Alcohol, essential oils, pharmaceutical and nutraceutical products, food ingredients, nanocrystalline cellulose (NCC), cellulose filament (CF), pyrolytic oils and biofuels, sugars and platform molecules.

❑ Regions of allotment and analysis zones

The Québec territory has been broken down into 13 regions of allotment with respect to the management of government forest resources. Ten of these regions are home to at least one sawmill with the characteristics necessary to be included in the analysis and having participated in the investigation into operating costs.

- In 2014, these 10 regions accounted for 85 of the 119 Québec sawmills whose operations include the processing of FSPL softwood.
- In 2014, these 85 sawmills:
 - processed in excess of 98% of FSPL softwood from public forests destined to sawmill operations³⁰,
 - obtained, on average, over 89% of their wood supply from public forests.

The three other regions of allotment also house sawmills that process FSPL softwood. Thus, 90% of the wood supply of two of these regions come from private forests or are imported; as for the other region, no sawmill participated in the investigation into operating costs. These regions are therefore not taken into consideration in the analysis.

³⁰ In addition to sawmill operations, FSPL softwood volumes from public forests can also be used in other sectors, such as pulp and paper, cogeneration and energy products.

The following table lists the 10 regions of allotment that were considered and, where applicable, indicates the zone in which they were grouped for confidentiality reasons.

— Such groups were created whenever the number of respondents from a given region was too low or if a few businesses dominated the investigation.

TABLE 3

Regions of allotment and analysis zones

	Analysis zones
Regions of allotment taken into consideration in the analysis	
01 – Bas-Saint-Laurent (BSL)	Zone 1
11 – Gaspésie–Îles-de-la-Madeleine (G-IDLM)	
02 – Saguenay–Lac-Saint-Jean (S-LSJ)	Zone 2
03 – Capitale-Nationale (Cap.-Nat.)	
04 – Mauricie	Zone 3
07 – Outaouais	
15 – Laurentides	
08 – Abitibi-Témiscamingue (Abitibi-Témisc.)	Zone 4
09 – Côte-Nord	Zone 5
10 – Nord-du-Québec	Zone 6
Regions of allotment not taken into consideration in the analysis	
05 – Estrie	—
12 – Chaudière-Appalaches	—
14 – Lanaudière	—

4.2.2 Financial model overview

The financial model makes it possible to evaluate, by analysis zone, the profitability of sawmill operations in 2014, and this by considering, among other things:

- the revenues generated by sales of softwood lumber and sawmill by-products;
- the costs associated with harvesting roundwood at the stump until its processing at a plant;
- the value of changes in inventory;
- government support and transfers to the government;
- net taxation of businesses.

□ Estimate of revenues

As regards revenues for 2014, the financial model calculated the revenue generated by the sale of softwood lumber and sawmill by-products, i.e. wood chips, sawdust, wood shavings and bark.

In the case of both softwood lumber and by-products, revenues are calculated on the basis of:

- Québec's real production volume for 2014, as declared by businesses in the forest registers;
- the unit selling price for softwood lumber and for each by-product, based on sales volumes and the real revenues declared during the course of the investigation into operating costs.

TABLE 4

Revenues from unit sales of softwood lumber and by-products, per zone – 2014

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
	BSL and G-IDLM	S-LSJ and Cap.-Nat.	Mauricie, Outaouais, Laurentides	Abitibi-Témisc.	Côte-Nord	Nord-du-Québec
Lumber (\$/Mfbm ⁽¹⁾)	348.97	351.50	353.97	360.56	334.66	337.24
By-products (\$/dmt ⁽²⁾)						
– Wood chips	95.27	109.31	112.20	93.00	127.26	93.11
– Sawdust	49.06	48.72	42.00	49.07	34.24	53.26
– Wood shavings	52.30	67.83	71.42	44.37	30.74	52.56
– Bark	7.05	15.51	7.11	8.49	13.01	4.21

(1) One thousand foot board measure.

(2) Dry metric tonne.

Source: Survey of operating costs.

Sawmills production overview

The production of FSPL (fir, spruce, jack pine and larch) sawmills consists of sawn wood (softwood lumber) of various sizes as well as four types of by-products: wood chips, sawdust, wood shavings and bark.

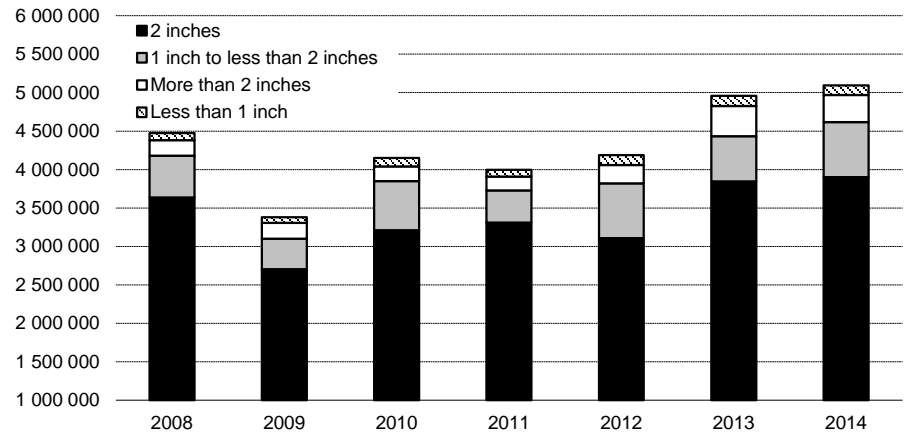
Softwood lumber

In 2014, softwood lumber production in Québec was slightly over 5 million thousand foot board measures (Mfbm), its highest level since the economic slowdown of 2008-2009.

Softwood lumber 2 inches in nominal thickness (2x3, 2x4, etc.) constituted nearly 82% of this production, while just over 15% was comprised of boards of a nominal thickness ranging between 1 and less than 2 inches (1x3, 1x4, etc.).

- The remainder of the production consisted of softwood lumber in non-traditional sizes (niche products), with a nominal thickness of less than 1 inch or over 2 inches.

Production of Québec FSPL sawmills (thousand foot board measures)



Source: Québec forest registers. Compilation by the Ministère des Forêts, de la Faune et des Parcs.

Sawmills production overview (cont.)

By-products

In 2014, the total Québec production of FSPL softwood by-products equalled 6.8 million dry metric tonnes (dmt), which consisted of:

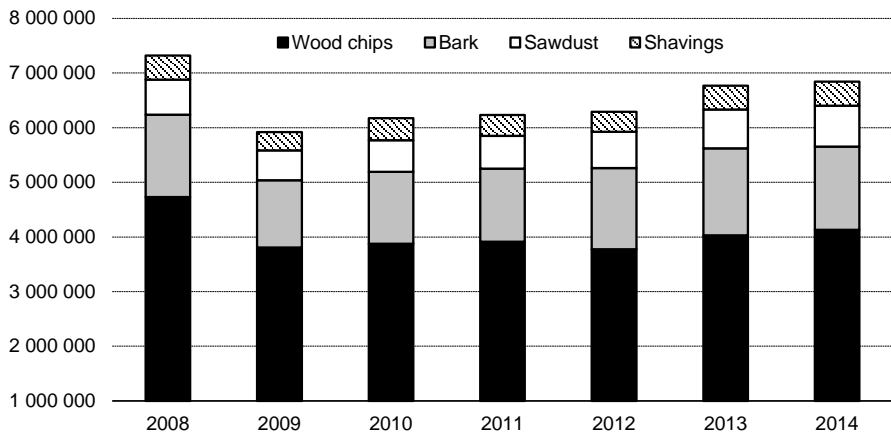
- wood chips (60.4%), a major source of raw materials for pulp and paper mills;
- sawdust and wood shavings (17.4%), which are mostly used for manufacturing boards and biofuels (wood pellets, compressed fibre logs, etc.);
- bark (22.2%), normally used by plants to produce thermal and electric power, but also used in a minor proportion to manufacture pellets for the industrial sector.

All by-products can also serve in the production of biofuels such as pyrolytic oils, cellulosic ethanol and biodiesel fuel.

- To date, such production is not carried out on a commercial scale, mainly due to the weak technological maturity of the industrial processes involved and the low cost of petroleum products.

Production of FSPL by-products

(dry metric tonnes)



Source: Québec forest registers. Compilation by the Ministère des Forêts, de la Faune et des Parcs.

Sawmills production overview (cont.)

2014 production for the six analysis zones

The softwood lumber production reported in the Québec forest registers in 2014 for the six zones considered in the analysis was 4.38 million Mfbm.

- The total by-products produced, in turn, amounted to 6.10 million dmt.

In the case of both softwood lumber and by-products, the variance in production between the six zones and Québec as a whole is mostly due to the FSPL softwood volumes processed in the three regions of allotment not considered.

- These regions, it bears recalling, are not taken into consideration in the analysis because two of them are getting 90% of their resource supply from private forests and imports (Estrie and Chaudière-Appalaches), while there is no participant in the investigation into operating costs in the other region (Lanaudière).

Production volume, per zone – 2014

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	
	BSL and G-IDLM	S-LSJ and Cap.-Nat.	Mauricie, Outaouais, Laurentides	Abitibi- Témisc.	Côte- Nord	Nord-du- Québec	Total
Lumber (millions of Mfbm)	0.57	1.35	0.65	0.82	0.37	0.63	4.38
By-products (millions of dmt)	0.60	1.92	0.88	1.12	0.71	0.87	6.10

Note: The figures have been rounded off, so they may not add up to the total indicated.

Source: Québec forest registers. Compilation by Ministère des Forêts, de la Faune et des Parcs and by Ministère des Finances du Québec.

❑ Operating costs estimate

The financial model, in turn, allows for calculating the costs associated with the supply of roundwood and its processing at the plant.³¹

The model, in considering supply cost, draws a distinction between wood from public forests which is harvested directly by the sawmills, wood obtained from public forest operators (forestry contractor, cooperative, etc.), and that acquired from a private forest or imported.

As regards processing, because the costs assessed in the investigation into operating costs are spread out over all of the processed logs, the model does not differentiate based on the origin of the wood but rather, estimates costs for all of the merchantable timber processed.³²

In addition to supply and processing costs, the model also considers the financial and depreciation expenses, as well as the amounts transferred by the sawmills for head office overhead.

TABLE 5

Operating costs, per zone – 2014 (dollars per cubic metre)

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
	BSL and G-IDLM	S-LSJ and Cap.-Nat.	Mauricie, Outaouais, Laurentides	Abitibi- Témisc.	Côte- Nord	Nord-du- Québec
Unit cost						
Wood fibre cost	61.24	66.12	63.78	69.88	68.63	67.38
– Supply ⁽¹⁾	47.58	50.73	50.60	49.08	59.21	53.52
– Transfers to the government	13.67	15.39	13.18	20.80	9.42	13.86
Processing	43.18	31.64	34.64	31.19	30.03	31.16
Overhead ⁽²⁾	8.26	5.43	4.63	5.07	2.42	3.97
Transportation to markets ⁽³⁾	8.53	9.37	10.32	10.37	10.32	15.03
TOTAL	121.21	112.57	113.36	116.50	111.40	117.55

Note: The figures have been rounded off, so they may not add up to the total indicated.

(1) Corresponds solely to harvest costs (stump-to-plant), net of government assistance. Costs related to the purchase of timber are confidential for most zones and are not considered here.

(2) Overhead includes depreciation and financial expenses as well as transfers to head offices.

(3) Transport-to-market costs are confidential for zones 3 and 5. For both these zones, the cost presented corresponds to the average cost for Québec, as observed in the Survey of operating costs.

Source: Survey of operating costs.

³¹ To ensure consistency with revenues, which are calculated on the basis of a selling price at the plant, cost estimates do not take into consideration the transportation of softwood lumber to markets.

³² The estimated volume of merchantable timber processed takes into account the volume softwood lumber produced and reported in the Québec forest registers for 2014 and the material yield observed in the Survey of operating costs.

❑ Adjustment for a change in stock

Some of the wood processed during normal activities may have in fact been harvested the previous year. Likewise, a portion of the wood harvested in a given year can be kept in stock, to be processed the following year.

Since the analysis only covers a single fiscal year, the model results are adjusted for a change in stock, in order to assign:

- a value to the wood volume harvested in 2014, but not processed (2015 stock);
- a cost to the wood volume processed in 2014 which was harvested in 2013 (2013 stock).

For each analysis zone, the type and extent of the change in stock is established by comparing the merchantable timber harvested with that processed in 2014.

- If the volume exceeds that processed, the variance is considered part of the 2015 stock.
 - A value equal to the stump-to-plant costs estimated during the investigation into operating costs (including transfers to the government) is then assigned to this stock.
- Conversely, if the volume harvested is less than that processed, the variance is considered part of the 2013 stock.
 - A cost equal to the stump-to-plant costs estimated for 2013 (including transfers to the government in force in 2013) is then assigned to this stock.

TABLE 6

Stock value, depending on type per zone

(dollars per cubic metre)

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
	BSL and G-IDLM	S-LSJ and Cap.-Nat.	Mauricie, Outaouais, Laurentides	Abitibi- Témisc.	Côte- Nord	Nord-du- Québec
2013 stock	N/A	N/A	N/A	67.34	65.67	N/A
2015 stock	61.24	66.12	63.78	N/A	N/A	67.38

N/A: Not applicable.

Source: Survey of operating costs. Compilation by the Ministère des Forêts, de la Faune et des Parcs.

Merchantable FSPL timber volume processed in 2014

Origin of processed FSPL volumes

In 2014, the volume of FSPL merchantable timber processed by sawmills included in the six zones analyzed totalled approximately 18.4-million cubic metres.

- Of this volume, some 2.0-million cubic metres came from private forests and imports.
- The balance, about 16.4-million cubic metres, came from public forests.

In 2014, public forest harvesting of FSPL softwood amounted to 16.5-million cubic metres.

Approximately 0.1- million cubic metres of the volume harvested was not processed in 2014 and was available in stock for 2015.

Origin of merchantable processed FSPL timber, per zone – 2014

(thousands of cubic metres)

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Total
	BSL and G-IDLM	S-LSJ and Cap.-Nat.	Mauricie, Outaouais, Laurentides	Abitibi- Témisc.	Côte- Nord	Nord- du- Québec	
Public forests							
– 2013 stock	0.00	0.00	0.00	0.61	0.12	0.00	0.73
– 2014 harvest	1.68	5.63	2.52	2.37	1.64	2.63	16.48
– 2015 stock	-0.15	-0.22	-0.01	0.00	0.00	-0.43	-0.81
Subtotal	1.53	5.41	2.51	2.98	1.75	2.21	16.39
Private forests	0.57	0.48	0.20	0.15	0.20	0.13	1.73
Imports	0.02	0.00	0.01	0.23	0.00	0.00	0.27
TOTAL	2.12	5.89	2.73	3.37	1.95	2.33	18.39

Note: The figures have been rounded off, so they may not add up to the total indicated.

Sources: Compilation by the Ministère des Forêts, de la Faune et des Parcs and the Ministère des Finances du Québec.

❑ Government assistance and government transfers

■ Government assistance

The financial model takes into account the value of financial assistance received by sawmills in 2014 as part of the assistance for salvage work and the credit for commercial silvicultural work (partial harvests). The value of this government assistance is calculated based on:

- the volume of FSPL timber from public forests harvested by sawmills in 2014, as compiled in the database system (MESUBOIS);
- the unit aid observed in the Survey of operating costs.

TABLE 7

Government assistance, per zone – 2014

(dollars per cubic metre)

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
	BSL and G-IDLM	S-LSJ and Cap.-Nat.	Mauricie, Outaouais, Laurentides	Abitibi- Témisc.	Côte- Nord	Nord-du- Québec
Financial assistance for salvage work	—	—	0.03	0.03	0.40	0.01
Credit for commercial silvicultural work	0.64	0.21	0.34	0.42	0.08	0.07

Source: Survey of operating costs.

Government assistance taken into account in the model

Government assistance for salvage work

The aim of the financial assistance program for salvage work is to promote the implementation of timber salvage plans in case of a natural disaster (fire, windthrow, insect infestation, etc.) before the trees are downgraded and are no longer able to be processed.

The assistance provided varies according to the type and severity of disturbances and is designed to help offset the additional harvesting costs related to these disturbed areas.

Credit for commercial silvicultural work

The aim of the credit program for commercial silvicultural work is to foster partial cutting activities.

- Partial cutting helps meet a number of silvicultural objectives: to increase the value of the forest in the long term for example; however, it does entail additional harvesting costs.

The financial compensation amount, which varies depending on the type and difficulty of partial cutting involved, is designed to help offset the additional harvesting costs incurred in carrying out cutting activities as set out in the management strategy.

❑ Government transfers

The government transfer model takes into account the amounts that sawmills had to pay in 2014 with regard to:

- the volume of FSPL timber from public forests that were harvested through SGs and open-market purchase;
- the activities of the Société de protection des forêts contre les insectes et maladies (SOPFIM) and the Société de protection des forêts contre le feu (SOPFEU).

These government transfers, accounted for in the cost of fibre, are calculated based on:

- the volume of FSPL timber from public forests allocated as part of the supply guarantees in 2014, for royalties;
- the volume of FSPL timber from public forests harvested by sawmills in 2014, for the MVST and payments related to the SOPFIM and SOPFEU;
- the unit transfer observed in the Survey of operating costs for each of these items.

TABLE 8

Government transfers, per zone – 2014

(dollars per cubic metre)

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
	BSL and G-IDLM	S-LSJ and Cap.-Nat.	Mauricie, Outaouais, Laurentides	Abitibi- Témisc.	Côte- Nord	Nord-du- Québec
Royalties and MVST	12.19	14.16	11.73	19.50	7.99	12.56
SOPFIM and SOPFEU	1.47	1.23	1.45	1.30	1.43	1.31

Source: Survey of operating costs.

❑ Net taxation

The financial model incorporates a net taxation estimate (income taxes and tax credits) for sawmills included in the six zones analyzed by the Ministère des Finances.

- Among the credits considered are the tax credit for investments and tax credit for processing activities in the resource regions.

4.2.3 Overall profitability

The results of the financial model show that, overall, Québec's FSPL lumber industry was profitable in 2014. The six zones posted:

- total revenues of approximately \$2.05 billion;
- operating expenses of approximately \$1.95 billion, once government transfers and government assistance are taken into account;
- after-tax profits and depreciation of approximately \$95.12 million, equal to a margin of \$5.11 per cubic metre of merchantable processed timber.
- In 2014, this profit is comparable to the \$4.33 per cubic metre estimated for Ontario mills as set out in the Québec–Ontario comparative study.

TABLE 9

Estimated profitability, summary per zone – 2014

(millions of dollars, except otherwise indicated)

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	
	BSL and G-IDLM	S-LSJ and Cap.-Nat.	Mauricie, Outaouais, Laurentides	Abitibi- Témisc.	Côte- Nord	Nord-du- Québec	Total
Revenues	244.92	645.58	300.95	370.01	188.32	296.77	2 466.55
Expenditures ⁽¹⁾	250.25	611.17	285.21	344.66	194.30	268.74	1 954.34
Earnings after tax and depreciation ⁽²⁾							
– In millions of dollars	-4.68	35.02	15.91	25.34	-5.67	29.19	95.12
– Per m ³ of processed merchantable timber	-2.20	5.95	5.83	7.52	-2.91	12.51	5.11
– In dollars per Mfbm	-8.27	25.94	24.51	30.83	-15.50	46.43	21.71

Note: The figures have been rounded off, so they may not add up to the total indicated.

(1) Expenditures factor in transfers to the government and government assistance.

(2) Factors in net taxation.

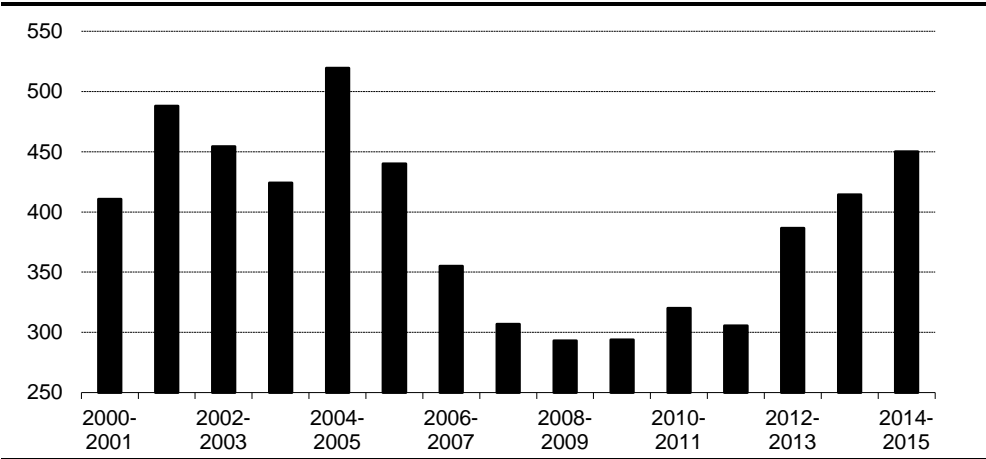
Since 2008, we see that 2014 has posted the best results in terms of the lumber production volume and selling price.

— In comparison, the Pribec price index for FSPL lumber group was 53% lower in 2009.

Thus, the overall profitability calculated for 2014 is based on a delicate balance particularly attributable to favourable market conditions for softwood, where we see the highest prices in ten years.

CHART 16

Pribec price index for FSPL lumber
(dollars per thousand board feet)



Source: Québec Forest Industry Council (Pribec).

❑ Regional profitability

A regional analysis shows that the overall profitability of the industry is dependent on the sound financial performance of four of the six zones, as follows:

- Zone 2 (Saguenay–Lac-Saint-Jean and Capitale-Nationale);
- Zone 3 (Mauricie, Outaouais and Laurentides);
- Zone 4 (Abitibi-Témiscamingue);
- Zone 6 (Nord-du-Québec).

Representing nearly 80% of the harvesting volume in the regions under analysis, sawmill activities in these four zones generated in 2014 a profit estimated at between \$15.91 million and \$35.02 million.

- Depending on the zone, this profit represents a margin of \$5.83 to \$12.51 per cubic metre processed.

In the remaining two zones - zone 1 (Bas-Saint-Laurent and Gaspésie–Îles-de-la-Madeleine) and zone 5 (Côte-Nord) — sawmill activities resulted in deficits estimated at \$4.68 million and \$5.67 million respectively in 2014.

- For zone 5 (Côte-Nord), the result is consistent with the financial position provided by mills in the region, leading to the implementation of support measures announced by the Québec government at the end of summer 2015.

TABLE 10

Estimated profitability, per zone – 2014

(millions of dollars, unless otherwise indicated)

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	
	BSL and G-IDLM	S-LSJ and Cap.-Nat.	Mauricie, Outaouais, Laurentides	Abitibi- Témisc.	Côte- Nord	Nord-du- Québec	Total
Revenues							
Lumber sales	197.46	474.59	229.80	296.41	122.40	212.05	1 532.71
By-product sales	38.50	156.18	70.29	73.60	65.92	55.88	460.36
Other revenues ⁽¹⁾	8.97	14.80	0.86	0.00	0.00	28.84	53.47
Total – Revenues	244.92	645.58	300.95	370.01	188.32	296.77	2 046.55
Expenses							
Supply	122.83	333.21	146.57	140.25	110.70	154.84	1 008.39
Processing	91.69	188.18	98.09	105.12	58.53	72.70	614.31
Financial and depreciation expenses	15.78	18.72	9.65	10.07	3.25	7.41	64.88
Other expenses ⁽²⁾	1.39	10.67	2.64	45.74	9.01	1.84	71.30
Total – Expenses	231.69	550.79	256.94	301.18	181.50	236.78	1 758.88
Transfers to the government							
Royalties and MVST	17.35	56.34	25.88	41.57	11.46	29.16	181.76
SOPFIM and SOPFEU	2.14	4.88	3.19	2.90	2.03	2.99	18.12
Total – Transfers to the government	19.49	61.22	29.06	44.48	13.48	32.15	199.88
Government assistance							
Government assistance	-0.93	-0.83	-0.79	-1.00	-0.68	-0.19	-4.42
Net taxation							
Taxes and tax credits	-0.65	-0.62	-0.17	0.01	-0.31	-1.17	-2.91
Profit after tax and amortization							
– Millions of dollars	-4.68	35.02	15.91	25.34	-5.67	29.19	95.12
– Dollars per merchantable m ³ processed	-2.20	5.95	5.83	7.52	-2.91	12.51	5.11
– Dollars per Mfbm	-8.27	25.94	24.51	30.83	-15.50	46.43	21.71

Note: The figures have been rounded off, so they may not add up to the total indicated.

(1) Includes stock adjustments.

(2) Includes stock adjustments and transfers to head office.

❑ **Determinants of profitability**

Many factors impact a sawmill's revenues and expenses. as demonstrated in the profitability observed by region.

- These factors can particularly depend on market conditions and the business environment (sales prices, capacity utilization. etc.), company choices (product mix, production factors, etc.) or even the normative framework implemented by the government (harvest rules, attributions, etc.).

The analysis of the determinants of profitability provides a better understanding of these factors and helps target appropriate government intervention to support the industry.

■ **Analysis of revenue level**

For 2014, lumber represented, on average, 41.5% of the production volume of sawmills analyzed, compared with 58.5% for by-products.

- Average sawmill sales revenue was \$348.85/Mfbm for lumber and \$76.71/dmt for by-products.

The composition of the product mix and sales revenues obtained can vary significantly from one zone to another. As these two factors determine the value of production. A comparison of zones can partly explain the differences in profitability observed.

TABLE 11

Production volume, material yield and revenues, per zone – 2014
(per cent, unless otherwise indicated)

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	
	BSL and G-IDLM	S-LSJ and Cap.-Nat.	Mauricie. Outaouais Laurentides	Abitibi- Témisc.	Côte- Nord	Nord-du- Québec	Weighted average
Production volume							
Lumber	49.4	40.5	41.3	42.8	32.7	42.8	41.5
By-products	50.6	59.5	58.7	57.2	67.3	57.2	58.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Material yield⁽¹⁾							
m ³ /Mfbm	3.86	4.36	4.20	4.10	5.33	3.71	4.25
Sales revenue by unit							
Lumber (\$/Mfbm)	348.97	351.50	353.97	360.56	334.66	337.24	348.85
By-products (\$/dmt) ⁽²⁾	64.62	81.14	80.23	65.62	92.48	64.22	76.71

Note: The figures have been rounded off, so they may not add up to the total indicated.

(1) This indicator represents the quantity of cubic metres of lumber required for a sawmill to produce one thousand board feet (m³/Mfbm). For Nord-du-Québec, the relatively low material yield observed for 2014 is due to more effective processing methods.

(2) Average sales revenue, based on the relative importance of each type of by-product.

Sources: Québec forest registers and Survey of operating costs. Compilation by Ministère des Forêts, de la Faune et des Parcs and the Ministère des Finances du Québec.

■ Composition of the product mix

The composition of the product mix is particularly dependent on the quality of processed wood (species, size of the logs, etc.), the operational structure in which sawmills function and the production factors (equipment, labour, etc.).

- For example, processing logs with a small diameter often leads to production of wood shavings if the sawmill does not have the possibility of supplying a secondary processing plant that uses smaller-sized lumber.
- In addition, an independent sawmill's choice of production will generally be focused on lumber, the market offering the best return on sawmill activities, which is not necessarily the case for a plant integrated into a paper mill.
- In addition, the use of modern and robust equipment will allow a sawmill to produce a larger quantity of lumber per log processed.

These factors therefore explain why, from one zone to another, concentration of lumber and by-products in the product mix varies.

In terms of profitability, we see in the four zones estimated to generate profits in 2014, production volume composed of more than 40% of lumber, or products offering the best value to sawmills.

- In these zones, the material yield is between 3.71 and 4.36 m³/Mfbm, confirming increased lumber production per unit of processed merchantable wood.

For comparison purposes, zone 5, which shows a deficit for 2014, is characterized by a product mix of less than 33% of lumber and a material yield of 5.33 m³/Mfbm, the highest of the six zones.

In general, it appears that a product mix with a low concentration of lumber and a high material yield are two factors likely to negatively impact a zone's profitability.

Material yields for sawmills

Presentation of material yield

Material yield¹ is often used to account for sawmill performance.

This indicator represents the quantity of cubic metre of timber it takes for a sawmill to produce one thousand board feet (m³Mfbm).

- The lower the material yield, the lower the quantity of timber per unit of board produced.

Factors that may influence material yield

Many factors may explain the difference in the various material yields observed from sawmill to sawmill. including:

- The product mix;
- The size of logs processed;
- The upgrade of equipment and sawing methods;
- Employee experience and work methods;
- The sawmill's operating structure and the needs of customers served.

Change in material yield

Beyond the quality of the production factors, changes in material yield are dictated by changes in demand from the various markets.

For example, the difficult conditions characterizing the paper market has prompted integrated sawmills to reduce their production of wood shavings and improve their material yield.

¹ This yield may be expressed on a sawmill's production (material yield at the sawmill) or on a planer's production (material yield at the planer).

■ Unit sales revenue

The sales revenue of sawmills depends on their production characteristics (sawmill size, species, etc.), operating structure and demand patterns for by-products.

- Sawmills that focus on fir production will not generate the same revenue as their counterparts that focus on spruce, for which there is greater demand.
- An independent sawmill's production will usually be sold at market price whereas that of an integrated mill will be sold at a less volatile transfer price.
- The presence, within a given area, of a single buyer for a sawmill's by-products could impact its sales revenue.

From one zone to another, these factors partially explain the differences in unit sales revenue for lumber and by-products.

In terms of profitability, in the zones with estimated profits in 2014, sawmills generated average sales revenue of between \$337.24 and \$360.56 per Mfbm for lumber and between \$64.22 and \$81.14 per dmt for their by-products.

By comparison, in the two zones with estimated deficits in 2014:

- sales revenue generated by sawmills in zone 1 was \$348.97 per Mfbm for lumber and \$64.62 per dmt for by-products;
- sales revenue generated by sawmills in zone 5 was \$334.66 per Mfbm for lumber and \$92.48 per dmt for by-products.

In general, this comparison shows that:

- despite relatively high unit sales revenue, by-products are proportionately less profitable for sawmills such that if production is focused on by-products, the profitability of a given zone may be negatively affected;
- relatively low unit sales revenue for by-products can jeopardize a zone's ability to add value to its production and cover its operating costs;
- relatively low unit sales revenue for lumber can be offset by a low material yield and therefore allow a zone to improve its sales revenue per unit of processed timber.

❑ Expense analysis

According to the results of the Survey of operating costs, the average operating cost in Québec for FSPL timber was \$113.88 per cubic metre in 2014. This cost includes:

- supply costs (timber harvesting) of \$51.73;
- transfers to the government (royalties, MVST, SOPFIM and SOPFEU) of \$14.97;
- mill processing costs of \$32.14;
- general costs of \$4.72;
- transportation-to-market costs of \$10.32.

TABLE 12

Operating costs per zone – 2014

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	
	BSL and- G-IDLM	S-LSJ and Cap.-Nat.	Mauricie, Outaouais, Laurentides	Abitibi- Témisc.	Côte- Nord	Nord-du- Québec	Total
Unit costs (\$/m³)							
Cost of fibre	61.24	66.12	63.78	69.88	68.63	67.38	66.70
— Supply ⁽¹⁾	47.58	50.73	50.60	49.08	59.21	53.52	51.73
— Transfers to government	13.67	15.39	13.18	20.80	9.42	13.86	14.97
Processing	43.18	31.64	34.64	31.19	30.03	31.16	32.14
General costs ⁽²⁾	8.26	5.43	4.63	5.07	2.42	3.97	4.72
Transportation to markets ⁽³⁾	8.53	9.37	10.32	10.37	10.32	15.03	10.32
TOTAL	121.21	112.57	113.36	116.50	111.40	117.55	113.88
Share of costs (%)							
Cost of fibre	50.5	58.7	56.3	60.0	61.6	57.3	58.6
— Supply	39.3	45.1	44.6	42.1	53.2	45.5	45.4
— Transfers to government	11.3	13.7	11.6	17.9	8.5	11.8	13.1
Processing	35.6	28.1	30.6	26.8	27.0	26.5	28.2
General costs	6.8	4.8	4.1	4.3	2.2	3.4	4.1
Transportation to markets	7.0	8.3	9.1	8.9	9.3	12.8	9.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: The figures have been rounded off, so they may not add up to the total indicated.

(1) Corresponds solely to harvest costs (stump-to-plant), net of government assistance. Costs related to the purchase of timber are confidential for most zones and are not considered here.

(2) Overhead includes depreciation, financial expenses and transfers to head offices.

(3) Transport-to-market costs are confidential for zones 3 and 5. For both these zones, the cost presented corresponds to the average cost for Québec, as observed in the Survey of operating costs.

Source: Survey of operating costs.

■ Costs that vary from zone to zone

Both on a relative and per-unit basis, costs vary greatly from zone to zone mainly due to:

- access to the resource;
- characteristics and quality of the harvested timber;
- the equipment used and its efficiency;
- plant size and level of capacity utilization.

For example, the following was noted for each unit of processed wood:

- a lower cost of fibre in zone 2 than in zone 5 (\$66.12 per cubic metre compared to \$68.63 per cubic metre), particularly due to shorter transportation distance to the plant;
- higher processing costs in zone 1 than in zone 6 (\$43.18 per cubic metre compared to \$31.16 per cubic metre), mainly due to higher unit cutting, planning and drying costs.
 - These higher costs are due to low capacity utilization stemming from, for example, low availability of supply and a relatively large number of small plants.

■ **MVST – a mechanism that reduces cost variances**

Cost variances attributable to resource characteristics (quality, accessibility, transportation distance to the plant, etc.) are reduced by the mechanism used to set the MVST and therefore have a limited impact on profitability.

— Zones, which for the above reasons have higher costs, will have a lower MVST and vice-versa.

For cost variances not attributable to resource characteristics, the MVST factors in the costs of a plant with average efficiency.

— Under this pricing system, regions with plants that have relatively higher costs are not granted a lower MVST and vice-versa.

— It therefore encourages less productive plants to improve and more productive plants to maintain their output, thereby promoting investment in productivity.

Consequently, cost variances attributable to below average operating efficiency due to, for example, production factors (e.g. equipment, labour) and the capacity utilization rate, are not reduced through the MVST and directly impact sawmill profitability.

— Zone 1 is a good example.

— In this zone, the low capacity utilization rate resulted in high processing costs, which did not translate into a lower MVST.

— This situation, combined with a fairly low unit price for by-products, helps explain the estimated deficit in 2014, despite production that is heavily concentrated on lumber.

In this context, improved plant productivity, better capacity utilization through consolidation, among other avenues, and the introduction of more efficient forestry practices can increase sawmill profitability and competitiveness.

■ Sawmill productivity – a key factor in profitability

Sawmills can improve their productivity in the long run by focusing on investment, innovation and human capital.

■ Investment and innovation

The recovery of investment in wood product manufacturing, which includes sawmills, has not been enough to offset the capital stock decline in this subsector.³³

Besides the 2008-2009 economic slowdown and change in the U.S. housing market in 2008, this situation may be explained by a possible correlation between the allowable cut in Québec, which has been decreasing in recent years, and the capital stock of Québec plants.

— This correlation seems logical insofar as uncertainty about the availability of raw materials would limit sawmills' interest in investing and their capacity to self-finance.

Continuing with this possible causal link, greater raw material availability and some industry consolidation are likely to encourage investment in Québec sawmills and increase their capital stock.

As well, based on investment data and R&D spending in the wood products sector, which includes sawmills, a recent study³⁴ commissioned by The Forest Products Association of Canada suggests that a number of firms in Québec are using physical capital stock that is not in keeping with the latest innovations.

More innovation in terms of production processes and product development could help ensure the industry's survival and growth.

■ Labour and human capital

Québec will face a labour shortage in the years ahead, particularly in the forestry sector.

Remote regions are especially affected, such as Côte-Nord, Abitibi-Témiscamingue and Nord-du-Québec, where the forestry industry usually has to compete with other sectors that offer attractive compensation to specialized employees.

Increasing the appeal for key specialized plant jobs such as process engineers, who are responsible for optimizing plant production and raw material yield, could boost the industry's productivity.

³³ Statistics on the change in investment and capital stock are set out in appendix 1.

³⁴ Centre for the Study of Living Standards. *A detailed analysis of productivity trends in the forest products sector in Quebec 2000-2013: adversity drives productivity*. July 2015.

❑ Limitations of the financial model

■ Analysis limited to a single link in the value chain

The financial model assesses the profitability of FSPL lumber, which is just one link in the forestry value chain.

However, the structure of some sawmills is such that production choices are made with a view to maximizing overall profit and therefore includes the profits of affiliated plants (pulp and paper or secondary processing).

The data used by the model does not distinguish sawmills that are part of an affiliated plant and therefore the impact of such an operating structure on profitability cannot be assessed.

The failure to consider the interplay of profits and losses between affiliated companies is likely to skew the profitability assessment and its interpretation.

■ Zones encompassing more than one region

Certain regional data were grouped for confidentiality reasons.

— The data was grouped for regions where a few large firms dominate and for those with a relatively small number of operators.

For zones encompassing more than one region, the results must be interpreted with caution since the results of a zone can be influenced by the situation of one of its regions, rendering them less representative of the other regions.

Moreover, the weighting of the cost data by zone based on the relative volumes of the mills that responded to the Survey of operating costs do not necessarily reflect the actual proportions between the regions.

■ Analysis of 2014

The profitability of the sawmill industry is estimated only for 2014.

Analyzing a single year makes it possible to compare supply costs and competitiveness issues from region to region, as set out in the mandate given to the Cellule d'Intervention forestière.

Based on information currently available, the profitability estimate for years prior to 2014 would not have provided comparable results.

- Because no figures are available for lumber sales revenue prior to 2014, a revenue simulation would be required based on generic prices and a theoretical product mix.
- A comparison of simulated revenues with the actual revenues reported in the Survey of operating costs would have produced skewed results.

The methodology and information that will be collected in future Survey of operating costs could be adjusted to allow for a multi-year comparison.

■ Analysis on ten of the thirteen regions of allotment

The financial model estimates sawmill profitability for ten of the thirteen regions of allotment.

The estimated profitability cannot be considered an accurate reflection of Québec as a whole since it does not include the Estrie, Chaudière-Appalaches and Lanaudière regions.

5. PRINCIPAL FINDINGS AND AREAS FOR IMPROVEMENT

The analysis has yielded certain findings on the profitability of Québec's fir, spruce, jack pine and larch (FSPL) softwood sawmill industry, as well as on the relationship between the industry's supply costs, profitability and competitiveness.

5.1 Main findings on the forestry industry's supply costs and competitiveness issues

❑ Competitiveness of the sawmill industry

According to the results of the comparative Québec-Ontario study, operating costs were lower in Québec than in Ontario in 2010, 2012 and 2014.

Despite greater efficiency in terms of operating costs, the lower relative value of the product mix decreased the profitability of Québec sawmills.

To make Québec sawmills more competitive, some Ontario forestry practices could be applied in Québec, such as a greater load allowance for logging trucks during frost periods, a program to finance forestry roads, and the possibility of not harvesting small trees.

❑ Profitability of the sawmill industry

The results of the financial model created by the Ministère des Finances show that the FSPL softwood sawmill industry was profitable overall in 2014.

However, this overall profitability rests on a fragile balance that, among other things, is due to a favourable situation in the 2014 softwood lumber market.

■ Determinants of profitability

Several factors impact sawmill revenues and expenses, and therefore the profitability recorded per region.

For revenue, the makeup of the product mix and prices obtained for lumber and by-products are two determinants of profitability by zone. In general, the following are observed:

- a product mix with a low lumber content is likely to hurt profitability of a zone;
- relatively low unit sales revenue for by-products can jeopardize a zone's ability to capitalize on all of its production and cover its operating costs.

In terms of expenses, although cost variances arising from resource characteristics are mitigated by the market value of standing timber (MVST) setting mechanism and have a limited impact on profitability, cost variances attributable to below-average operating efficiency due to, for example, the production factors and level of capacity utilization, are not mitigated by the MVST and directly impact profitability from region to region.

Improving mill productivity, better utilization of capacity through consolidation, among other avenues, and adopting more efficient forestry practices can allow a sawmill to increase profitability and become more competitive.

❑ **Operating costs**

Operating costs include all costs, from harvesting roundwood at stump to transporting finished product to the markets.

According to the results of DDM's Survey of operating costs, the average cost of fibre in Québec for FLSP softwood was assessed at \$65.95 per cubic metre in 2014.

— As reference: the comparative Québec-Ontario study estimates that, for the Ontario mills analyzed, the cost of fibre was \$59.16 per cubic metre for the same year.

According to the same sources, in 2014, the average operating cost in Québec was \$113.07 per cubic metre, compared with \$121.15 in Ontario.

■ **Value of standing timber**

Among other objectives, the new forest regime that came into effect on April 1, 2013, was to ensure to the government that timber was sold at a fair price.

In this context, the MVST is established based on the results of sales at auction in the open market, considering in particular the characteristics of the resource and market conditions.

According to historical data, the evolution of the Québec MVST:

- remained stable with respect to prices for finished products after the introduction of the new forest regime;
- is more sensitive to market conditions than Ontario's, and is therefore more representative of the context in which sawmills operate.

■ Sawmill productivity

To improve productivity in the long term, sawmills can, among other things, look to investment, innovation and human capital.

- In the context of diminishing allowable cuts, consolidation within the sector may also increase productivity.

In this respect, factors that may have decreased the industry's capacity to modernize and innovate include relatively low investment in the wood processing industry during the economic downturn, the substantial drop in the allowable cut in the last 10 years (which limited the capacity of sawmills to exploit their production potential), and a shortage of specialized labour.

5.2 Avenues for improving the forestry business environment

The forestry industry is essential to the economy of many Québec regions. Its sustainability requires productive sawmills and the development of a range of products that will permit an increase in the value of their entire output, including by-products.

The findings of the analysis of sawmills' financial situation shows that focusing production on milling generally enables greater profitability. Sawmills could become more productive by:

- adopting new transformation and optimization processes and procedures designed for commodity and niche products;
- basing production decisions on all of the attributes of the fibre;
- optimizing log value based on market demand.

Moreover, the emergence of a green economy and design of new high-value-added products offer opportunities to diversify market for primary wood processing firms, helping make the industry less vulnerable to economic fluctuations that affect commodity products.

In this respect, as noted in the report *Chantier sur la production de bois – le volet économique de la Stratégie d'aménagement durable des forêts*, the primary challenge consists of "getting a few key products from the chemical processing or biorefining of wood fibre to the commercial growth stage by focusing to the greatest extent possible on market mechanisms and forces."³⁵ The pulp and paper industry could, in part, support such redeployment.

Over the medium range, therefore, transformation and diversification of the forestry industry would be partly based on:

- more productive and innovative sawmills and pulp and paper mills;

³⁵ ROBERT BEAUREGARD, *Chantier sur la production de bois, le volet économique de la stratégie d'aménagement durable des forêts, Rapport final, 2015*, p. 18.

- greater synergy among industry components, including traditional sectors and those from the chemical industry or construction material manufacturing, for example.

A number of businesses have already begun the modernization and diversification process. It will take time and substantial investment for this to spread to the industry as a whole.

In this context, the government can play an important role in accelerating the process, for example through actions to improve the business environment and mobilize key players in forestry sector research and innovation.

❑ **Actions already taken**

Some of these actions have already been taken, such as:

- measures to make the tax system more favourable to investment by primary and manufacturing sector businesses. i.e.;
 - gradually lowering, as of January 1, 2017, the general tax rate from 11.9% to 11.5% by 2020,
 - lowering the tax rate from 8% to 4% for manufacturing SMBs since April 1, 2015, and as of January 1, 2017, for primary sector SMBs,
 - an additional deduction for the transportation costs of remote manufacturing SMBs,
 - lowering the Health Services Fund contribution rate from 2.7% to 1.6% for primary sector and manufacturing sector SMBs as of January 1, 2015,
 - competitive electricity rates, particularly the economic development rate,
 - a new, expanded tax holiday for major investment projects. as well as the continuation and five-year extension of the investment tax credit for resource regions;
- Initiatives focused on industry diversification and the development of new outlets, including:
 - the 2015 implementation, in collaboration with Fondation and the Quebec Federation of Forestry Cooperatives, of a \$20.2 million fund to foster development of the forest biomass sector,
 - eligibility of the pulp and paper sector for the Fonds Valorisation Bois with capitalization of \$170 million intended, among other things, for innovation projects enabling the development of new uses of wood fibre,
 - implementation of the Wood Charter, announced in 2013, favouring use of wood in construction and increasing prospects for Québec sawmills;

- various measures announced since the start of 2015-2016 to help reduce the forestry industry's operating costs, such as:
 - a series of extraordinary measures in some regions to permit preventive harvesting of forests affected by the spruce budworm infestation,
 - a program³⁶ to compensate for supplementary operating costs in the territory covered by the agreement between the government of Québec and the Cree Nation (Paix des Braves agreement),
 - \$225 million investment to carry out silviculture work in 2016-2017, allowing businesses to plan activities that will generate timber volumes over the medium and long term.

In addition, the 2015-2016 price schedule for the market value of standing timber was made public in August 2015. The schedule introduced an average drop of 9% in the value of Québec timber in relation to fluctuations in finished product markets.

❑ Areas for improvement resulting from key observations

To follow up on the findings resulting from the work of the Cellule d'intervention forestière, further actions will be needed, however.

Firstly, minimize uncertainty about the wood supply for primary processing plants is critical. Having an adequate supply is important to maintain a processing capacity utilization rate and foster job creation in forestry. It is therefore important to:

- support the implementation of a timber production strategy to increase the allowable cut over the long term and the stability of supply;
- promote the mobilization of private forest timber;
- promote the consolidation of industrial wood processing capacity.

Moreover, some policies could be adapted to allow businesses to seek more efficiency gains in their activities, for example:

- by allowing businesses to have the best possible information on forest inventories, since this information underlies businesses' operational decisions and government decisions on resource management and planning;
- by revising the terms for transporting timber and harvests, particularly with respect to harvesting small trees in the forest that are impeding sawmill productivity;
- by revising the financing of some activities the industry participates in that benefit the community, such as building multi-use roads and protecting forests from fire and disease.

³⁶ Program to maintain forest supply activities on the territory covered by the agreement on new relations between the Québec government and the Cree Nation.

Lastly, it is essential to support innovation in the framework of a concerted long term vision, to make sure the forestry sector is durable and promote forest development. Starting now, the government can be a major factor for the development and demonstration of technologies and the emergence of new industries by promoting partnerships.

It is, however, essential that any actions taken:

- be based on the legal framework provided by the Sustainable Forest Development Act;
- comply with the various free trade agreements, given such factors as potential investigations on countervailing and anti-dumping duties on Québec exporters provided for in the North American Free Trade Agreement (NAFTA) and the World Trade Organization (WTO).

APPENDIX 1: PRODUCTION, EMPLOYMENT, INVESTMENT AND CAPITAL STOCK IN THE FORESTRY SECTOR

❑ Evolution of production by subsector

Since 2005, production in the forestry and logging subsector has held up, while the wood and paper product manufacturing industry had its own dynamics.

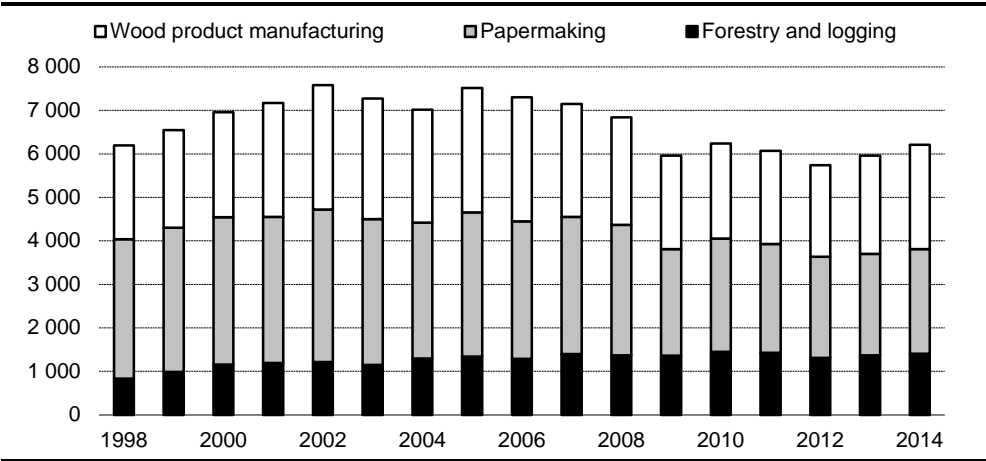
The value of production by the forestry and logging subsector, combined with that of support activities for forestry, went from \$833.8 million in 1998 to \$1 340.1 million in 2005 and \$1 405.0 million dollars in 2014.

Wood product manufacturing is heavily influenced by the economic situation, particularly in the construction industry. The production value of this subsector fluctuated, going from \$2 155.7 million in 1998 to \$2 857.8 million in 2005, and \$2 398.9 million in 2014.

Affected by the decline in newsprint use, the paper manufacturing subsector is undergoing profound restructuring. The value of this subsector's output went from \$3 205.9 million in 1998 to \$3 316.7 million in 2005 and \$2 407.2 million in 2014.

CHART 17

Change in production by subsector in Québec
(millions of real 2007 dollars)



Source: Statistics Canada.

❑ Evolution of forestry employment

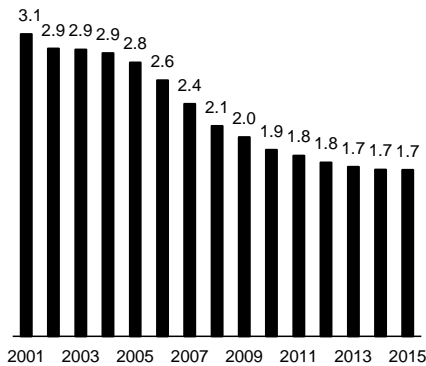
The share of Québec forestry industry direct employment has been declining since 2001. Forestry employed 94 100 people in 2001; the number of employees has slowly declined, dropping to 59 100 in 2015, including:

- 21 800 jobs in the paper manufacturing subsector;
- 28 000 jobs in the wood product manufacturing subsector, of which 9 700 were in sawmills and wood processing plants;
- 9 200 jobs in the forestry and forestry-support activities subsector.

Among other things, the decline is attributable to business closings and the mechanization of some processes.

CHART 18

The forestry sector share of total employment in Québec (per cent)

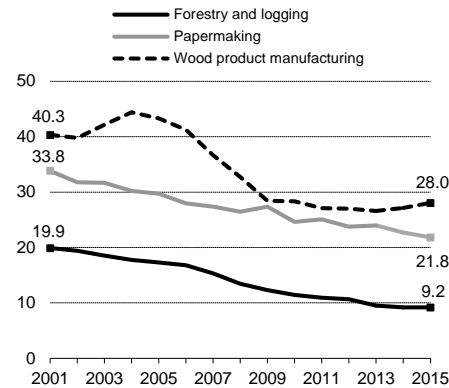


Note: Includes the forestry and logging subsectors (NAICS 113), support activities for forestry (NAICS 1153), wood product manufacturing (NAICS 321) and paper manufacturing (NAICS 322).

Source: Statistics Canada.

CHART 19

Change in forestry employment by subsector in Québec (thousands)



Source: Statistics Canada.

Change in investment and capital stock

In the forestry industry as a whole, investment is recovering to different degrees in the main subsectors:

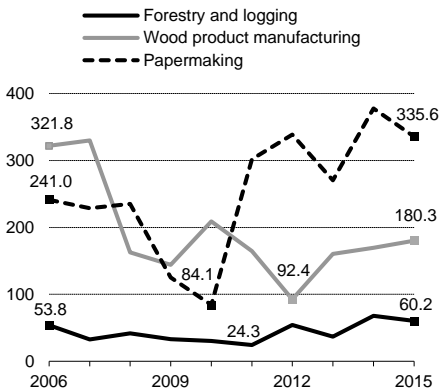
- forestry and logging subsector investment went from \$53.8 million in 2006 to \$24.3 million in 2011 and \$60.2 million in 2015;
- wood product manufacturing subsector investment went from \$321.8 million in 2006 to \$92.4 million in 2012 and \$180.3 million in 2015;
- paper manufacturing subsector investment went from \$241.0 million in 2006 to \$84.1 million in 2010 and \$335.6 million in 2015.

Despite the upswing in investment, forestry capital stock is declining overall.

- The rise of investment in wood product manufacturing is insufficient to compensate for the subsector's decline in capital stock.
- However, in the paper manufacturing subsector, restructuring has resulted in investment growth, keeping the capital stock constant since 2011.

CHART 20

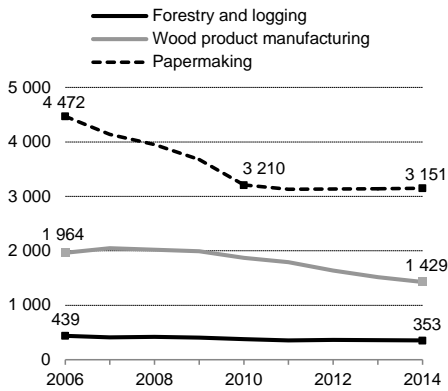
Change in forestry industry investment by subsector in Québec
(millions of dollars)



Source: Statistics Canada.

CHART 21

Change in forestry industry capital stock by subsector in Québec
(millions of dollars)



Source: Statistics Canada.

APPENDIX 2: MAIN MARKETS FOR QUÉBEC WOOD PRODUCTS

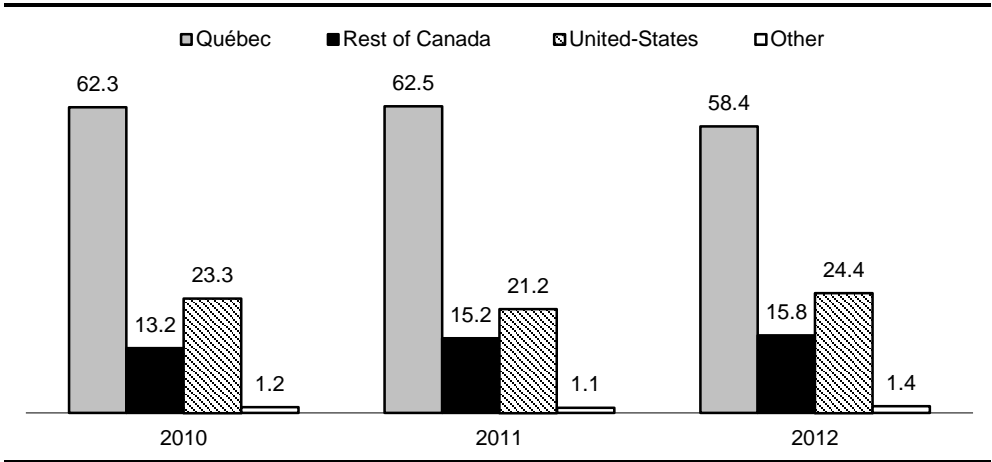
Wood products

The output of the wood product manufacturing subsector primarily goes to Québec.

- In 2012, 58.4% of wood products manufactured in Québec were shipped within Québec, 24.4% were shipped to the United States, and 15.8% went to the rest of Canada.
- Nearly half of sawmill deliveries are exported outside Canada.

CHART 22

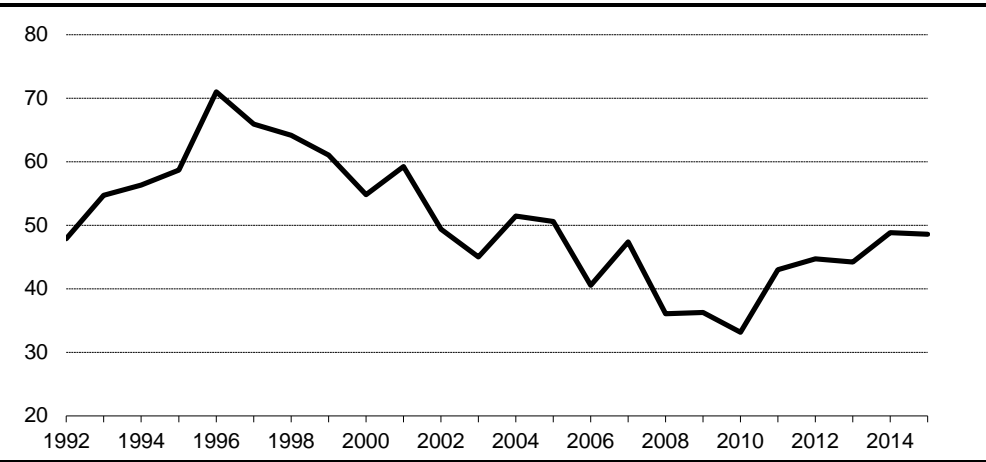
Shipment of wood products by destination
(per cent)



Note: Figures have been rounded off.
Source: Institut de la statistique du Québec.

CHART 23

Proportion of international exports in relation to sawmill shipments
(per cent)



Note: Includes the sawmill sector except for shingle and shake mills (NAICS 321111).

Source: Institut de la statistique du Québec.

❑ Paper products

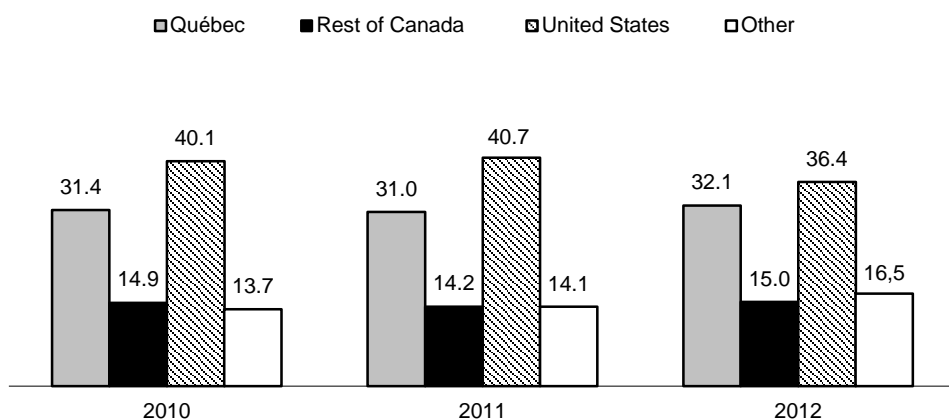
The paper manufacturing subsector primarily ships its products to the United States, Québec and the rest of Canada.

— In 2012, 32.1% of the paper products made in Québec were shipped within Québec.

— For the same year, 36.4% of paper products manufactured in Québec were shipped to the United States, while 15.0% went to the rest of Canada.

CHART 24

Shipment of paper products by destination (per cent)



Note: Figures have been rounded off.

Source: Institut de la statistique du Québec.

❑ Evolution of paper markets

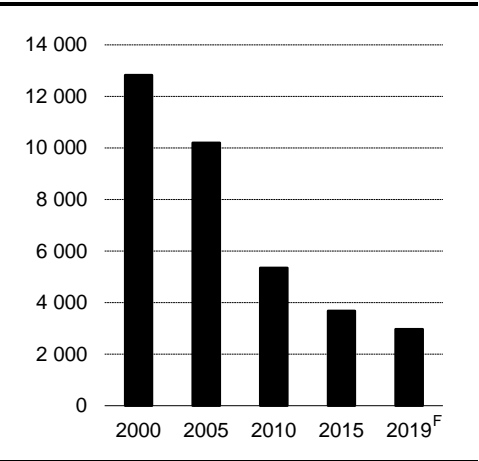
The North American newsprint market has been declining steadily since the start of the 2000s. The market should keep contracting in the coming years.

Printing and writing paper should also keep declining, but not as quickly as newsprint.

CHART 25

North American newsprint consumption

(thousands of metric tonnes)



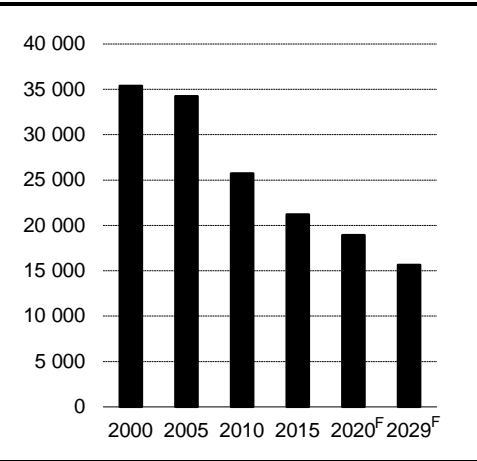
F: Forecast.

Source: RISI. Compilation by the Ministère des Forêts, de la Faune et des Parcs.

CHART 26

Apparent North American consumption of printing and writing paper

(thousands of metric tonnes)



F: Forecasts.

Source: RISI. Compilation by the Ministère des Forêts, de la Faune et des Parcs.

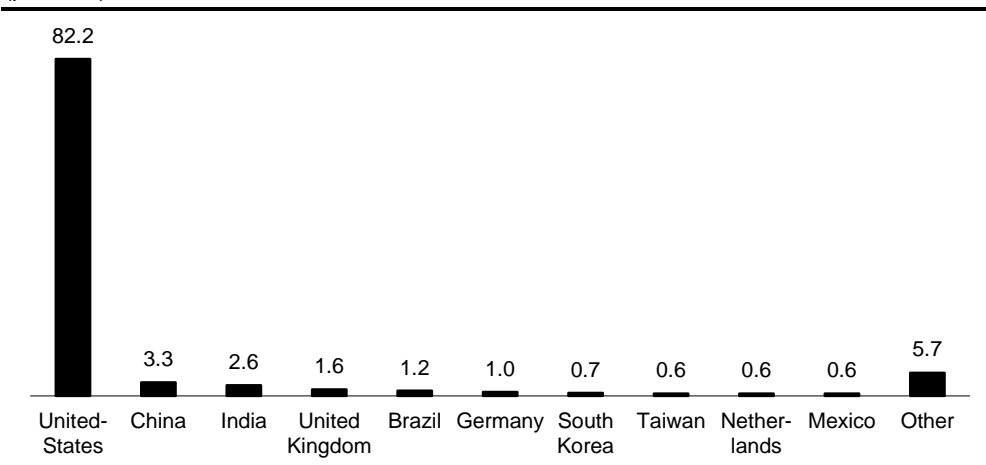
❑ **The United States as primary export market**

Most Québec exports of forest products go to the United States.

- In 2015, more than 80% of Québec forest product exports went to the United States.
- In comparison, China (3.3%) and India (2.6%) rank second and third among countries that import Québec forest products.

CHART 27

Value of forest product exports by destination in 2015
(per cent)



Note: Includes the forestry and logging subsectors (NAICS 113), wood product manufacturing (NAICS 321) and paper manufacturing (NAICS 322).

Source: Institut de la statistique du Québec.

APPENDIX 3: ROLE OF STAKEHOLDERS IN THE NEW FOREST REGIME

☐ **Ministère des Forêts, de la Faune et des Parcs**

The Ministère des Forêts, de la Faune et des Parcs (MFFP) is responsible for the sustainable management of Québec forests. Among other things, its role is to ensure the protection and renewal of the forest while allowing it to be at the core of Québec's economic development. It also oversees the Chief Forester and the Bureau de mise en marché des bois (BMMB) in their respective duties.

The MFFP is also responsible for public consultations with key stakeholders, silviculture work, dissemination of knowledge and the compilation of forest statistics, strategies to protect the forest from fire, insects and disease, as well as the development of policies on wood processing and use.

☐ **Chief Forester**

The Chief Forester's mandate is to:

- establish the methods, means and tools required to calculate allowable cuts in government-owned forests;
- prepare, publish and update a sustainable forest management manual, which governs the components of this mandate while disseminating goals and calculation principles;
- determine the allowable cut for management units and local forests while considering local and regional sustainable development objectives;
- produce a five-year progress report on the state of forests and the results obtained in terms of sustainable management of forests on state-owned property;
- produce notices and observations made on the state and management of forests, advise the Minister on forestry R&D orientation and planning as regards activities to be carried out to optimize forest management strategies, and on any issue deemed important enough to be brought to the attention of the government or that would require government intervention.

❑ Bureau de mise en marché des bois

The BMMB is an administrative unit within the MFFP. Its primary mission is to sell wood and other forest products from government lands on the open market and establish the marketing process. The BMMB fosters optimal use of the resource and maximizes wealth creation from forestry activities for all of Québec society.

To achieve this, the BMMB must fill a variety of functions, such as establishing the minimum volume to sell on the open market and auction mechanisms to be used. For every round of auctions, it must determine, circumscribe and inventory the sections to be auctioned, set starting prices, minimum prices and reserve prices for each sector, and draw up request for proposal documents. In the wake of the auction process, the BMMB is designing a marketing platform, creating a register of auctioneers, and pre-determining how the wood will be measured and invoiced.

The BMMB also has other related functions. For example, it sets the market value of wood offered as a supply guarantee, conducts economic studies pertaining to the forestry industry, and publishes a variety of manuals, including the *Manuel de mise en marché des bois*, as well as an annual report.

APPENDIX 4: REGIONAL STATISTICS ON THE ALLOWABLE CUT AND HARVEST OF FSPL SOFTWOOD IN PUBLIC FORESTS

TABLE 13

**Allowable cut, assignment and harvest of FSPL in Québec's
public forests and supply guarantee application regions – 2014-2015**
(in millions of cubic metres, unless otherwise indicated)

	Allowable cut		Assignment		Harvest	
	Volume (Mm ³)	Québec share	Volume (Mm ³)	Québec share	Volume (Mm ³)	Québec share
01 – Bas-Saint-Laurent	0.5	2.6 %	0.5	2.9%	0.7	4.1%
02 – Saguenay–Lac-Saint-Jean	5.2	27.2%	5.0	29.0%	5.2	30.5%
03 – Capitale-Nationale	0.4	1.9 %	0.3	1.8%	0.3	1.9%
04 – Mauricie	2.3	11.8%	2.1	12.2%	2.1	12.4%
05 – Estrie	0.0	0.1 %	0.0	0.1%	0.0	0.2%
07 – Outaouais	0.7	3.7 %	0.6	3.6%	0.6	3.5%
08 – Abitibi-Témiscamingue	1.8	9.5%	1.8	10.3 %	1.5	9.1%
09 – Côte-Nord	3.0	15.6%	2.0	11.9%	1.7	10.1%
10 – Nord-du-Québec	3.3	17.0%	3.2	18.7%	3.0	18.0%
11 – Gaspésie–Îles-de-la-Madeleine	1.1	5.6 %	1.0	5.7%	1.0	6.0%
12 – Chaudière-Appalaches	0.1	0.7 %	0.1	0.7%	0.1	0.7%
14 – Lanaudière	0.2	1.2 %	0.1	0.4%	0.2	0.9%
15 – Laurentides	0.6	3.0 %	0.5	2.8%	0.5	2.8%
Québec⁽¹⁾	19.3	100%	17.2	100%	17.0	100%

Note: Due to rounding, numbers may not add up to the total indicated.

(1) The total for Québec is calculated at the level of the thirteen supply guarantee application regions.

Source: Québec forest registers. Compilation by the Ministère des Finances du Québec.

TABLE 14

**Each source's share in total FSPL supply of sawmills located
in regions – 2014**
(per cent)

	Public forests	Private forests	Other	Total
01 – Bas-Saint-Laurent	62.6	35.6	1.8	100.0
02 – Saguenay–Lac-Saint-Jean	95.4	4.6	0.0	100.0
03 – Capitale-Nationale	65.2	34.8	0.1	100.0
04 – Mauricie	92.4	7.6	0.0	100.0
05 – Estrie	0.1	59.4	40.4	100.0
07 – Outaouais	88.6	10.3	1.1	100.0
08 – Abitibi-Témiscamingue	88.6	4.5	6.9	100.0
09 – Côte-Nord	89.2	10.8	0.0	100.0
10 – Nord-du-Québec	94.7	5.3	0.0	100.0
11 – Gaspésie–Îles-de-la-Madeleine	84.4	15.5	0.1	100.0
12 – Chaudière-Appalaches	6.5	30.4	63.1	100.0
14 – Lanaudière	89.9	6.5	3.7	100.0
15 – Laurentides	92.1	6.2	1.7	100.0
16 – Montérégie	0.0	60.3	39.7	100.0
17 – Centre-du-Québec	0.0	100.0	0.0	100.0
Weighted average	79.1	12.6	8.4	100.0

Note: Due to rounding, numbers may not add up to the total indicated.

Source: Québec forest registers. Compilation by the Ministère des Forêts, de la Faune et des Parcs and Ministère des Finances du Québec.

APPENDIX 5: TRANSPOSITION EQUATION

❑ The transposition equation and factors that influence timber value

Forest characteristics have repercussions for harvest costs, sawmills processing costs and product value, and therefore on the market value of timber.

Using a database of all public forest auction sales, the Bureau de mise en marché des bois (BMMB) uses a statistical method to determine the relationship between forest characteristics and the value of the timber calculated in dollars per cubic metre. This makes it possible to transpose the results of auction sales to the value of timber under guarantee and define an annual price schedule for supply guarantee timber sold by species, quality and pricing zone. The schedule is indexed every quarter to the change in market prices for forest products.

A minimum number of observations is required to ensure that the models yield reliable results. The transposition equation was therefore added to the market value of standing timber (MVST) calculation as of 2015-2016, although the new plan has been in force since 2013. For 2015-2016, the method is based on a total of 261 sales in softwood forest comprised of 75% or more fir, spruce, jack pine and larch (FSPL), and 175 sales in mixed and hardwood forests. Upcoming auctions will be added to the number of observations in years to come.

■ Methodology details

Statistical analysis shows that two separate models are required to properly assess the impact of timber characteristics on price, that is, a model for softwood forests and a model for mixed and hardwood forests.

Among other things, the models contain the following variables:

- transportation distances and costs to mills and markets;
- wood volumes by hectare and tree;
- proportion of some species, like spruce and fir;
- the costs and difficulty of building and repairing roads;
- difficulty in harvesting the timber;
- net revenue of mills.

Several of the variables used are calibrated using the sawmill operational cost survey. The survey is done every five years. The latest update dealt with 2014. This makes it possible to determine the industry's costs for building logging roads, for example, and revenue per pricing zone.

Each variable in the transposition equation of the softwood model has an impact on the MVST calculation. The magnitude of that influence varies depending on the variable's weight and range in the equation. For the 2015-2016 equation, the most important variables are, in order:

- transportation distance to the mill;
- the proportion of FSPL softwood in the sector;
- net mill revenue;
- timber volume per hectare.

APPENDIX 6: PRIMARY CHARACTERISTICS OF THE FSPL RESOURCE IN PUBLIC FORESTS

TABLE 15

Certain biophysical characteristics of the FSPL resource in Québec and regions 01, 02, 03, 04, 05 – 2015-2016

Characteristics	Bas-Saint-Laurent (01)	Saguenay–Lac-St-Jean (02)	Capitale-Nationale (03)	Mauricie (04)	Estrie (05)	Public forests
Volume per hectare (m ³ /ha)	167	109	114	130	130	116
Volume per tree, all species (dm ³)	163	111	118	148	187	121
Softwood, proportion of volume/ha (%)	71	84	72	70	49	78
Proportion of rot (%)	5.4	1.7	2.0	2.0	3.9	2.2
Transportation distance to mill (km)	70	136	108	121	50	151
Average DBH (cm)	23	20	20	21	21	20
Taper (cm/m)	1.38	1.24	1.38	1.23	1.40	1.25
Portion of net volume⁽¹⁾						
– Spruce (%)	32	63	41	49	23	60
– Fir (%)	68	23	59	26	77	26
– Jack pine (%)	0	14	0	25	0	14

Note : The characteristics are defined as follows:

- Volume per hectare: the volume of merchantable timber available in a hectare;
- Volume per tree: the volume of merchantable wood available per tree;
- Softwood proportion of volume/hectare: proportion of the volume of FSPL softwood available per total hectare;
- Proportion of rot: proportion of a total volume in which the wood has been physically deteriorated, making it unfit for milling;
- Transportation distance to mill: transportation distance between the forest harvest site and processing site (mill);
- Portion of net volume - Spruce: proportion of FSPL softwood volume of spruce;
- Portion of net volume - Fir: proportion of FSPL softwood volume of fir;
- Portion of net volume – Jack pine: proportion of FSPL softwood volume of jack pine;
- Average DBH: average diameter of a tree at breast height (130 cm);
- Taper: decrease in a tree's diameter from the base of the trunk to the crown.

(1) The larch portion of the volume is not considered because it is less than 1%.

Source: Ministère des Forêts, de la Faune et des Parcs.

TABLE 16

**Certain biophysical characteristics of the FSPL resource in Québec regions
07, 08, 09 and 10 – 2015-2016**

Characteristics	Outaouais (07)	Abitibi- Témiscamingue (08)	Côte-Nord (09)	Nord-du- Québec (10)	Public forests
Volume per hectare (m ³ /ha)	116	109	105	101	116
Volume per tree, all species (dm ³)	188	129	105	97	121
Softwood, proportion of volume/ha (%)	54	82	100	97	78
Proportion of rot (%)	1.9	2.0	3.9	1.3	2.2
Transportation distance to mill (km)	175	116	224	148	151
Average DBH (cm)	21	20	20	18	20
Taper (cm/m)	1.22	1.18	1.33	1.20	1.25
Portion of net volume⁽¹⁾					
– Spruce (%)	58	65	62	76	60
– Fir (%)	32	11	36	5	26
– Jack pine (%)	10	24	2	20	14

Note : The characteristics are defined as follows:

- Volume per hectare: the volume of merchantable timber available in a hectare;
- Volume per tree: the volume of merchantable wood available per tree;
- Softwood proportion of volume/hectare: proportion of the volume of FSPL softwood available per total hectare;
- Proportion of rot: proportion of a total volume in which the wood has been physically deteriorated, making it unfit for milling;
- Transportation distance to mill: transportation distance between the forest harvest site and processing site (mill);
- Portion of net volume - Spruce: proportion of FSPL softwood volume of spruce;
- Portion of net volume - Fir: proportion of FSPL softwood volume of fir;
- Portion of net volume - Jack pine: proportion of FSPL softwood volume of jack pine;
- Average DBH: average diameter of a tree at breast height (130 cm);
- Taper: decrease in a tree's diameter from the base of the trunk to the crown.

(1) The larch portion of the volume is not considered because it is less than 1%.

Source: Ministère des Forêts, de la Faune et des Parcs.

TABLE 17

Certain biophysical characteristics of the FSPL resource in Québec and regions 11, 12, 14 and 15 – 2015-2016

Characteristics	Gaspésie– Îles-de-la- Madeleine (11)	Chaudière- Appalaches (12)	Lanaudière (14)	Laurentides (15)	Public forests
Volume per hectare (m ³ /ha)	142	144	145	124	116
Volume per tree, all species (dm ³)	126	174	180	173	121
Softwood, proportion of volume/ha (%)	83	60	48	65	78
Proportion of rot (%)	4.6	2.5	4.2	3.0	2.2
Transportation distance to mill (km)	97	61	89	121	151
Average DBH (cm)	21	22	22	21	20
Taper (cm/m)	1.39	1.35	1.31	1.23	1.25
Portion of net volume⁽¹⁾					
– Spruce (%)	43	46	28	57	60
– Fir (%)	57	54	70	32	26
– Jack pine (%)	0	0	3	11	14

Note : The characteristics are defined as follows:

- Volume per hectare: the volume of merchantable timber available in a hectare;
- Volume per tree: the volume of merchantable wood available per tree;
- Softwood proportion of volume/hectare: proportion of the volume of FSPL softwood available per total hectare;
- Proportion of rot: proportion of a total volume in which the wood has been physically deteriorated, making it unfit for milling;
- Transportation distance to mill: transportation distance between the forest harvest site and processing site (mill);
- Portion of net volume - Spruce: proportion of FSPL softwood volume of spruce;
- Portion of net volume - Fir: proportion of FSPL softwood volume of fir;
- Portion of net volume - Jack pine: proportion of FSPL softwood volume of jack pine;
- Average DBH: average diameter of a tree at breast height (130 cm);
- Taper: decrease in a tree's diameter from the base of the trunk to the crown.

(1) The larch portion of the volume is not considered because it is less than 1%.

Source: Ministère des Forêts, de la Faune et des Parcs.

APPENDIX 7: GLOSSARY

TABLE 18

List of acronyms

BMMB	Bureau de mise en marché des bois
DBH	Diameter at breast height
FSPL	Fir, spruce, jack pine and larch
GDP	Gross domestic product
MD	Management delegation agreement
MFFP	Ministère des Forêts, de la Faune et des Parcs
MVST	Market value of standing timber
NAFTA	North American Free Trade Agreement
NAICS	North American Industry Classification System
PHSM	Permit to harvest to supply a wood processing mill
QFIC	Québec Forest Industry Council
SFDA	Sustainable Forest Development Act
SG	Supply guarantee
SLA	Softwood lumber agreement
SMB	Small and medium-sized businesses
SOPFEU	Société de protection des forêts contre le feu
SOPFIM	Société de protection des forêts contre les insectes et maladies
TMA	Territory management agreement
TSFMA	Timber supply and forest management contract
USDA	U.S. Department of Agriculture
WTO	World Trade Organization

TABLE 19

List of units of measure

Designator	Description
\$/dmt	Dollars per-dry metric tonne
\$/m ³	Dollars per cubic metre
\$/Mfbm	Dollars per thousand board-foot measure
cm	Centimetre
cm/m	Centimetre per metre
d ³	Cubic decimetre
dmt	Dry metric tonne
fbm	Board-foot
ha	Hectare
km	Kilometre
km ²	Square kilometre
m ³	Cubic metre
m ³ /ha	Cubic metre per hectare
m ³ /Mfbm	Cubic metre per thousand board-foot measure
Mfbm	Thousand board-foot measure
Mm ³	Millions of cubic metres
Mmt	Millions of metric tonnes
mt	Metric tonne
US\$	U.S. dollars

TABLE 20

Conversion factors

1 board foot	Piece of wood that is a nominal 1 inch thick by a nominal 1 foot wide by 1 foot long
1 square kilometre	100 hectares (0.386 of a square mile)

