Timber industry

Specialised analysis for the Timber Towns Victoria council areas

2021

TIMBER TOWNS VICTORIA

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EXECUTIVE SUMMARY

The management of forests and their products, the logging and processing of timber material, generates considerable employment and economic value in many regional communities across Victoria. This report specifically looks at the Timber Industry in Timber Town Victoria (TTV) Local Government Areas (LGAs).

- In 2019/20, the industry was estimated to directly support just almost 4,500 jobs or 2.3% of all jobs in the combined TTV areas.
- The industry generated $1.4B in sales/output of which $432M was direct value added. Many individual LGAs display key specialisations in the industry.
    - Latrobe City had the second largest number of jobs in forestry and logging and second largest number in pulp and paper product manufacturing in all of Australia in 2016.
    - Colac Otway Shire had the third largest number of jobs in log sawmilling and dressing.
- The Timber Industry workforce in Timber Towns Victoria is generally made up of Australian born, middle aged men. The average worker is full time, working long hours and earning an above average income.

The Timber Industry is undergoing transition as commercial and government policy decisions see plantation wood increasingly take the place of native forests supply.

- The industry has had mixed fortunes in recent years. Direct industry jobs grew strongly between 2014/15 and 2016/17 reaching 5,089. They have subsequently declined by an estimated 615 jobs at an average rate of -4.2% p.a.
- Local industry movements parallel a drop in the volume of log production in Victoria as a whole over the last few years.

In 2019, the Victorian Government announced a plan to phase out altogether the logging of native trees by 2030. This will have substantial impacts on the Timber Industry.

- The estimated contribution of native forests to logging, processing and other timber related activities in the Timber Towns Victoria areas has been modelled. It is approximate to a situation where native logging ceased immediately.
- It is estimated that native forest related activities support approximately 2,649 jobs in 2019/20 (1,114 direct as well as an additional 809 from supply chain impacts and 726 from consumption impacts).
- Output in the region reliant on native forest products/byproducts was estimated at $714M in 2019/20 of which $356M was a direct impact.
- Industry value added was estimated at $246M in 2019/20 of which $109M was a direct impact.
- The impacts resulting from the State Government decision to cease logging in native forests is more likely to fall on the local government areas to the east of Melbourne due to it being home to the large majority of native forest that is allowed to be logged.
- This report considers only the economic impacts of native logging. It is acknowledged there are a number of issues that need to be considered with the transition to zero native forest logging. These include potential undersupply of plantation timber; a rise in imports (especially appearance grade timber) which have a higher carbon footprint and may come from forests where industry does not follow sustainable practices; loss of fire management expertise; and a loss of specialised manufacturing skills and equipment.

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INTRODUCTION

This report presents an overview of the Timber Industry in the regions and shires that are part of Timber Towns Victoria (TTV).

TTV is an incorporated local government association representing the interests of municipal councils in relation to forestry on both public and private land.

In terms of this report, the Timber Industry directly relates mainly to industries that incorporate the management of forests or the transofrmation and sale of forestry related products. The following ABS ANZSIC industries[1] are incorporated in direct estimates:

- Forestry and Logging
- Forestry and Logging Support Services
- Wood Product Manufacturing
- Pulp, Paper and Paper Product Manufacturing
- Timber Product Wholesaling.

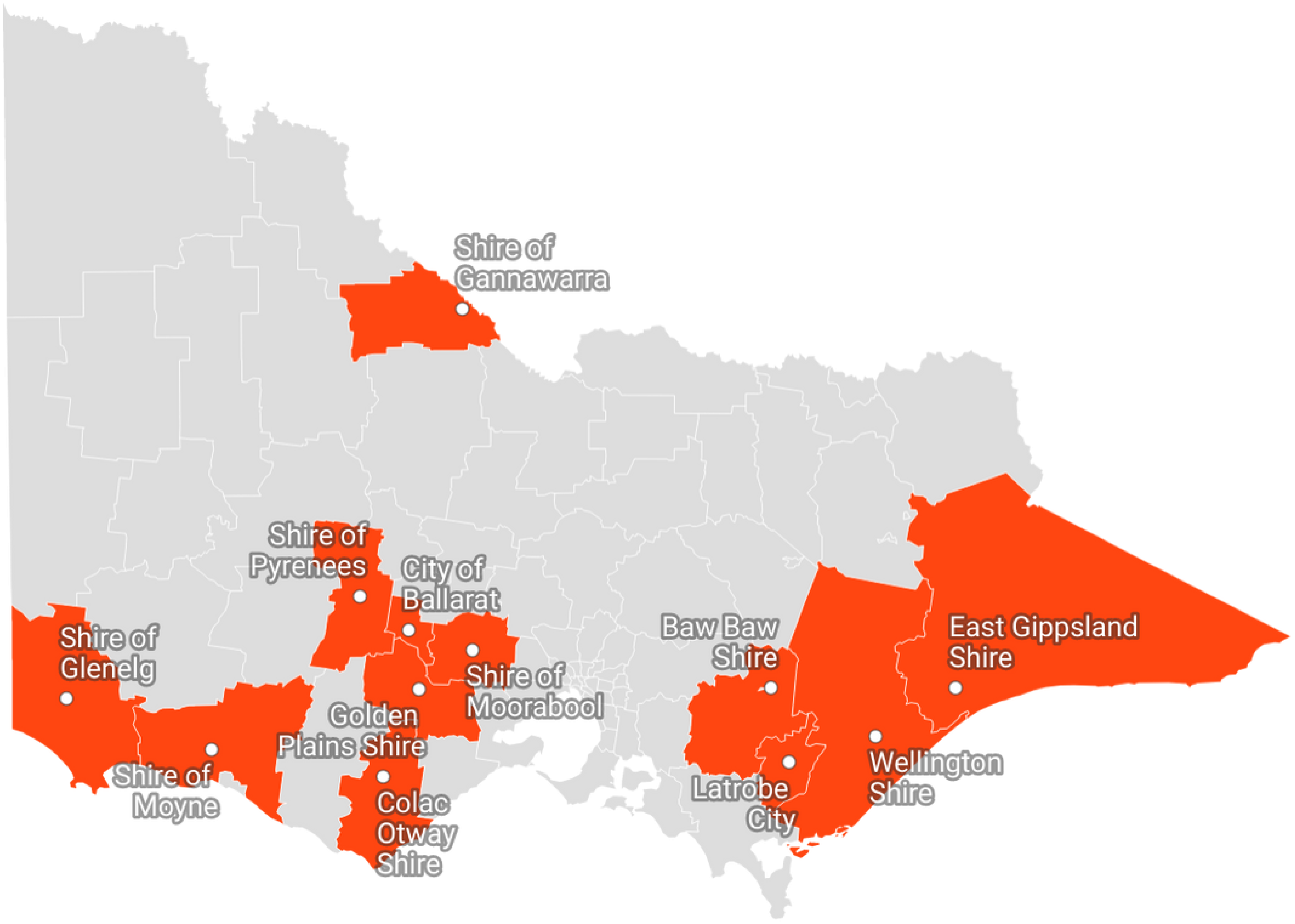
Other complementary industries, such as road transport, are considered in indirect supply chain impacts.

This report presents key economic data for the industry as well as workforce characteristics.

The estimated impacts resulting from the planned ban on logging in native forests is also explored.

[1] Australian Bureau of Statistics Australian and New Zealand Standard Industrial Classification

Timber Towns Victoria Member Councils



Industry Overview

SCALE OF THE TIMBER INDUSTRY

The Timber industry is a substantial employer in the TTV council areas. In 2019/20, the industry was estimated to directly support just almost 4,500 jobs which represented 2.3% of all jobs in the combined regions.

The industry generated $1.4B in sales/output of which $432M was direct value added for the regions. This represented 1.9% of total industry value added[1] in 2019/20.

The true value of the Timber Industry is highlighted in the role it plays in generating export value which brings new wealth into the regions beyond what the local market would support.

In 2019/20, it was estimated that the industry generated $1B in exports ($1,033M), of which $278M was international. This represented 5.6% of total export value for the TTV areas.

1 Value added is the value of sales generated by each industry, minus the cost of its inputs. It is a stronger measure of local productivity than sales/output.

Direct Impacts of Timber Industry in TTV Areas, 2019/20

4,474
JOBS

4,128
EMPLOYED RESIDENTS

$1,420M
OUTPUT

$432M
VALUE ADDED

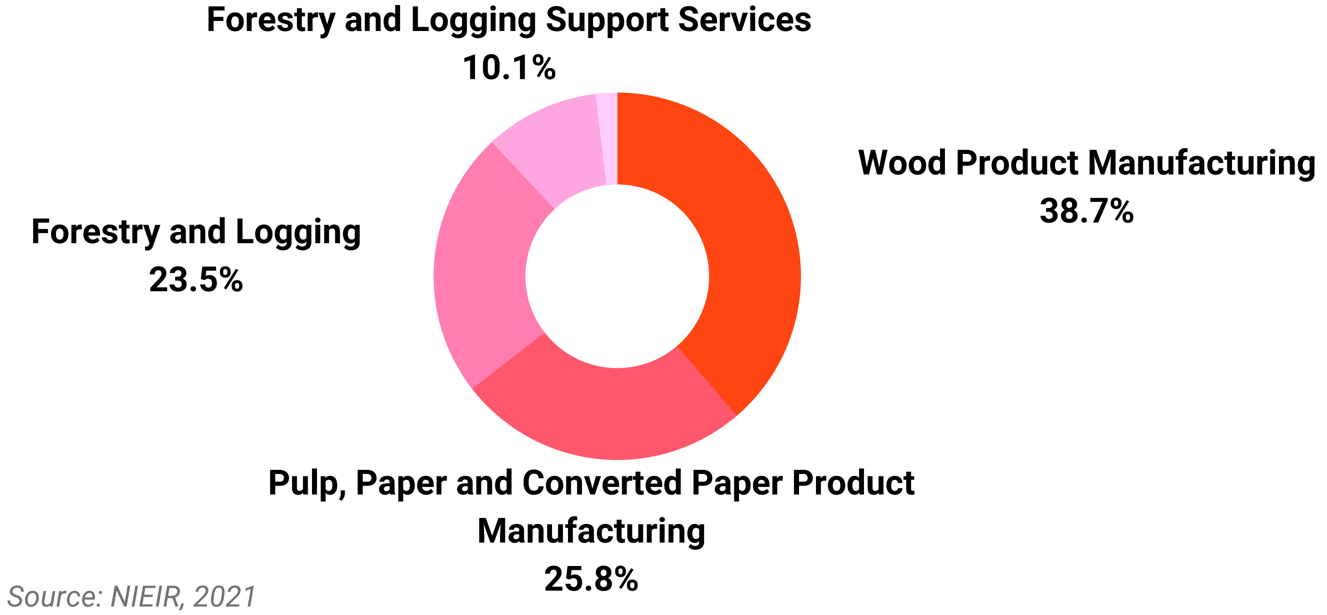
$278M
OVERSEAS EXPORTS

$755M
DOMESTIC EXPORTS

Direct Timber Industry as a Share of Total Economy, 2019/20

Source: NIEIR, 2021

Share of Direct Jobs by Sub-industry, TTV Areas, 2019/20



Source: NIEIR, 2021

CONTRIBUTION BY LOCATION AND SUB-INDUSTRY

The Timber Industry is of varying importance to the local economies across Timber Towns Victoria areas.

In some LGAs, it is one of the most substantial contributors. In 2019/20, it was estimated that 6.4% of all local jobs in Colac Otway Shire and 7.1% of value added were directly related to the industry[1]

In terms of sub-industries, it was estimated that wood product manufacturing contributed the most to jobs (39% of total) in 2019/20, followed by pulp, paper and converted paper product manufacturing (the vast majority [97%] of this production occurs in the Latrobe City).

[1] Only direct impacts can be split into regions due to the inter-relationships in supply chains between the Shires.

FLOW ON MULTIPLIER EFFECTS

The Timber Industry supports a considerable amount of additional employment and economic value in other industries via supply chain impacts and as a result of consumption by its workforce. These are typically termed indirect or flow-on impacts.

Utilising a local area specific economic impact model and adjusting for complementary relationships, these indirect impacts can be estimated.[1]

In 2019/20, it was estimated that the industry supported an additional 4,369 indirect jobs and $967M in indirect output/sales which resulted in an additional $388M in value added.

The total Timber Industry output/sales impact was estimated to represent 4.6% of total Timber Towns Victoria areas' economy in 2019/20. The industry was estimated to support 4.5% of total economy jobs and 3.6% of total industry value added.

1 It is acknowledged that sub-industries within the Timber industry are quite inter-dependent meaning the one sub-industry's inputs can be another sub-industry's output/sales. The economic impact model has been adjusted on an industry by industry basis to remove this effect and ensure there is no double counting of impacts.

Total Estimated Impacts of Timber Industry in TTV Areas, 2019/20

$1,420M + $967M = $2,387M in Total Output

DIRECT *INDIRECT*

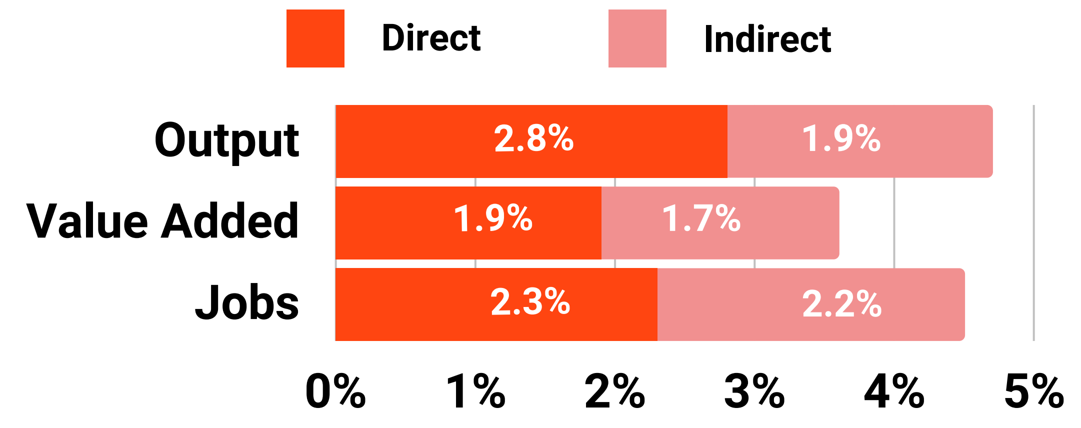
$432M + $388M = $820M in Total Value Added

DIRECT *INDIRECT*

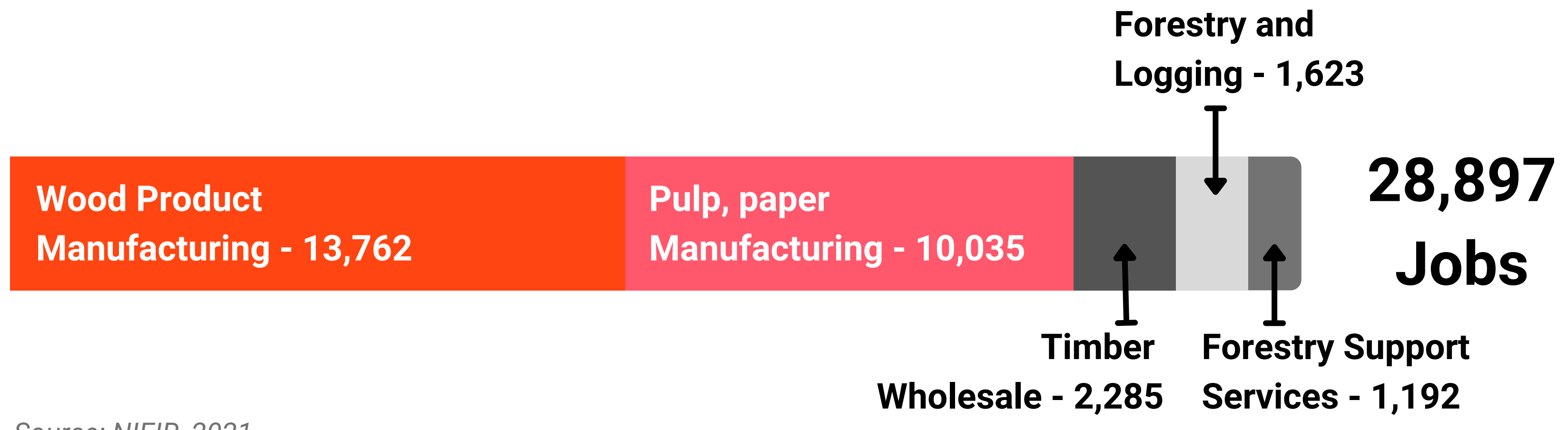
4,474 + 4,369 = 8,843 in Total Jobs

DIRECT *INDIRECT*

Total Impacts as share of Total TTV Areas Economy, 2019/20

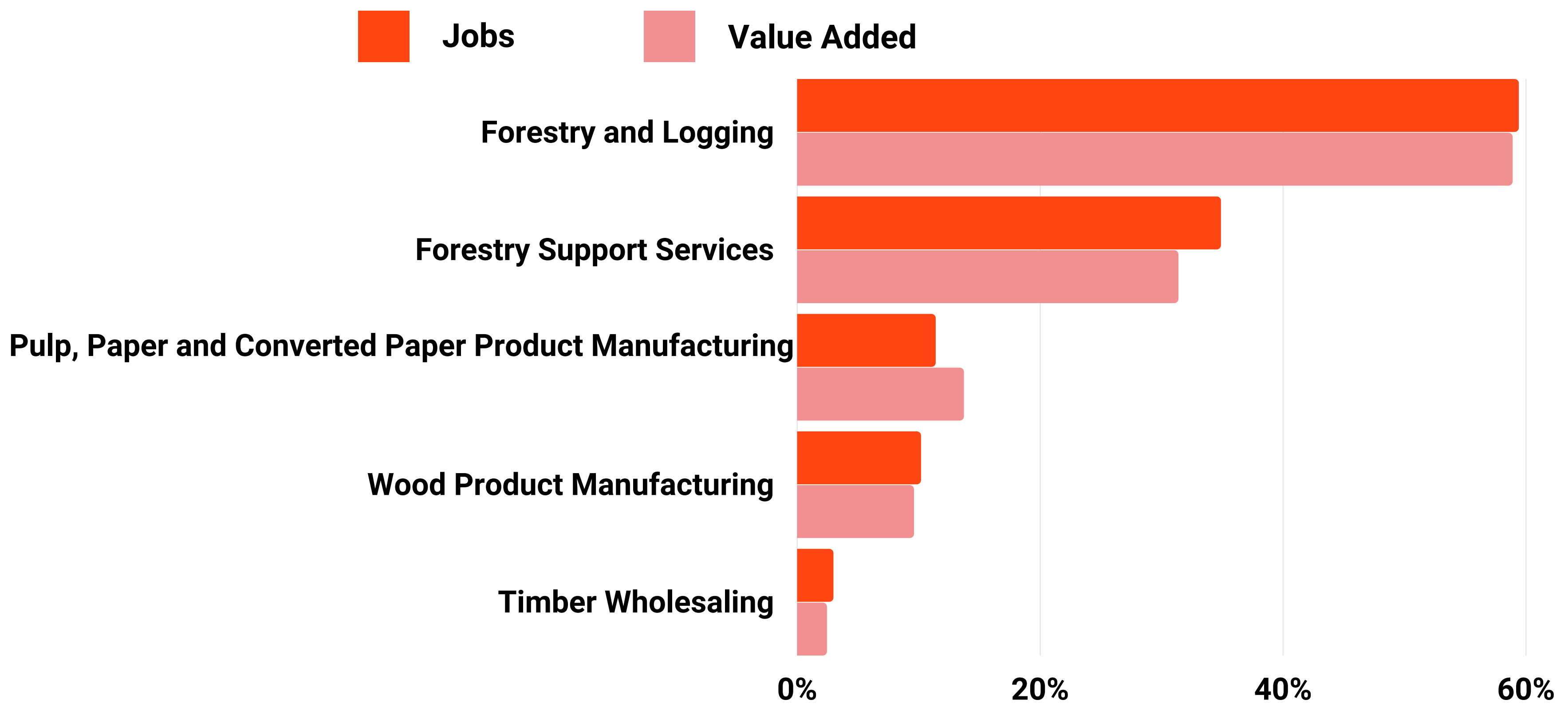


Direct Timber Industry Jobs, Victoria, 2019/20



Source: NIEIR, 2021

Share of Direct Total Victoria Jobs, TTV Areas, 2019/20



Source: NIEIR, 2021

THE INDUSTRY AT A STATE LEVEL

The Timber Industry at a Victorian State level was estimated to directly support almost 29,000 jobs in 2019/20 and generated $2,770M in industry value added.

It is important to note that the state industry relies on a large amount of imported timber particularly in hardwood products where local demand is much greater than we can supply domestically.

TTV areas' share of the state sub-industries varies. In 2019/20 it was estimated that the combined areas supported approx. 60% of jobs and value-added in forestry and logging and toughly a third of forestry support services economic activity.

The TTV areas' share of wood product (10.2%) and paper product manufacturing (11.4%) was much lower due to large production facilities (e.g. Visy in Campbellfield) and commercial offices (Opal ANZ – Head Office in Kew) being based in Melbourne.

RECENT TRENDS

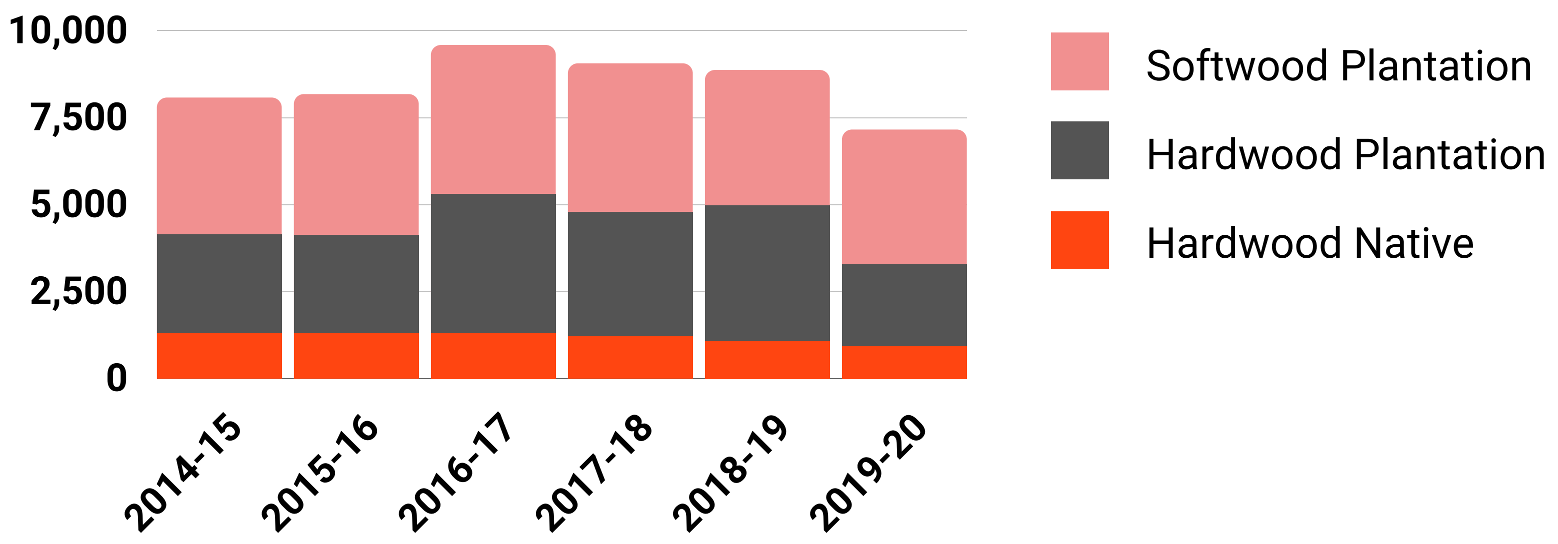
Output in the Timber Industry in TTV areas peaked in 2016/17 at $1.89B, but has subsequently fallen by an estimated $467M to $1.42B in 2019/20.

Value Added also peaked in 2016/17 at $628M. In 2019/20 it was estimated to be $432M, or $196M lower.

Local Jobs in the industry grew strongly between 2014/15 and 2016/17 reaching 5,089 direct jobs. They have subsequently declined by an estimated 615 jobs at an average rate of -4.2% p.a.

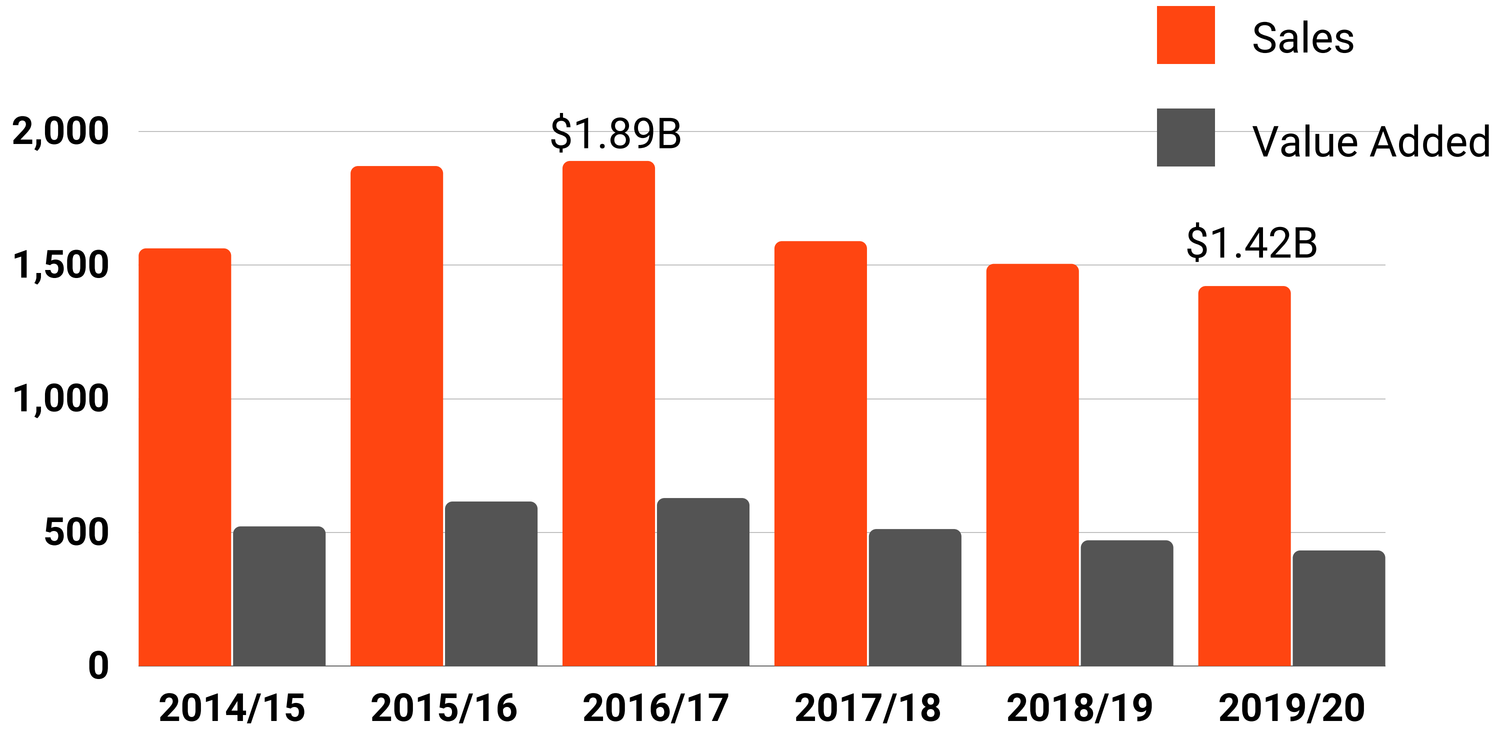
Local industry movements parallel a drop in the volume of log production in Victoria as a whole over the last few years.

Gross Volume of Logs Harvested, Victoria



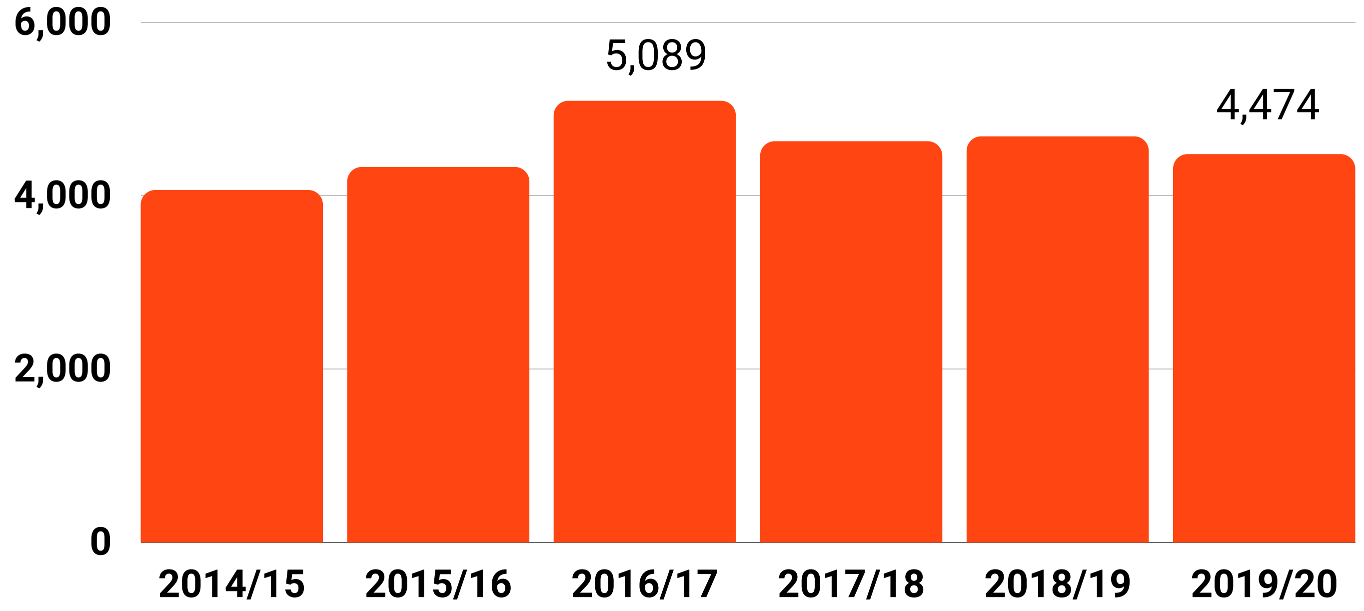
Source: ABARES, 2021

Direct Timber Industry Value, TTV Areas, 2014/15 to 2019/20



Source: NIEIR, 2021

Direct Timber Industry Jobs, TTV Areas, 2014/15 to 2019/20



Source: NIEIR, 2021

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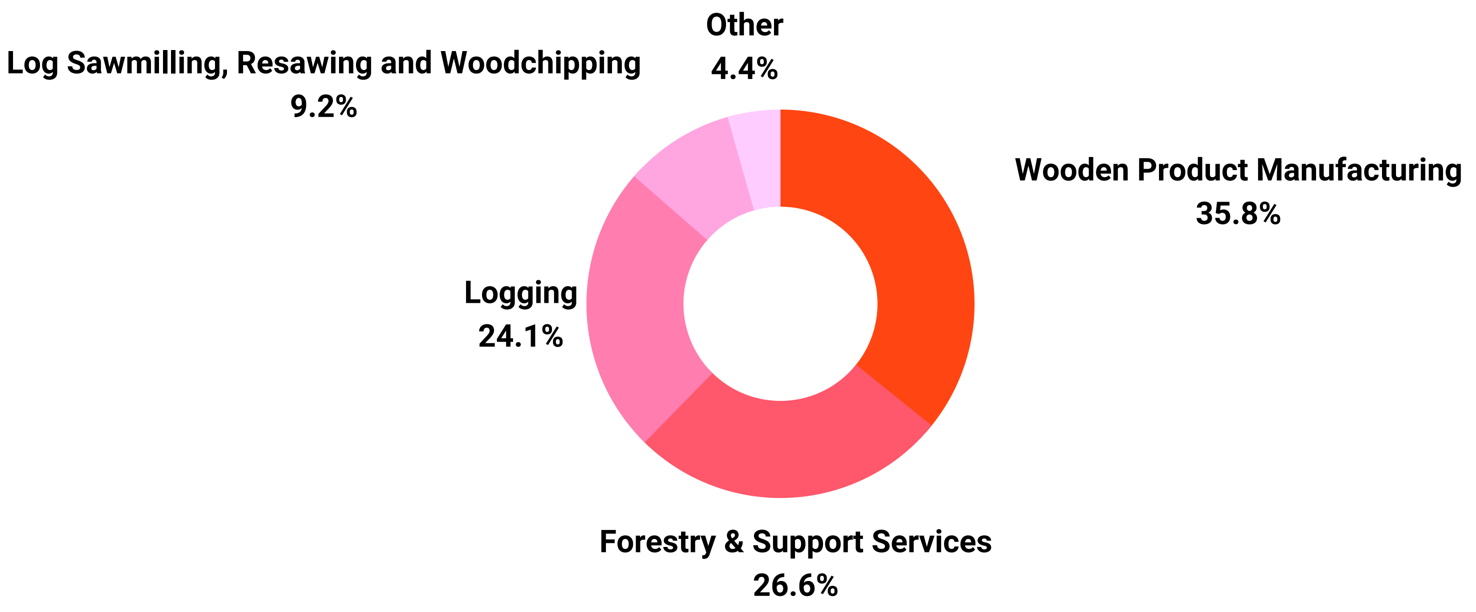
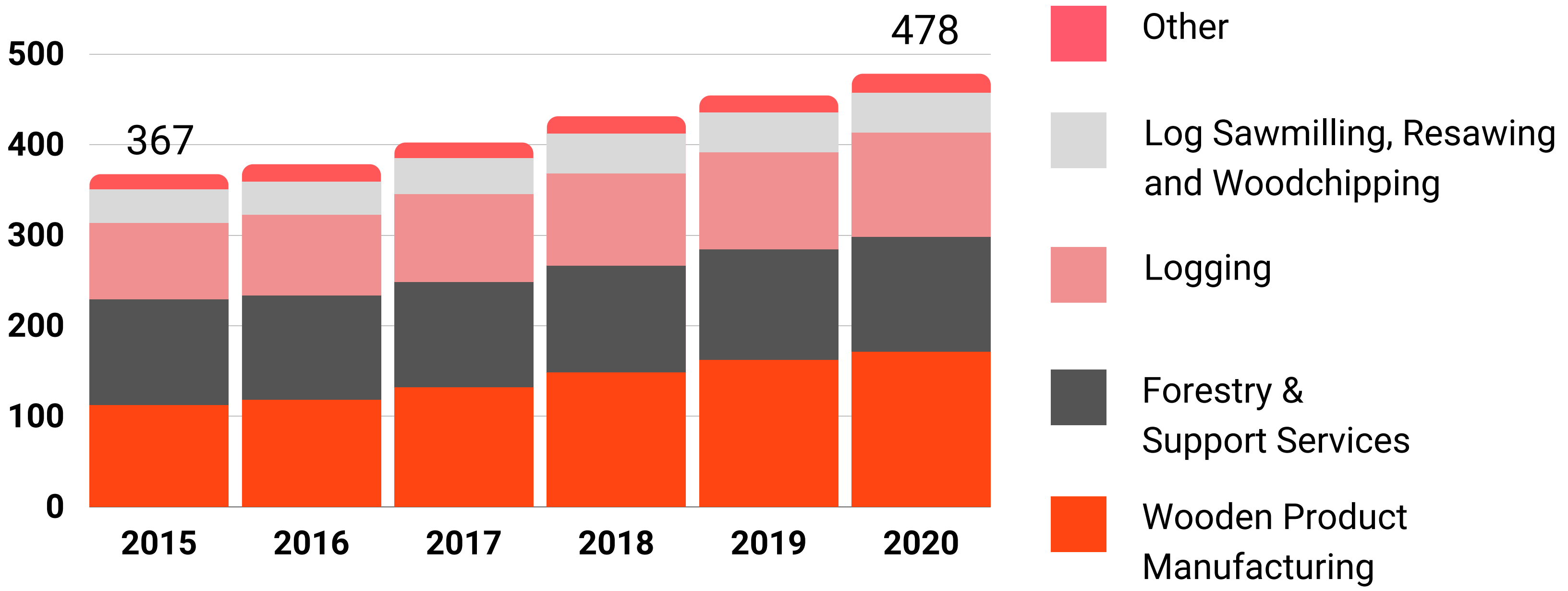
BUSINESS NUMBERS

Share of GST Registered Businesses by Sub-Industry Area, June 2020



Source: ABR, 2021

Growth in GST Registered Businesses, Five Years to June 2020



Source: ABR, 2021

In 2020, over a third of all GST registered Timber Industry businesses in the TTV Areas were in wooden product manufacturing (36%).

The second largest share of businesses were in forestry & support services (27%) and the third largest in logging (24%).

There were only four businesses registered in paper manufacturing related areas which contrasts with the employment generated in this industry. Opal Australian Paper actually has its headquarters in the Melbourne suburb of Hawthorn.

In contrast to the fluctuating employment numbers, net registered business numbers[1] steadily increased by 121 businesses between June 2015 and 2020, led by increases in wooden product manufacturing (9% p.a.) and logging (6% p.a.).

1 Net registered businesses equals those businesses who have registered for GST by that date and have not cancelled their registration.

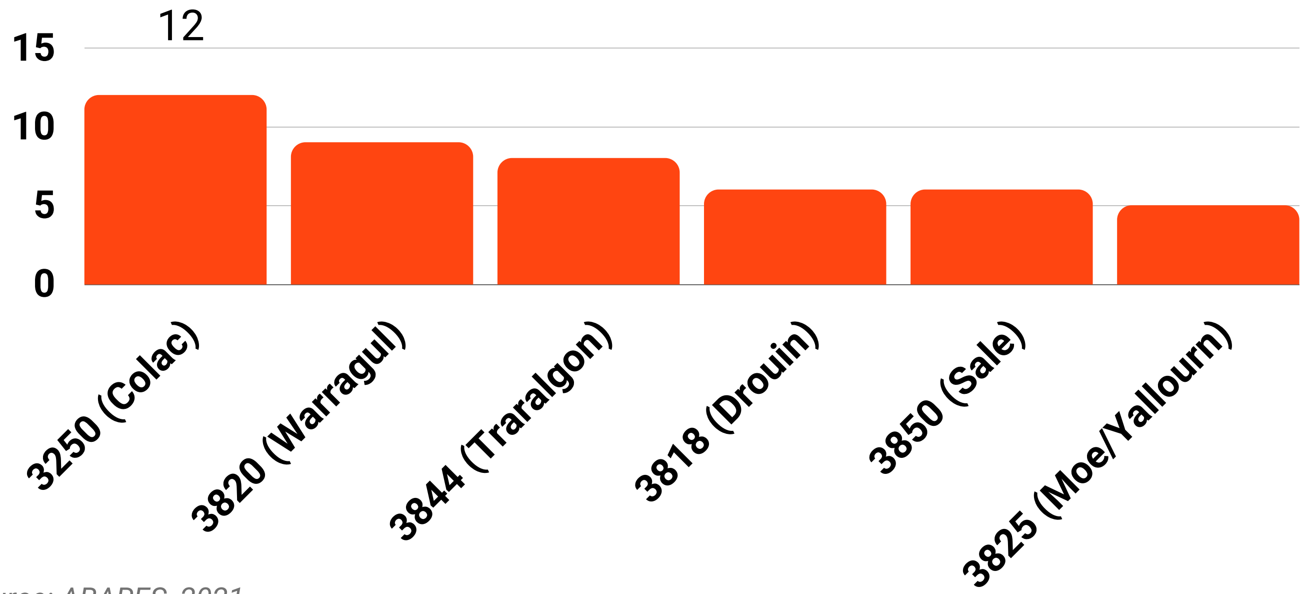
LOCATION OF BUSINESSES

The largest number of Timber Industry GST registered businesses in the TTV areas were located in the postcodes 3350 in Ballarat and 3844 around Traralgon. They had 44 and 32 registered businesses respectively at June 30, 2020.

Warragul (postcode 3820) and Colac (3250) were other key locations, each home to 25 registered businesses.

In the five years to 2020, Colac (3250) saw the largest net increase in Timber Industry businesses registered for GST with 12 registrations. The area around Warragul also saw large numbers.[1] In contrast, Ballarat (3350) saw a fall in net registered businesses (-8).

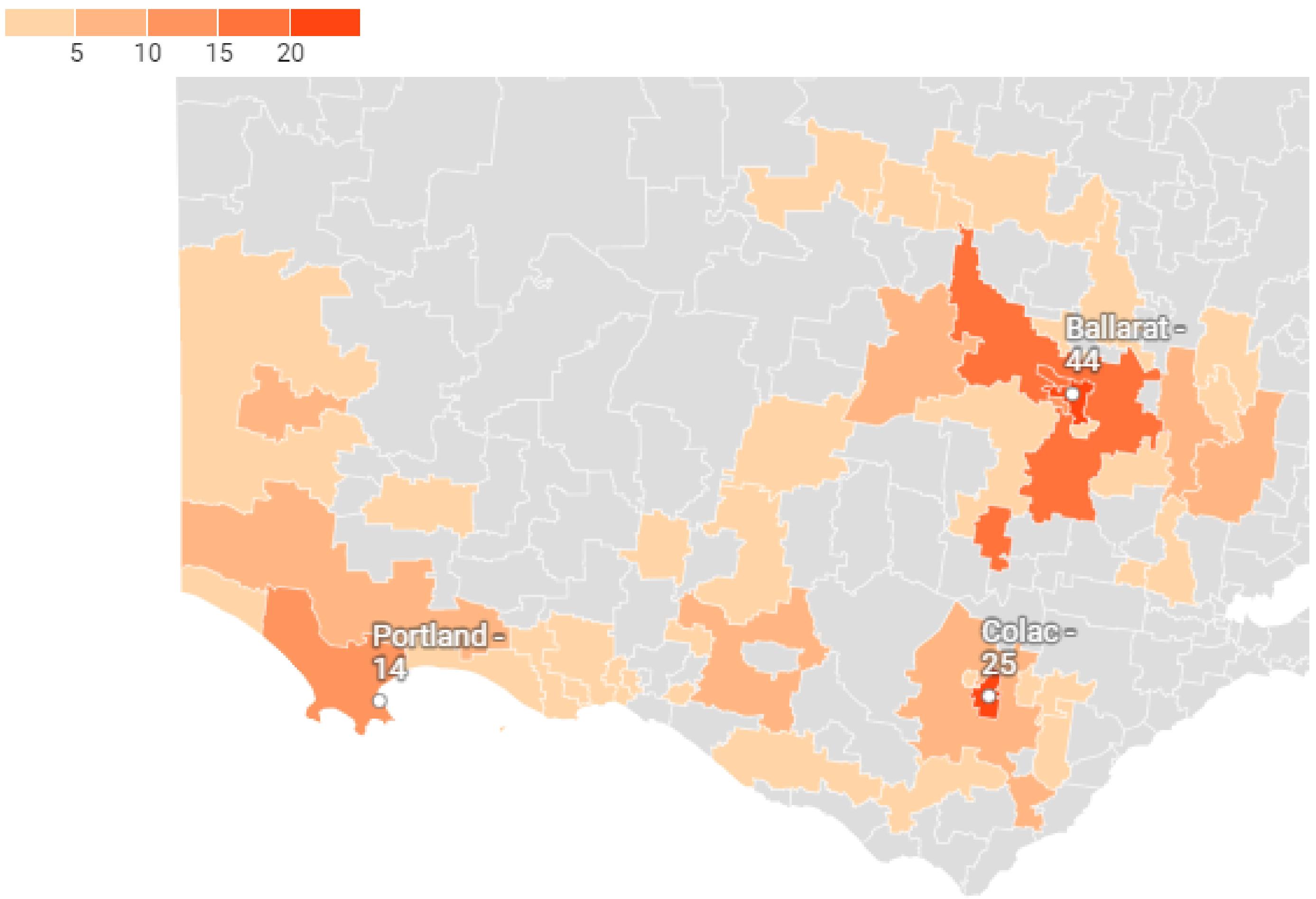
Net increase in Timber Industry GST Registrations by postcode, June 2015-2020

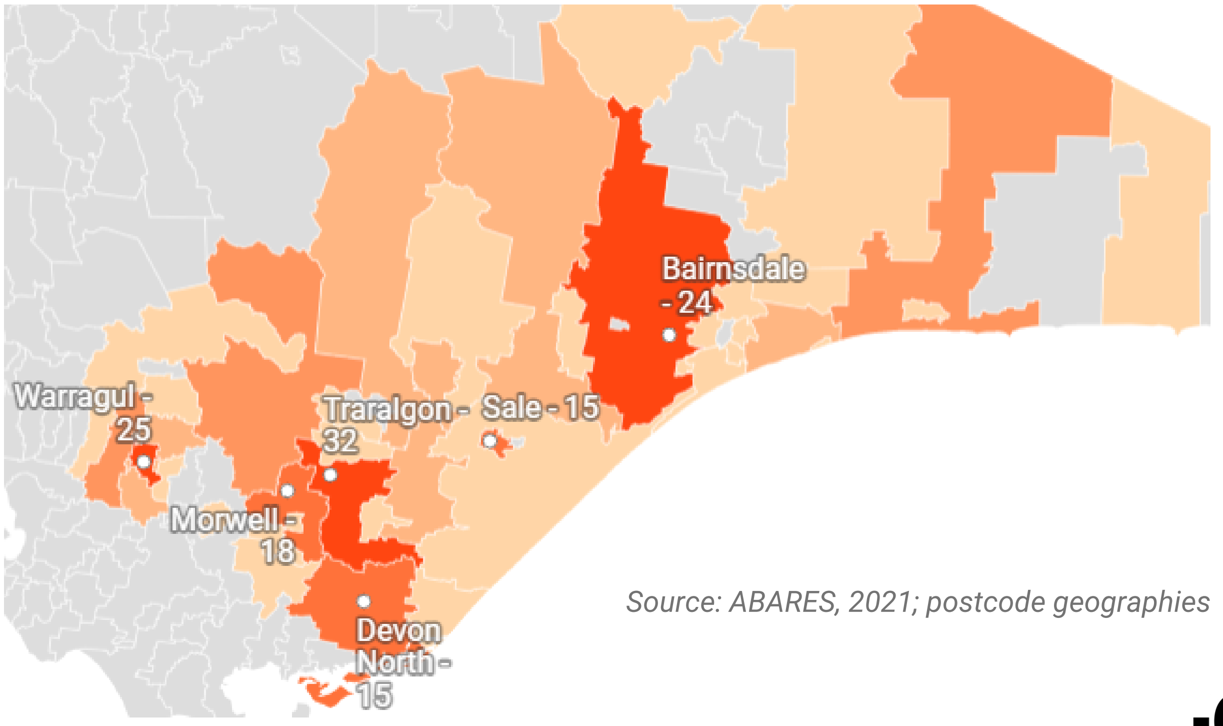


Source: ABARES, 2021

1 Net registrations equals new registrations minus cancelled registrations.

Location of Timber Industry GST Registered Businesses, June 30, 2020





Source: ABARES, 2021; postcode geographies

LOCAL SPECIALISATIONS

National Ranking in Terms of Largest Number of Jobs, 2016

Sub-industry	Rank	Area	Rank	Area
FORESTRY AND LOGGING	2nd	Latrobe City	7th	Wellington Shire
LOG SAWMILLING AND DRESSING	3rd	Colac Otway Shire	5th	Wellington Shire
FORESTRY SUPPORT SERVICES	6th	Glenelg Shire	9th	East Gippsland Shire
PULP, PAPER PRODUCT MANUFACTURING	2nd	Latrobe City		

Source: ABS Census of Population and Housing, 2016

The Timber Industry is a competitive strength for a number of the TTV local government areas.

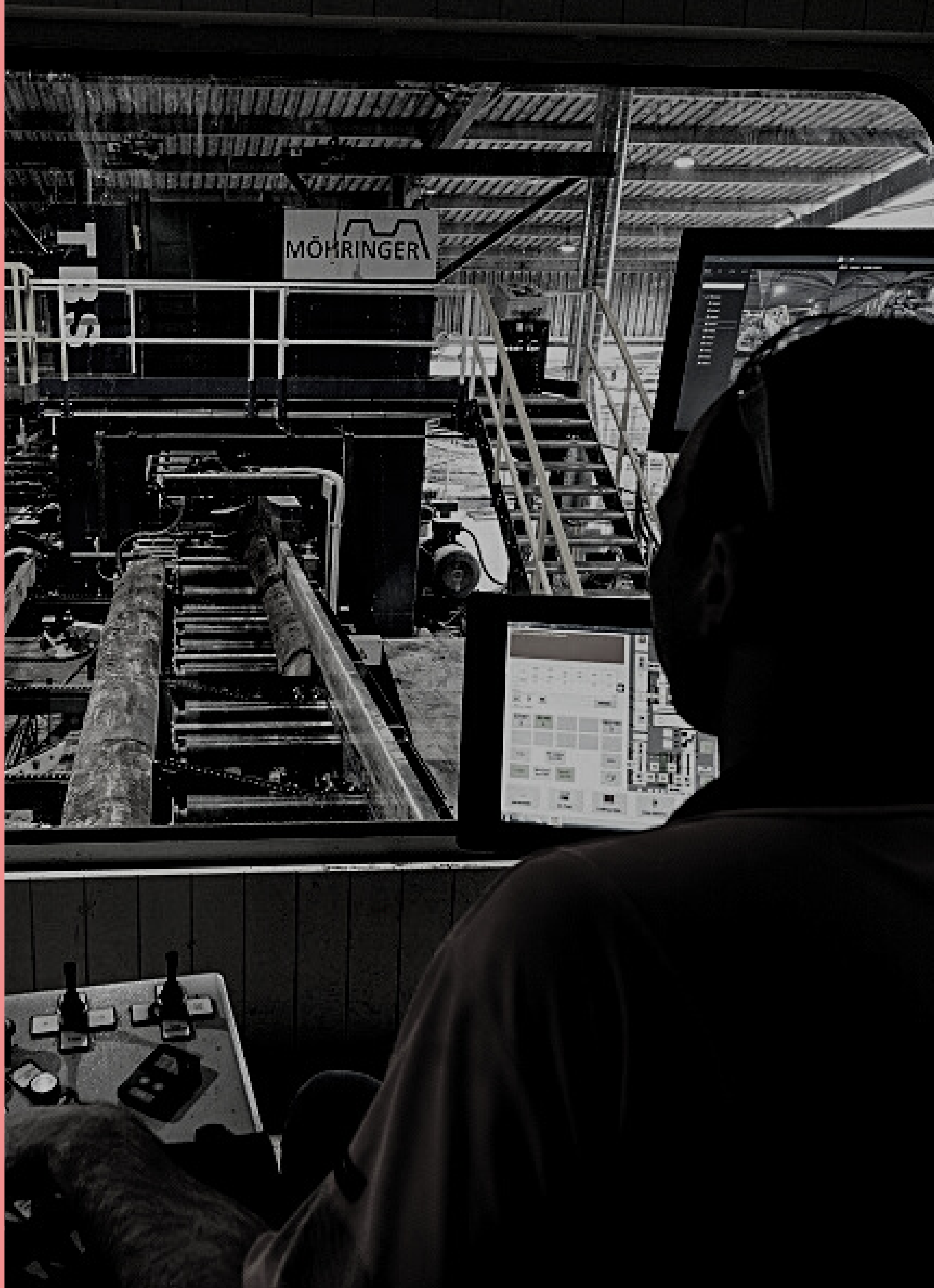
Looking at jobs numbers by sub-industry from the 2016 Census, Latrobe City and the Wellington Shire were in the top 10 locations in Australia for Forestry and Logging.

Colac Otway Shire had the third largest amount of workers in log sawmilling and dressing, and Wellington Shire the 5th largest.

Glenelg Shire and East Gippsland Shire were in the top 10 for Forestry Support Services.

Latrobe City, home to Opal's (Australia Paper) manufacturing facilities, supported the second largest amount of Pulp, Paper and Converted Paper Product Manufacturing jobs, six percent of Australia's total.

Workforce Profile



WORKFORCE OVERVIEW

In 2016, the Timber Industry workforce in Timber Towns Victoria was generally made up of Australian born, middle aged men.

They were slightly less likely to be qualified than the general workforce but much more likely to be working full-time and earning higher salaries. In fact, 9 out of 10 workers were in full-time employment.

It is noted that qualification levels have risen since 2016 as the workforce has undertaken specialised training to be able to operate new machinery plants have invested in.

It has been suggested that the industry has also subsequently employed more female workers improving the gender balance.

Profile of Direct Timber Industry Workforce in TTV Regions, 2016

44

Median Age

TTV - 44 years
Victoria - 41 years

Male 90% **Female 10%**

TTV - 51%, 49%
Victoria - 53%, 47%

Overseas Born 9%

TTV - 11%
Victoria - 31%

Post-School Qualification 56%

TTV - 61%
Victoria - 67%

Full-Time Employment 90%

TTV - 60%
Victoria - 61%

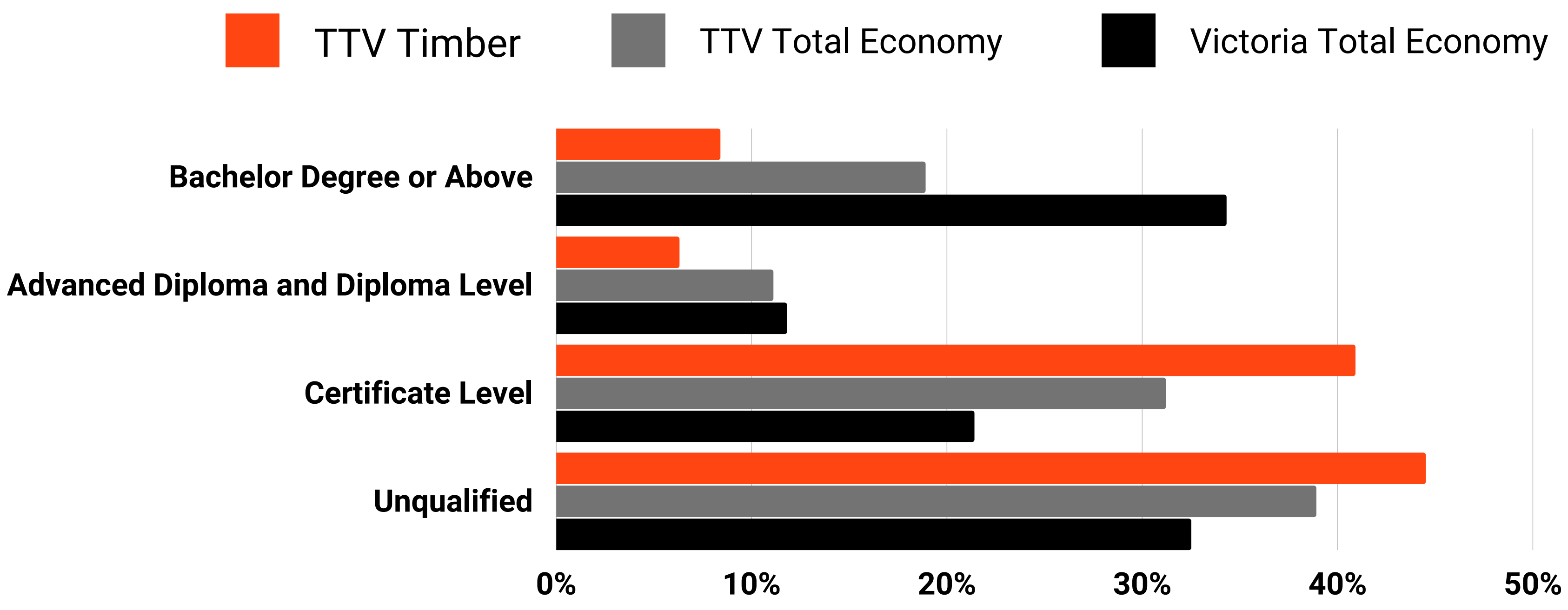
$63,023 Median Income

TTV - $44,357
Victoria - $51,100

Source: ABS Census, 2016

OCCUPATIONS AND QUALIFICATIONS

Qualification Level of Workforce, 2016



Top Qualifications of Direct Timber Industry Workforce, 2016

- Mechanical and Industrial Engineering and Technology
- Building
- Manufacturing Engineering and Technology
- Engineering and Related Technologies, nfd
- Automotive Engineering and Technology
- Business and Management
- Forestry Studies
- Electrical and Electronic Engineering and Technology

Top Occupations of Direct Timber Industry Workforce, 2016

- Miscellaneous Factory Process Workers
- Machine Operators
- Mobile Plant Operators
- Stationary Plant Operators
- Mechanical Engineering Trades Workers
- Farm, Forestry and Garden Workers
- Construction, Distribution and Production Managers
- Wood Trades Workers
- Truck Drivers
- Natural and Physical Science Professionals

Source: ABS Census, 2016

In 2016, Timber Industry workers in the TTV areas were on average less qualified than the rest of the economy. They were less likely to be diploma or degree educated but far more likely to have technical certificate level qualifications.

The main occupations of workers in the Timber Industry were Factory Workers, Machinery Operators and Mobile Plant Operators.

The top field of study areas for qualified workers were: mostly in building and engineering related areas (e.g. Mechanical and Industrial, Manufacturing, Automotive and Electrical).

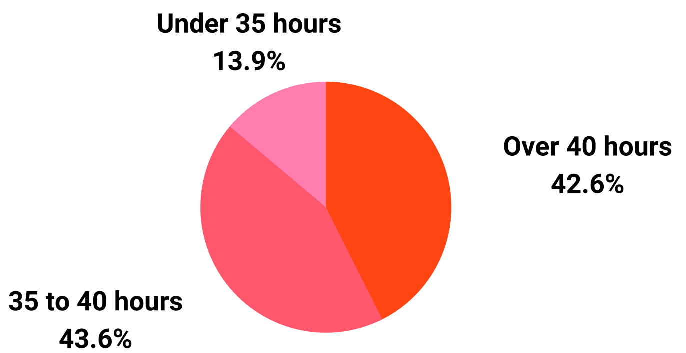
AGE AND INCOME OVERVIEW

In 2016, almost half (48%) of local workers in the TTV Timber Industry were aged between 35 and 54 years. This compared to 42% for the total economy. There was a much lower share of young adults or over 65s, age cohorts with typically higher share of part time workers.

The TTV Timber workforce had a very high share of people working longer than 40 hours per week in 2016 (42.6%). This was well above the average for all workers in TTV areas (25%)

This characteristic of high full-time middle career workers translated to a substantially higher share of the workforce earning high incomes ($78,000 or more p.a.) in 2016. Nearly 4 in 10 workers (37%) were in this bracket, compared to 19% for the total TTV areas' economy.

Weekly Hours Worked, Timber Industry, TTV Areas, 2016



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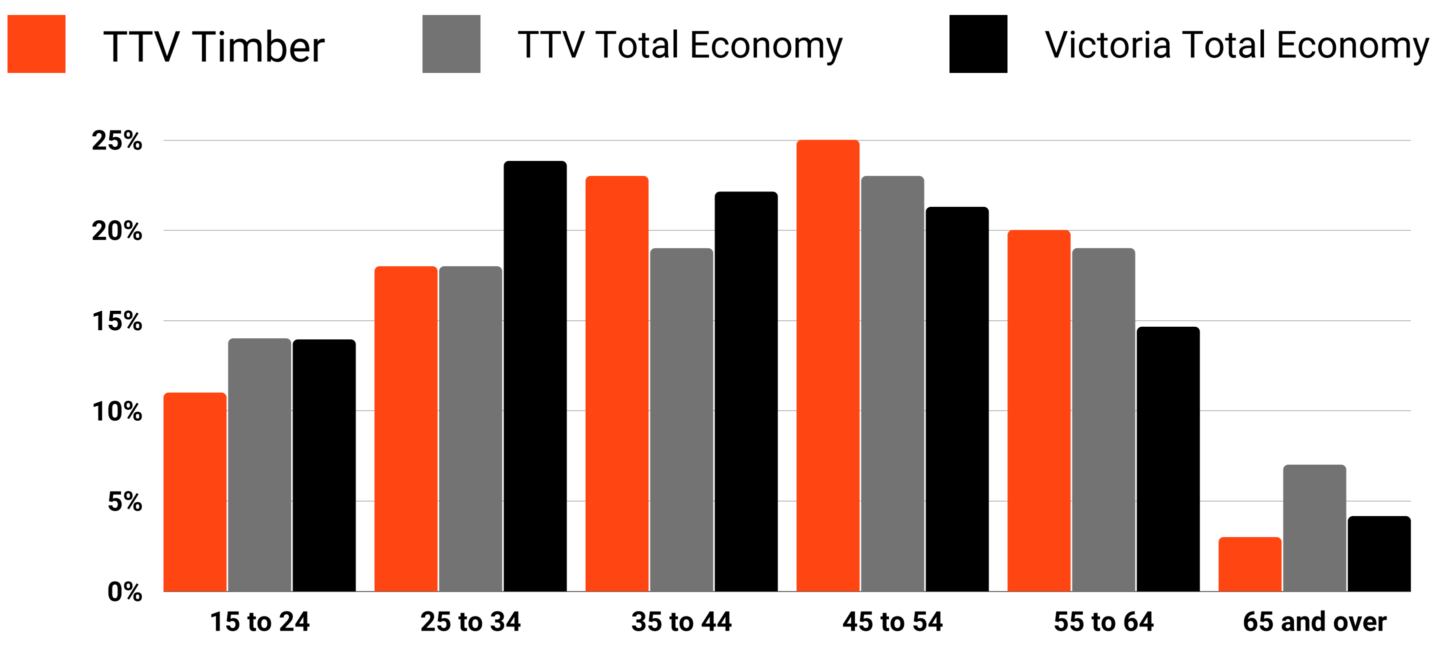
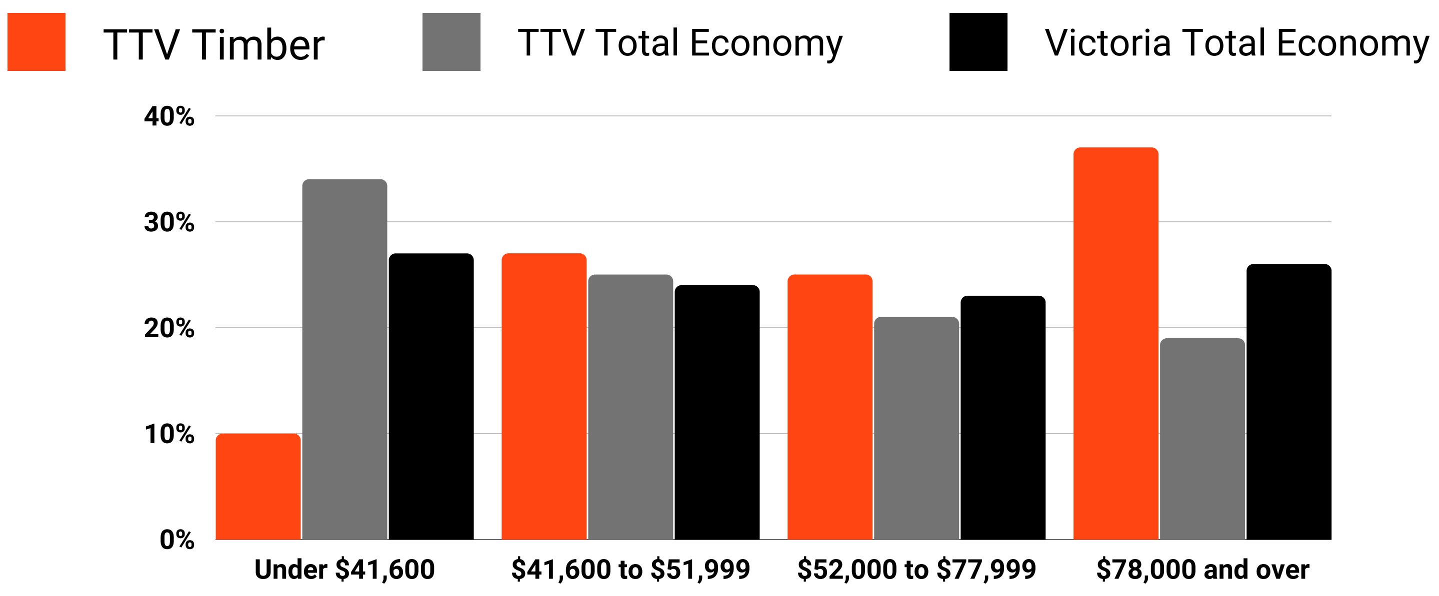
Source: ABS Census, 2016

Age Breakdown of Workforce, 2016



Annual Income Breakdown of Workforce, 2016



Source: ABS Census, 2016

Impact of Native Logging Ban

NATIVE LOGGING BAN

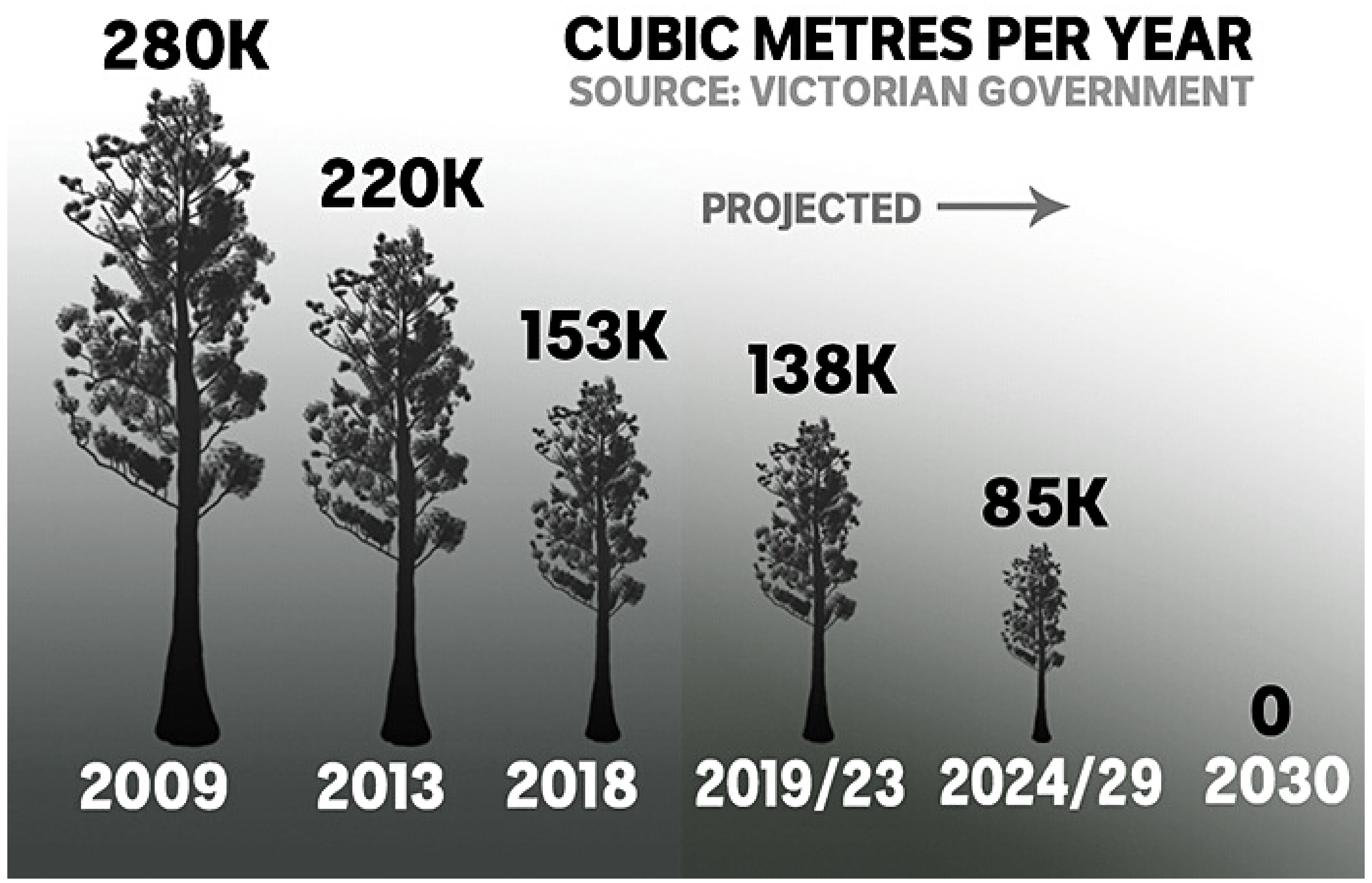
In 2019, the Victorian Government announced a plan to phase out logging of native trees by 2030.

Victoria's Forestry Plan saw logging in old growth forests end immediately. The policy also included reducing the current level of native timber available for logging from 2024-25. A competitive process will be used to allocate timber from mid-2024 to 2030, after which commercial native timber harvesting in State forests is set to cease.

A $120 million transition package was announced by the Government to help communities adapt. This is proposed to include grants to grow and create local businesses and jobs, financial support for community projects and funding for local infrastructure.

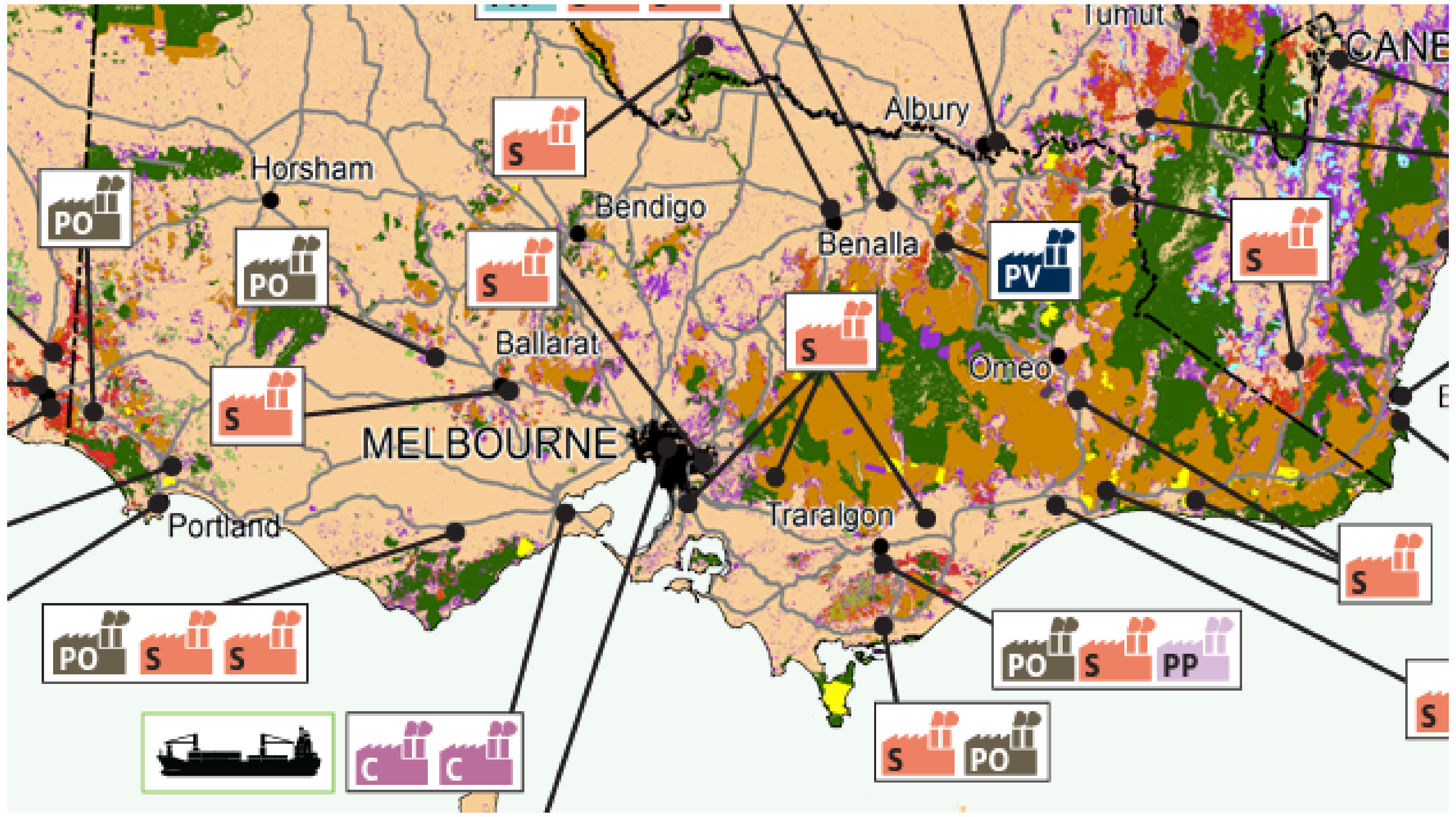
Immediate financial assistance is being provided to affected local businesses to prepare and plan their response to the transition. This includes assistance to retool in order to switch to plantation timber as well as financial compensation.

Source: Victorian Forestry Plan, 2021



Source: ABC News, 2020

Distribution of Forests, Plantations and Processing Facilities, 2017



Source: ABARES, Australia's forestry industry 2017

GEOGRAPHICAL BURDEN OF IMPACTS

The impacts resulting from the decision to cease logging in native forests is more likely to fall on the local government areas to the east of Melbourne.

This region is home to the large majority of native forest that is determined as 'multiple-use' and has a greater number of processing facilities that rely on native timber.

A 2017 study estimated that 81.5% of the jobs in Victoria reliant on native forestry timber were located in the Central Highlands and Gippsland region (east and north eastern Victoria).[1]

This distributional effect is taken into account when modelling the potential impacts of the native logging decision.

[1] Schirmer et al., 2018, Socio-economic impacts of the forest industry Victoria (exc. the Green Triangle)

ECONOMIC IMPACTS ON TTV AREAS

It is acknowledged that the decision to cease native logging is a phased approach designed to allow businesses and the industry to transition to alternative sources. However, given the current timelines this may prove difficult.

The estimated contribution of native forests to logging, processing and other timber related activities in the Timber Towns Victoria areas has been modelled. This approach is approximate to if native logging ceased immediately.[1]

It is estimated that native forest related activities supported approximately 2,649 jobs in 2019/20 (1,114 direct as well as an additional 809 from supply chain impacts and 726 from consumption impacts).

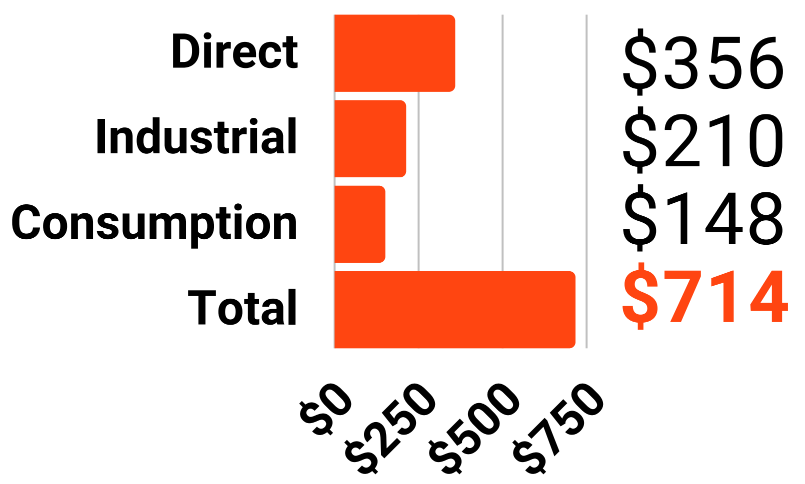
Output reliant on native forest products/byproducts in the TTV areas was estimated at $714M in 2019/20 of which $356M was a direct impact.

Value Added was estimated to be $246M with $109M being direct impacts.

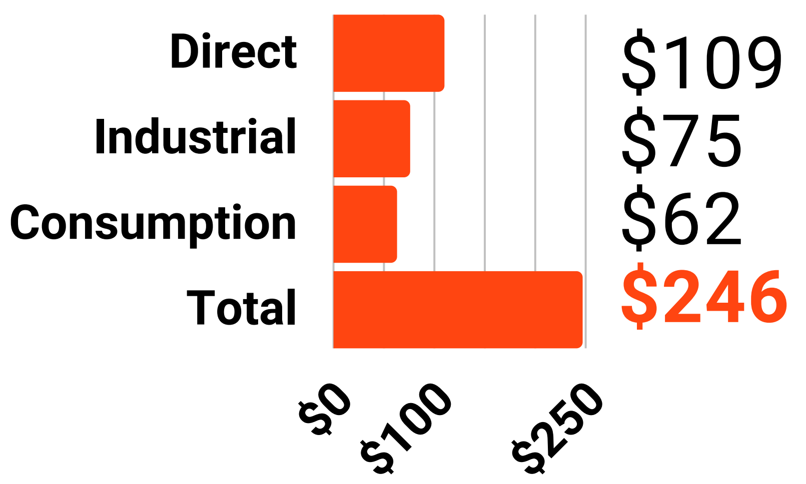
[1] This is based on the share of Timber Industry reliant on native forestry inputs vs plantation timber (and/or imported inputs) in different locations across Victoria. Assumptions on shares based on industry discussions and Schirmer et al., 2018. For more detail of model utilised, refer to Appendix.

Estimated Impacts of Native Logging Reliant Activities, TTV Areas, 2019/20

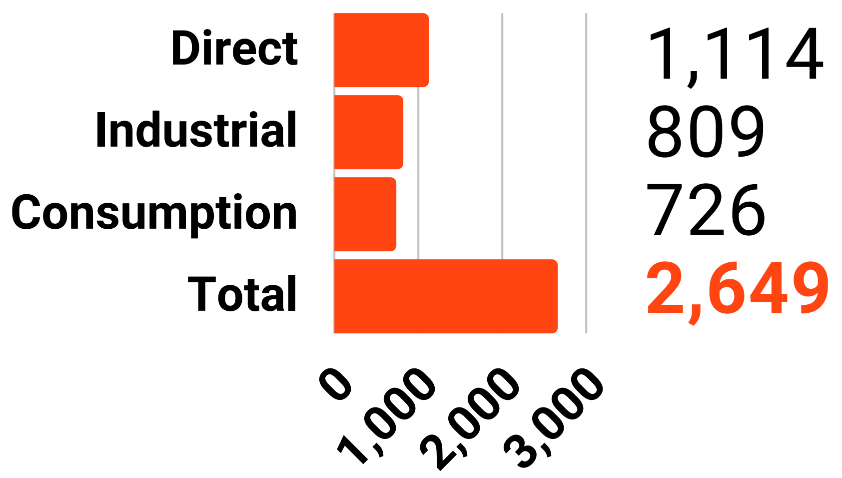
SALES/OUTPUT $M



VALUE ADDED $M



JOBS



Source: NIEIR, 2021

Total Estimated Job Impacts by Industry, 2019/20

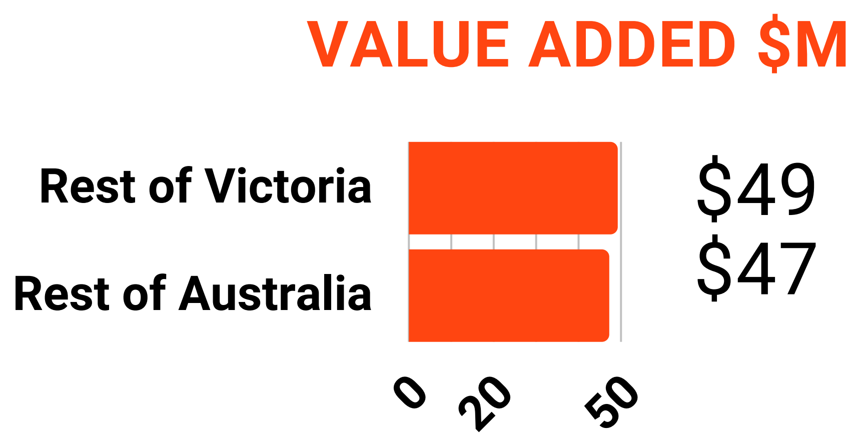
Source: NIEIR, 2021

IMPACTS BY INDUSTRY AND OUTSIDE THE REGION

When looking at the incidence of impacts, it is not just local workers in forestry and sawmilling that native logging activities contributes to. When considering flow on impacts, 43% or 1,152 local jobs are estimated to be in industries outside of Manufacturing and Agriculture, Forestry and Fishing.

In addition, local activities have ripples across industries outside the TTV areas. It is estimated that native logging connected activities in the TTV areas contribute to additional supply chain and consumption induced impacts of 390 jobs in the rest of Victoria and 367 jobs outside the state.

Estimated Impacts Outside TTV Areas, 2019/20



Source: NIEIR, 2021

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ECONOMIC IMPACTS AT STATE LEVEL

The estimated contribution of native forests to logging, processing and other timber related activities at a state (Victoria wide) level has also been modelled using a state based input-output model.[1]

To effectively model the native logging ban at a macro state level a Computable General Equilibrium (CGE) framework is recommended to take into account reallocation of resources over the medium term. A CGE approach is out of scope of this report.

It is estimated that native forest related activities supported approximately 5,760 jobs in 2019/20 (2,184 direct as well as an additional 1,790 from supply chain impacts and 1,787 from consumption impacts).

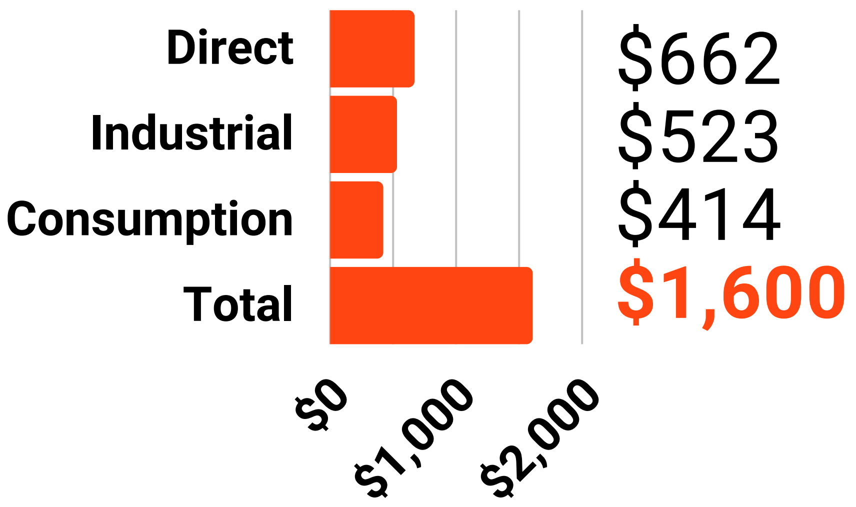
Output reliant on native forest products/byproducts at a state level was estimated at $1,600M in 2019/20 of which $662M was a direct impact.

Value Added was estimated to be $582M with $216M being direct impacts.

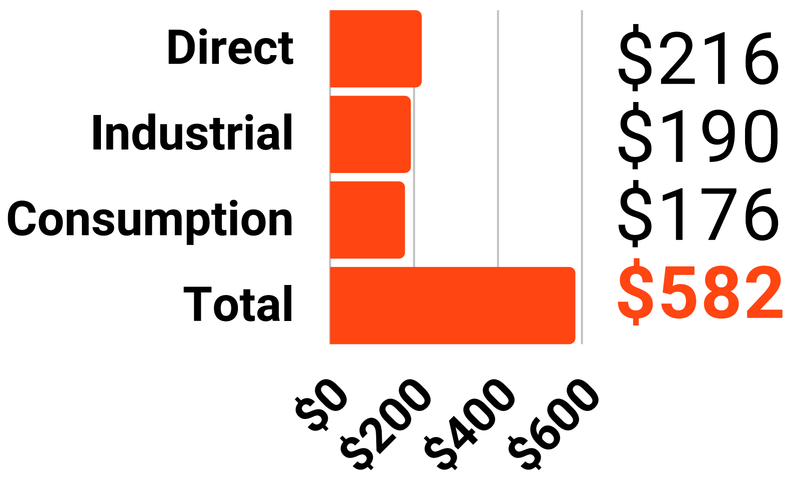
[1] This is based on the share of Timber Industry reliant on native forestry inputs vs plantation timber (and/or imported inputs) in different locations across Victoria as well as relevant state shares of timber production volumes by timber source from ABARES, 2021.

Estimated Impacts of Native Logging Reliant Activities, Victoria, 2019/20

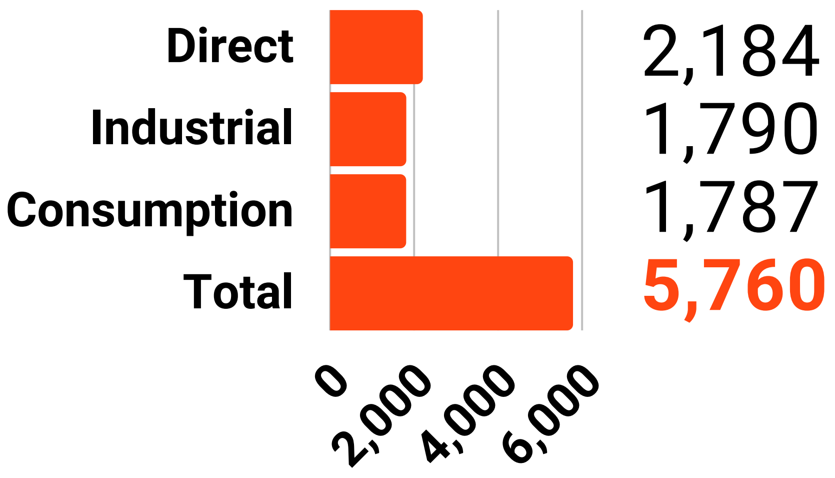
SALES/OUTPUT $M



VALUE ADDED $M



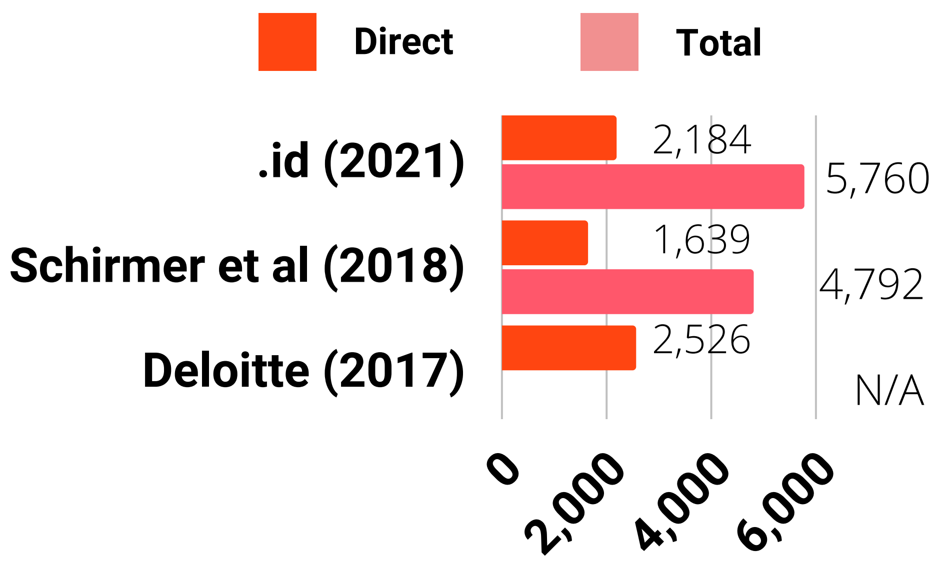
JOBS



Source: NIEIR, 2021

.id

Comparison of Native Logging Reliant Employment Estimates, Victoria



Notes

- .id (2021) Direct estimates are for logging, primary and secondary processing. Adjusted to remove double counting supply chain impacts.
- Schirmer et al (2018) Estimates for forestry, logging and primary processing. They do not include secondary processing.
- Deloitte (2017) Estimates do not include secondary processing but incorporates all Opal/Australian Paper employment as classified as a VicForests customer.

STATE IMPACTS COMPARISONS

A number of other research reports and surveys have estimated the jobs and/or economic value of native logging activities over the last decade.

Schirmer et al (2018) estimated logging and primary processing employment reliant on native forests for the state and sub-regions. They did not estimate employment in secondary production directly related to native timber.

Deloitte (2017), estimated FTE employment of VicForests, contractors and direct customers. This report estimated value added from secondary production (10 year cumulative NPV) but did not estimate employment in secondary production directly related to native timber. The report potentially overestimates direct employment due to incorporating all of Opal/Australian Paper's employment.

PwC (2016) generated an estimate of direct employment in native forestry. However, its employment estimate appears to substantially underestimate the related activities. This is likely due to the report only looking at forestry and logging and not the substantial primary and secondary processing activities. In addition, the report appears to only utilise ABS Labour Force survey data which is unreliable at sub-industry levels unless combined with other data sources.

.id's estimate varies from previous reports but is within the range if other reports incorporated secondary processing and were adjusted for declines in the industry subsequent to their publishing.

WIDER IMPACTS TO CONSIDER

The ban on native logging activities is likely to have impacts beyond those simply connected to the reduction in output and employment in native logging reliant businesses and suppliers. It is acknowledged that there exist environmental and potentially economic benefits (e.g. tourism) from the ban. However, there are additional potential costs that must be considered including:

- Undersupply of plantation[1] timber - plantations in Australia which under federal Government plans were supposed to reach 3 million hectares by 2020, however, actual forecasts are approximately 1.9 million hectares in 2021-22. Particularly large undersupply of hardwood plantations which prevents any transition plans,
- Lack of alternative supply if plantations destroyed - bushfires pose an ongoing risk to plantations due to density of forests,
- Imported wood products will rise (esp. appearance grade timber) to meet demand if local supply constraints are not fixed - imports have a higher carbon footprint and may come from forests where industry does not follow sustainable practices,
- Loss of native wood contractors and machinery may be detrimental to fire management efforts,
- Loss of specialised manufacturing skills and equipment - some native sawmills have made regular human and physical capital investments in recent years, machinery and labour may not be easily transferred to processing other timber or utilised in other industries,
- Climate change will potentially impact water availability which is crucial for timber plantations growth.

Impacts of Native Logging Ban to Consider

Industry and livelihoods at risk if adequate transitional support not provided

Future undersupply of plantation timber, especially if plantations burnt

Rise in imports to meet demand, leading to cost increases and greater carbon footprint

Imports may come from regions not following certified sustainable practices

Loss of contractors and machinery crucial to fire management

Skills and plant equipment not easily transferrable and represents loss investment

Appendix

DATA, METHODOLOGY AND DEFINITIONS

This report utilises an economic impact model that is specifically tailored to the Timber Town Victoria economies by using local input-output tables developed by National Economics (NIEIR).

An input-output matrix describes how the different industries in an economy interrelate, and how supply chains operate in the local area. Using input-output tables, multipliers can be calculated to provide a simple means of working out the flow-on effects of a change in output in an industry on one or more of imports, income, employment, or output in individual industries or in total.

The economic impact model is updated each year to take account of changes to the local economy. Multipliers for a region may change over time in response to changes in the economic and industry structure as well as price changes.

Economic impacts related to the ban on native logging have been estimated via isolating the share of industries reliant on native logging supply and running job numbers through the economic impact model to identify flow on impacts. For example, it is estimated that one third of Australian Paper's supply is from ViCForests or wood chips from hardwood sawmills processing native timber. Flow-on impacts in Timber Industry sub-industries have been removed or discounted in order to prevent double counting.

Identifying the likelihood of any transition plans enabling continued operations (e.g. by substituting wood supply) were out of scope of this report. Identifying uplift in other industries (potentially tourism) due to the ban on native logging was also out of scope.

Economic Impact Model Outputs

NIEIR's localised economic impact model produces estimates of:

- Direct impacts which are generated directly by businesses and organisations engaged in the timber industry.
- Indirect or flow-on impacts are the economic activity generated in other industries as a result of the activity of the timber industry. These include -
  - Industrial-induced (supply chain) impacts which are generated by businesses outside the timber industry that supply timber industry businesses.
  - Consumption-induced impacts generated when workers involved in the timber industry, and in businesses that supply the industry, spend their wages on goods and services.
- Total impact is the sum of direct and indirect (or flow-on) impacts.

Sales/Output is the gross sales of an industry, which includes the cost of inputs to that industry. To the extent that outputs from one industry are used as inputs to another, the economic productivity of an industry may be counted multiple times in output, which is why output totals generally appear much higher than value added or GRP.

Value added is the value of sales generated by each industry, minus the cost of its inputs.

Exports are sales of goods and services to non-resident households, businesses and other organisations, outside the LGA boundaries.

Local Jobs are the estimated number of people working within the LGA/region boundaries. This can include local and non-local residents who commute in for work. Estimates are developed based on numerous data sets including Census Journey to Work data.

SOURCES

Sources used for this report include:

- ABARES, 2020, *Australian forest and wood products statistics September and December quarters 2020*
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- Schirmer, J., Loxton, E and Campbell-Wilson, A., 2008, *Monitoring the social and economic impacts of forestry: A case study of the Green Triangle*
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