Economic Contribution Study of the SA Forestry Industry

Report prepared for the Green Triangle Forestry Industry Hub in collaboration with the South Australian Forest Products Association

Final Report

20th June 2022

ERC
Economic & Financial Analysis

Executive Summary

This report provides an indicative economic mapping of the forestry and wood products sector in South Australia, estimated for 2019/20. In summary:

- The sector had a combined turnover of $3.1 billion
- It directly paid wages of $0.6 billion and provided employment for 7,000 people.
- It generated a return on capital of $0.49 billion, and paid direct taxes of $59 million.
- It contributed $2.95 billion to state GDP, $1.15 directly and $1.8 billion through flow on effects.
- It supported a further 14,400 jobs in the state through flow on effects – for a total jobs contribution of 21,000 jobs.

The Green Triangle is the largest contributing region, especially with respect to forestry and sawmilling, but much of the finished product is distributed to other regions (for further processing), and as such the impact is distributed across the state (including metropolitan Adelaide). The analysis also provides a mapping for the Green Triangle region of Victoria as it interacts closely with the South East region of South Australia.

In addition, the sector makes a significant contribution as in intermediate input into other sectors of the economy. It is an important input into the local furniture manufacturing sector. But it is a critical input into the construction sector. In 2018/19 wood products represented 5% of the cost of producing a house, and 80% of this product was supplied from within Australia, with 20% imported. Given current international conditions a focus on domestic supply remains critical.

Table 1: Summary of Economic Mapping – Forestry Production in South Australia

	Green Triangle SA	Kangaroo Island	Mid North	Mt Lofty	Other South Australia	South Australia	Green Triangle Victoria	Total
Annual Turnover ($m)	$1,179.7	$47.0	$34.1	$65.2	$1,809.4	$3,135.4	$1,641.8	$4,777.1
Compensation of Employees ($m)	$210.8	$9.0	$5.8	$12.3	$365.3	$603.1	$288.4	$891.5
Employment (FTEs)	2,218	91	66	130	3,937	6,442	3,058	9,499
Employment (Jobs)	2,383	98	71	140	4,208	6,901	3,290	10,191
Gross Operating Surplus ($m)	$218.4	$10.5	$6.3	$13.3	$239.7	$488.2	$312.8	$801.1
Direct Taxes ($m)	$25.4	$1.2	$0.7	$1.5	$30.1	$58.9	$36.1	$95.0
Total net contribution - Industry and Downstream								
Value Added ($m)								
Direct	$454.5	$20.6	$12.8	$27.0	$635.2	$1,150.2	$637.4	$1,787.6
Induced	$385.3	$14.2	$11.2	$23.8	$1,366.8	$1,801.3	$561.5	$2,362.7
Total	$839.9	$34.8	$24.0	$50.8	$2,001.9	$2,951.4	$1,198.9	$4,150.3
Employment (FTEs)								
Direct	2,218	91	66	130	3,937	6,442	3,058	9,499
Induced	2,653	101	69	176	9,119	12,118	3,873	15,991
Total	4,871	192	134	306	13,056	18,560	6,931	25,490
Employment (Jobs)								
Direct	2,383	98	71	140	4,208	6,901	3,290	10,191
Induced	3,191	122	83	211	10,802	14,409	4,650	19,059
Total	5,574	220	154	351	15,011	21,309	7,940	29,250

The Industry sectors includes in Table 1 are Forestry and Logging, Sawmill and Wood Products Manufacturing and Pulp and Paper Manufacturing. It excludes Printing and Furniture Manufacturing which uses extensive inputs of the wood and wood products sector

The report models three scenarios for ongoing development in the sector (around long term trends rather current market conditions). The modelling indicates that:

- Scenario 1 – based on increased turnover of all sectors across the state by 10%, it is estimated that the industry would generate increased incomes in the state of $210 million and support an additional 1,500 jobs within the state.
- Scenario 2 – doubling the proportion of forestry and logging product that is processed in the region rather than sent out of the region would increase GSP in the state by $2.9 billion and create 24,300 jobs.
- Scenario 3 - the loss of production though a reduction in hectares in the Green Triangle (SA) region by 10% would reduce GSP in the state by $57 million, and reduce employment by an estimated 900.

PROJECT OVERVIEW AND OBJECTIVES

Background

This paper presents an economic contribution evaluation of the South Australian Forestry Industry. The Green Triangle Forestry Industry Hub summarises the contribution in recent reports as follows:

- The industry involves plantation estate of around 172,000 hectares representing about 12% of the national softwood estate and 5% of the hardwood estate
- Contributes $3B to the state's economy annually

The south east of South Australia, along with an area of south western Victoria comprise the area known as the Green Triangle, and its significance to the forestry and wood product sector of Australia is clear in that it produces: 30% of locally produced house framing, 23% of the particleboard used as flooring in houses, townhouses and apartments, and 48% of the packaging and industrial grade timber used by businesses in Australia. It also produces 60% of the poles, posts and similar products used in the domestic agricultural industry and external environment

The industry has in recent times faced challenges. The last decade has seen the loss of about 30,000 hectares of plantation estate in South Australia due primarily to the water policies of successive state governments. This equals about 30m trees. Further, in the last few years has seen the loss of 20,000 hectares on Kangaroo Island due to bushfires and transport constraints re lack of a wharf.

Objectives

The primary objective of this study is to provide an assessment of the economic contribution of the forestry industry to economic activity in South Australia and the regions that host forestry activity. An economic contribution evaluation involves a review of the jobs and incomes benefit of an industry or a project – and how it fits within the state's or region's economic structure. Some of these benefits will be within the industry directly but there will be both downstream and upstream (i.e., supply chain) issues to be included in the assessment. Impacts across the broader Green Triangle region (including SW Victoria) are also considered.

This assessment therefore demonstrates the potential value that the forestry industry brings to the economic and social fabric of South Australia and the regions most impacted.

The analysis provides summarized estimates of economic value of the forestry sectors of 2019/20, but also under alternative development scenarios, including direct and induced impacts relating to Gross State/Regional Product, employment, employee compensation and direct taxes.

The core data outputs of the project include from both a historical and future scenarios perspectives:

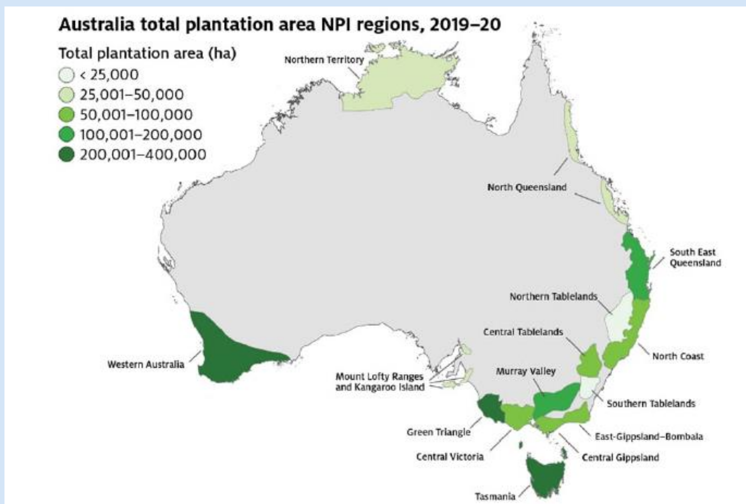
- Mapping of timber product by quantity and value of supply (local and imported) and use (local and exported)
- Historical data re employment, and incomes generated in timber production and in industries using timber (downstream)

Background - Forestry in Australia – Production Levels

The Forestry sector in Australia is active across all States and Territories, focused around the coastline. The key characteristics of production are summarised as follows:

- The total area under forestry plantation in Australia in 2019-20 was 17.775 million hectares.
- Almost 60% of this was in softwood, with 97.5% of the softwood area managed for sawlogs, and 2.5% for pulplog
- The remaining 40% are hardwood plantations, and are managed for 86% pulplog and 14% sawlog
- The hardwood plantation area has fallen by 22% since 2014-15, while softwood plantations have been relatively stable. There have been minimal new establishment since 2012. Bushfires and flooding impact on the production capacity of the plantation areas.
- Softwood plantation areas in 2019–20 are concentrated in New South Wales, Victoria and Queensland, hardwood plantation areas are concentrated in Western Australia and Tasmania. South Australia has 9.6% of the plantation area, mainly in softwood.
- The plantations have forecast availability for 2020-24
  - 15.3 million m^3 softwood logs per year, a reduction from 17 million m^3 in 2015-19 caused by the impact of bushfires - before increasing in the years beyond that (primarily post 2035)
  - 9.7 million m^3 hardwood logs – remaining steady

Figure 1: Geographic distribution– Forestry Production in Australia



Source: Australian plantation statistics and log availability report 2021, ABARES

Figure 2: Plantation Areas - Australia

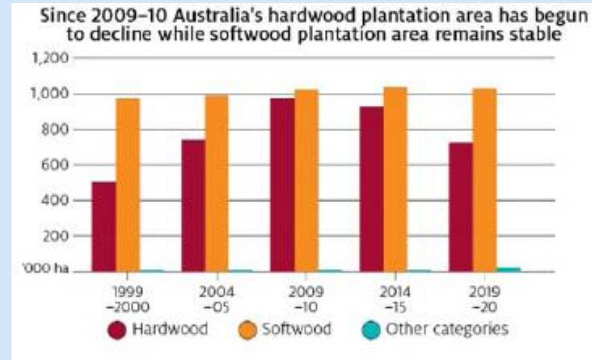


Figure 3: Forecasts of softwood log availability

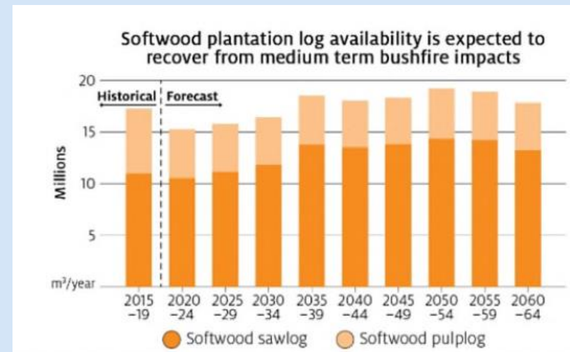
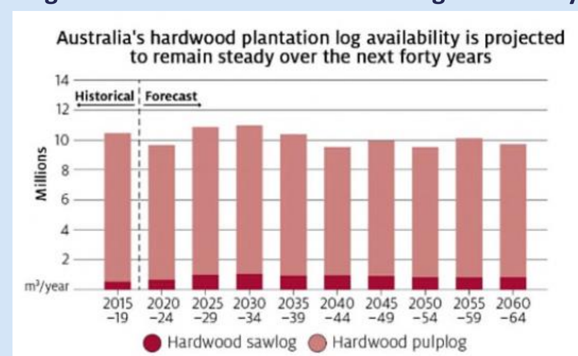


Figure 4: Forecasts of hardwood log availability



While the previous pages summarises production levels as published in October 2021, the latest data for sawmills (which gives more detail of the nature of production output) is for 2016-17 (the last ABARES survey):

- Associated with the forestry plantation areas there a were total of 299 mills operated in 2016–17, comprising 182 hardwood sawmills, 58 softwood sawmills, 23 wood-based panel mills, 19 post and pole mills and 17 cypress pine sawmills.
- The number of sawmills declined between 2006–07 and 2012-13 (hardwood sawmills decreasing by 64 per cent and softwood sawmills by 31 per cent) along with 38 percent decline in the volume of hardwood and softwood sawlogs harvested for domestic processing Sawmill numbers have since stabilised while sawlog processing volumes have increased.
- A total of 10.63 million cubic metres of sawlogs was processed in Australian sawmills - 1.91 million cubic metres of hardwood sawlogs, 8.58 million cubic metres of softwood sawlogs. This resulted in 4.71 million cubic metres of sawnwood (742,000 cubic metres of hardwood sawnwood, 3.91 million cubic metres of softwood sawnwood) and an estimated 280,000 cubic metres of posts and poles and 1.79 million cubic metres of wood-based panels was produced.
- A total of 5.49 million cubic metres of sawlog residues (primarily woodchip) was produced comprising 1.09 million cubic metres of hardwood residues and 4.40 million cubic metres of softwood residues.
- 27 per cent of hardwood sawnwood production was dry appearance-grade products, followed by green structural (24 per cent) and green other (24 per cent). 52 per cent of total softwood sawnwood production was dry structural-grade timber, followed by green other (23 per cent) and dry other (18 per cent).
- An estimated $2.48 billion of revenue was generated in 2016–17 from the sale of sawnwood processed in Australia, comprising $930 million from hardwood sawnwood sales and $1.55 billion from softwood sawnwood sales.

Figure 5: Geographic distribution of sawmills

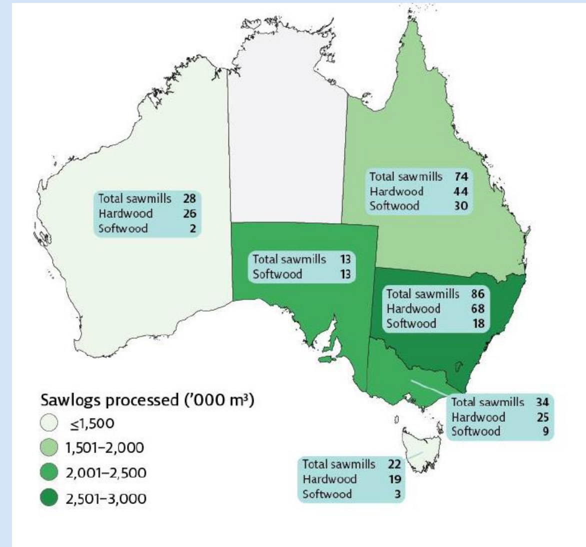
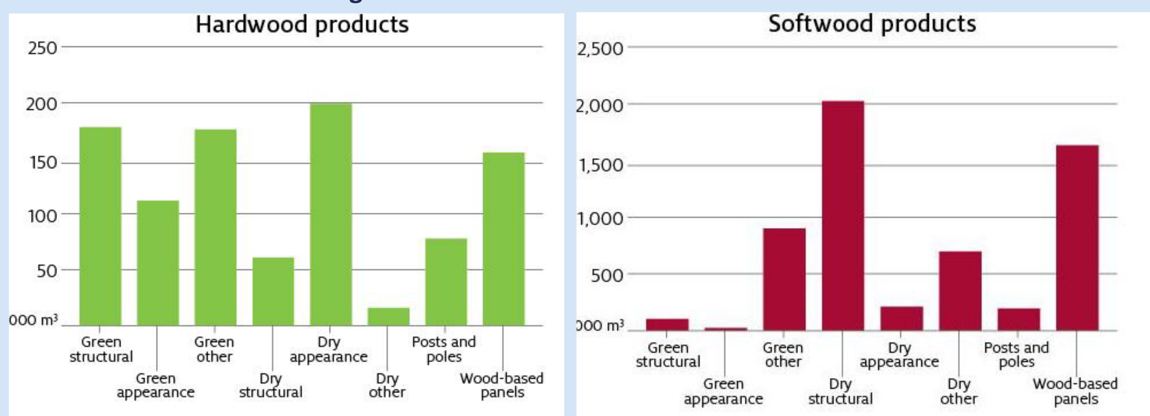


Figure 6: Sawnwood Product Profiles



Source: ABARES National Wood Processing Survey 2016–17

Summary of Economic Footprint

The ABARES data in previous pages summarizes production volumes for 2019-20. To get an indication of more detailed financial flows, this study uses as a base the 2018/19 national input output table produced by the ABS (indicatively adjusted to 2019/20) and this indicates that the economic footprint of the forestry and wood products industry is as presented in Table 2 with key points summarized as:

- Total turnover of the Wood and Paper products was $28.3 billion.
- Total exports were around $3.5 million , while imports were almost $6 billion.
- The sector employed of the order of 68,000 people (63,000 FTEs). Employment has been falling steadily over several years as labour productivity has been increased.
- Other than internal transfers, the majority of wood product is used within Australia in construction activity.

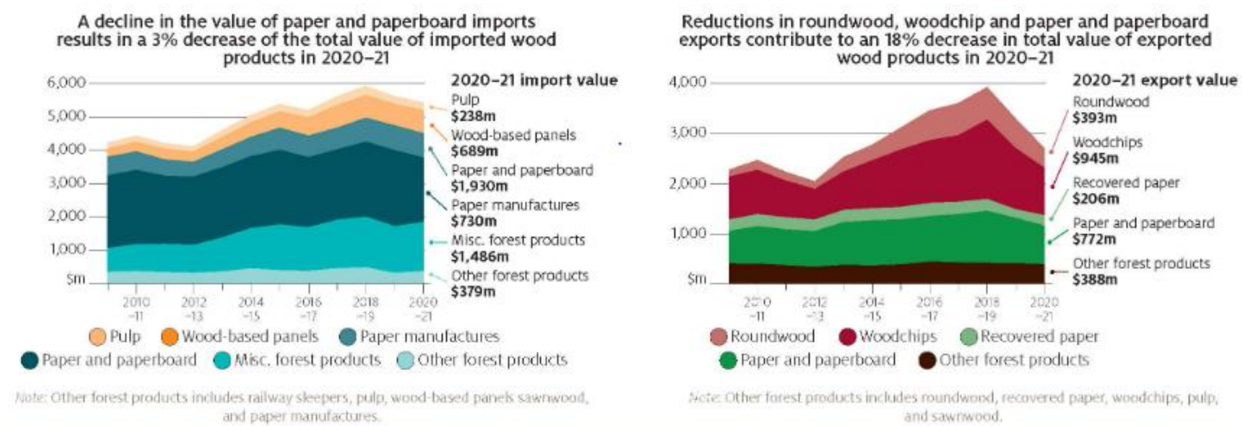
These estimates are supported in terms of orders of magnitude by ABARES data from their 2021 as discussed earlier, including that presented in Figures 7 and 8.

Table 2: Economic Mapping, Forestry Industry in Australia, 2019-20

	Forestry and Logging	Sawmill product manufacturing	Other wood product manufacturing	Pulp, paper and paperboard manufacturing	Paper stationery and other converted paper product manufacturing	Total Wood and Paper	Printing (including the Reproduction of Recorded Media)	Furniture manufacturing	Total
Annual Turnover ($m)	$4,093.0	$5,009.0	$9,630.0	$2,811.0	$6,769.0	$28,312.0	$6,364.0	$4,768.0	$39,444.0
Compensation of Employees ($m)	$692.0	$774.0	$2,312.0	$424.0	$1,264.0	$5,466.0	$2,122.0	$1,268.0	$8,856.0
Employment (FTEs)	5,725	11,629	30,677	2,865	12,323	63,220	30,860	25,367	119,446
Employment (Jobs)	6,180	12,563	33,140	2,999	12,900	67,782	33,807	27,639	129,228
Gross Operating Surplus ($m)	$1,284.0	$623.0	$1,211.0	$282.0	$609.0	$4,009.0	$450.0	$652.0	$5,111.0
Direct Taxes ($m)	$135.4	$81.6	$144.0	$46.3	$91.9	$499.2	$130.6	$89.5	$719.2
Inputs from within the region by sector									
Wood and Wood products sector	5.6%	39.2%	18.1%	13.4%	7.2%	17.0%	8.2%	12.2%	15.0%
Other agriculture and mining	15.0%	0.5%	0.9%	5.0%	2.5%	3.7%	0.7%	0.6%	2.8%
Other manufacturing	7.9%	1.2%	5.2%	5.2%	4.0%	4.6%	4.1%	7.6%	4.9%
Utilities	0.1%	1.5%	2.3%	12.5%	4.2%	3.3%	1.3%	1.8%	2.8%
Construction	0.2%	6.3%	4.5%	0.9%	1.2%	3.1%	1.5%	2.8%	2.8%
Trade	1.5%	2.2%	2.8%	2.4%	2.8%	2.5%	2.7%	3.7%	2.6%
Transport - inputs	2.3%	11.1%	5.7%	3.0%	2.4%	5.1%	1.3%	2.4%	4.1%
Transport - outputs	0.1%	2.6%	0.3%	0.4%	0.2%	0.6%	0.0%	0.8%	0.6%
Other Services	0.5%	4.3%	12.0%	15.8%	22.2%	11.8%	19.1%	6.8%	12.4%
Total	33.2%	68.8%	51.9%	58.6%	46.6%	51.6%	38.9%	38.7%	48.0%
Sales of Output									
Woods and woods products sector	70.6%	25.0%	6.2%	18.6%	4.6%	19.7%	4.9%	0.5%	15.0%
Construction	0.3%	41.0%	78.5%	5.8%	6.7%	36.2%	7.9%	26.2%	30.4%
Other Intermediate demand	9.5%	3.5%	8.1%	48.8%	50.4%	21.7%	79.8%	12.1%	29.9%
Households final demand	1.7%	0.9%	2.9%	5.1%	26.8%	8.3%	3.7%	31.0%	10.3%
Govt and investment final demand	4.7%	-0.5%	2.7%	1.1%	1.1%	1.9%	0.6%	24.5%	4.4%
Exports - Overseas	13.3%	30.0%	1.5%	20.5%	10.5%	12.3%	3.2%	5.6%	10.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Figure 7: Wood Products Employment by State

Figure 8: Trends in International Trade – Forestry and Wood Products



Source of figures https://www.awe.gov.au/abares/research-topics/forests/forest-economics/forest-wood-products-statistics 2021

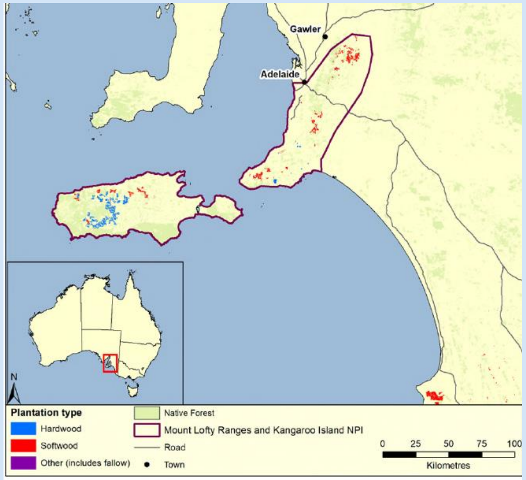
Mt Lofty and Kangaroo Island

Mount Lofty and Kangaroo Island plantation softwood area declined in 2019-20 as some plantations were converted to another land use.

ABARES forecasting shows Mount Lofty and Kangaroo Island softwood availability peaking in 2020-24 due to salvage logging activities – but this has not occurred. Forecasts of hardwood plantation log availability drops between 2040 and 2049 due to the age class distribution (Table 3).

The softwood plantations in this region supply sawlogs and pulplog to processing industries near Adelaide at Wingfield, Nuriootpa and Jamestown. Logs can be exported from Port of Adelaide.

Figure 9: Geographic Mapping of Forestry Areas in Mt Lofty and Kangaroo Island



Green Triangle

Green Triangle plantation area has declined since 2009-10 due to contractions in the hardwood estate while the softwood estate has been stable.

Green triangle hardwood and softwood supply expected to remain stable (Table 4)

The Green Triangle region has a well–established wood processing industry that sources its logs from plantations. Most of the softwood plantations in the Green Triangle region are radiata pine (P. radiata) and Tasmanian blue gum (E. globulus) is the main hardwood species. These provide a steady supply of sawlogs and pulplog to large-scale integrated processing industries at Mount Gambier, Tarpeena, Myamin, Colac and other locations. These industries produce sawn timber, laminated veneer lumber, particleboard, treated posts and poles. Small round wood and woodchips are exported from Portland.

Figure 9: Geographic Mapping of Forestry Areas in the Green Triangle

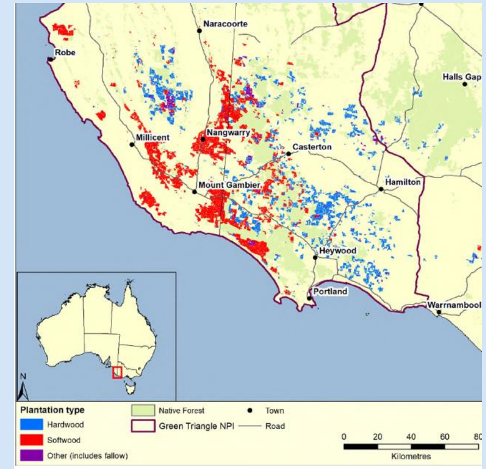


Table 3: Forecasts of Log Availability – Mt Lofty and Kangaroo Island

	2020-24	2025-29	2030-34	2035-39	2040-44	2045-49	2050-54	2055-59	2060-64
Hardwood pulplog	189	401	369	338	102	29	341	310	276
Hardwood sawlog	2	0	2	0	1	2	0	2	0
Softwood pulplog	67	54	69	62	54	38	58	48	48
Softwood sawlog	250	171	104	126	142	133	190	107	143
Grand Total	508	626	544	527	298	202	589	467	468

Table 4: Forecasts of Log Availability – Green Triangle

	2020-24	2025-29	2030-34	2035-39	2040-44	2045-49	2050-54	2055-59	2060-64
Hardwood pulplog	1,709	2,047	2,124	1,734	1,541	1,536	1,554	1,720	1,557
Hardwood sawlog	0	0	0	0	0	0	0	0	0
Softwood pulplog	907	872	868	856	797	828	835	809	910
Softwood sawlog	3,033	3,189	3,179	3,490	3,747	3,948	3,866	3,759	3,453
Grand Total	5,649	6,108	6,171	6,081	6,085	6,312	6,255	6,287	5,920

Source: Australian plantation statistics and log availability report 2021, ABARES

Green Triangle Forestry Activity – Background information

The Green Triangle region Freight Action Plan Update (June 2016) summarised a case for improved freight infrastructure, with the main driving factor being growth in the forestry transport task.

The major recommendations coming out of the Action Plan including the need for

1. Updating the evidence base for transport
2. New investment for priority freight corridors, with required investment of $179 million over 10 years (with BCR) of 1.74. These priority freight routes are;
   1. Princes Highway (a) Warrnambool to Heywood, (b) Heywood to South Australia Border
   2. Portland-Casterton Road
   3. Portland-Nelson Road
   4. Henty Highway a) Ring Road to Port b) Condah to Portland
3. A new user-pays framework for the region's road network

Figure 10: Freight Out from Port of Portland

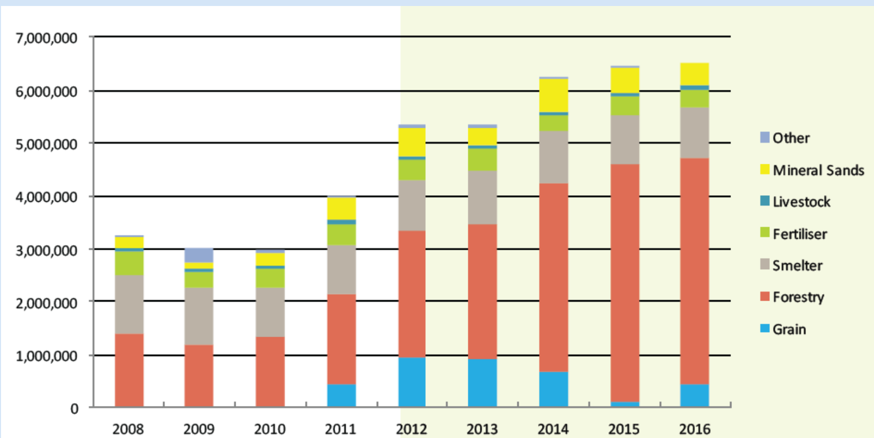


Figure 2: Port of Portland 2015, Commodity Exports including 2016 forecast (tonnes per annum)

The Freight Action Plan summarises the economic characteristics of the forestry and transport sector *(note the transport task includes more than just forestry as can be seen in Figure 10)*

- Largest plantation forestry area in Australia (355,000 hectares and 18 per cent of the national plantation estate)
- More than 150 separate businesses in the region rely on the forest industry
- More than 3,400 direct forest industry jobs with more than 550 additional jobs expected by end of 2016
- Over 18,000 jobs created by the region's forestry and transport sectors
- Six globally significant plantation companies operating
- More than 145,000 truck trips annually to the Port of Portland (2015)
- Forestry and transport combined output exceeding $790m per annum
- Combined value added exceeding $397m per annum
- Exports in raw timber and timber products, mineral sands, and grains, expected to grow over next five to 10 years
- Port of Portland is currently the largest hardwood chip export in the world

Green Triangle Strategic Directions

The report "Building the Nation: Growing the Green Triangle's Contribution to Australia's Future" (Green Triangle Forestry Industry Hub, 2021) indicates that the Green Tringale contributes more wood products into domestic markets than any other region producing:

- 35% of Australia's locally produced house framing and interior sawnwood
- 25% of the nation's particleboard
- 48% of the packaging and industrial grade timber
- 60% of the poles, posts, fencing and similar products, used in the agriculture, horticulture and external environments.

However, the report notes that over 40% of forestry output leaves the region unprocessed, and therefore the report, and the accompanying strategic plan also sets targets for the region to increase the extent of local production – rather than exporting log and residue. The report outlines strategies that focus on increasing the extent of local processing and presents the following targets.

Figure 11: GTFIH Strategic Targets -1

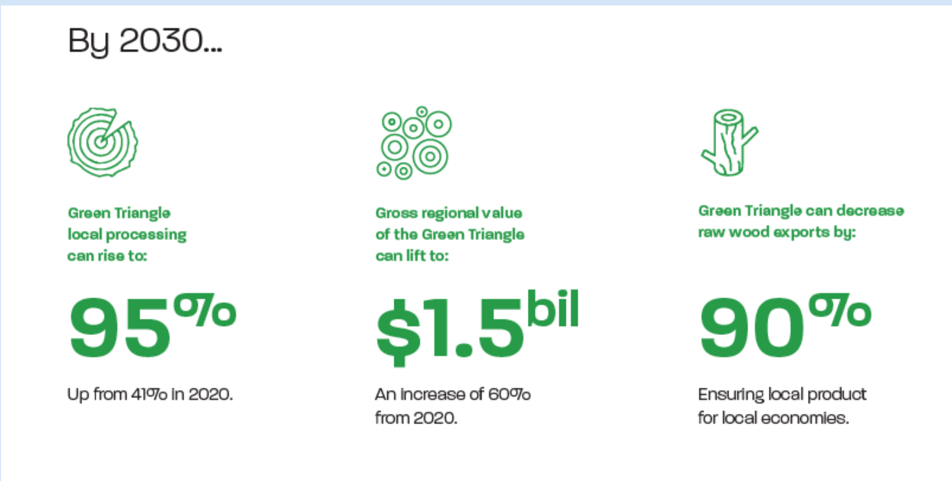
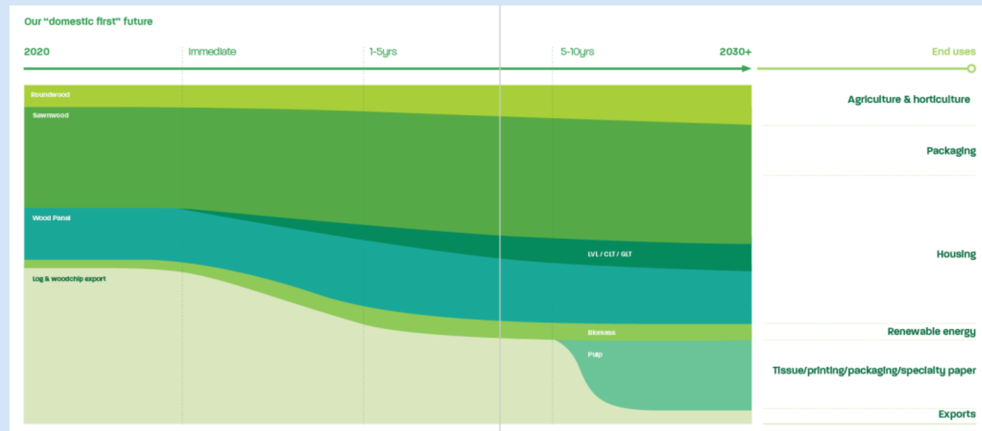


Figure 12: GTFIH Strategic Targets -2



Source: "Building the Nation: Growing the Green Triangle's Contribution to Australia's Future"

Context of Modelling and Summary of Economic Mapping Methodology

Without a full survey/audit of the companies involved in an industry there is limited data with respect to the economic structure of that industry at the regional level. In the main this is restricted to employment data and at sub-state level that in turn is limited to census data. It is clear from comparing ABS Labour Force data and Census data at the national and state level that census data substantially understates employment outcomes in the region.

At the national level, the best picture of an industry and how it is structured is available in an input output table prepared by the ABS, and the outcomes for the Forestry sector is summarised in Slide 6 above. To assess the contribution of the sector by region, with a focus on South Australia, the following steps have been undertaken:

- The last available national IO table at the beginning of this analysis (2018/19) has been updated to 2019/20 (mainly for inflation). Employment data by industry has been sourced from the labour force survey. The table has been structured at a 35-sector level, focussing on the industries of and linked to the forestry sector.
- State tables for SA and Victoria for 2019/20 have been prepared using a mathematical process (location quotient method) involving State Labour Force data of employment by industry and adjusting for data on wages and salaries (compensation of employees), gross operating surplus and direct taxes from the State Accounts data. Adjustment of jobs to FTEs is based on the ratios in the national IO tables.
- Regional tables have been prepared also using the location quotient method (applied to the underlying state table), based on journey to work census data for each region (and adjusted upwards for under-enumeration in census employment data (as evidenced from the labour force data at the state level)). Regional tables are defined at the Statistical Area Level 3 ABS definition (or aggregated as appropriate).

This process provides a picture of the respective regional economies. It should be cautioned that it is not an audited/full survey approach – and as such should be understood to be indicative. Further it is noted this an economic contribution perspective – and it should be noted that it cannot be concluded that a region would decline by the levels estimated (proportionally) should the industry somehow shrink. Should this happen, there would potentially be some offsetting macroeconomic responses or in the medium to longer term the evolution of replacement industries (e.g., forestry areas taken over by alternative agriculture) that would offset.

The Industry sectors that are mapped include: Forestry and Logging, Sawmill product manufacturing, Other wood product manufacturing, Pulp, paper and paperboard manufacturing, Paper stationery and other converted paper product manufacturing as the focus, but also as they are inter-related include Printing (including the Reproduction of Recorded Media) and Furniture manufacturing. The forestry regions tend to have increased focus on the first two and to some extent the third sector, and output from those sectors is "exported from the region" to other regions of the state to be used in the other sectors (and construction as discussed further on), to other states and overseas

Tables 5 to 11 present the mapping outcomes based on this methodology for the State of South Australia, and then for the "forestry intensive" regions in South Australia. In addition, because of the interaction between the Green Triangle areas of South Australis and Victoria a mapping of the Green Triangle Victorian region is included, and for the Green Triangle as a whole.

The mapping focusses first on identifying the direct turnover, employment, compensation of employees (gross) and gross operating surplus (returns to capital) and taxes. It reviews the linkages within the economy and provides an estimate of where outputs of each sector are "sold". The estimates are in basic values and exclude margins.

National accounting conventions measure activity in terms of value added (compensation of employees + gross operating surplus + taxes) and employment. Therefore, the turnover in each sector is then applied to the economic model to provide estimates of direct and induced value added and employment outcomes. Induced outcomes are the flow on effects created by the business-to-business flows (i.e., the forestry and wood products sector buys from other industries) and the spend of wages generated. The modelling allows for flows that occur within the sector to avoid double counting.

It is noted that this is an economic contribution study – it is the footprint of the industry as it currently exists. It is not suggested that should the forestry sector somehow cease to exist the economies would reduce by the estimated level of activity. Resources currently used by the forestry sector could be taken up by other sectors and the impact would be moderated by this and possible supply side adjustments. This methodology is broadly consistent with that used in "Socio-economic impacts of the forest industry - Green Triangle, November 2017" (Forest and Wood Products Australia) and "Timber industry: Specialised analysis for the Timber Towns Victoria council areas" (.id informed decisions, 2021).

SA Forestry Industry Mapping

Table 5: Forestry and Woods Product Industry Mapping – South Australia

	Forestry and Logging	Sawmill product manufacturing	Other wood product manufacturing	Pulp, paper and paperboard manufacturing	Paper stationery and other converted paper product manufacturing	Total Wood and Paper	Printing (including the Reproduction of Recorded Media)	Furniture manufacturing	Total
Annual Turnover ($m)	$684.4	$549.5	$933.4	$67.3	$900.8	$3,135.4	$344.9	$305.3	$3,785.6
Compensation of Employees ($m)	$115.7	$84.9	$224.1	$10.2	$168.2	$603.1	$115.0	$81.2	$799.3
Employment (FTEs)	870	1,160	2,703	69	1,640	6,442	1,673	1,624	9,738
Employment (Jobs)	939	1,253	2,920	72	1,717	6,901	1,832	1,770	10,503
Gross Operating Surplus ($m)	$214.7	$68.3	$117.4	$6.8	$81.0	$488.2	$24.4	$41.7	$554.3
Direct Taxes ($m)	$22.6	$9.0	$14.0	$1.1	$12.2	$58.9	$7.1	$5.7	$71.7
Inputs from within the region by sector									
Wood and Wood products sector	5.6%	39.2%	18.0%	11.7%	4.5%	15.0%	5.2%	12.1%	13.9%
Other agriculture and mining	15.0%	0.4%	0.7%	3.4%	1.8%	4.1%	0.5%	0.5%	3.5%
Other manufacturing	7.9%	1.2%	5.2%	5.2%	4.0%	4.7%	4.1%	7.6%	4.9%
Utilities	0.1%	1.5%	2.3%	12.2%	4.1%	2.4%	1.3%	1.8%	2.3%
Construction	0.2%	5.5%	4.0%	0.8%	1.0%	2.5%	1.3%	2.4%	2.4%
Trade	1.5%	2.1%	2.8%	2.3%	2.6%	2.3%	2.5%	3.6%	2.4%
Transport - inputs	2.2%	10.7%	5.5%	2.9%	2.3%	4.7%	1.3%	2.3%	4.2%
Transport - outputs	0.1%	4.8%	1.5%	0.2%	0.1%	1.4%	0.1%	0.9%	1.2%
Other Services	0.5%	3.8%	10.2%	12.6%	18.1%	9.3%	15.3%	5.7%	9.5%
Total	33.1%	69.2%	50.1%	51.2%	38.5%	46.4%	31.5%	36.9%	44.3%
Sales of Output									
Woods and woods products sector	46.7%	17.7%	4.9%	22.5%	3.2%	16.2%	5.0%	0.5%	13.9%
Construction	0.1%	23.0%	48.3%	4.7%	3.0%	19.4%	6.6%	21.7%	18.4%
Other Intermediate demand	5.6%	2.4%	7.2%	56.8%	33.7%	14.7%	76.8%	13.9%	20.3%
Households final demand	0.6%	0.5%	1.9%	4.4%	12.5%	4.5%	3.2%	26.8%	6.2%
Govt and investment final demand	1.2%	0.0%	2.2%	0.9%	0.4%	1.0%	0.8%	16.1%	2.2%
Exports - Other Aust regions	35.2%	32.3%	34.3%	0.2%	38.8%	34.7%	4.4%	15.4%	30.4%
Exports - Overseas	10.6%	24.0%	1.2%	10.4%	8.4%	9.5%	3.2%	5.6%	8.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total net contribution - Industry and Downstream									
Value Added ($m)									
Direct	$353.0	$162.2	$355.4	$18.0	$261.5	$1,150.2	$146.5	$128.7	$1,425.3
Induced	$311.1	$274.2	$590.0	$40.3	$585.6	$1,801.3	$223.5	$173.7	$2,198.5
Total	$664.2	$436.4	$945.5	$58.4	$847.1	$2,951.4	$370.0	$302.4	$3,623.8
Employment (FTEs)									
Direct	870	1,160	2,703	69	1,640	6,442	1,673	1,624	9,738
Induced	2,034	1,457	3,960	261	4,405	12,118	1,662	1,213	14,993
Total	2,905	2,616	6,663	330	6,045	18,560	3,335	2,837	24,731
Employment (Jobs)									
Direct	939	1,253	2,920	72	1,717	6,901	1,832	1,770	10,503
Induced	2,414	1,748	4,716	308	5,223	14,409	1,989	1,447	17,844
Total	3,354	3,001	7,636	380	6,939	21,309	3,821	3,216	28,347

Summary:

- The mapping reaffirms the earlier cited Green Triangle Forestry Industry Hub estimate of industry value. In this modelling the sector is estimated as generating $3.1 billion of direct turnover, or $3.0 billion of income/value added generated (direct and indirect).
- The sector supports wages directly of $603 million and 6,900 jobs
- However, because of the purchases of inputs and the spend of wages it supports a further 14,400 jobs throughout the SA economy, with a total therefore of 21,300 jobs.
- Forestry and wood products provides significant inputs into local construction.
- The industry in terms of share of Gross State Product and employment represents approximately 3.3.% of the state economy.

Green Triangle – SA Forestry Industry Mapping

Table 6: Forestry and Woods Product Industry Mapping – Green Triangle (South Australia)

	Forestry and Logging	Sawmill product manufacturing	Other wood product manufacturing	Pulp, paper and paperboard manufacturing	Paper stationery and other converted paper product manufacturing	Total Wood and Paper	Printing (including the Reproduction of Recorded Media)	Furniture manufacturing	Total
Annual Turnover ($m)	$414.8	$365.5	$187.8	$12.7	$198.9	$1,179.7	$5.3	$9.3	$1,194.3
Compensation of Employees ($m)	$70.1	$56.5	$45.1	$1.9	$37.1	$210.8	$1.8	$2.5	$215.0
Employment (FTEs)	527	771	544	13	362	2,218	26	49	2,293
Employment (Jobs)	569	833	588	14	379	2,383	28	54	2,465
Gross Operating Surplus ($m)	$130.1	$45.5	$23.6	$1.3	$17.9	$218.4	$0.4	$1.3	$220.0
Direct Taxes ($m)	$13.7	$6.0	$2.8	$0.2	$2.7	$25.4	$0.1	$0.2	$25.7
Inputs from within the region by sector									
Wood and Wood products sector	5.6%	39.2%	18.0%	11.4%	4.0%	17.8%	3.6%	12.0%	17.7%
Other agriculture and mining	15.0%	0.2%	0.2%	0.6%	0.3%	5.4%	0.1%	0.4%	5.4%
Other manufacturing	6.2%	0.9%	4.1%	4.1%	3.2%	3.7%	3.2%	6.0%	3.7%
Utilities	0.1%	0.8%	1.2%	5.6%	1.8%	0.8%	0.7%	0.9%	0.8%
Construction	0.1%	4.3%	3.1%	0.6%	0.8%	2.0%	0.9%	1.9%	2.0%
Trade	1.4%	2.1%	2.6%	1.9%	2.5%	2.0%	2.3%	3.4%	2.0%
Transport - inputs	2.2%	10.5%	5.4%	2.8%	2.1%	5.3%	1.2%	2.3%	5.2%
Transport - outputs	0.2%	7.9%	3.4%	1.0%	0.5%	3.1%	0.1%	1.0%	3.1%
Other Services	0.4%	2.5%	6.4%	7.7%	10.3%	3.7%	8.8%	3.4%	3.8%
Total	31.2%	68.4%	44.3%	35.8%	25.4%	43.9%	21.0%	31.3%	43.7%
Sales of Output									
Woods and woods products sector	42.3%	5.7%	3.2%	20.3%	2.7%	17.8%	13.3%	2.0%	17.7%
Construction	0.0%	1.0%	6.2%	0.7%	0.4%	1.4%	3.7%	14.1%	1.5%
Other Intermediate demand	0.5%	0.2%	1.2%	9.4%	5.1%	1.4%	63.1%	11.4%	1.7%
Households final demand	0.0%	0.0%	0.3%	0.8%	1.8%	0.4%	2.4%	25.2%	0.6%
Govt and investment final demand	0.1%	0.0%	0.4%	0.2%	0.1%	0.1%	1.9%	0.0%	0.1%
Exports - Other Aust regions	46.5%	69.1%	87.4%	58.2%	81.6%	66.1%	12.4%	41.6%	65.7%
Exports - Overseas	10.6%	24.0%	1.2%	10.4%	8.4%	12.9%	3.2%	5.6%	12.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total net contribution - Industry and Downstream									
Value Added ($m)									
Direct	$214.0	$107.9	$71.5	$3.4	$57.7	$454.5	$2.3	$3.9	$460.7
Induced	$118.9	$130.4	$68.6	$3.6	$63.8	$385.3	$1.7	$2.9	$389.9
Total	$332.9	$238.3	$140.2	$7.0	$121.5	$839.9	$4.0	$6.8	$850.6
Employment (FTEs)									
Direct	527	771	544	13	362	2,218	26	49	2,293
Induced	859	729	516	26	523	2,653	14	23	2,691
Total	1,386	1,500	1,060	39	885	4,871	40	73	4,984
Employment (Jobs)									
Direct	569	833	588	14	379	2,383	28	54	2,465
Induced	1,027	881	621	32	630	3,191	18	28	3,236
Total	1,597	1,714	1,208	45	1,009	5,574	46	82	5,701

Summary:

- The mapping indicates an estimated value of the forestry and wood products sector in the Green Triangle at $1.2 billion of turnover directly or $0.84 billion of incomes generated (direct and indirect).
- The sector supports wages directly of $211 million and 2,380 jobs.
- However, because of the purchases of inputs and the spend of wages it supports a further 3,060 jobs throughout the regional economy, for a total of 5,570 jobs in the region.
- The industry in terms of share of Gross Regional Product and employment represents approximately 18-21% of the regional economy.

The economic model for this analysis is defined at the SA3 ABS area definition – the Limestone Coast region

Mt Lofty Ranges Forestry Industry Mapping

Table 7: Forestry and Woods Product Industry Mapping – Mt Lofty

	Forestry and Logging	Sawmill product manufacturing	Other wood product manufacturing	Pulp, paper and paperboard manufacturing	Paper stationery and other converted paper product manufacturing	Total Wood and Paper	Printing (including the Reproduction of Recorded Media)	Furniture manufacturing	Total
Annual Turnover ($m)	$27.5	$15.6	$20.3	$0.0	$1.8	$65.2	$6.5	$10.0	$81.6
Compensation of Employees ($m)	$4.6	$2.4	$4.9	$0.0	$0.3	$12.3	$2.2	$2.7	$17.1
Employment (FTEs)	35	33	59	0	3	130	31	53	215
Employment (Jobs)	38	36	64	0	3	140	34	58	233
Gross Operating Surplus ($m)	$8.6	$1.9	$2.6	$0.0	$0.2	$13.3	$0.5	$1.4	$15.1
Direct Taxes ($m)	$0.9	$0.3	$0.3	$0.0	$0.0	$1.5	$0.1	$0.2	$1.8
Inputs from within the region by sector									
Wood and Wood products sector	5.6%	39.1%	17.6%	na	0.7%	17.2%	1.6%	10.6%	15.2%
Other agriculture and mining	15.0%	0.4%	0.7%	na	1.8%	6.7%	0.5%	0.5%	5.4%
Other manufacturing	6.8%	1.0%	4.5%	na	3.5%	4.6%	3.6%	6.6%	4.8%
Utilities	0.1%	1.0%	1.5%	na	2.8%	0.8%	0.8%	1.1%	0.8%
Construction	0.2%	5.3%	3.8%	na	0.9%	2.5%	1.1%	2.3%	2.4%
Trade	1.4%	2.1%	2.7%	na	2.4%	2.0%	2.3%	3.4%	2.2%
Transport - inputs	2.1%	10.0%	5.1%	na	2.0%	4.9%	1.2%	2.2%	4.3%
Transport - outputs	0.2%	5.3%	1.7%	na	0.3%	1.9%	0.2%	1.0%	1.6%
Other Services	0.4%	3.3%	8.8%	na	15.6%	4.1%	13.5%	4.9%	4.9%
Total	31.8%	67.5%	46.3%	na	30.0%	44.8%	24.7%	32.6%	41.7%
Sales of Output									
Woods and woods products sector	32.8%	13.8%	5.2%	na	0.7%	18.8%	1.8%	0.4%	15.2%
Construction	0.1%	21.3%	42.7%	na	2.7%	18.5%	4.9%	14.5%	17.0%
Other Intermediate demand	3.9%	2.4%	7.1%	na	31.1%	5.3%	60.8%	10.5%	10.3%
Households final demand	0.4%	0.5%	1.8%	na	10.9%	1.1%	2.4%	20.7%	3.6%
Govt and investment final demand	0.7%	0.0%	2.5%	na	4.9%	1.2%	1.0%	0.0%	1.1%
Exports - Other Aust regions	51.5%	37.9%	39.4%	na	41.2%	44.2%	25.8%	48.2%	43.3%
Exports - Overseas	10.6%	24.0%	1.2%	na	8.4%	10.8%	3.2%	5.6%	9.6%
Total	100.0%	100.0%	100.0%	na	100.0%	100.0%	100.0%	100.0%	100.0%
Total net contribution - Industry and Downstream									
Value Added ($m)									
Direct	$14.2	$4.6	$7.7	na	$0.5	$27.0	$2.7	$4.2	$34.0
Induced	$8.8	$5.8	$8.5	na	$0.8	$23.8	$2.6	$3.6	$30.0
Total	$22.9	$10.4	$16.2	na	$1.3	$50.8	$5.3	$7.9	$64.0
Employment (FTEs)									
Direct	35	33	59	na	3	130	31	53	215
Induced	67	34	69	na	7	176	25	32	233
Total	102	67	128	na	10	306	56	85	448
Employment (Jobs)									
Direct	38	36	64	na	3	140	34	58	233
Induced	80	41	82	na	8	211	30	38	279
Total	117	76	146	na	12	351	64	96	512

Summary:

- The mapping indicates an estimated value of the forestry and wood products sector in the Adelaide Hills at $66 million of turnover directly or $51 million of incomes generated (direct and indirect).
- The sector supports wages directly of $12 million and 140 jobs.
- However, because of the purchases of inputs and the spend of wages it supports a further 210 jobs throughout the regional economy, , for a total of 350 jobs in the region
- The industry in terms of share of Gross Regional Product and employment represents approximately 2.3% of the regional (Adelaide Hills) economy

The economic model for this analysis is defined at the SA3 ABS area definition – the Adelaide Hills region

Table 8: Forestry and Woods Product Industry Mapping – Mid North

	Forestry and Logging	Sawmill product manufacturing	Other wood product manufacturing	Pulp, paper and paperboard manufacturing	Paper stationery and other converted paper product manufacturing	Total Wood and Paper	Printing (including the Reproduction of Recorded Media)	Furniture manufacturing	Total
Annual Turnover ($m)	$11.0	$19.2	$3.8	$0.0	$0.0	$34.1	$1.1	$1.3	$36.5
Compensation of Employees ($m)	$1.9	$3.0	$0.9	$0.0	$0.0	$5.8	$0.4	$0.3	$6.5
Employment (FTEs)	14	40	11	0	0	66	5	7	78
Employment (Jobs)	15	44	12	0	0	71	6	8	84
Gross Operating Surplus ($m)	$3.5	$2.4	$0.5	$0.0	$0.0	$6.3	$0.1	$0.2	$6.6
Direct Taxes ($m)	$0.4	$0.3	$0.1	$0.0	$0.0	$0.7	$0.0	$0.0	$0.8
Inputs from within the region by sector									
Wood and Wood products sector	5.6%	38.9%	16.5%	na	na	25.6%	0.5%	6.3%	24.1%
Other agriculture and mining	15.0%	0.3%	0.4%	na	na	5.1%	0.3%	0.4%	4.8%
Other manufacturing	7.9%	1.2%	5.2%	na	na	3.8%	4.1%	7.6%	3.9%
Utilities	0.1%	1.3%	1.9%	na	na	1.0%	1.0%	1.6%	1.0%
Construction	0.1%	4.0%	2.9%	na	na	2.6%	0.9%	1.8%	2.6%
Trade	1.5%	2.1%	2.6%	na	na	1.9%	2.3%	3.2%	2.0%
Transport - inputs	1.7%	8.3%	4.2%	na	na	5.7%	1.0%	1.8%	5.4%
Transport - outputs	0.1%	7.5%	2.1%	na	na	4.5%	0.2%	1.0%	4.2%
Other Services	0.3%	2.2%	5.7%	na	na	2.0%	7.5%	3.0%	2.2%
Total	32.2%	65.8%	41.5%	na	na	52.2%	17.8%	26.6%	50.2%
Sales of Output									
Woods and woods products sector	73.5%	3.1%	2.1%	na	na	25.8%	0.7%	0.2%	24.1%
Construction	0.1%	6.7%	34.1%	na	na	7.7%	4.4%	15.1%	7.8%
Other Intermediate demand	7.1%	1.1%	8.8%	na	na	3.9%	62.8%	14.7%	6.1%
Households final demand	0.5%	0.2%	1.8%	na	na	0.5%	2.4%	25.4%	1.4%
Govt and investment final demand	0.9%	0.0%	6.9%	na	na	1.1%	3.1%	0.1%	1.1%
Exports - Other Aust regions	7.4%	64.9%	45.2%	na	na	44.0%	23.5%	38.9%	43.2%
Exports - Overseas	10.6%	24.0%	1.2%	na	na	17.1%	3.2%	5.6%	16.2%
Total	100.0%	100.0%	100.0%	na	na	100.0%	100.0%	100.0%	100.0%
Total net contribution - Industry and Downstream									
Value Added ($m)									
Direct	$5.7	$5.7	$1.5	na	na	$12.8	$0.5	$0.6	$13.8
Induced	$3.2	$6.6	$1.3	na	na	$11.2	$0.4	$0.4	$11.9
Total	$8.9	$12.2	$2.8	na	na	$24.0	$0.8	$1.0	$25.8
Employment (FTEs)									
Direct	14	40	11	na	na	66	5	7	78
Induced	23	35	10	na	na	69	3	3	75
Total	38	76	21	na	na	134	8	10	153
Employment (Jobs)									
Direct	15	44	12	na	na	71	6	8	84
Induced	28	43	12	na	na	83	4	4	90
Total	43	87	24	na	na	154	9	11	175

Summary:

- The mapping indicates an estimated value of the forestry and wood products sector in the Mid North of SA at $34 million of turnover directly or $24 million of incomes generated (direct and indirect).
- The sector supports wages directly of $5.8 million and 71 jobs.
- However, because of the purchases of inputs and the spend of wages it supports a further 83 jobs throughout the regional economy, for a total of 154 jobs in the mid north region.
- The industry in terms of share of Gross Regional Product and employment represents approximately 1.8% of the regional economy.

The economic model for this analysis is defined at as the SA3 ABS area definition – the Mid North region of SA

Table 9: Forestry and Woods Product Industry Mapping – Kangaroo Island

	Forestry and Logging	Sawmill product manufacturing	Other wood product manufacturing	Pulp, paper and paperboard manufacturing	Paper stationery and other converted paper product manufacturing	Total Wood and Paper	Printing (including the Reproduction of Recorded Media)	Furniture manufacturing	Total
Annual Turnover ($m)	$24.4	$6.8	$15.8	$0.0	$0.0	$47.0	$2.4	$9.5	$58.9
Compensation of Employees ($m)	$4.1	$1.0	$3.8	$0.0	$0.0	$9.0	$0.8	$2.5	$12.3
Employment (FTEs)	31	14	46	0	0	91	12	50	153
Employment (Jobs)	34	15	50	0	0	98	13	55	166
Gross Operating Surplus ($m)	$7.7	$0.8	$2.0	$0.0	$0.0	$10.5	$0.2	$1.3	$12.0
Direct Taxes ($m)	$0.8	$0.1	$0.2	$0.0	$0.0	$1.2	$0.0	$0.2	$1.4
Inputs from within the region by sector									
Wood and Wood products sector	5.6%	38.7%	15.1%	na	na	13.6%	0.8%	10.1%	12.5%
Other agriculture and mining	15.0%	0.3%	0.4%	na	na	8.0%	0.2%	0.4%	6.4%
Other manufacturing	4.3%	0.6%	2.8%	na	na	3.3%	2.2%	4.2%	3.4%
Utilities	0.1%	0.9%	1.3%	na	na	0.6%	0.8%	1.0%	0.7%
Construction	0.2%	5.4%	3.8%	na	na	2.1%	1.1%	2.4%	2.1%
Trade	1.4%	2.1%	2.5%	na	na	1.8%	2.2%	3.2%	2.1%
Transport - inputs	1.7%	8.4%	4.3%	na	na	3.5%	1.0%	1.8%	3.2%
Transport - outputs	0.2%	4.9%	1.4%	na	na	1.3%	0.2%	1.1%	1.2%
Other Services	0.4%	3.0%	7.6%	na	na	3.2%	10.7%	4.0%	3.6%
Total	28.8%	64.2%	39.3%	na	na	37.4%	19.3%	28.2%	35.2%
Sales of Output									
Woods and woods products sector	21.2%	16.5%	6.4%	na	na	15.5%	1.1%	0.3%	12.5%
Construction	0.1%	23.3%	50.3%	na	na	20.3%	5.1%	12.9%	18.5%
Other Intermediate demand	3.3%	2.7%	5.8%	na	na	4.1%	63.8%	6.3%	6.9%
Households final demand	0.3%	0.5%	1.8%	na	na	0.8%	2.4%	15.2%	3.2%
Govt and investment final demand	0.6%	0.1%	2.2%	na	na	1.0%	1.9%	0.0%	0.9%
Exports - Other Aust regions	63.9%	33.0%	32.3%	na	na	48.8%	22.6%	59.7%	49.5%
Exports - Overseas	10.6%	24.0%	1.2%	na	na	9.4%	3.2%	5.6%	8.5%
Total	100.0%	100.0%	100.0%	na	na	100.0%	100.0%	100.0%	100.0%
Total net contribution - Industry and Downstream									
Value Added ($m)									
Direct	$12.6	$2.0	$6.0	na	na	$20.6	$1.0	$4.0	$25.6
Induced	$6.6	$2.2	$5.4	na	na	$14.2	$0.8	$2.8	$17.8
Total	$19.2	$4.2	$11.5	na	na	$34.8	$1.8	$6.8	$43.5
Employment (FTEs)									
Direct	31	14	46	na	na	91	12	50	153
Induced	47	12	42	na	na	101	7	24	131
Total	79	26	87	na	na	192	19	74	285
Employment (Jobs)									
Direct	34	15	50	na	na	98	13	55	166
Induced	57	14	50	na	na	122	9	29	159
Total	91	30	100	na	na	220	21	84	325

Summary:

- The mapping indicates an estimated value of the forestry and wood products sector in the Kangaroo Island and Fleurieu at $47 million of turnover directly or $35 million of incomes generated in 2019/20 (direct and indirect).
- The sector supported wages directly of $9.0 million and 98 full time equivalent jobs.
- However, because of the purchases of inputs and the spend of wages it supported a further 122 jobs throughout the regional economy – or a total of 220.
- The industry in terms of share of Gross Regional Product and employment represents approximately 2.2% of the regional economy.

The economic model for this is analysis is defined at as the SA3 ABS area definition – the Fleurieu- Kangaroo Island region

ERC Economic & Financial Analysis

Green Triangle – Victoria Forestry Industry Mapping

Table 10: Forestry and Woods Product Industry Mapping – Green Triangle (Victoria)

	Forestry and Logging	Sawmill product manufacturing	Other wood product manufacturing	Pulp, paper and paperboard manufacturing	Paper stationery and other converted paper product manufacturing	Total Wood and Paper	Printing (including the Reproduction of Recorded Media)	Furniture manufacturing	Total
Annual Turnover ($m)	$195.8	$223.7	$38.5	$0.0	$4.1	$462.1	$10.5	$10.2	$482.8
Compensation of Employees ($m)	$33.1	$34.6	$9.2	$0.0	$0.8	$77.7	$3.5	$2.7	$83.9
Employment (FTEs)	249	472	111	0	7	840	51	54	945
Employment (Jobs)	269	510	120	0	8	907	56	59	1,022
Gross Operating Surplus ($m)	$61.4	$27.8	$4.8	$0.0	$0.4	$94.5	$0.7	$1.4	$96.6
Direct Taxes ($m)	$6.5	$3.6	$0.6	$0.0	$0.1	$10.8	$0.2	$0.2	$11.2
Inputs from within the region by sector									
Wood and Wood products sector	5.6%	38.9%	16.7%	na	0.4%	22.6%	0.8%	9.1%	21.9%
Other agriculture and mining	13.2%	0.2%	0.2%	na	0.5%	5.7%	0.1%	0.3%	5.5%
Other manufacturing	7.9%	1.2%	5.2%	na	4.0%	4.4%	4.1%	7.6%	4.4%
Utilities	0.1%	0.9%	1.5%	na	2.6%	0.6%	0.9%	1.1%	0.6%
Construction	0.1%	4.2%	3.0%	na	0.7%	2.4%	0.9%	1.9%	2.3%
Trade	1.4%	2.1%	2.6%	na	2.4%	1.8%	2.3%	3.3%	1.9%
Transport - inputs	2.3%	10.9%	5.6%	na	2.3%	6.7%	1.3%	2.4%	6.5%
Transport - outputs	0.1%	8.0%	1.9%	na	15.0%	4.2%	0.3%	1.1%	4.1%
Other Services	0.3%	2.4%	6.5%	na	11.0%	2.0%	9.2%	3.5%	2.1%
Total	31.0%	68.9%	43.1%	na	38.9%	50.4%	19.8%	30.2%	49.3%
Sales of Output									
Woods and woods products sector	50.0%	2.6%	4.5%	na	0.7%	22.8%	1.0%	0.3%	21.9%
Construction	0.0%	2.7%	37.5%	na	2.5%	4.5%	2.5%	10.9%	4.5%
Other Intermediate demand	2.0%	0.5%	8.8%	na	41.9%	2.2%	46.4%	10.3%	3.3%
Households final demand	0.2%	0.1%	2.1%	na	14.1%	0.4%	1.7%	20.8%	0.9%
Govt and investment final demand	0.3%	0.0%	3.6%	na	6.0%	0.5%	2.4%	0.0%	0.5%
Exports - Other Aust regions	36.9%	70.2%	42.3%	na	26.5%	53.4%	42.8%	52.1%	53.1%
Exports - Overseas	10.6%	24.0%	1.2%	na	8.4%	16.3%	3.2%	5.6%	15.8%
Total	100.0%	100.0%	100.0%	na	100.0%	100.0%	100.0%	100.0%	100.0%
Total net contribution - Industry and Downstream									
Value Added ($m)									
Direct	$101.0	$66.0	$14.7	na	$1.2	$182.9	$4.5	$4.3	$191.7
Induced	$56.4	$82.5	$14.3	na	$1.9	$155.2	$3.6	$3.3	$162.1
Total	$157.5	$148.5	$28.9	na	$3.1	$338.1	$8.1	$7.6	$353.8
Employment (FTEs)									
Direct	249	472	111	na	7	840	51	54	945
Induced	418	462	106	na	16	1,002	31	27	1,060
Total	667	934	217	na	24	1,842	82	81	2,005
Employment (Jobs)									
Direct	269	510	120	na	8	907	56	59	1,022
Induced	500	558	127	na	19	1,203	37	32	1,273
Total	768	1,068	247	na	27	2,110	93	92	2,295

Summary:

- The mapping indicates an estimated value of the forestry and wood products sector in the Green Triangle in Victoria at $0.46 billion of turnover directly or $0.34 billion of incomes generated (directly and induced).
- The sector supports wages directly of $78 million and 907 jobs.
- However, because of the purchases of inputs and the spend of wages it supports a further 1,200 jobs throughout the regional economy for a total of 2,110 jobs.
- The industry in terms of share of Gross Regional Product and employment represents approximately 4.6% of the regional economy.

The economic model for this is analysis is defined at as the SA3 ABS area definition the combines statistical areas of Glenelg - Southern Grampians, Colac – Corangamite, and Warrnambool.

Green Triangle Total Area Forestry Industry Mapping

Table 11: Forestry and Woods Product Industry Mapping – Green Triangle (SA and Victoria)

	Forestry and Logging	Sawmill product manufacturing	Other wood product manufacturing	Pulp, paper and paperboard manufacturing	Paper stationery and other converted paper product manufacturing	Total Wood and Paper	Printing (including the Reproduction of Recorded Media)	Total	Percentage of total region activity
Annual Turnover ($m)	$611	$589	$226	$13	$203	$1,642	$16	$19	$1,677
Compensation of Employees ($m)	$103	$91	$54	$2	$38	$288	$5	$5	$299
Employment (FTEs)	777	1,244	655	13	369	3,058	77	104	3,238
Employment (Jobs)	838	1,343	708	14	387	3,290	84	113	3,487
Gross Operating Surplus ($m)	$192	$73	$28	$1	$18	$313	$1	$3	$317
Direct Taxes ($m)	$20	$10	$3	$0	$3	$36	$0	$0	$37
Inputs from within the region by sector									
Wood and Wood products sector	5.6%	39.2%	18.0%	11.5%	4.0%	19.2%	3.8%	11.9%	19.0%
Other agriculture and mining	15.0%	0.3%	0.3%	1.1%	0.6%	5.8%	0.2%	0.4%	5.7%
Other manufacturing	7.1%	1.1%	4.7%	4.7%	3.6%	4.2%	3.7%	6.9%	4.2%
Utilities	0.1%	0.9%	1.4%	7.6%	2.6%	0.9%	0.8%	1.1%	0.9%
Construction	0.1%	4.3%	3.1%	0.6%	0.7%	2.1%	0.9%	1.9%	2.1%
Trade	1.4%	2.1%	2.6%	2.0%	2.5%	2.0%	2.4%	3.5%	2.0%
Transport - inputs	2.2%	10.6%	5.4%	2.8%	2.2%	5.6%	1.2%	2.3%	5.6%
Transport - outputs	0.1%	7.9%	3.0%	0.7%	0.3%	3.4%	0.0%	1.0%	3.3%
Other Services	0.4%	2.5%	6.6%	7.9%	11.1%	3.4%	9.4%	3.6%	3.4%
Total	32.1%	68.7%	45.1%	39.0%	27.7%	46.5%	22.5%	32.5%	46.2%
Sales of Output									
Woods and woods products sector	44.8%	4.6%	3.8%	21.7%	2.8%	19.3%	7.0%	1.0%	19.0%
Construction	0.0%	1.7%	14.4%	1.8%	0.9%	2.7%	4.6%	13.9%	2.9%
Other Intermediate demand	1.0%	0.3%	3.2%	28.6%	15.2%	3.0%	81.5%	12.5%	3.9%
Households final demand	0.1%	0.0%	0.8%	2.3%	5.5%	0.8%	2.9%	24.8%	1.1%
Govt and investment final demand	0.1%	0.0%	0.9%	0.5%	0.2%	0.2%	1.7%	0.0%	0.2%
Exports - Other Aust regions	43.5%	69.4%	75.8%	34.6%	67.0%	60.1%	0.0%	42.2%	59.3%
Exports - Overseas	10.6%	24.0%	1.2%	10.4%	8.4%	13.8%	2.2%	5.6%	13.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total net contribution - Industry and Downstream									
Value Added ($m)									
Direct	$315	$174	$86	$3	$59	$637	$7	$8	$652
Induced	$185	$216	$86	$4	$70	$561	$5	$6	$573
Total	$500	$390	$172	$7	$129	$1,199	$12	$15	$1,226
Employment (FTEs)									
Direct	777	1,244	655	13	369	3,058	77	104	3,238
Induced	1,358	1,237	660	29	590	3,873	47	53	3,972
Total	2,134	2,480	1,315	42	959	6,931	124	157	7,211
Employment (Jobs)									
Direct	838	1,343	708	14	387	3,290	84	113	3,487
Induced	1,622	1,494	792	35	708	4,650	57	64	4,771
Total	2,460	2,837	1,500	49	1,095	7,940	141	177	8,258

Summary:

- The mapping indicates an estimated value of the forestry and wood products sector in the Green Triangle (SA and Victoria) at $1.64 billion of turnover directly and $1.2 billion of incomes generated (direct and indirect).
- The sector supports wages directly of $288 million and 3,290 jobs
- However, because of the purchases of inputs and the spend of wages it supports a further 4,650 jobs throughout the regional economy for total of 6,931 jobs supported.
- The industry in terms of share of Gross Regional Product and employment represents approximately 10.7% of the regional economy (of value added).

Note that the numbers in this table differ slightly to the summation of the Green Triangle (SA and Green Triangle (Victoria) mapping, in that the modelling allows for feedback between these regions

The following summarises the employment characteristics within the sector, which provides a context for the skill sets that will be required into the future if the objectives of undertaking more local processing with the state (and respective regions)

Table 12: Employment by Occupation – South Australia Forestry Industry

	Forestry and Logging	Log Sawmilling and Timber Dressing	Other Wood Product Manufacturing	Pulp, Paper and Converted Paper Product Manufacturing	Printing
Managers	8.8%	8.9%	11.0%	13.3%	15.8%
Professionals	9.1%	4.1%	3.2%	7.7%	12.6%
Technicians and Trades Workers	15.0%	14.0%	42.9%	21.2%	40.4%
Community and Personal Service Workers	0.0%	0.8%	0.5%	0.3%	0.0%
Clerical and Administrative Workers	7.8%	7.9%	9.2%	10.1%	12.5%
Sales Workers	0.0%	2.5%	3.3%	5.5%	6.1%
Machinery Operators and Drivers	41.9%	37.8%	15.0%	25.4%	3.5%
Labourers	17.4%	24.0%	14.8%	16.6%	9.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Table 13: Employment by Educational Background – South Australia Forestry Industry

	Forestry and Logging	Log Sawmilling and Timber Dressing	Other Wood Product Manufacturing	Pulp, Paper and Converted Paper Product Manufacturing	Printing
Postgraduate Degree Level	2.5%	0.0%	0.8%	1.6%	1.4%
Graduate Diploma and Graduate Certificate	0.0%	0.0%	0.2%	0.5%	0.8%
Bachelor Degree Level	6.6%	2.7%	3.7%	9.7%	8.7%
Advanced Diploma and Diploma Level	4.9%	3.5%	4.5%	7.8%	10.2%
Certificate III & IV Level	29.9%	30.9%	44.5%	33.1%	43.8%
Secondary Education - Years 10 and above	42.9%	52.6%	39.5%	41.9%	30.6%
Certificate I & II Level	0.0%	0.0%	0.0%	0.0%	0.0%
Secondary Education - Years 9 and below	7.9%	6.6%	4.4%	3.0%	2.0%
Supplementary Codes	5.3%	3.7%	2.4%	2.5%	2.5%
Total	100%	100%	100%	100%	100%

Summary:

The labour force in the sector is heavily oriented towards trades and machinery operators and drivers with TAFE training. The forestry and logging sector has a larger number of university educated professionals associated with agriculture and forestry training.

Source of data: 2016 Census

Timber use and the construction sector

The prime use of timber product is in the construction sector. As noted above at the Australian level, 36.2% of the sectors output is used in the Australian construction sector – but this is 66% for wood products and 6% for paper products). Paper products are primarily used in other manufacturing (e.g. packaging) and in business services.

While local supply of timber is therefore critical for efficient construction activity throughout Australia, it is also clear that there is a heavy dependence on imports – with imported timber product into the construction sector being approximately double that locally supplied product.

Total Construction (Residential, Non-residential, Engineering and Construction Services):

- Locally produced sawmill and wood products used in the construction industry in 2018/19 were $9.6 billion, representing 2.0% of the value of construction activity.
- Imported sawmill and wood products used in the construction industry in 2018/19 were $2.4 million, representing 0.5% of the value of production
- Wood imports represented 20% of the total wood products input into the construction sector

Residential Construction:

- Locally produced sawmill and wood products used in residential construction in 2018/19 were $4.8 billion, representing 5.0% of the value of construction activity.
- Imported sawmill and wood products used in the construction industry in 2018/19 were $1.1 million, representing 1.1% of the value of production
- Wood imports represented 18.5% of the total wood products input into the construction sector

Current circumstances (Covid supply constraints, and the Russia/Ukraine war and very high freight cost from Europe to Australia) demonstrates the potential for increasing local supply within the mix to bring benefits.

Summary:

In 2018/19 wood products represented 5% of the cost of producing a house, and 80% of this product was supplied from within Australia with 20% imported. Given current international conditions a focus on domestic supply remains critical

Evaluation of Industry Development Scenarios

The impact of the following scenarios has been modelled with respect to outcomes of the Green Triangle (SA) region, and for the state of South Australia.

Scenario 1 – increasing turnover of the forestry focussed sectors in the region/state by 10%. (Forestry and Logging, Sawmill product manufacturing, Other wood product manufacturing, Pulp, paper and paperboard manufacturing). Estimated increases in turnover by 10% is traced through the economic model (but is adjusted to be net of transfers of product within the forestry sector. The increase in sawmill product output or other wood product manufacturing could be linked to an increase in supply of local product to the construction industry.

Scenario 2 – doubling the proportion of forestry and logging product that is processed in the region/state rather than sent out of the region (from approx. 45% to 90%). This is consistent with the objectives of the "Building the Nation: Growing the Green Triangle's Contribution to Australia's Future".

Scenario 3 - loss of production though a 10% reduction in hectares in the Green Triangle region of South Australia (the Green Triangle makes up some 60% of the plantation area of South Australia, leading to around a 6% reduction of forestry output. The reduction in forestry hectares is assumed to b directly linked to a proportional decrease in output and result in less throughput through sawmills and other wood manufacturing.

The modelling involves applying the turnover changes to an unconstrained input output model of the region/state. This assumes that the sector specific changes can be implemented without any resource implications for other sectors (and is therefore consistent with a long run closure of a general equilibrium model – with prices primarily set nationally, and labour relatively free to move between regions. More detailed modelling would allow for alternative use of land. These outcomes are incremental over current values.

Summary:

- Scenario 1 – based on increased turnover of all sectors by 10%, it is estimated that the industry would generate increased incomes in the state of $210 million and support an additional 1,500 jobs.
- Scenario 2 – doubling the proportion of forestry and logging product that is processed in the region rather than sent out of the region would increase GSP in the state by $2.9 billion and create 24,300 jobs.
- Scenario 3 - the loss of production though a reduction in hectares in the Green Triangle region by 10% would reduce GSP in the state by $57 million and reduce employment by an estimated 900.

Table 14: Economic Outcomes of Alternative Scenarios: Green Triangle (SA) only

	Scenario 1	Scenario 2	Scenario 2
Value Added $m)			
Direct	$29.82	$380.50	-$30.17
Induced	$37.65	$647.26	-$36.86
Total	$67.47	$1,027.75	-$67.03
Compensation of Employees $m)			
Direct	$13.95	$263.72	-$14.16
Induced	$17.26	$320.59	-$16.87
Total	$31.21	$584.31	-$31.03
Employment (FTEs)			
Direct	157	3,466	-156
Induced	251	4,481	-252
Total	408	7,947	-408
Employment (Jobs)			
Direct	170	3,745	-169
Induced	296	5,300	-297
Total	466	9,045	-465

Table 15: Economic Outcomes of Alternative Scenarios All of South Australia

	Scenario 1	Scenario 2	Scenario 2
Value Added $m)			
Direct	$69.02	$860.06	-$41.17
Induced	$137.84	$2,089.09	-$81.45
Total	$206.86	$2,949.15	-$122.62
Compensation of Employees $m)			
Direct	$36.24	$581.40	-$21.94
Induced	$58.93	$927.74	-$34.72
Total	$95.16	$1,509.14	-$56.66
Employment (FTEs)			
Direct	415	7,330	-249
Induced	894	13,911	-535
Total	1,310	21,242	-785
Employment (Jobs)			
Direct	448	7,919	-269
Induced	1,053	16,404	-630
Total	1,502	24,323	-899