



Market analysis Availability of forest products and by-products Eastern Canada

Client

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1. Introduction

SGS has been assigned by Electrabel to analyse the market availability of the feedstock used to produce wood pellets in Canada, in order to assess to what extent the use of those materials for energy purpose might compete with the industrial use of those resources both locally and internationally.

This report will cover the following wood resources used as raw material by pellet producers in Eastern Canada :

- Residues of forest exploitation
- Round from forest thinning & harvesting
- Wood processing residues

The industrial activities concerned by those materials are:

- sawmills
- pulp and paper
- wood panels production

The geographic range called Eastern Canada, and covered by the analysis includes the Provinces of

- Quebec (QC)
- Ontario (ON)
- New Brunswick (NB)
- Newfoundland & Labrador (NL)



Figure 1 : Geographic scope of this assessment
(map source : E Pluribus Anthony on Wikimedia Commons, 2006)

2. Production volumes

2.1. Harvested volumes

According to the most recent statistics available from the FAO to data¹ (Figure 2) the production of roundwood in Canada in 2016 was 162.6 million m³. It shows a progressive increase since 2010 after radical decrease of about 45% experienced between 2004 and 2010, because of the economic downturn (especially in the housing sector of the US which is a major driver for the exports of Canadian lumber). The current production levels are still far below the production levels of 2004 (208 million m³), even though the forest economy seems to recover slowly.

An identical trend can be observed in Eastern Canada (Figure 3), where the total volumes of roundwood dropped sharply from 2005 until 2009. Despite a slow recovery from 2010 onwards, the levels of roundwood production in 2014 (33 million m³) are still much lower than the levels

¹ http://faostat3.fao.org/faostat-gateway/go/to/browse/F/*/E

recorded before the crisis (50 million m³ in 2004), even though they are comparable to the levels achieved at the beginning of the years 1990ies.

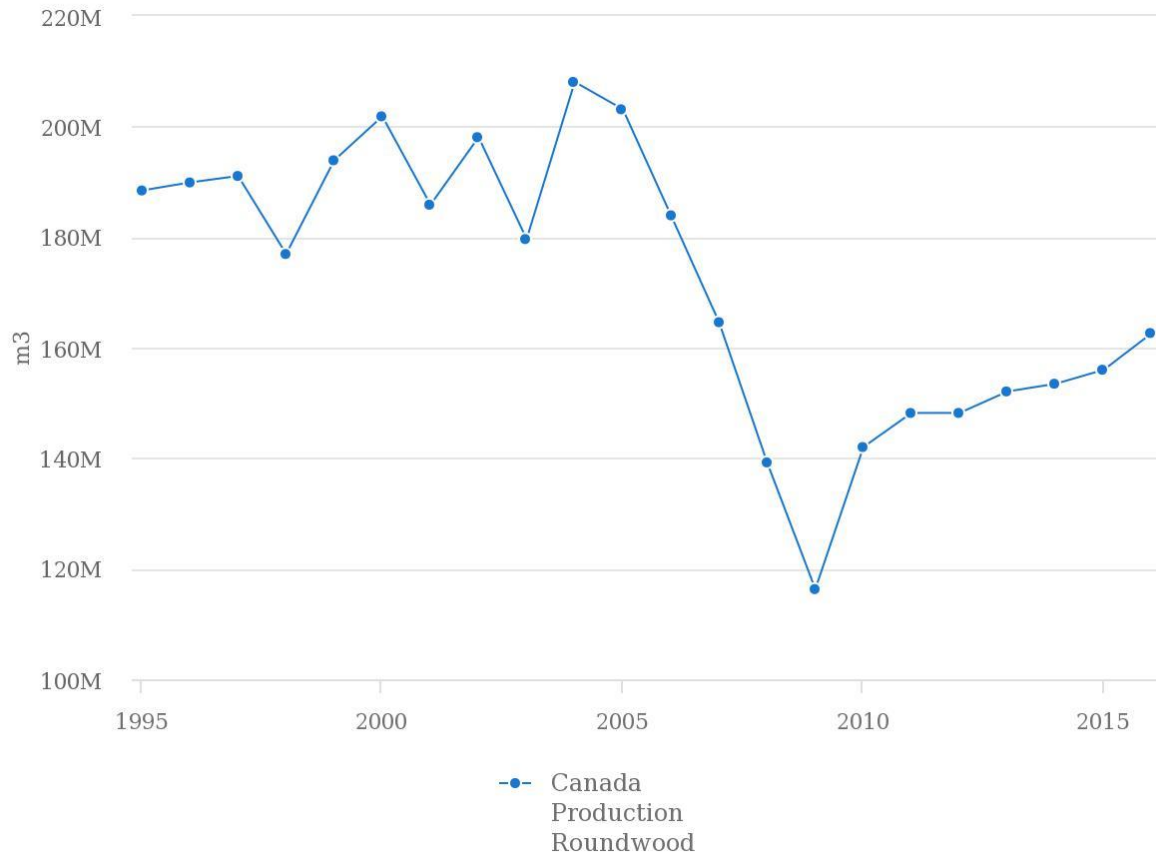


Figure 2 : Production of roundwood in Canada (1995-2016)
(source : FAOstat)

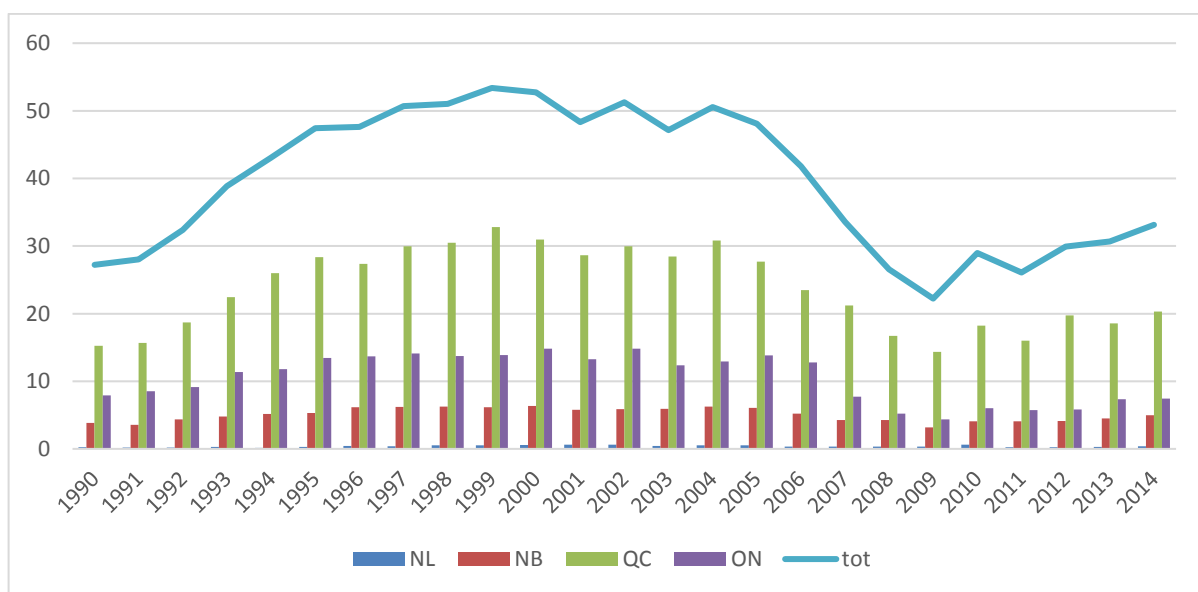


Figure 3 : Production of roundwood in Eastern Canada (1990-2014) in million m³
(source : national forestry database <http://nfdp.ccfm.org>)

2.1. Production volumes per types

As can be seen on Figure 4, the production of pulp for paper, sawnwood and wood-based panels has also been decreasing in Canada after 2005, following a similar trend as the roundwood production. Even though there has been a recovery of sawnwood and wood based panels from 2010 onwards, the pulps and paper sector keeps on struggling and a recovery is unlikely as many facilities have been driven out of business. The production capacity has decreased dramatically.

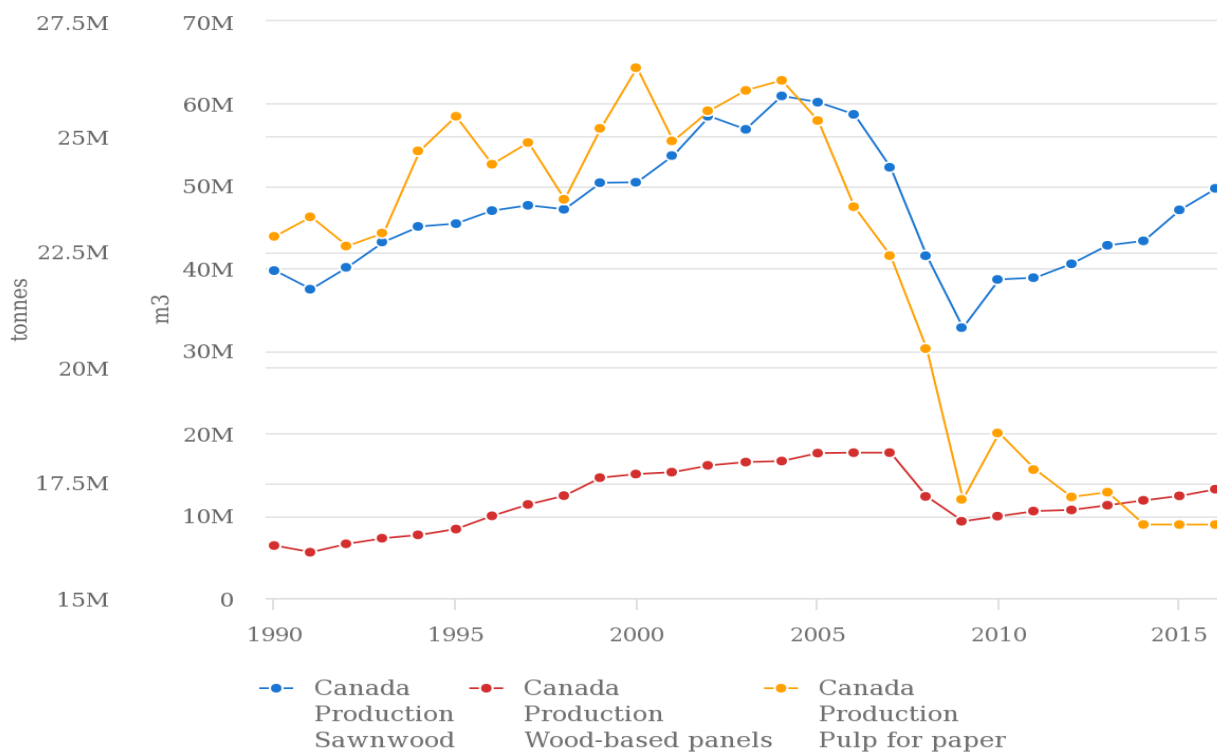


Figure 4 : Production of pulp for paper (tonnes), sawnwood (m³) and wood-based panels (m³) in Canada between 1990 and 2016
(source : FAOstat)

The same trend can be identified in the four considered provinces in Eastern Canada. As can be seen on Figure 5, the volume of sawnwood in NL, NB, Qc and ON has decrease from 2003 through 2010 and has recovered afterwards to reach 25 million m³ in 2017 (approximately half the sawnwood production of Canada).

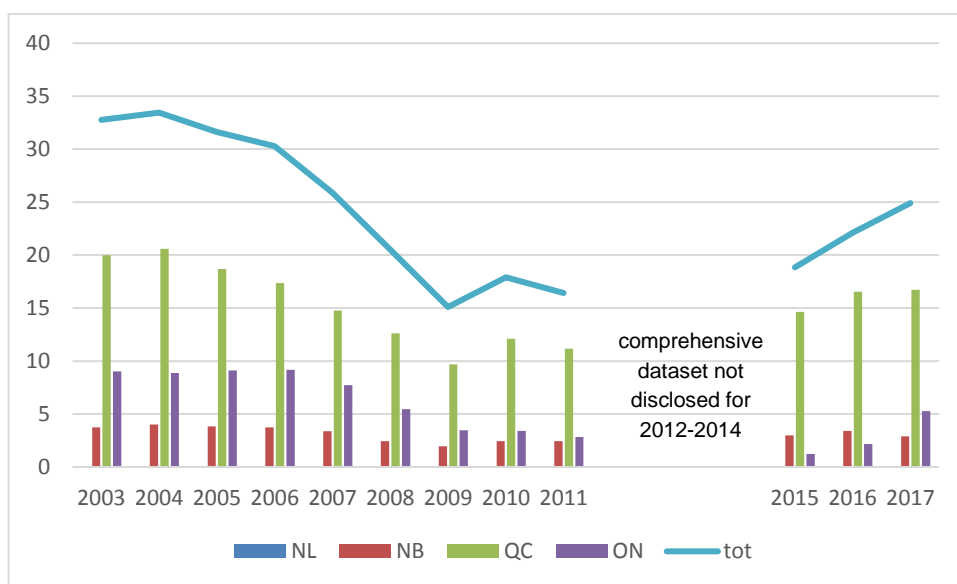


Figure 5 : Production of sawnwood (lumber) in Eastern Canada (2003-2017) in million m³
(source : Statistics Canada <http://www5.statcan.gc.ca/cansim/a47>)

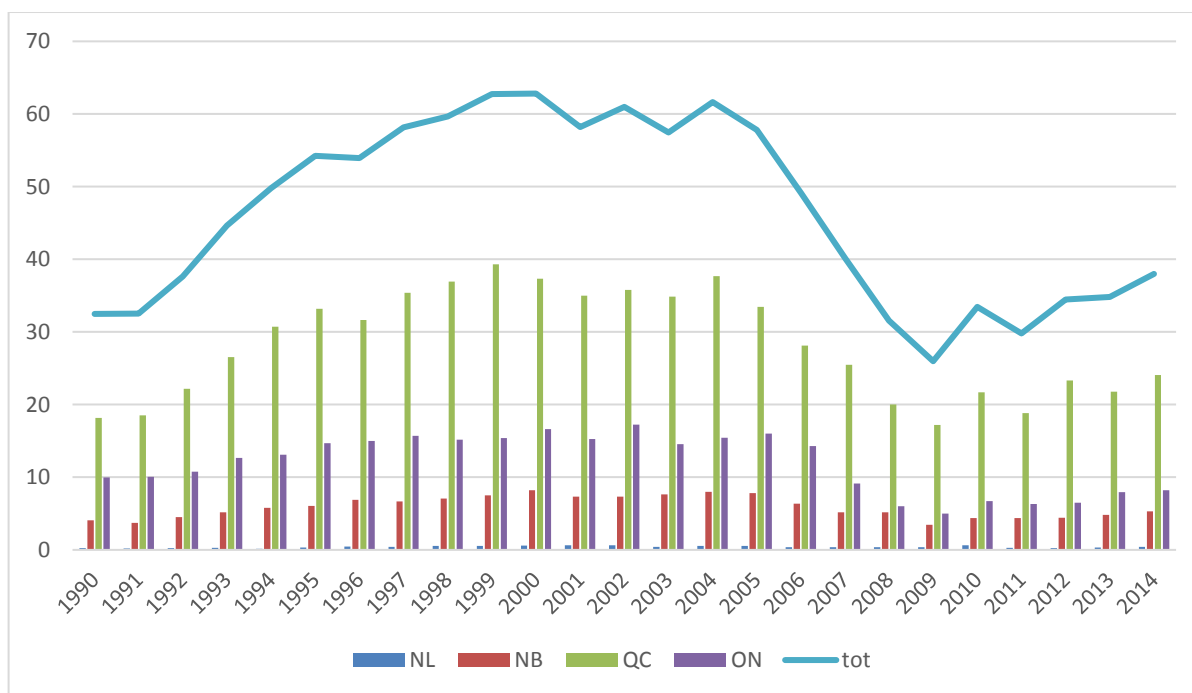


Figure 6 : Production of logs and bolts in Eastern Canada (1990-2014) in million m³
(source : national forestry database <http://nfdp.ccfm.org>)

As can be seen on Figure 6 the production of “logs and bolts” (used to produce sawnwood and veneer in the first place, and generating residues for other uses) has dramatically decreased in Eastern Canada between 2003 and 2010, before showing signs of recovery after 2010. This is

the same pattern as observed for sawnwood production in Canada as a whole (Figure 4) and in the four eastern provinces in particular (Figure 5).

Most of the wood harvested in the considered provinces of Eastern Canada consist in “logs and bolts” with 40 million m³ produced in 2014 (Figure 6). Other types of wood account for much smaller volumes, with 12 million m³ pulpwood (Figure 7), 2 million m³ for other industrial uses (Figure 8) and 2 million m³ for firewood (Figure 9).

On Figure 7, we can see that the trend for pulpwood is a constant decrease in the considered provinces of Eastern Canada, as it is in Canada as a whole (Figure 4). The total pulpwood production of the four considered provinces has decreased by 50% since 1990, even though it was rather stable in New Brunswick. The paper sector has been experiencing a decline due the reduced demand of paper products in general (and newsprint in particular), as well as sharp competition against cheaper Asian alternatives.

On Figure 8, we can see that other types of industrial wood (such as wood posts) features an irregular pattern but remains marginal.

On Figure 9, we can see the spectacular increase of firewood from 2010 onwards. This category reflects both the domestic and the industrial use of wood energy. The sharp increase in the use of wood energy is essentially due to Ontario, where the decision has been made to phase out coal fired power plant between 2010 and 2013 ². The coal production capacity has been replaced by increasing the share of nuclear, gas and non-hydro renewables (i.e. wind, sun and biomass mostly) in the mix. Hence a reliance on wood energy during this period.

² <https://www.ontario.ca/page/end-coal>

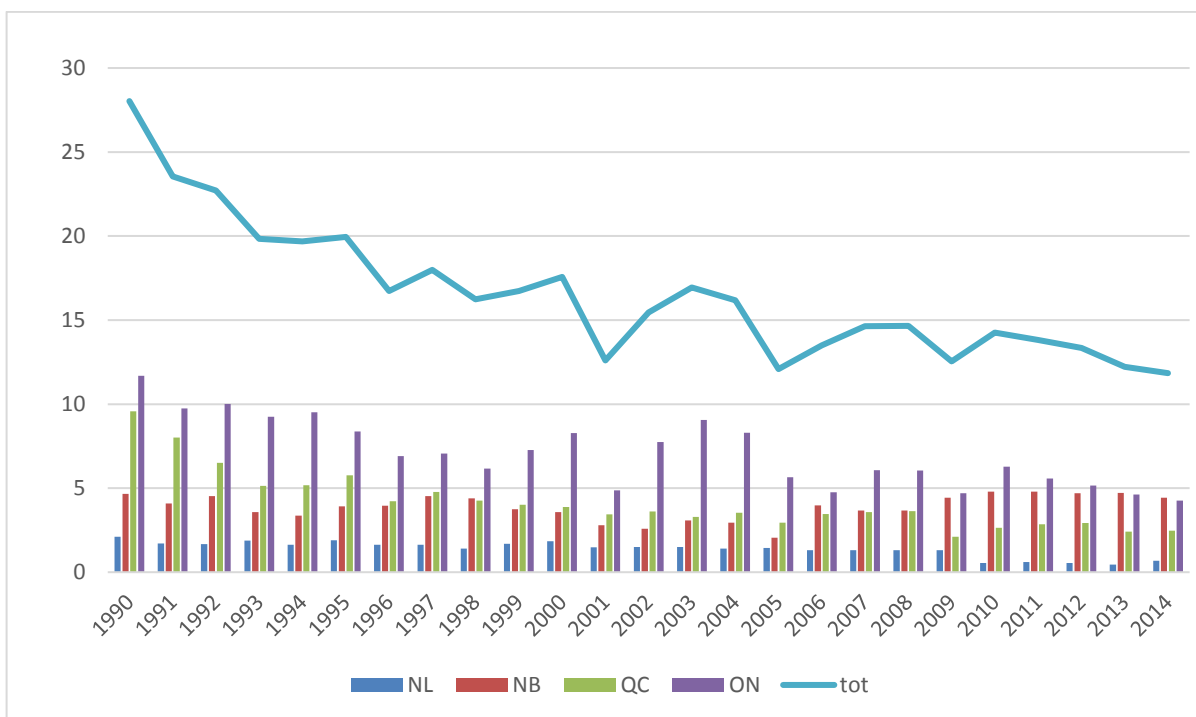


Figure 7 : Production of pulpwood in Eastern Canada (1990-2014) in million m³
(source : national forestry database <http://nfdp.ccfm.org>)

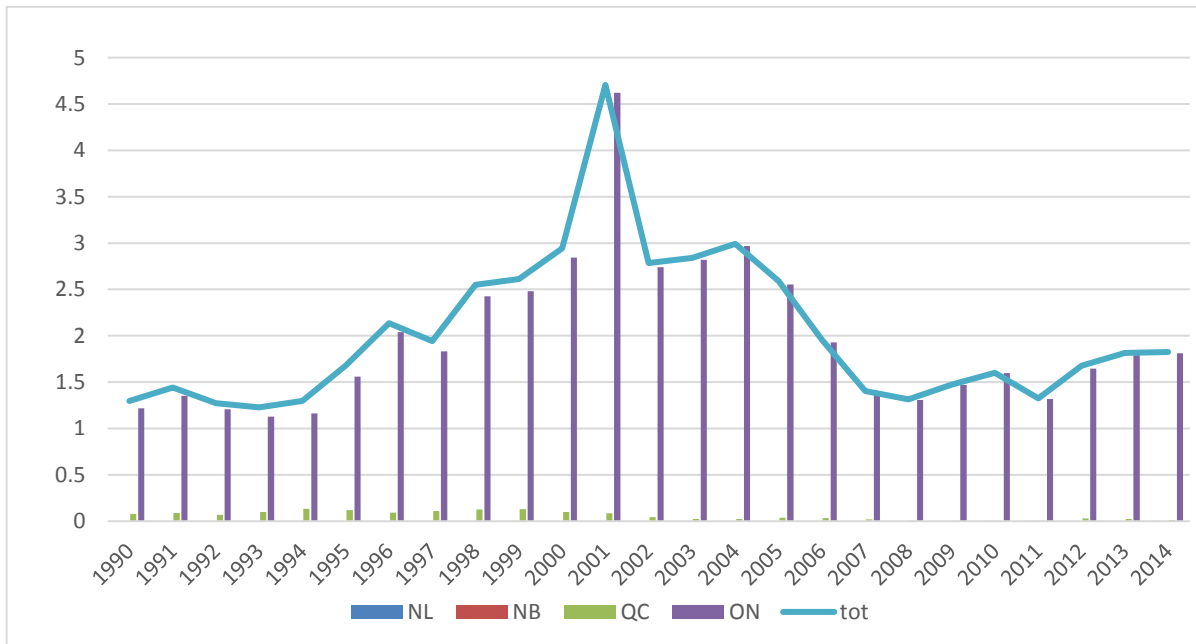


Figure 8 : Production of other industrial wood in Eastern Canada (1990-2014) in million m³
(source : national forestry database <http://nfdp.ccfm.org>)

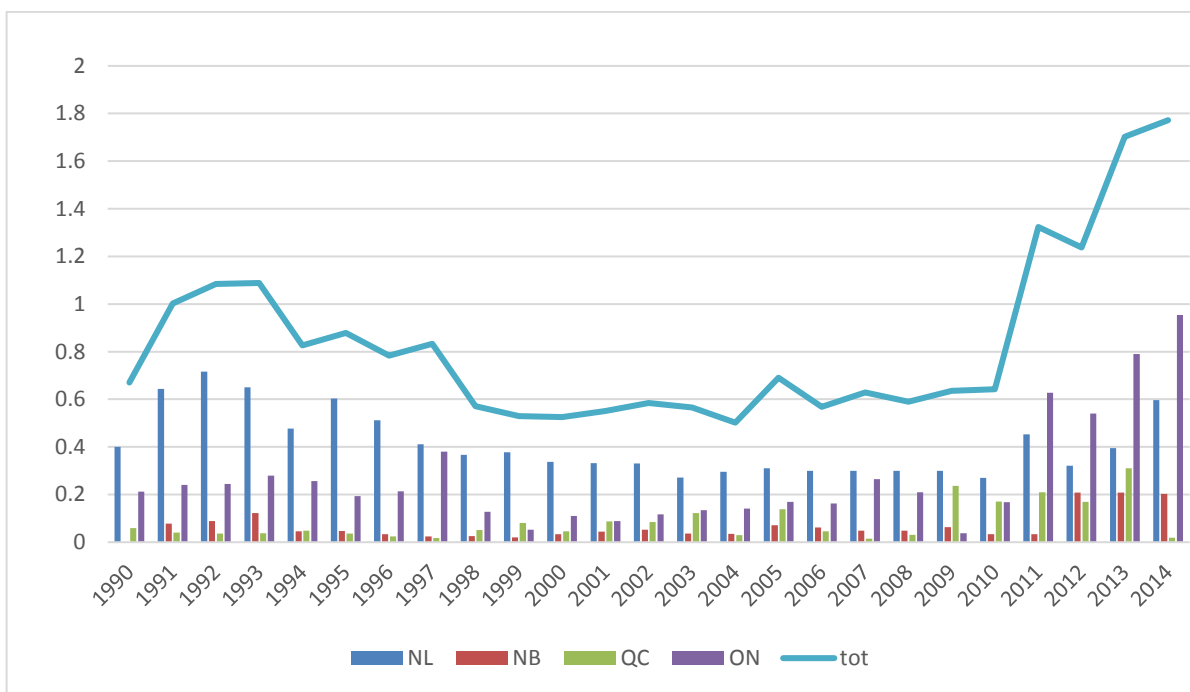


Figure 9 : Production of domestic and industrial firewood in Eastern Canada (1990-2014) in million m³

(source : national forestry database <http://nfdp.ccfm.org>)

3. Forest exploitation levels

The volumes of harvested wood in Eastern Canada is compared to the annual increment in the respective SGS report on forest sustainability.

A central concept in forest management and in forest economics is the Wood Supply, which reflects the potential sustainable harvest. According to the National Forestry Database³, *it refers to an allowable volume of timber that can be harvested over a specified period of time.* On Crown Land, the Wood Supply is also referred to as Annual Allowable Cuts, which is the maximum amount of wood that the authorized operator of the respective forest management unit is allowed to harvest. Each province estimates their potential harvest levels or ACCs on lands under their jurisdiction.

In Canada, we can see that the actual cut always remains below the level of wood supply and that the gap between both was especially large in the period 2005-2010 because of the reduced commercial harvesting during this period (Figure 10).

³ http://nfdp.ccfm.org/supply/background_e.php

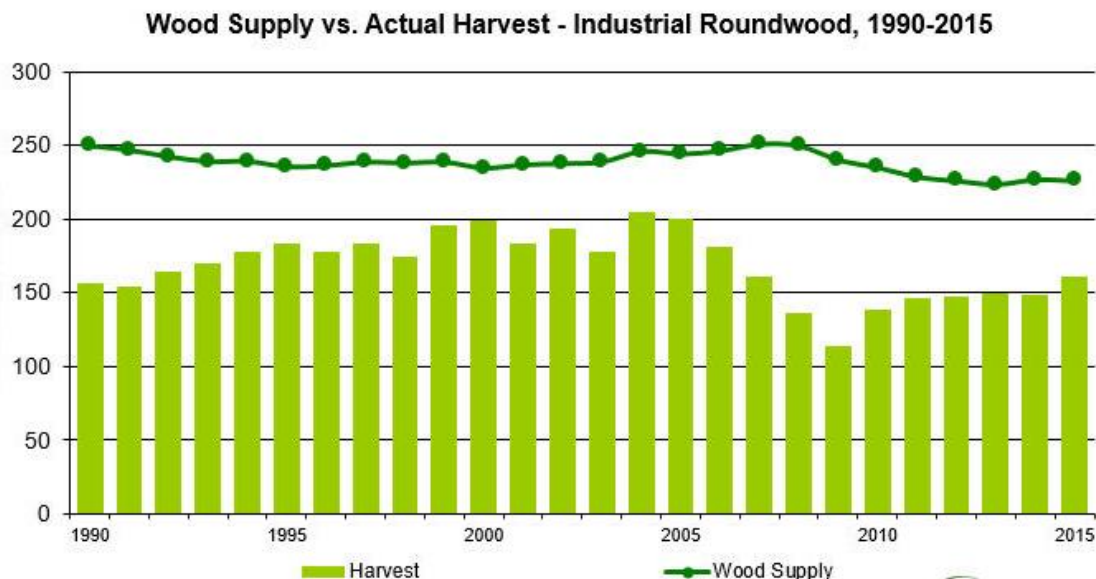


Figure 10 : Comparison of estimated sustainable wood supply and actual wood harvest in Canada (1990-2015) in million m³

(source : national forestry database <http://nfdp.ccfm.org>)

The same trend can be observed in NL, NB, QC and ON (Figure 11), even though the gap between the available wood supply and the actual remains considerable even after 2010, as the level of harvesting tend to increase more slowly in Eastern Canada than on the West Coast. This reflects a very parsimonious use of the available wood resources through time the vast stocks of living wood and the persisting difficulties of the forest sector in Eastern Canada. The existence of a considerable gap between sustainable Wood Supply and levels of harvesting also means that the availability of feedstock is not a limiting factor for further development of wood-based products in Eastern Canada for the time being.

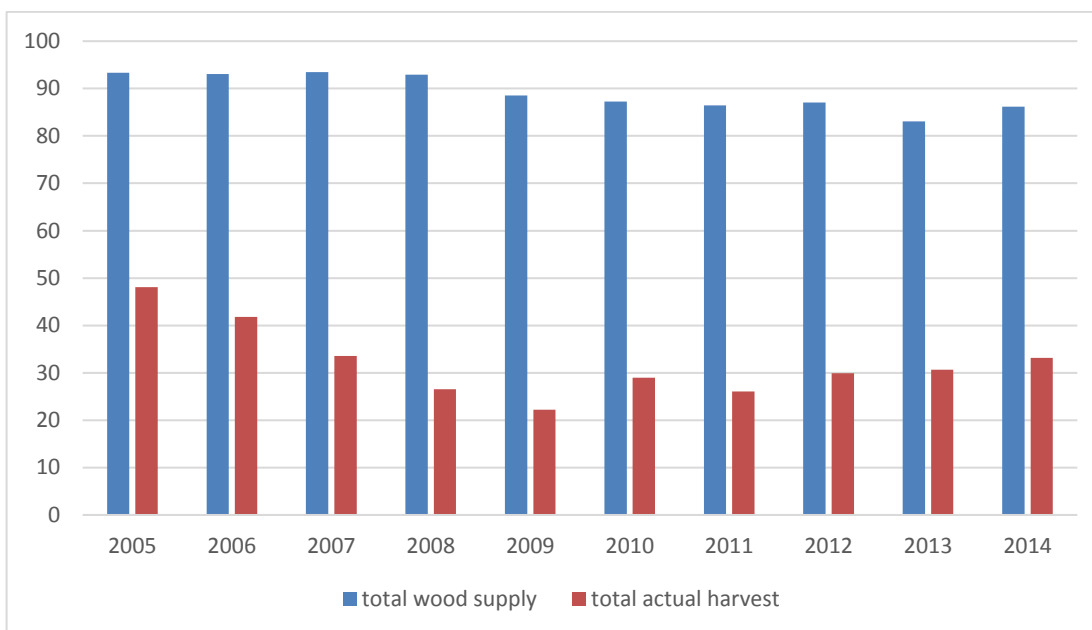


Figure 11 : Comparison of estimated sustainable wood supply and actual wood harvest in Eastern Canada (2005-2014) in million m³ (NL,NB, QC, ON)
(source : national forestry database <http://nfdp.ccfm.org>)

4. Price of wood resources

Because of massive exports of Canadian sawnwood to the USA, it is common practice in Canada to refer to USA's Random Lengths softwood lumber composite price when analysing the trends in lumber prices (Figure 12).

Lumber prices in North America have fallen between 2005 and 2009 in relationship with the Mortgage Subprime Crisis. Even though they have not yet recovered up to the levels of 2005, the most recent figure show that they have reached a level which is close to the average of the last 30 years (if prices are corrected to take into account the inflation).

Figure 13 present price indices for the price of sawnwood in Canada feature

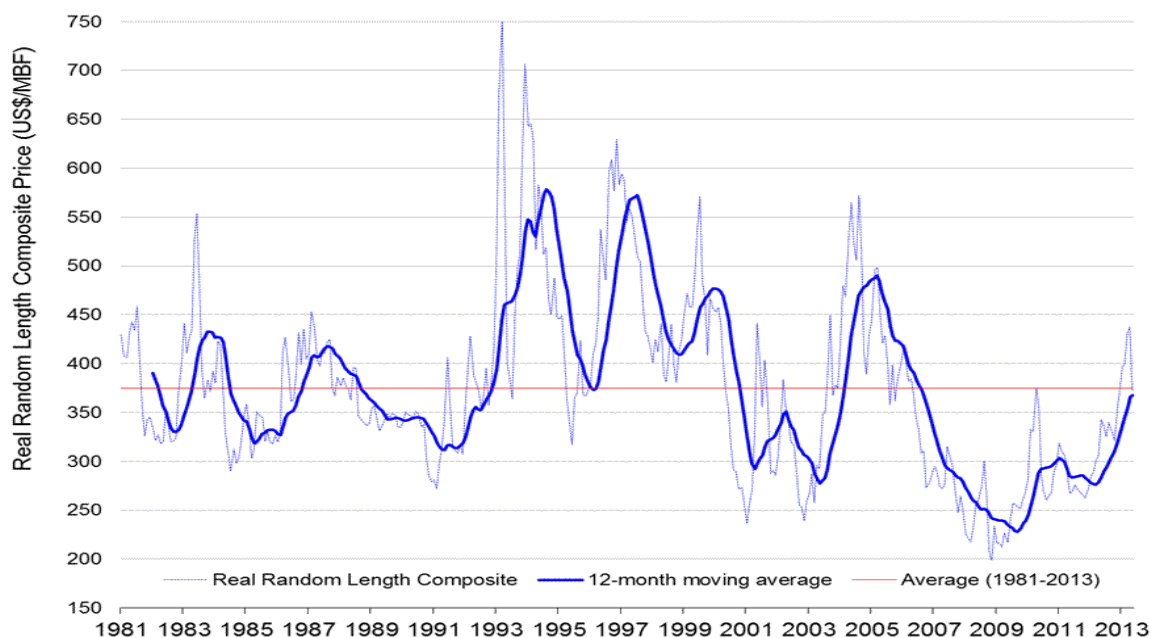


Figure 12 : Random Lengths softwood lumber composite price (1995-2012), in USD/MBF

All prices converted in May 2013 dollars for the purpose of the comparison

(source : Natural Resource Canada <https://cfs.nrcan.gc.ca/selective-cuttings/50>)

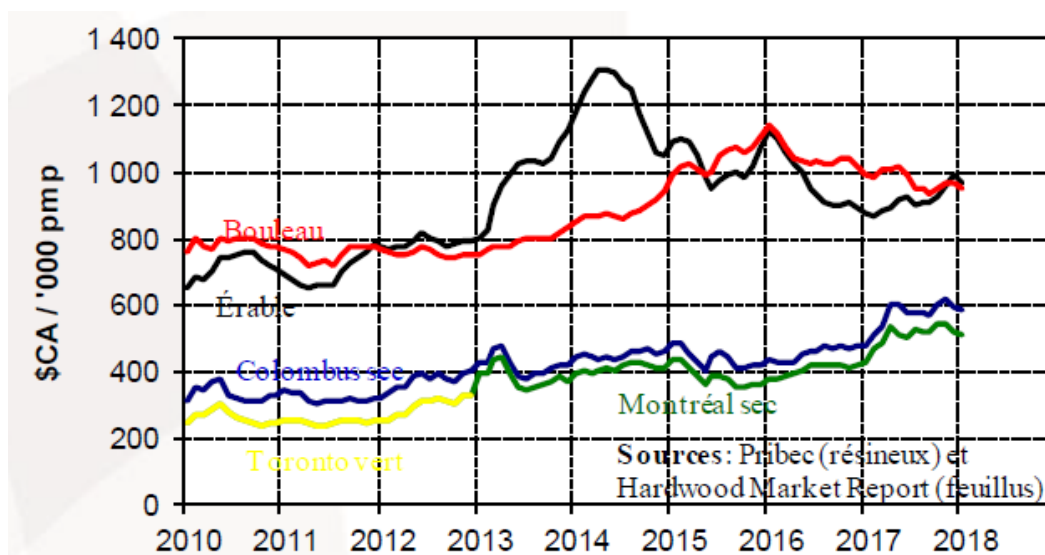


Figure 13 : Sawnwood prices in Canada (2010-2018)

Red=birch, black = maple, green = Montreal index for softwood, blue = Columbus index for softwood, yellow = Toronto index for softwood.- Prices in Canadian dollars, not adjusted to compensate inflation ; (source : Forêts, Faune et Parcs Québec⁴)

⁴ <https://mffp.gouv.qc.ca/wp-content/uploads/prix.pdf>

After year 2000, the prices of wood pulp and wood chips remained rather stable in Canada, as reflected on Figure 14, while the price of newsprint paper shows more fluctuation, without long term increase or decrease.

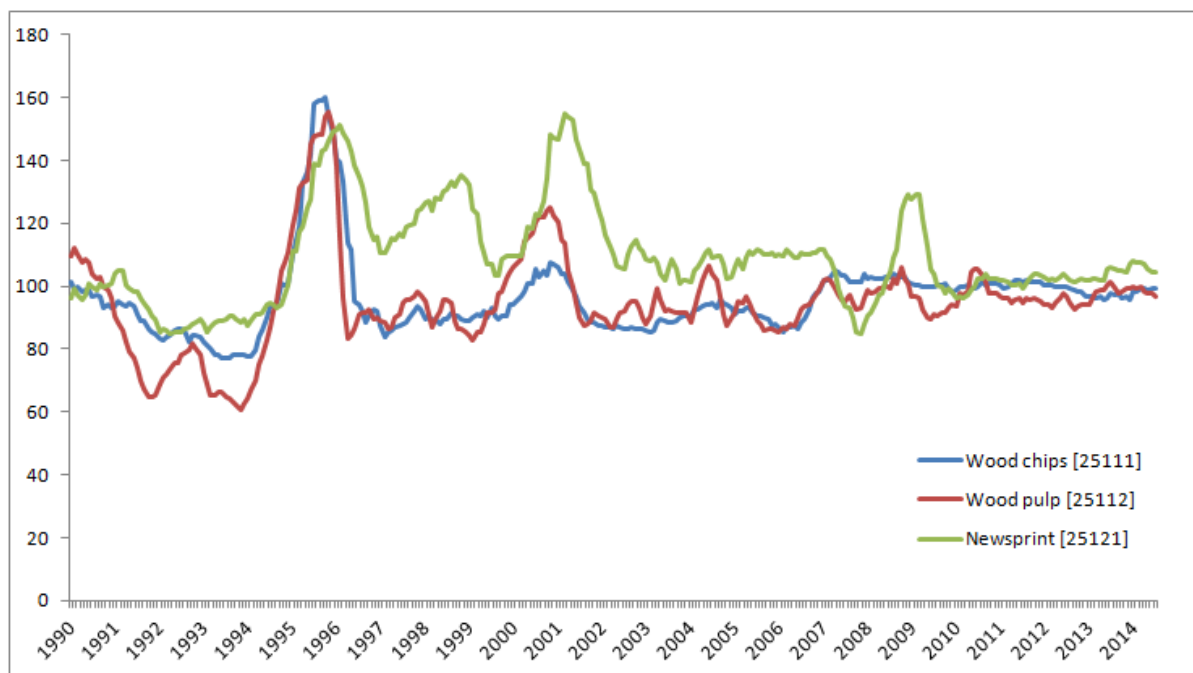


Figure 14 : Price index for wood chips, wood pulp and newsprint in Canada (1990-2014)

reference : 100 = price index for 2010

(source : Statistics Canada, CANSIM, Industrial product price index, by North American Product Classification System - NAPCS)

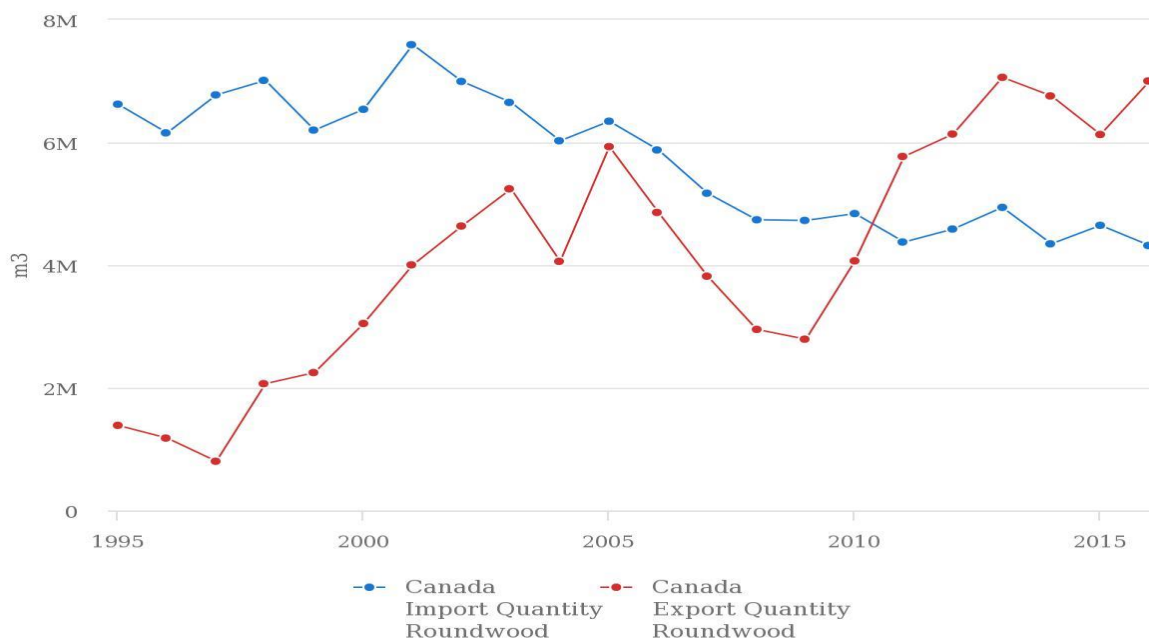
5. Import and export of wood resources

In this section, imports and exports are taken into account to assess the availability of the different kind of materials.

While the imports and exports of roundwood to/from Canada remain negligible compared to the domestic production, it is noticeable that both the imports and exports have decreased between 2005 and 2009, when the economic crisis struck the US construction market (Figure 15).

Even though Canada is a very large exporter of wood, very little volumes are exported as roundwood. This is because the sawmill industry is very well developed and competitive, as it can process large amounts of roundwood, available at cheap price on the domestic market (because stumpage prices on Crown land are low). Most of the wood exports are as lumber. As per 2016, the roundwood exports represent only 5% of Canada's roundwood production.

However, we don't see the same pattern at all in Eastern Canada. Actually, Eastern Canada hardly export any roundwood at all (presumably because of a more difficult access to Asian markets towards which Western Canada has been exporting more and more since 2010). And we can also see that most roundwood imported in Canada is actually directed to Eastern Canada, with a volume in the range of 3 to 4 millions m³ : this is in the range of the 10-15% of the Roundwood production in the four considered provinces.



Source: FAOSTAT (Apr 10, 2018)

Figure 15 : Roundwood imports and exports in Canada (1995-2016)
(source : FAOstat)

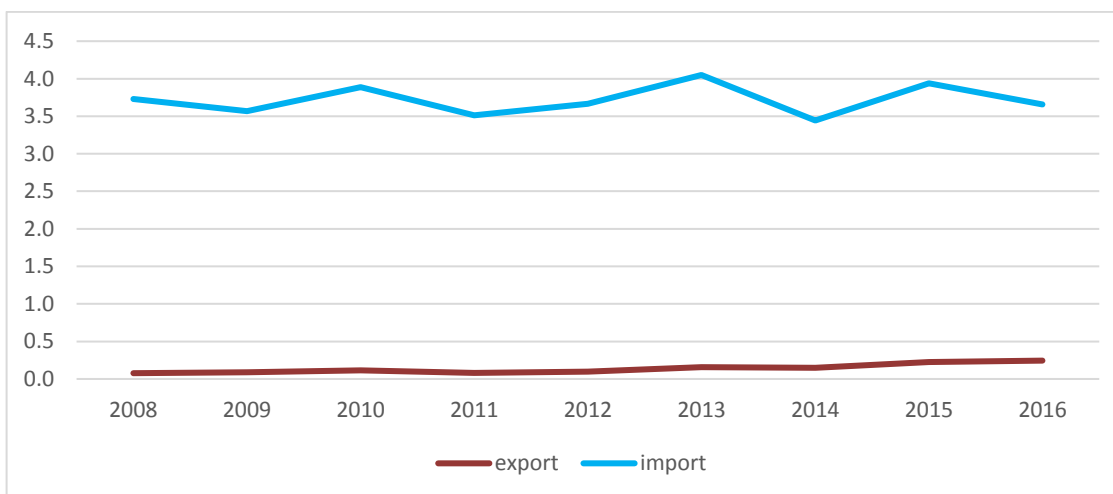


Figure 16 : Roundwood imports and exports in Eastern Canada (2008-2016) in millions m³

NL, NB, QC, ON

Source : Natural Resources Canada <https://cfs.nrcan.gc.ca/statsprofile/trade/ca>

The exports of pulp for paper have remained rather stable, with only a small increase between 2005 and 2009, while the production of pulp for paper was falling sharply (Figure 17). This suggests that the decrease in the production of pulp for paper was mostly at the expense of the domestic paper production (which collapsed between 2005 and 2009) and not at the expense of pulp exports. The domestic production capacity of both pulp and paper has indeed sharply decreased between 2005 and 2009. Currently, the export of pulp for paper account for more than 50% of the domestic production and the imports remain negligible.

On Figure 18 we can see the same pattern in the four provinces of Eastern Canada. The imports are negligible, while the exports remain stable.

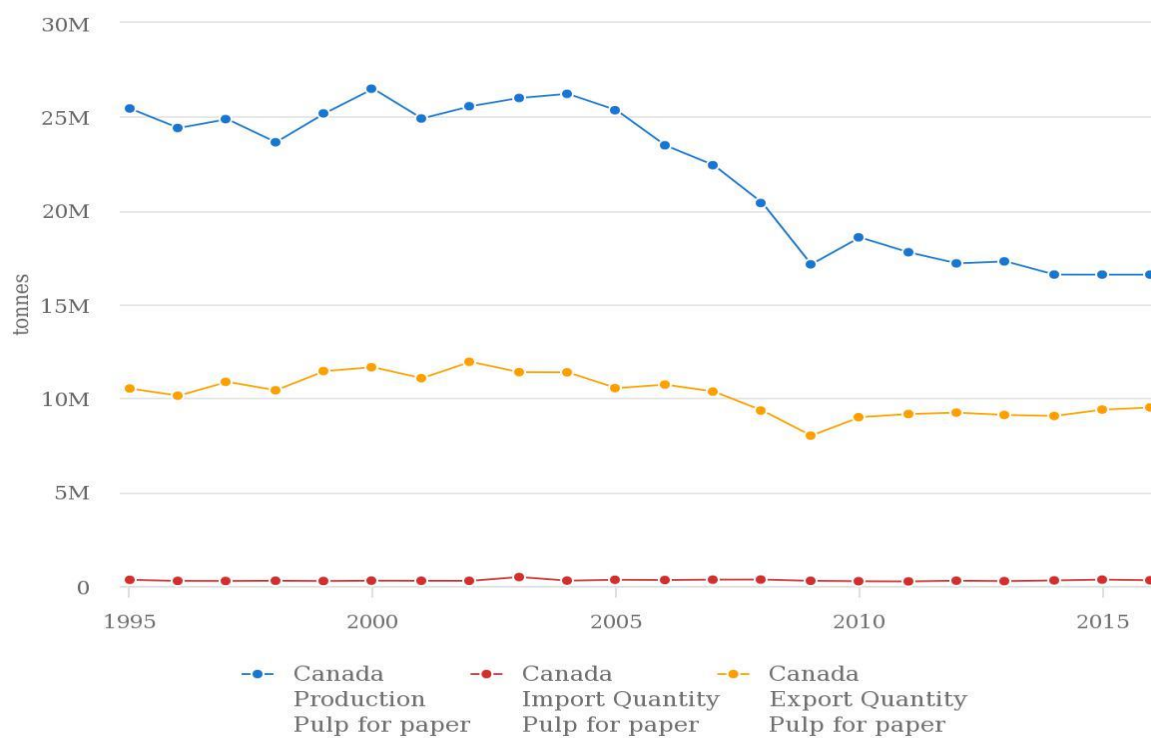


Figure 17 : Production, imports and exports of pulp for paper in Canada (1995-2016)
(source : FAOstat)

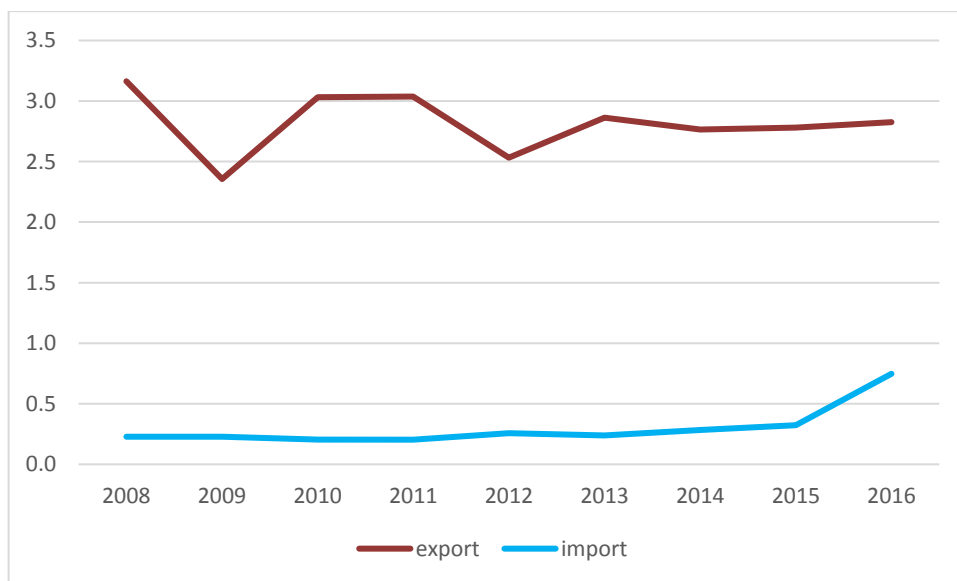
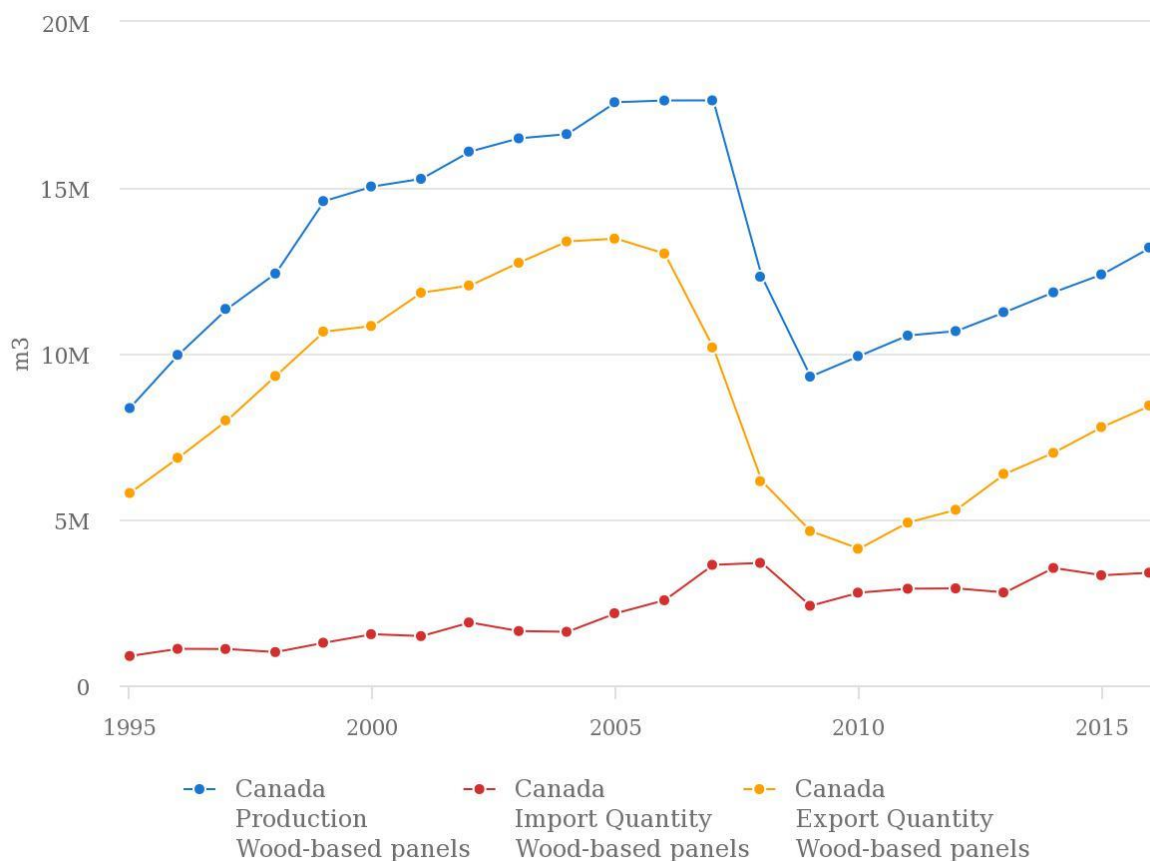


Figure 18 : Wood pulp imports and exports in Eastern Canada (2008-2016) in millions dry tons
NL, NB, QC, ON

Source : Natural Resources Canada <https://cfs.nrcan.gc.ca/statsprofile/trade/ca>

The produced and exported volumes of wood-based panels have sharply fallen after 2005, in relation with the dropping demand on US markets, which is the major market for the panels used in construction (Figure 19). The exports have hardly increased again after 2009. During the same period, the exported volumes have remained negligible.

In Eastern Canada, we can observe the same trend, with an excellent recovery of the exports of panels between 2009 and 2016. The imports of wood -based panels into Eastern Canada are dominated by plywood, while the exports from Eastern Canada are dominated by especially fibreboard and oriented strandboards. Like in Canada as a whole, exports have been slightly increasing after 2010. Imports are rather irregular.



Source: FAOSTAT (Apr 10, 2018)

Figure 19 : Production, imports and exports of wood-based panels in Canada (1992-2013)

(source : FAOstat)

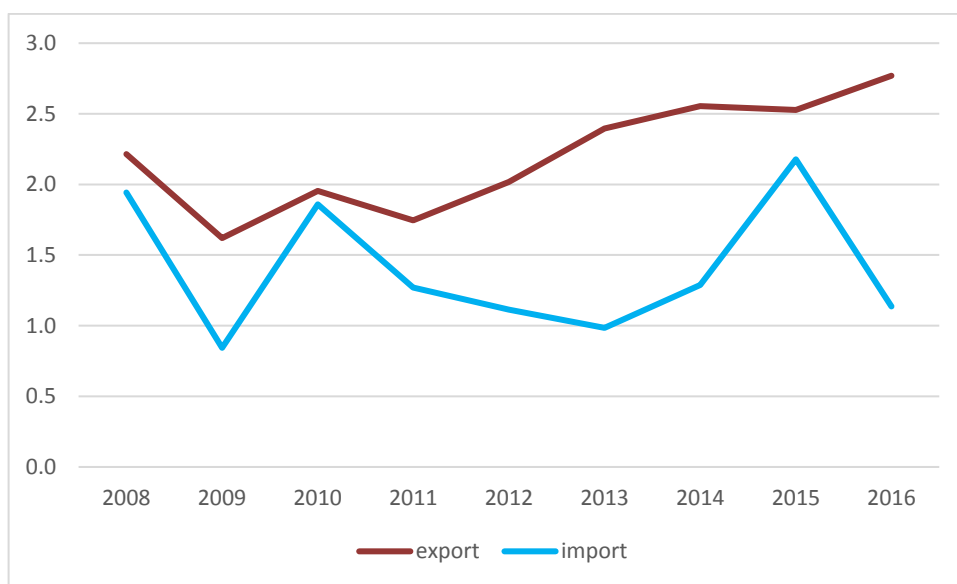


Figure 20 : Wood-based panels imports and exports in Eastern Canada (2008-2016) in millions m³

NL, NB, QC, ON

Source : Natural Resources Canada <https://cfs.nrcan.gc.ca/statsprofile/trade/ca>

After a sharp decrease of sawnwood production and exports between 2005 and 2009, again because of the economic crisis in the construction sector in the USA, the exports have started increasing again after 2009 (Figure 21), thanks to two major drivers:

- the slow recovery of the US construction market
- the quick rising demand for wood on the Asian markets (China, Japan, Korea...)

Approximately 75% of the Canadian sawnwood (lumber) is exported. the imported volumes have been rather stable.

The sawnwood imports and exports from/to the four considered provinces in Eastern Canada is presented on Figure 22. The export market is recovering highly after the end of the crisis: export volumes from Eastern Canada have doubled between 2009 and 2016. About half the sawnwood production of Eastern Canada is exported. Imports are not very significant.

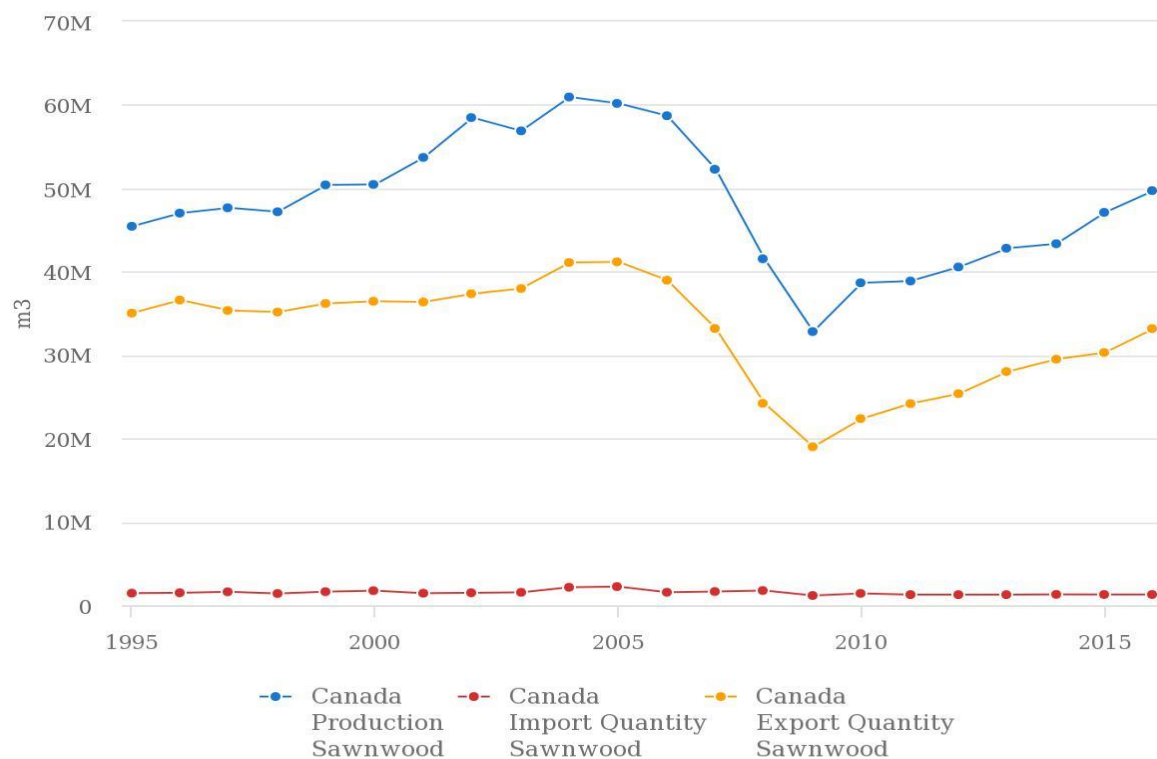


Figure 21 : Production, imports and exports of sawnwood in Canada (1995-2016)
(source : FAOstat)

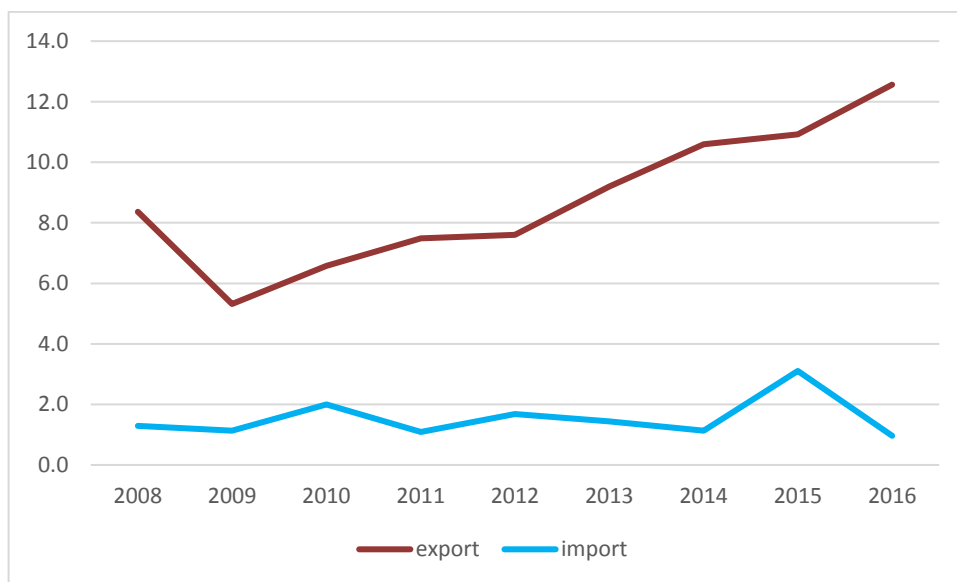


Figure 22 : Sawnwood imports and exports in Eastern Canada (2008-2016) in millions m³

NL, NB, QC, ON

Source : Natural Resources Canada <https://cfs.nrcan.gc.ca/statsprofile/trade/ca>

6. Wood pellets

The recent evolutions of the wood pellet production in Canada as a whole is presented on Figure 23. We can see that the pellet production has nearly doubled in only four years. More than 80% of the pellets are currently exported.

Even though production statistics are not available by province, Figure 24 indicates the repartition of the production capacity per province. We can see that the four considered provinces of Eastern Canada account for about 1/3 of the national production capacity. Through the combination of the two figures hereunder, we can estimate the yearly production is around 850,000 tonnes pellets for those 4 provinces. Through a rough estimation with the suitable conversion factors, we can come to the conclusion that the production of wood pellets in Eastern Canada represent about 5% the annual roundwood harvesting.

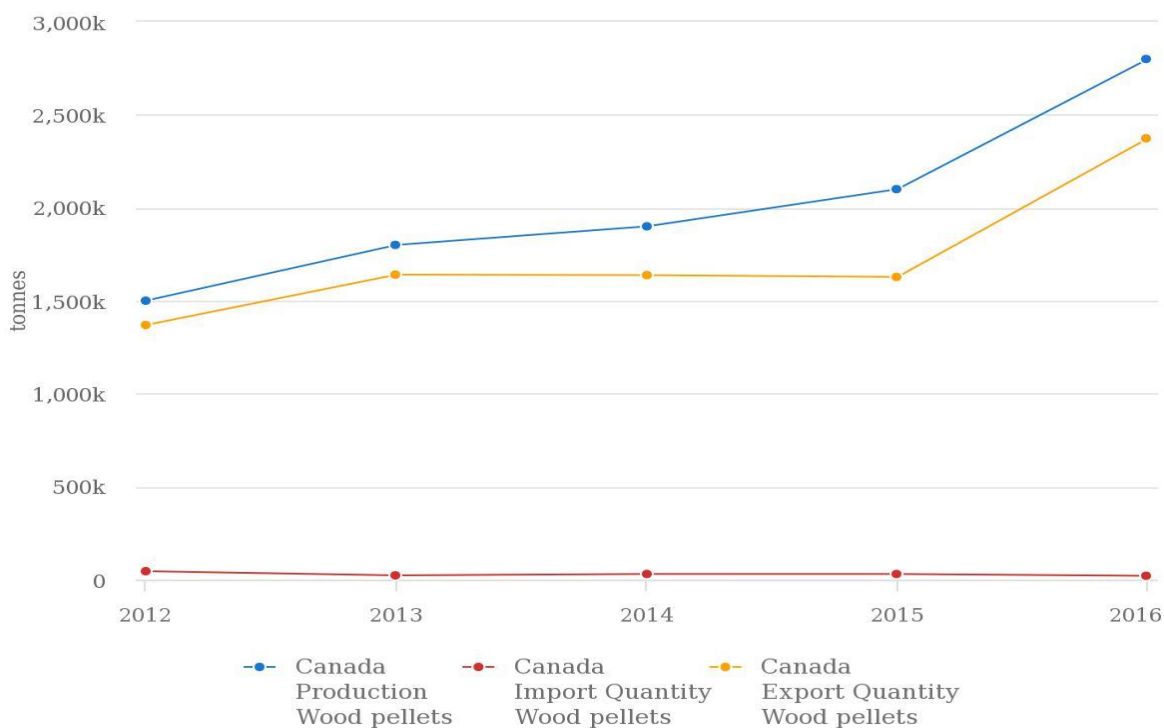


Figure 23 : Production, imports and exports of sawnwood in Canada (2012-2016)
(source : FAOstat)

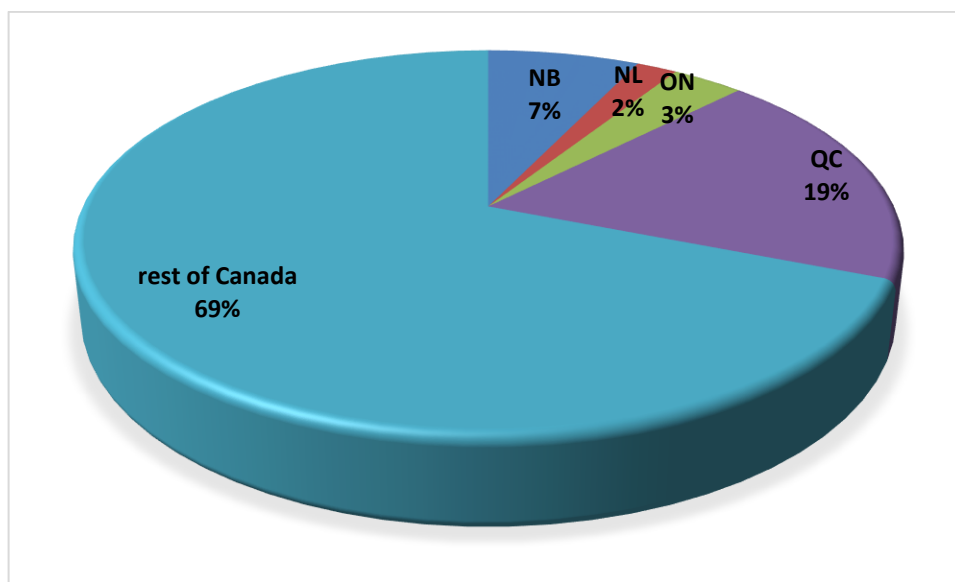


Figure 24 : Wood pellet production capacity per province

(source : Wood Pellet Association of Canada

https://www.pellet.org/images/CBM_Pelletmap2012FINAL.pdf)

7. Conclusion

Canada and especially the four considered provinces in Eastern Canada (NL, NB, ON and QC) have a forest industry essentially oriented to the export markets. The exported products are mostly lumber, wood panels, as well as pulp and paper. The USA are the major destination for sawn wood (lumber).

Only 5% of the wood production from Canada is exported as roundwood. In Western Canada there is rapid increase of roundwood export to Asia, but this evolution is not relevant to Eastern Canada from which access to Asian markets is more difficult than from the West Coast. And indeed, we can see that the exports of roundwood from Eastern Canada remains negligible and has not increased in recent years.

The analysis of the wood market shows that a major decrease of roundwood production in the considered provinces of Eastern Canada (by about more 50%) was triggered by the subprime mortgage crisis in USA between 2005 and 2009, which caused the demand for wood based panels and sawnwood to collapse. The Roundwood production levels have partially recovered afterwards (to a bit less than 40 million m³ in 2014), but are still significantly lower than the levels of harvesting in the decade before the crisis (in the range of 60 million m³ in 1995-2005).

During the same period, the pulp and paper export experienced a turndown as well, with permanent closure of some facilities and diminution of the production capacity. The production of pulp and paper, which remains oriented to the export markets, has been decreasing in Eastern Canada since the early nineties and doesn't show any sign of recovery. This is because the international demand for paper stagnates and the prices on the international markets remain low.

Large amounts of roundwood are available for harvesting, but in recent years the actual harvested volumes remained far below the estimated sustainable Wood Supply because of market conditions. In the four assessed provinces of Eastern Canada, it is estimated that the actual harvest has been consistently less than the half the sustainable Wood Supply during the last decade, which shows that the commercial harvesting has considerable room for expansion if the market conditions are favourable and the investments in processing facilities are made.

The wood market is slowly recovering, as lumber prices, production levels and exported volumes have been increasing since 2010. The production and export levels of wood based panels have been recovering quite well since 2009 as well. However, the pulp and paper production in Eastern Canada fails to stabilize though, and a constant decline remains noticeable, even after 2009, even though at a slower pace.

The recovery of sawmill activity after 2009 means that larger amounts of sawmill residues are available again for pulp, panels and bioenergy. Since the production capacity of pulp and paper has significantly decreased in the meantime, it does not seem the availability of pulp wood might be an issue in the current conditions. The wood panel production shows a very

dynamic evolution in Eastern Canada, (especially fibreboard and oriented strandboards), with strong increase of the exports levels after 2009. The extension of this industry also relies on the availability of residues.

The recent evolution of firewood (for domestic and industrial purpose) shows a significant increase after 2010, especially in Ontario, because of the phasing down of coal fired power plants in this province and the replacement of coal by other sources of renewable and fossil energy, including biomass.

After the downturn experienced between 2005 and 2010, the forest sector in Eastern Canada features a dynamic recovery, stimulated by various policy and innovation, such as the development of advanced wood materials, new developments in advanced wood energy (including biofuels associated with the activities pulp and paper sector), investments and research in biomaterials, research of new markets for finished products (in particular in Asia). The development of wood pellets production and export might also play a role in this process.

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