



Market analysis Availability of forest products and by-products Western Australia

Client:

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Introduction

SGS has been assigned by Engie - Electrabel to analyze the market availability of the feedstock used to produce wood pellets in Western Australia (Australian state), 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 Australia and Western Australia:

- Wood processing residues
- Round from forest thinning & harvesting
- Forests management residues

The industrial activities concerned by those materials are:

- pulp and paper
- wood panels production
- sawnwood production

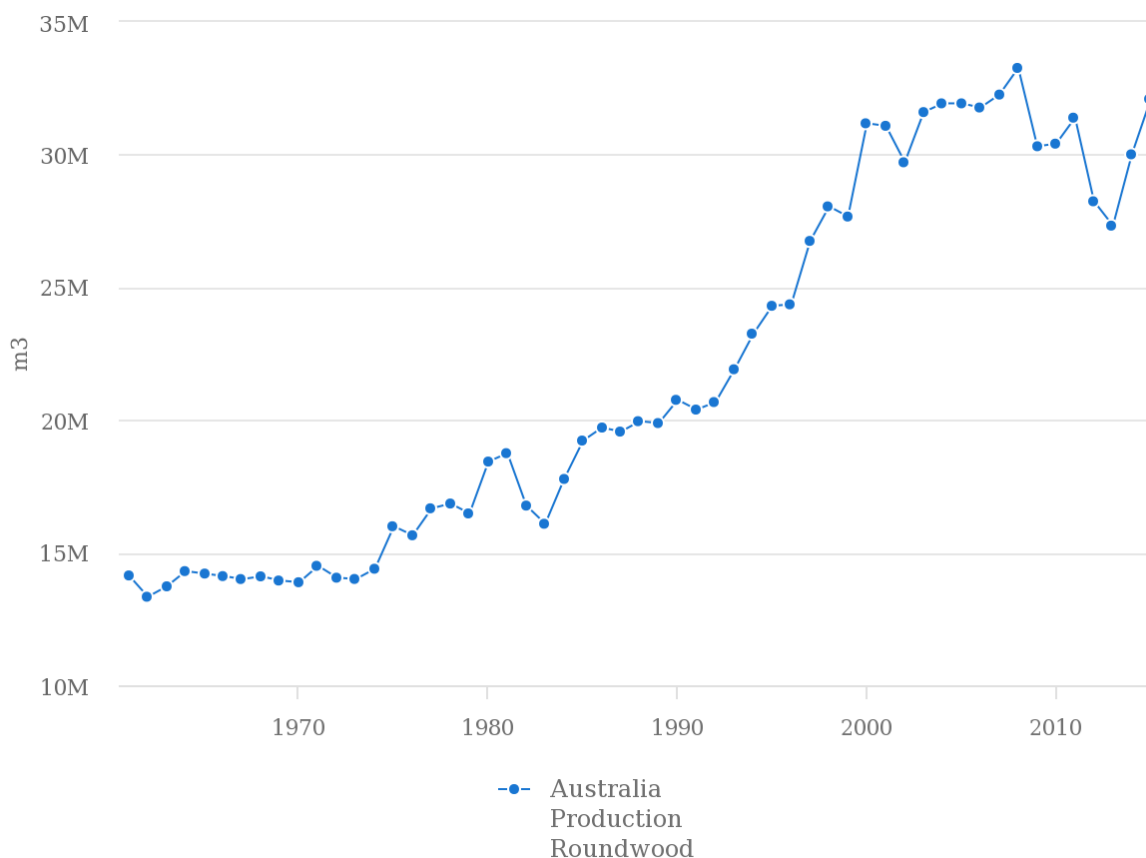
The geographic range covered by the analysis includes Australia and Western Australia.

All the data from FAOstat consist of an aggregate of official, semi-official, estimated and/or calculated data.

1. Production volumes

Roundwood

The production volumes of roundwood between 1961 and 2016 are shown in Figure 1. The estimated production volume in 1961 was 14.1 million m³. It increased (with small decreases from time to time) to a maximum of 33.3 million m³ in 2008. The production faced the global economic crisis of 2008 and lost 9.0% of its production volume in a year. Between 2009 and 2011, it went back on the rise before sharply decreasing until 2013 to a value of 27.3 million m³. This sharp decrease was followed by a sharp rise and stabilization to a production volume of 32.1 million m³ in 2015.



Source: FAOSTAT (Aug 16, 2017)

Figure 1 : production of roundwood in Australia (1961-2015)
(source : FAOstat)

The log harvest between 2005 and 2016 according to the Australian Bureau of Agricultural and Resources Economics and Sciences (ABARES) is shown below. For both hardwood and softwood, the volume of logs harvested diminished until 2012-13. Since that year, volumes are on the rise. The volume of hardwood harvested in 2015-16 was 13.7 million m³ and the volume of softwood harvested was 16.3 million m³.

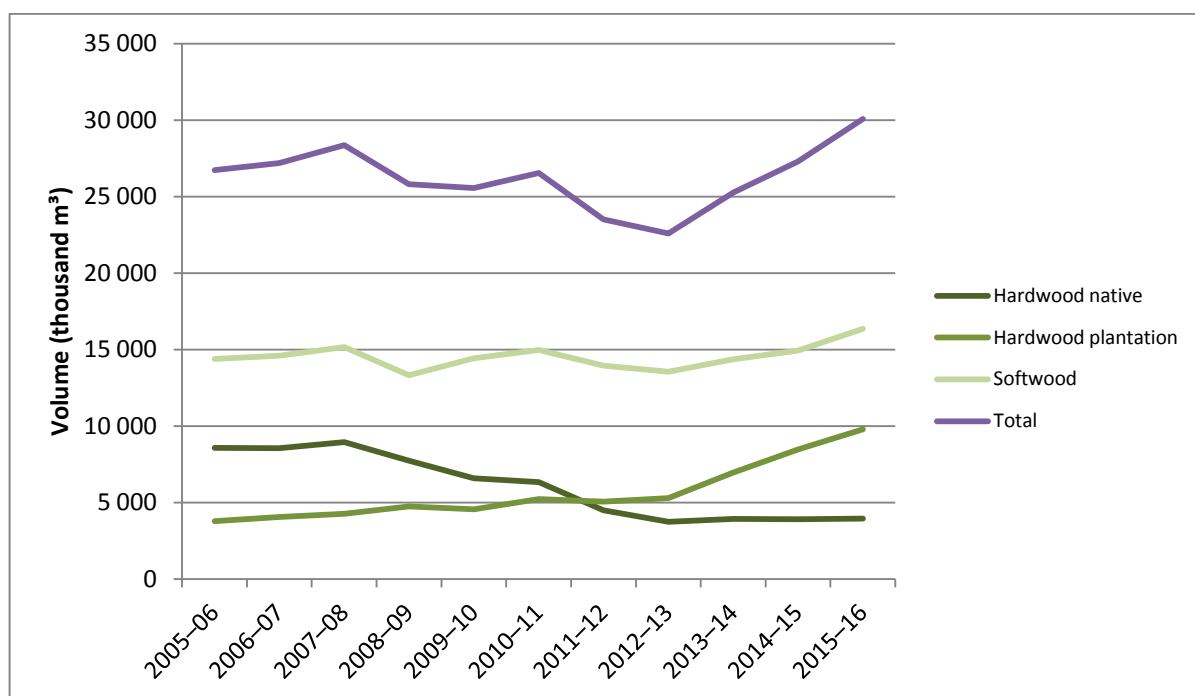


Figure 2 : Logs harvested in Australia (2005-2016)

(source : ABARES)

The situation of logs harvest in Western Australia is presented in Figure 3. The curve trend is quite similar to the national curve (Figure 2). The total logs harvest volume increased until 2010-11 in order to decrease until 2012-13. Since that year it grows. It reached its maximal value in 2015-16 with almost 5 million m³. The majority of the harvested logs come from Hardwood plantations (74.5% of the total in 2015-16). The volume coming from Hardwood native forests is slowly decreasing while the volume from Softwood plantations is more or less stable in time. Softwood is only harvested in industrial plantations. The harvest of logs in Western Australia represents 15.5% of the total log harvesting volume in the country.

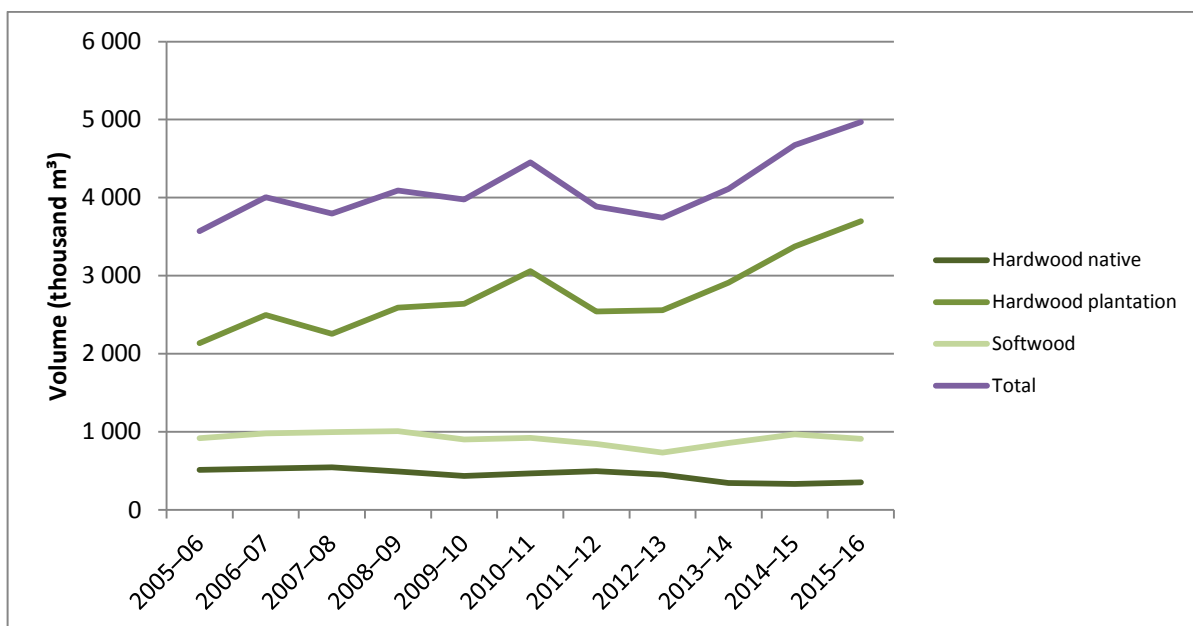


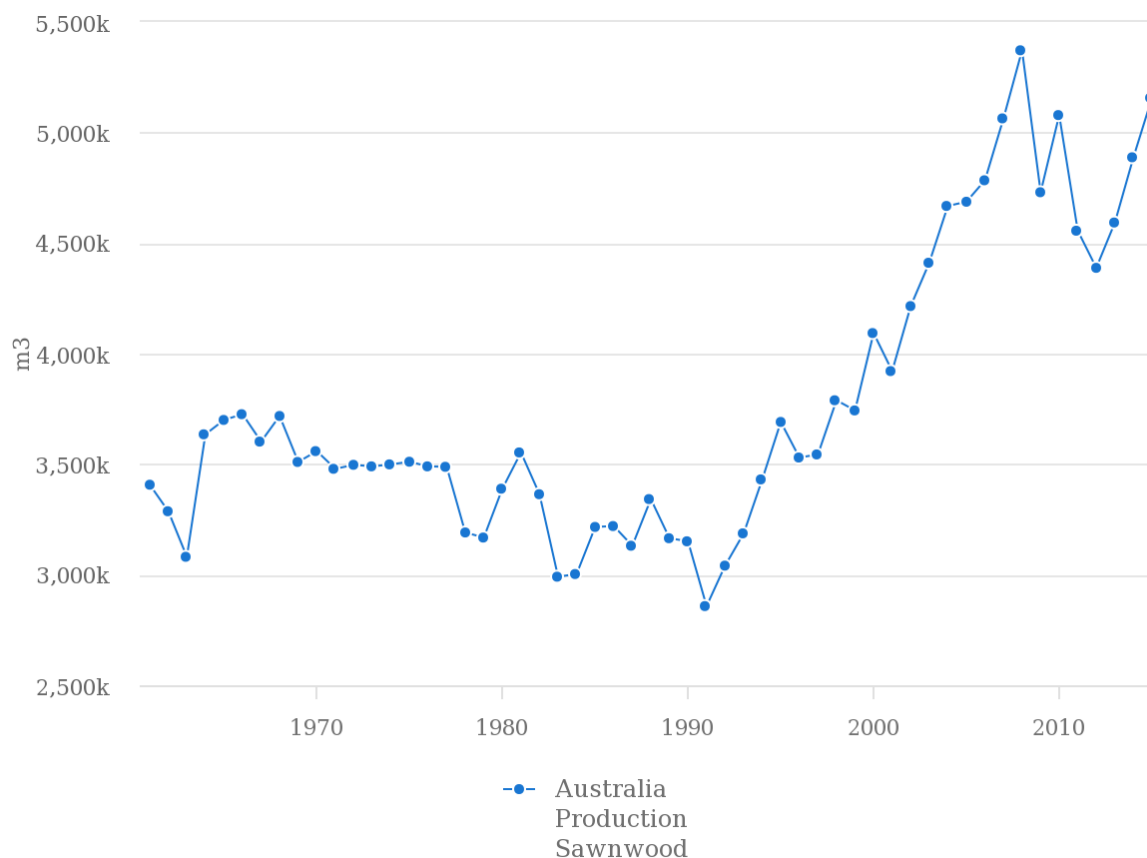
Figure 3 : Logs harvested in Western Australia (2005-2016)

(source : ABARES)

Sawnwood

The production of sawnwood in m³ is shown in Figure 4. From the 1960s to the beginning of the 1990s, there is a decreasing trend with ups and downs. The production volumes reached its lowest point in 1991: 2.8 million m³. A sharp rise followed until 2008. The production volume increased by 88.0% and attained its maximum: 5.4 million m³. Suffering from the global economic crisis, it went down until 2012. An increase followed to reach the final value of 5.2 million m³ in 2015¹.

¹ Australian forest and wood products statistics, September and December quarters 2015.



Source: FAOSTAT (Aug 16, 2017)

Figure 4 : Production levels of sawnwood in Australia (1961-2015)

(source : FAOstat)

Sawnwood production in Western Australia is shown below. It is less documented than at the national level. The most recent values are under 300 thousand m³ for a combination of both hardwood and softwood. The majority of sawnwood consists of softwood (77% of the total production in 2012-13), the trend does not seem to reverse.

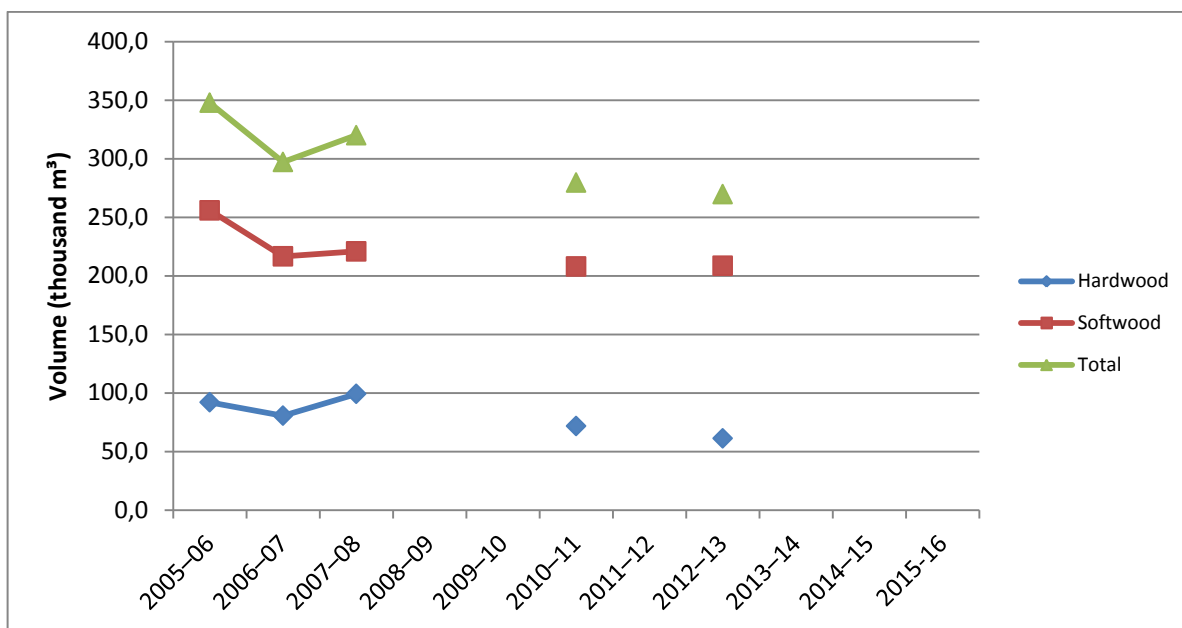


Figure 5 : production levels of sawnwood in Western Australia (2005-2016)

(source : ABARES)

Wood-based panels

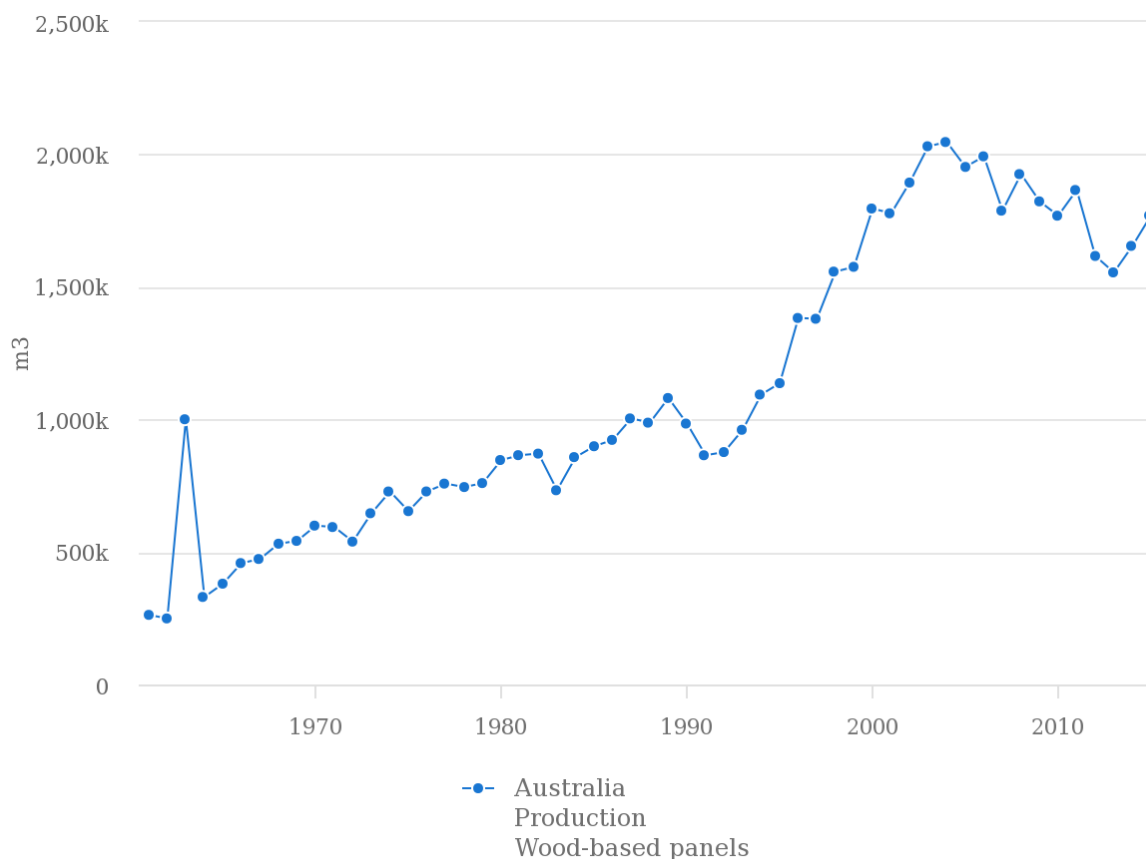
The production of wood-based panels in Australia is shown in Figure 6. At the beginning of the period, the production volume was 262.7 thousand m³. Except for a peak in 1963 (the peak might be a value error), the wood-based panels' production has undergone a rather stable increase between 1961 and 1989, it increased by +311% to a value of 1.1 million m³. From 1989 to 1991, it decreased to 865 thousand m³. The decrease might be linked to the early 1990s recession that happened in the country. A sharp increase occurred between 1991 and 2004, it increased by +137% and reached 2.0 million m³ in 2004. Until 2013, the production volume decreased with oscillations down to 1.6 million m³. Since that year, the production volume increased to a final value of almost 1.8 million m³ in 2015².

The early 1990s recession is described as follows:

"The early 1990s recession came swiftly after the Black Monday of October 1987, resulting from a stock collapse of unprecedented size caused the Dow Jones Industrial Average to fall by 22.6%. This collapse, larger than the stock market crash of 1929, was handled effectively by the global economy and the stock market began to quickly recover. However, in North America, the lumbering savings and loans industry was facing decline which eventually led to a savings and loan crisis which compromised the wellbeing of millions of Americans. The following recession thus impacted the many countries closely linked to the United States, including Australia. Paul Keating, who was Prime Minister at the time, famously referred to it as "the recession that Australia had to have." During the recession, GDP fell by 1.7%, employment by 3.4% and the unemployment rate rose to 10.8%.

² Australian forest and wood products statistics, September And December quarters 2015.

However, the recession did assist in reducing long-term inflation rate expectations and Australia has maintained a low inflation environment since the 1990s to the present-day.³



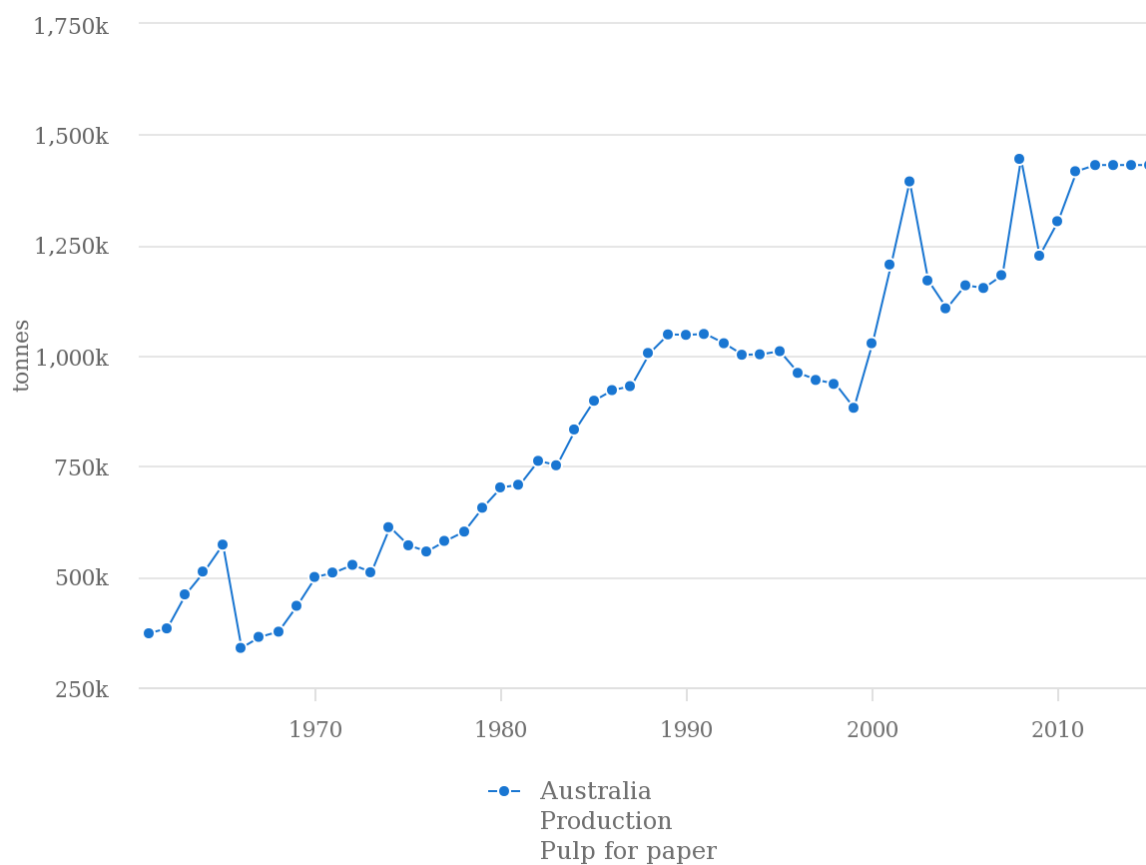
Source: FAOSTAT (Aug 16, 2017)

Figure 6 : production levels of wood-based panels in Australia (1961-2015)
(source : FAOstat)

Pulp for paper

The production of pulp for paper is presented in Figure 7. In 1961, the production volume was 372 thousand tonnes. The period begins with an increase until 1965, followed by a drop in 1966. From a weight of 339 thousand t in 1966, it increased until 1989 and a weight of 1.0 million t in 1989. The production weight stagnated for two years before decreasing until 1999. Once again, it can be estimated that this decrease is linked to the early 1990s recession. A peak in 2002 happened to a weight of 1.39 million t. It continued to increase and a second peak happened in 2008 to a maximal value for the period: 1.44 million t. Since 2011, the production weight of pulp for paper shows signs of stagnation around a volume of 1.43 million t.

³ https://en.wikipedia.org/wiki/Economy_of_Australia#Early_1990s_Recession

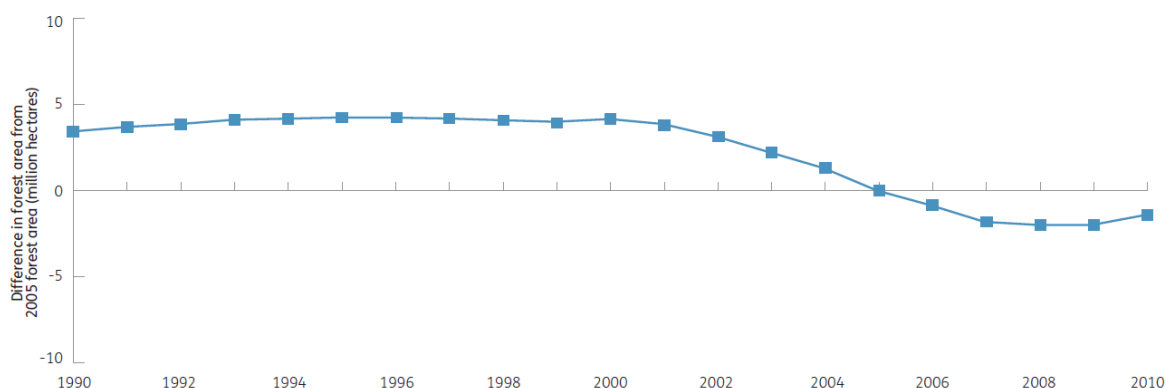


Source: FAOSTAT (Aug 16, 2017)

Figure 7 : Production levels of pulp for paper in Australia (1961-2015)
(source : FAOstat)

2. Forest exploitation levels

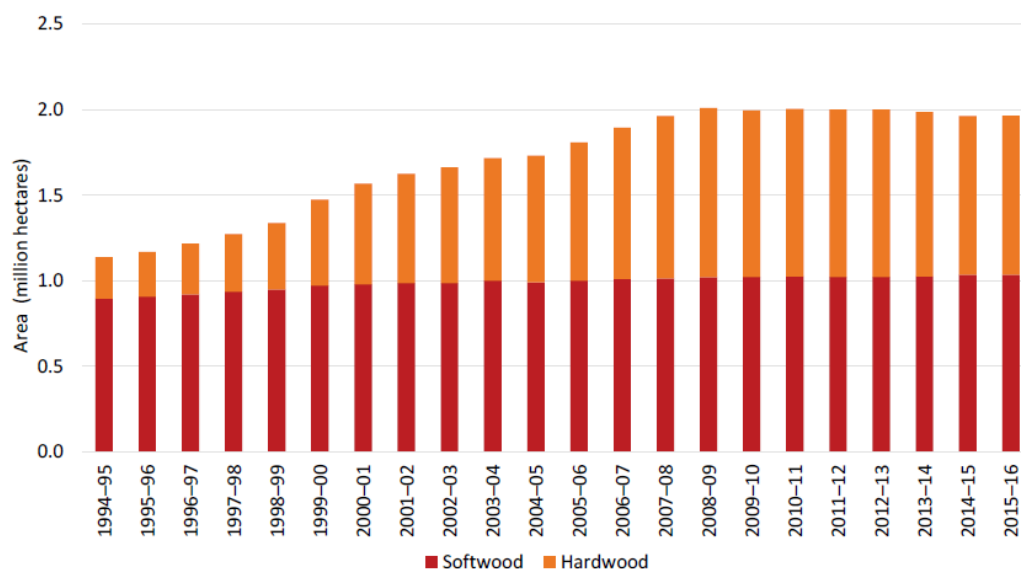
In Australia, logs are harvested from Native forests as well as industrial plantations. The total forest area change is shown in the figure below. After a long decrease starting in 2000, it stabilized and began to increase in 2009. The industrial plantation area presented in the figure below shows a stable situation around 2 million ha since 2008.



Note: In SOFR 2008 data from the then Australian Government Department of Climate Change and Energy Efficiency (DCCEE) were used to report change in forest area to 2005 (DCCEE data are reported by calendar year). Values above are calculated as differences from 2005 forest area reported by the National Carbon Accounting System (107.5 million hectares), which is set as zero.

Source: Calculated by the Australian Bureau of Agricultural and Resource Economics and Sciences from DCCEE data.

Figure 8 : Forest area in Australia (1990-2010)
(source : Australia's State of the Forests Report 2013)



Note: Data for 1994-95 to 2004-05 are for calendar years representing 1994 to 2005; data for 2005-06 to 2015-16 are for financial years. 'Other' category plantations are not included.

Figure 9 : Industrial plantation area in Australia (1994-2016)
(source : ABARES)

The recent situation in Western Australia consists of a decrease of the plantation area since 2008-09. Between 2014-15 and 2015-16 the area appears to be stable, however, the period is too short to propose a real trend.

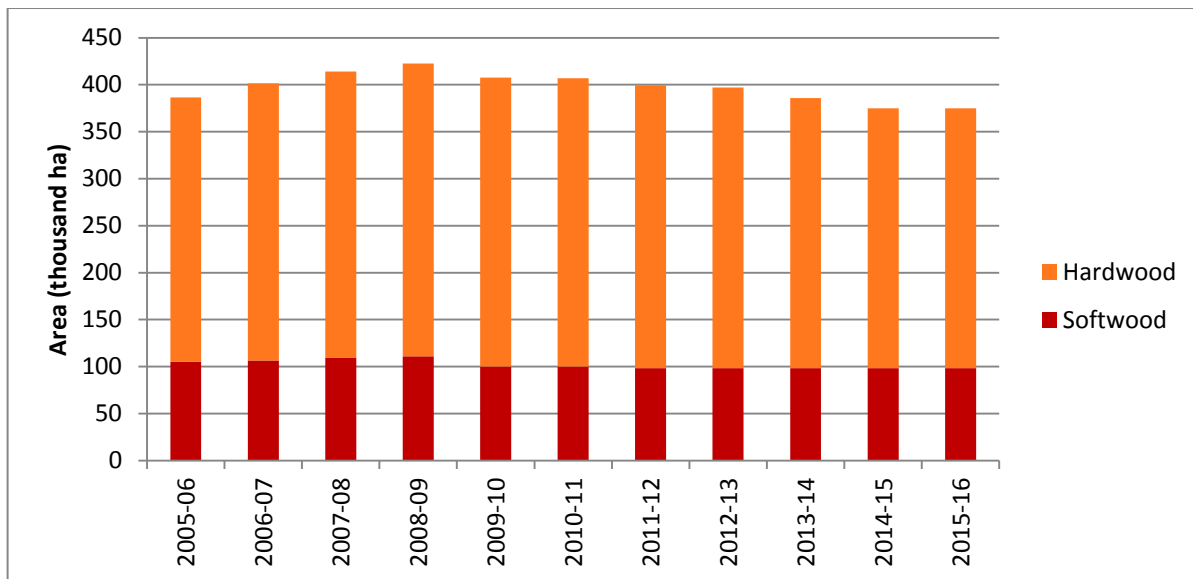
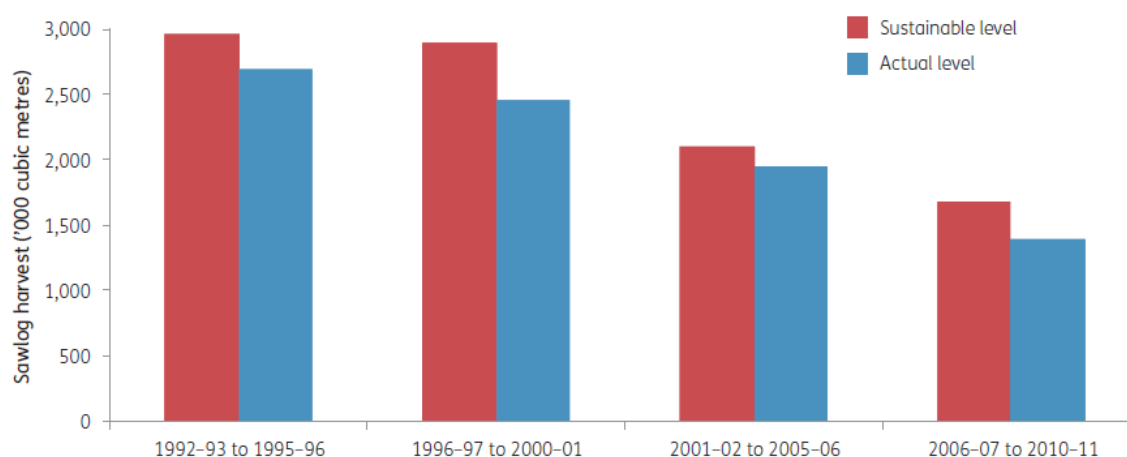


Figure 10 : Industrial plantation area in Western Australia (2005-2016)
(source : ABARES)

In terms of sustainability, the actual harvested volumes in multiple-use public forests are below the sustainable levels for the whole period between 1992 and 2011. There are multiple causes for the reduction of the forest area at the beginning of the 2000s, the main cause being wildfire. It can be considered that wood harvesting in Australia is sustainable as it respects the sustainable level and the recent change in forest area is stable.



Note: Sawlog includes only high-quality and veneer logs. The first reporting period includes an adjustment applied to Victorian C+ sawlogs and expressed as a D+ equivalent (see Figure 2.13, Table 2.10).

Source: Australian Bureau of Agricultural and Resource Economics and Sciences database, state agencies, SOFR 2003, SOFR 2008.

Figure 11 : Average annual harvest and sustainable yield for multiple-use native forests in Australia (1992-2011)
(source : ABARES)

3. Price of wood resources

The producer price indexes of the materials used and the articles produced by manufacturing industries for the period between 2005 and 2016 are shown below (Figure 12 and Figure 13). The price indexes seem to follow a general increasing trend. Only a few indexes are under 100 after 2011-12: All manufacturing index (Figure 12) and pulp, paper & paperboard, sanitary paper product (Figure 13).

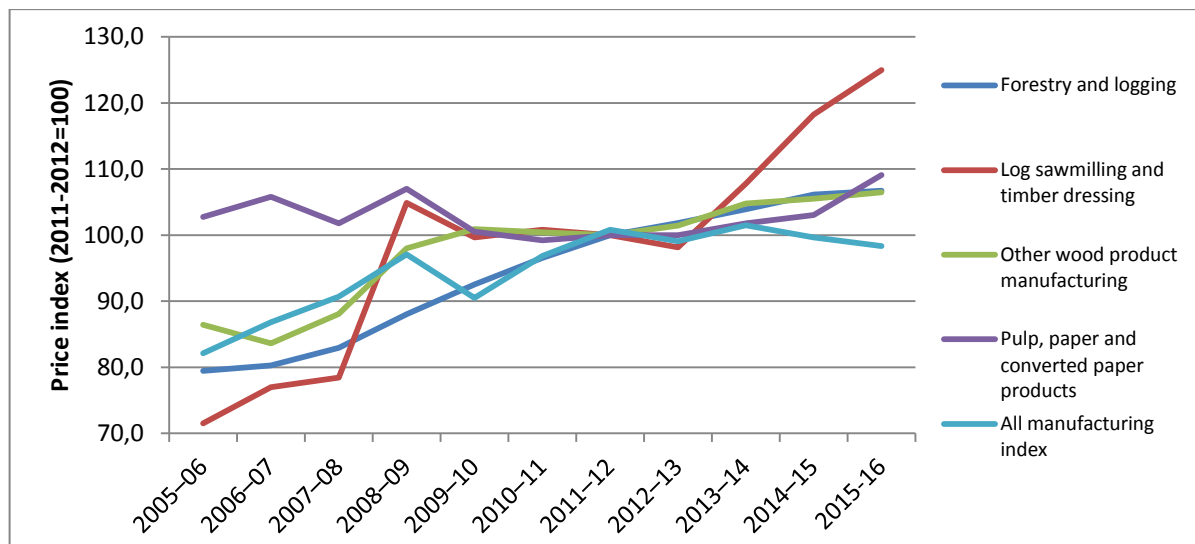


Figure 12 : Price indexes of materials used in manufacturing industries in Australia (2005-2016)

(source : Australian Bureau of Statistics)

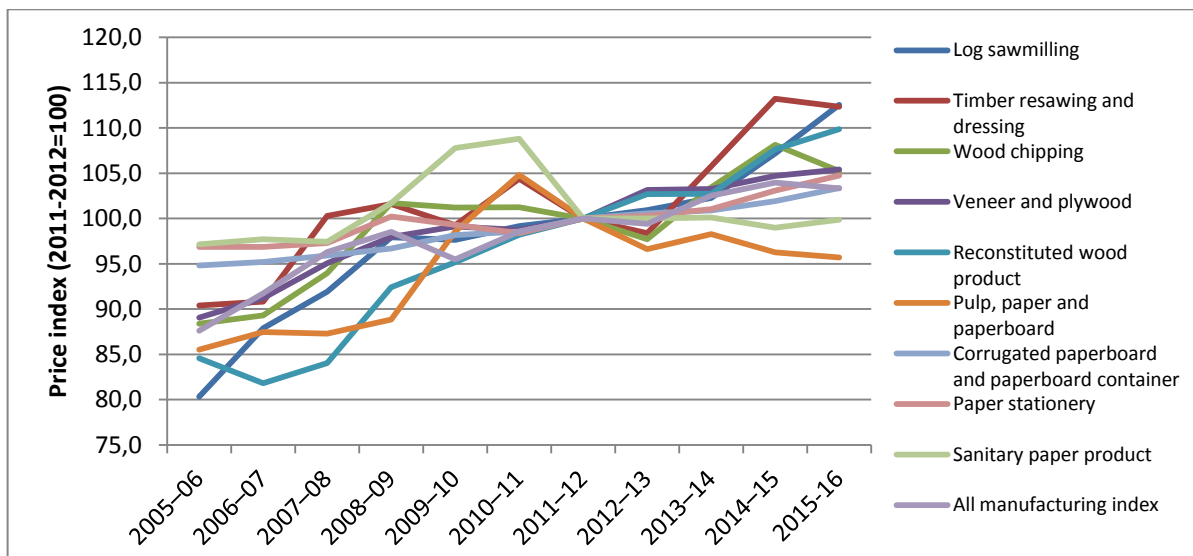


Figure 13 : Price indexes of articles produced by manufacturing industries in Australia (2005-2016)

(source : Australian Bureau of Statistics)

The import and export unit prices between 1992 and 2016 are presented in Figure 14 and Figure 15. The unit prices are a calculated average from different countries for a selection of products. It does not represent the entire market.

Import prices

Concerning the imports unit prices of sawnwood, the curve is increasing for Radiata and Meranti, lauan, seraya (roughsawn). Considering Douglas fir, the prices are stable until 2004. Since that year, it oscillates between 200 \$/m³ and 800 \$/m³. All the prices of sawnwood products ranged from 377 \$/m³ to 1041 \$/m³ in 2016. The import prices of several wood-based panels' products seem to present an increasing trend starting in 2011. They ranged from 452 \$/m³ to 862 \$/m³ in 2016. The pulp and paper price trend is more stable through time than the other two products price trends. In 2016, the unit prices ranged from 648 \$/t and 1,117 \$/t.

Export prices

The export unit price of Roundwood is stagnating until 2005 then it starts to increase. It reached its maximal value in 2016: 133 \$/m³. Considering sawnwood, prices oscillate until 2002. Since that year, they are stable. The export unit price of medium density fibreboard oscillates through time. As years pass, fluctuation of the curve diminishes. The paper and paperboard unit price is stable. Since 1995, printing and writing unit price follows a slow decreasing trend. All curves present a local maximum in 1995.

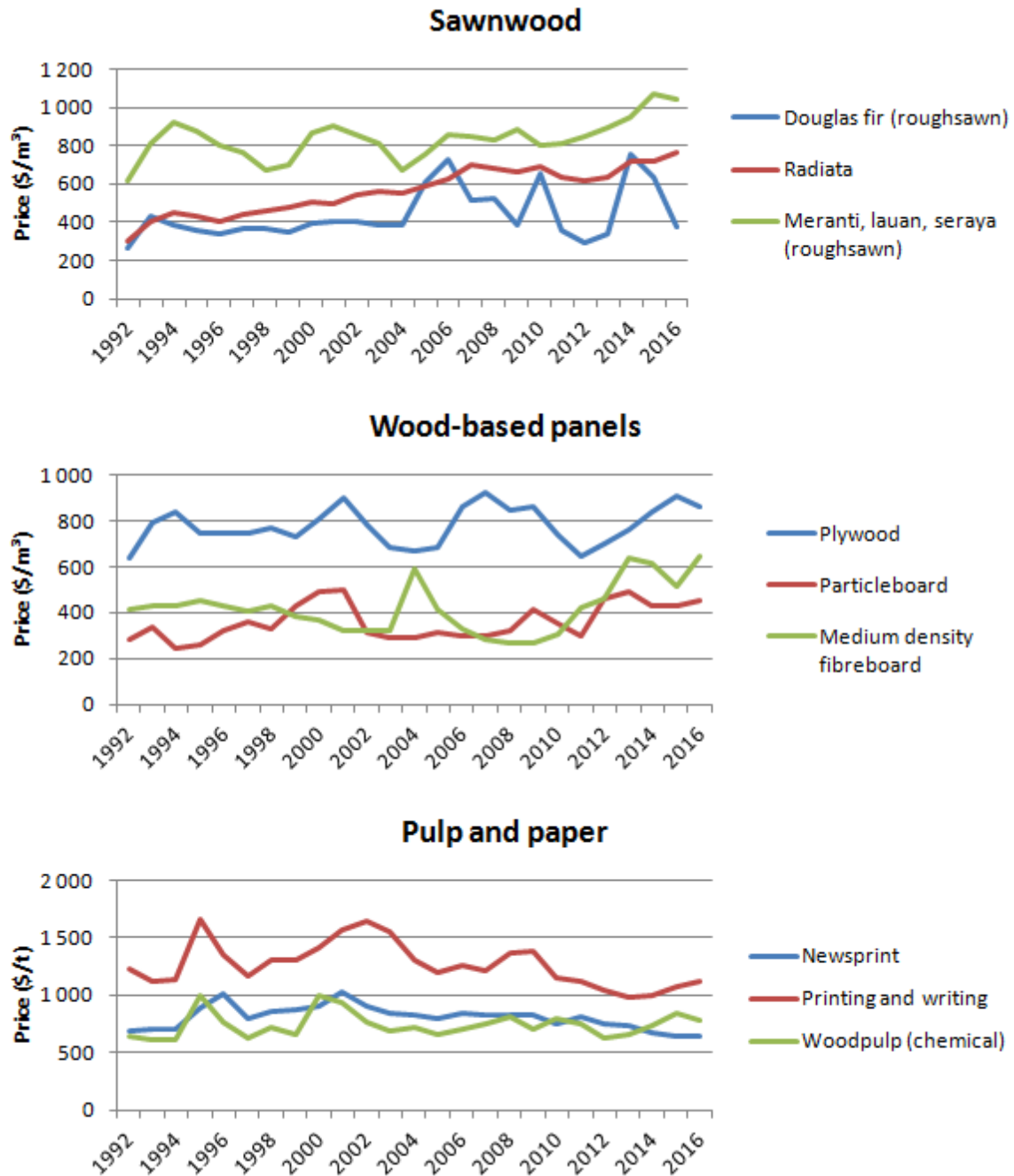


Figure 14 : Imports unit prices (1992-2016)
(source : ABARES)

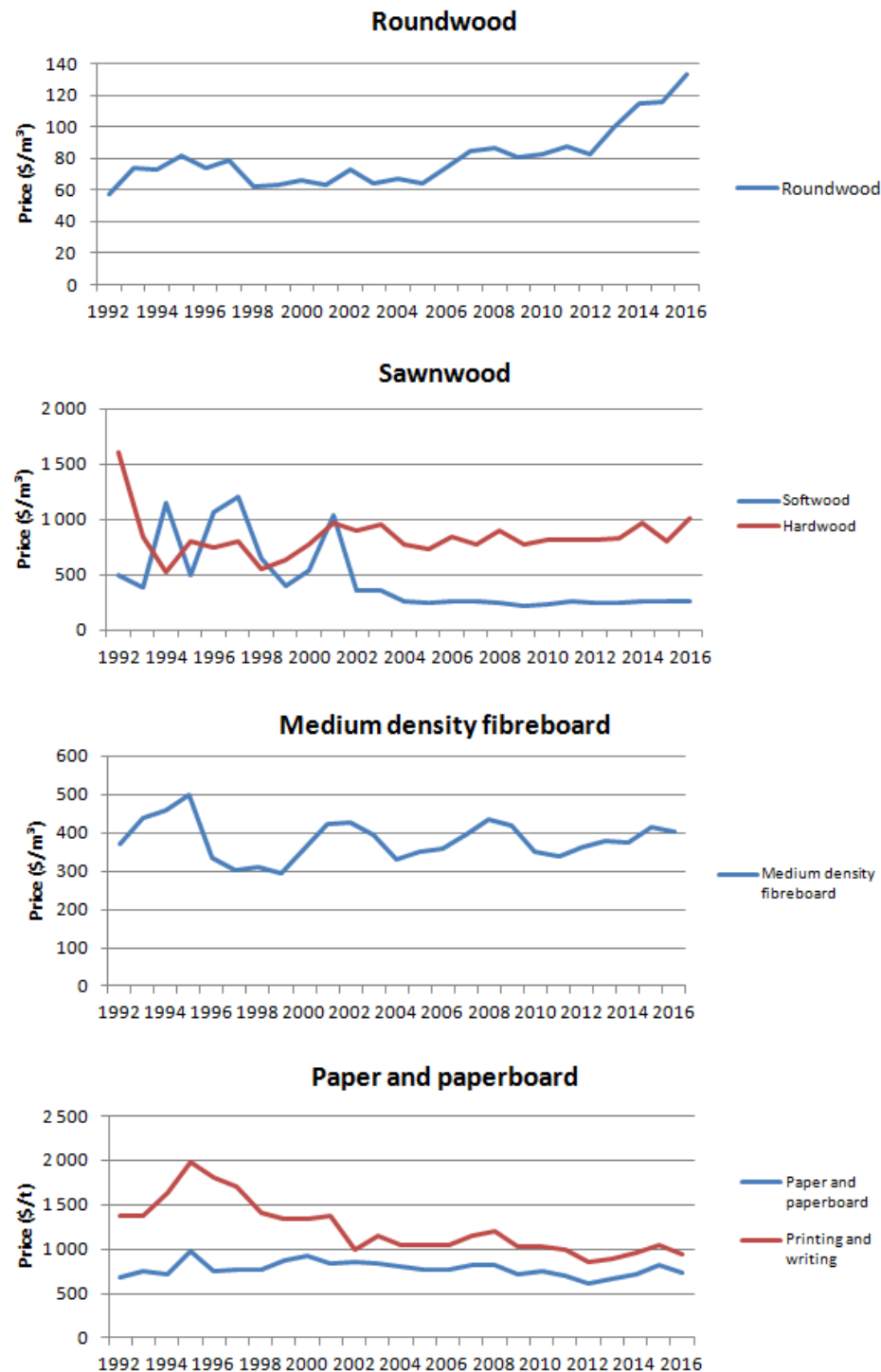


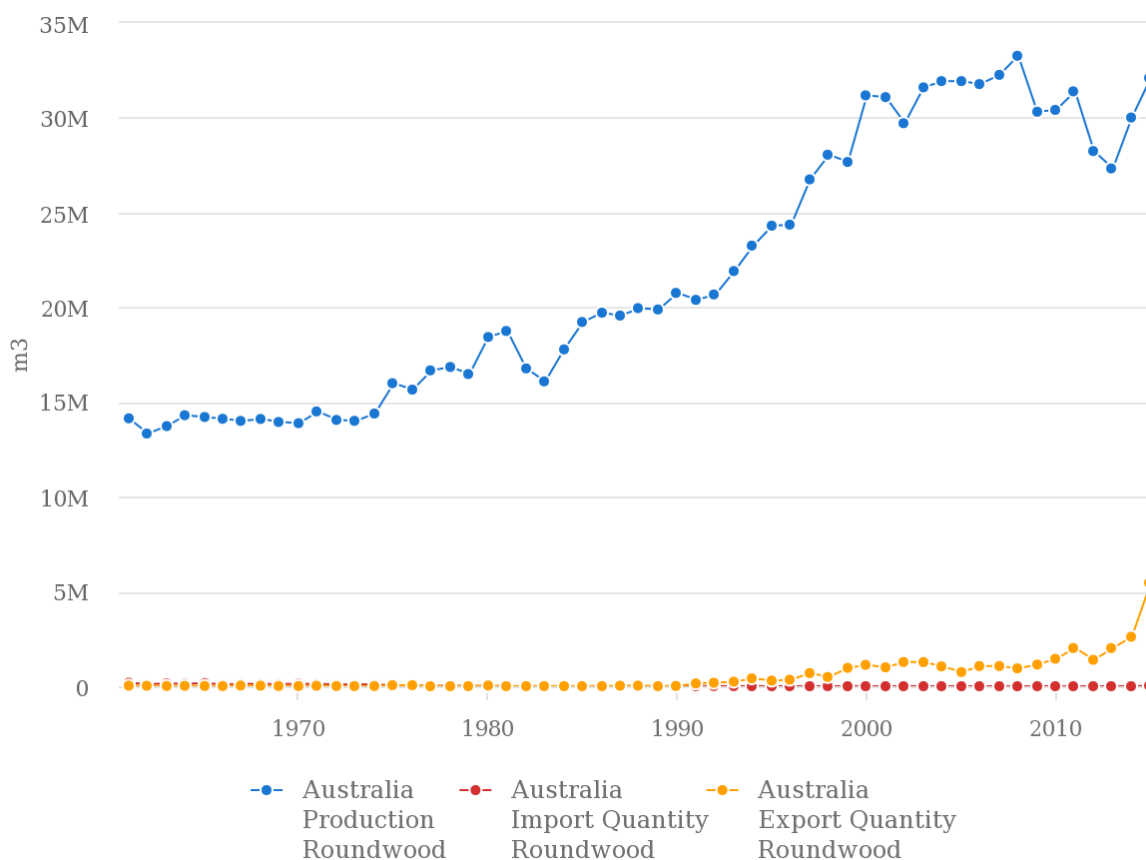
Figure 15 : Export unit prices (1992-2016)
(source : ABARES)

4. Import and export of wood resources

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

Roundwood

The export and import volumes of roundwood are shown in Figure 16. Both the import and export quantities are minor compared to the production volumes. It is only since the beginning of the 1990s that the export volumes start to increase slowly. Starting in 2014, the increase becomes sharper. The final export quantity is 5.5 million m³ in 2015. It represents 17% of the total production. The import volumes stayed very low for the whole period. In 1961, the volumes equaled 186 thousand m³, in 2015, it equaled 30 thousand m³. The roundwood production in Australia is almost exclusively oriented towards domestic market until 1990. Since that year, it orients itself towards exportation.



Source: FAOSTAT (Aug 16, 2017)

Figure 16 : imports, exports and production of roundwood in Australia (1961-2015)

(source : FAOstat)

In Western Australia, the exports of roundwood are close to zero m³ until 2000 (Figure 17). From 2000 to 2010, it increased with oscillations. Between 2010 and 2013, it dropped by 87% from 158

thousand m³ to 20.1 thousand m³. It raised sharply over 100 thousand m³ until 2015. The final value was 97.1 thousand m³ in 2016. The trend is very different compared to the national exports (Figure 16). It appears to be less stable.

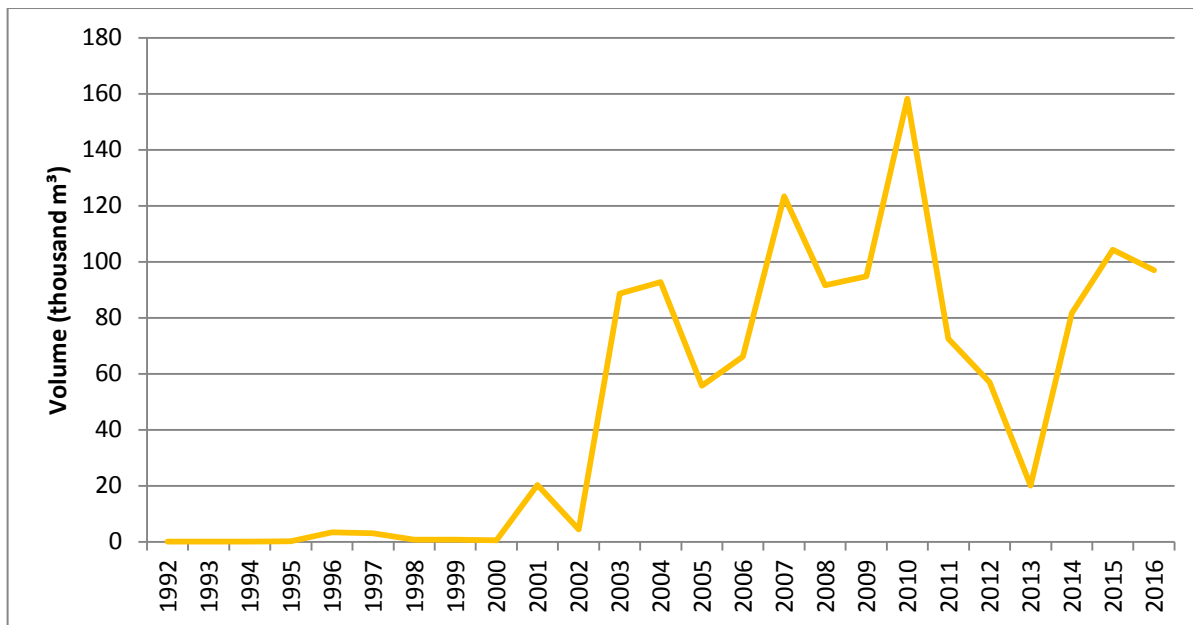
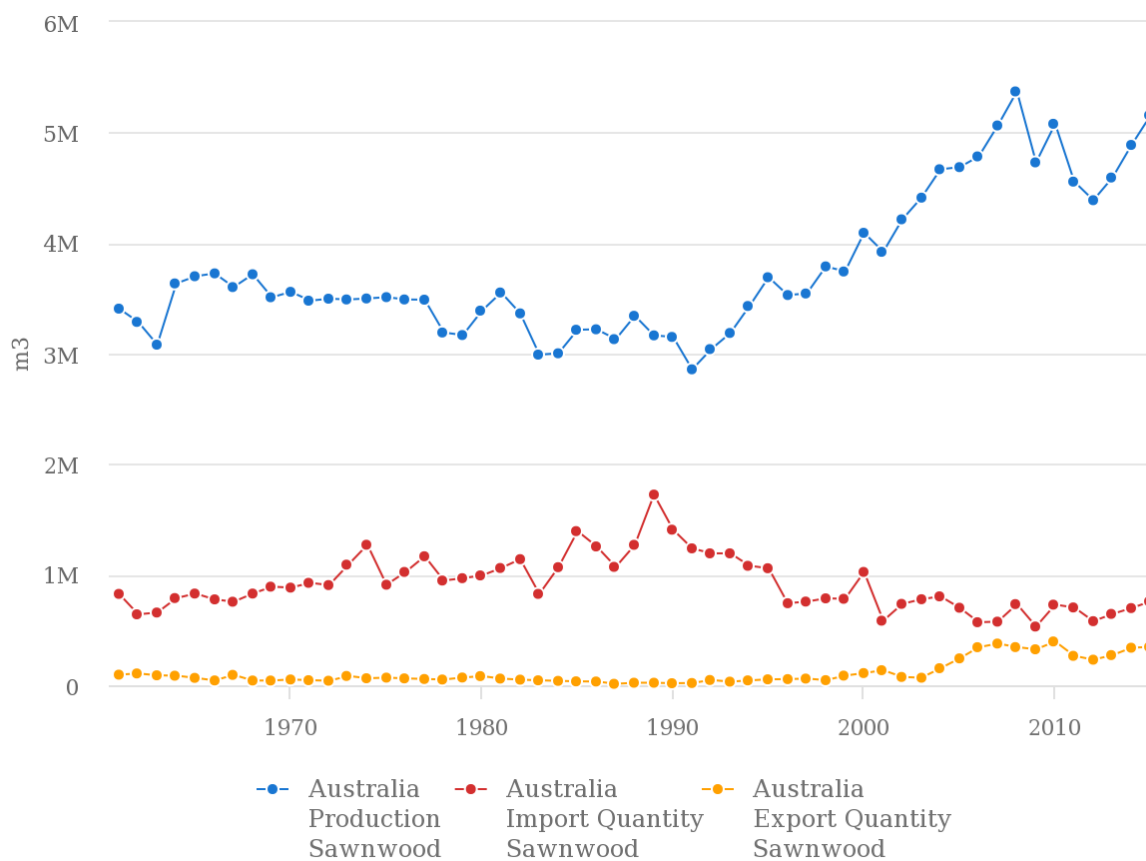


Figure 17 : Exports of roundwood in Western Australia (1992-2016)

(source : ABARES)

Sawnwood

Figure 18 presents the sawnwood production, imports and exports according to the FAO. As for roundwood, the export volumes of sawnwood stay low for a certain time before increasing. The slow increase began in 1998 and reached a volume of 347 thousand m³ in 2015. The trend of import volumes for the period is a slow increase until 1989, followed by a decrease until 2012. Since that year the volumes show signs of a slow increase. In 1961, the import volumes equaled 826 thousand m³. The maximum value was 1.7 million m³ in 1989; and the final value was 759 thousand m³ in 2015, it represents 14.7% of the production volume. The production quantity curve is the opposite of the import quantity curve. As the first increases, the latter decreases. As the production of sawnwood develops, the need for importation diminishes. Since 2012, all curves increase. The sawnwood industry is oriented towards imports and domestic market.



Source: FAOSTAT (Aug 16, 2017)

Figure 18 : Production, imports and exports of sawnwood in Australia (1961-2015)

(source : FAOstat)

The imports and exports of sawnwood in Western Australia are shown in Figure 19. The import volumes follow an increasing trend since the early 2000s. It reached its maximal value of 69.3 thousand m³ in 2015, it represents only 9.1% of the country's import volume for the same year. The exports follow approximately the same trend. Both imports and exports present a drop in their quantities in 2016, their volumes being respectively 41.9 thousand m³ and 23.3 thousand m³.

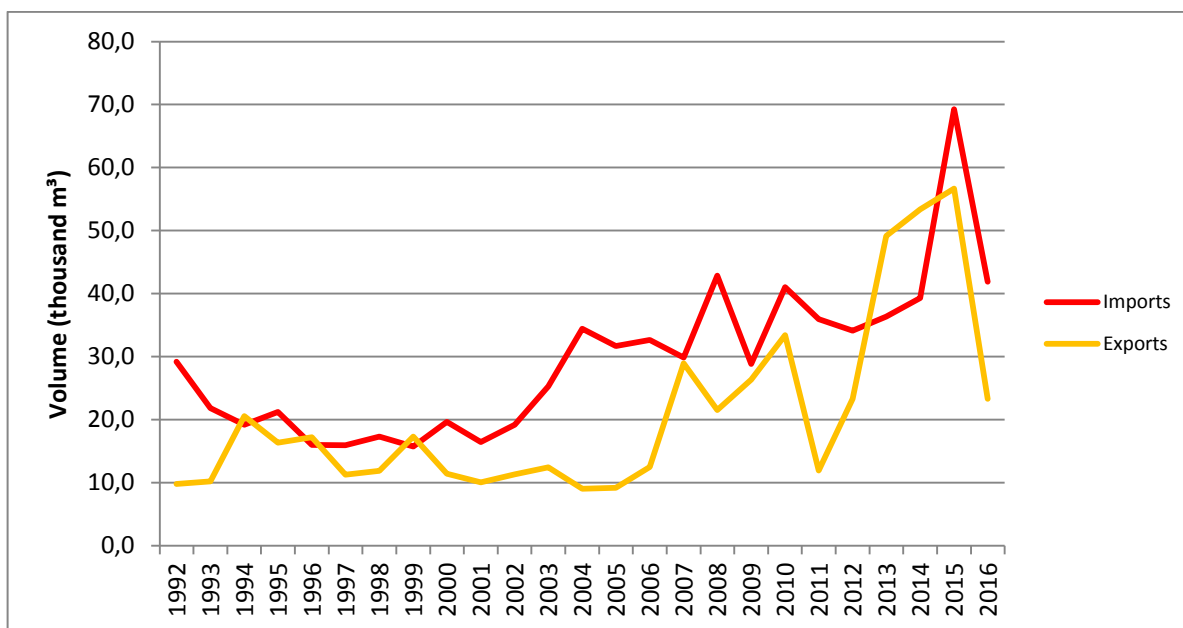
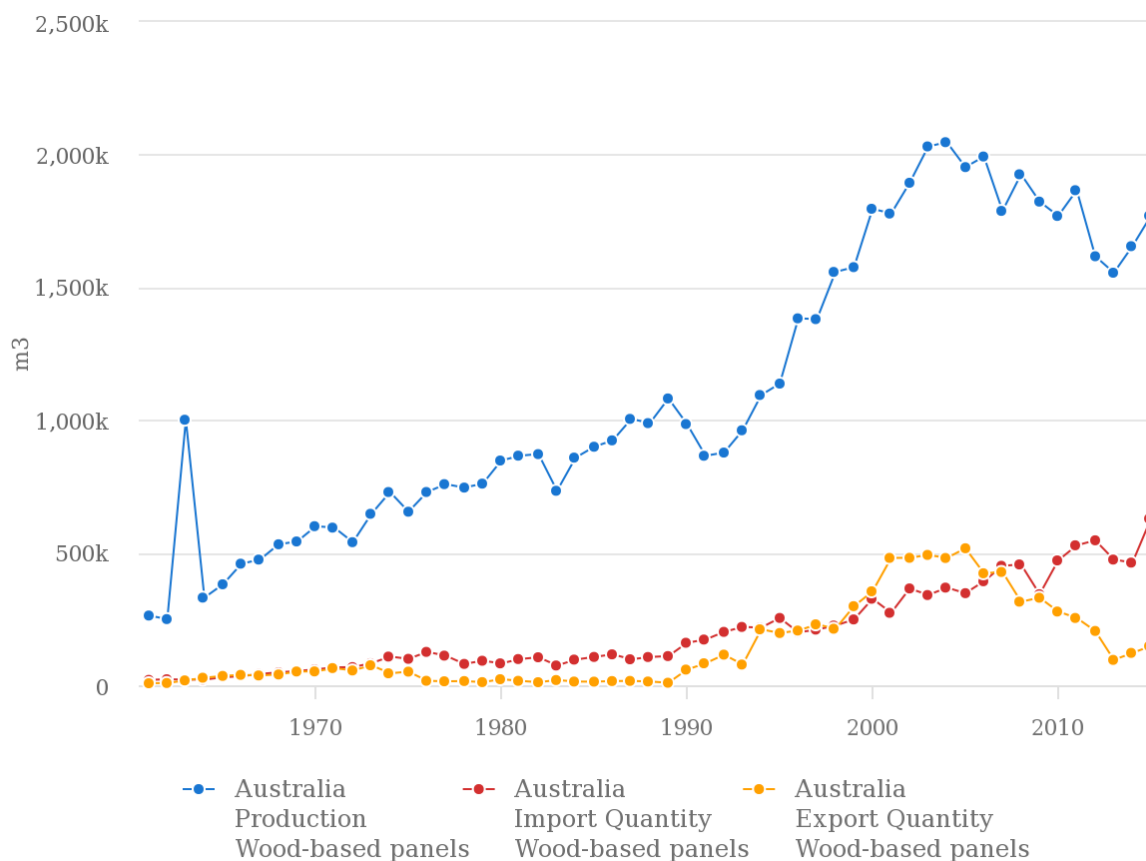


Figure 19 : Imports and exports of sawnwood in Western Australia (1992-2015)

(source : ABARES)

Wood-based panels

The production, import and export volumes of wood-based panels in Australia are presented in Figure 20. Between 1961 and the beginning of the 1990s, the export quantities stayed low, between 7,500 and 75,000 m³. Since the 1990s, the export volumes curve follows the same pattern as the production volumes curve at a lower scale. It increased until the mid 2000s; it decreased until 2012 before increasing again. The maximum value was 516 thousand m³ in 2005 and the final value was 147 thousand m³ in 2015. The export volumes are not stable through time. The import quantities follow a stable increasing trend to a maximum quantity in 2015: 628 thousand m³ or 35.5% of the production volume.



Source: FAOSTAT (Aug 16, 2017)

Figure 20 : Production, imports and exports of wood-based panels in Australia (1961-2015)
(source : FAOstat)

The imports of several wood-based panels' products in Western Australia are shown in Figure 21. The additional volume of plywood, particleboard, hardboard and veneer followed a stable trend between the beginning of the period in 1992 and 2000. In 2001, the import volume increased sharply for particleboard, began to increase for plywood and hardboard and remained stable for veneer. After that year, the curve of the combined volumes is oscillating but seems to follow a slow increasing trend. The major drop in 2009 can be linked to the global economic crisis of 2008.

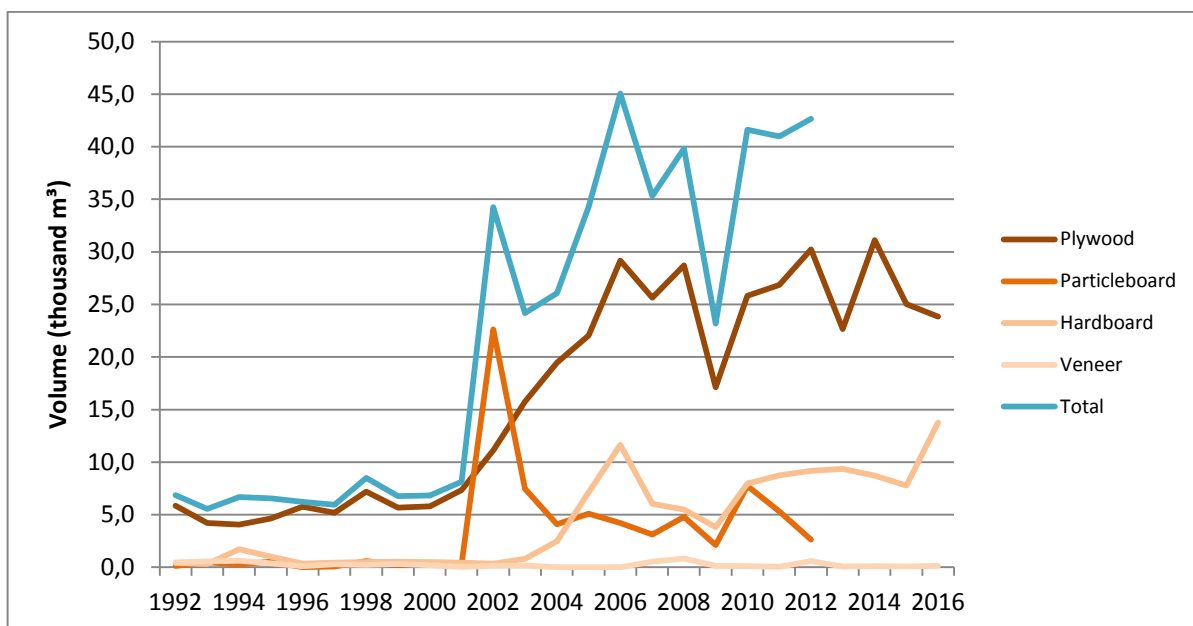


Figure 21 : Imports and exports of wood-based panels in Western Australia (1992-2016)
(source : ABARES)

Pulp for paper

The pulp for paper production, import and export volumes are shown in Figure 22. The export volumes stay near zero for the whole period, the maximum value being 19,000 tonnes (very low compared to the production volume and its maximum: 1.4 million t). The import quantities stayed low until 1967. After a sharp increase in 1968, the import volumes followed a stagnating trend around a little more than 270 thousand t. the maximum value was 414,450 t in 2008 and the final value was 287 thousand t in 2015, it represents 20% of the production quantity. The pulp industry is oriented towards domestic consumption.

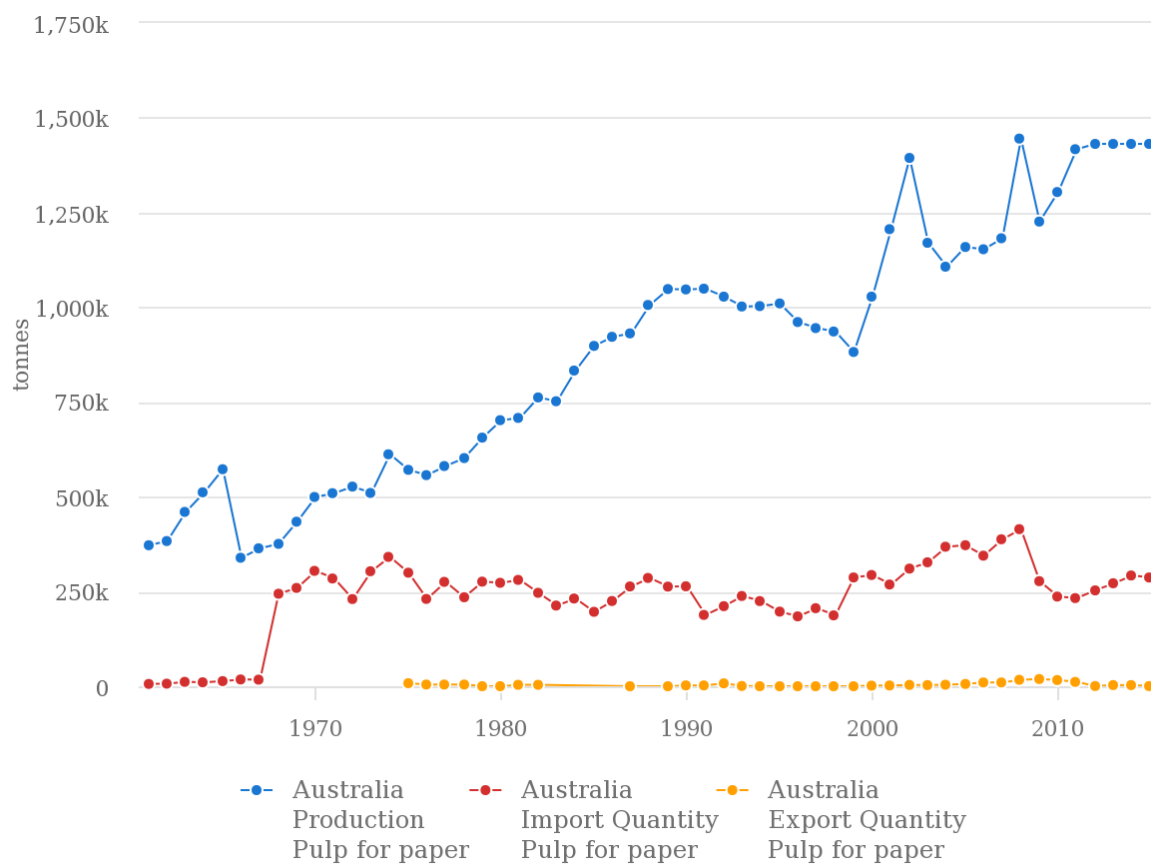


Figure 22 : Production, imports and exports of pulp for paper in Australia (1961-2015)
(source : FAOstat)

5. Conclusion

Considering the production volumes of roundwood, sawnwood, wood-based panels and pulp for paper in Australia, the general trend is an increase. Some production volumes decreased in the 2000s, however for the last 2-3 years, all present a rise. In Western Australia, log harvesting is on the rise and sawnwood present decreasing points.

In Australia, native forest areas showed signs of increase in the early 2010s after a long decrease initiated in 2000. The industrial plantations areas in Australia and Western Australia slowly decrease since 2008-09. All harvest in native forests is under sustainable levels from 1992 until 2011.

Roundwood industry in Australia is the only sector having a larger export volume than import volume in 2016. Considering the other sectors (sawnwood, wood-based panels and pulp for paper) the import volumes are bigger than export volumes (which are close to zero for the most part). However, those import volumes are much smaller than the domestic production volume. The market is oriented towards imports and domestic consumption.

The increase of wood products production supports the increase of potentially usable material for wood pellet production.

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