Report

FOREST INDUSTRY CONSULTING

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Investment Opportunities in the Australian Forest Products Industry

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PREFACE

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EXECUTIVE SUMMARY

Investment opportunities in the Australian forest industry can be found throughout the country and at varying scale. The majority of investment opportunities identified in this report would utilise the increasing availability of softwood from plantations over the coming years. By 2010, additional opportunities for processing the expanding hardwood plantation resource should arise. The traditionally important native forest resource is expected to continue to provide sustainable volumes, but sawlog yields are currently committed for utilisation by existing industry.

Resources

The Australian forest industry is an important contributor to the national economy with a total annual turnover of some 12 billion dollars. In the year 1999-00, total harvest removals were around 10.7 million m^3 from native forest hardwoods, 12.3 million m^3 of mostly exotic plantation softwoods and over 0.8 million m^3 of plantation hardwoods (ABARE, 2001).

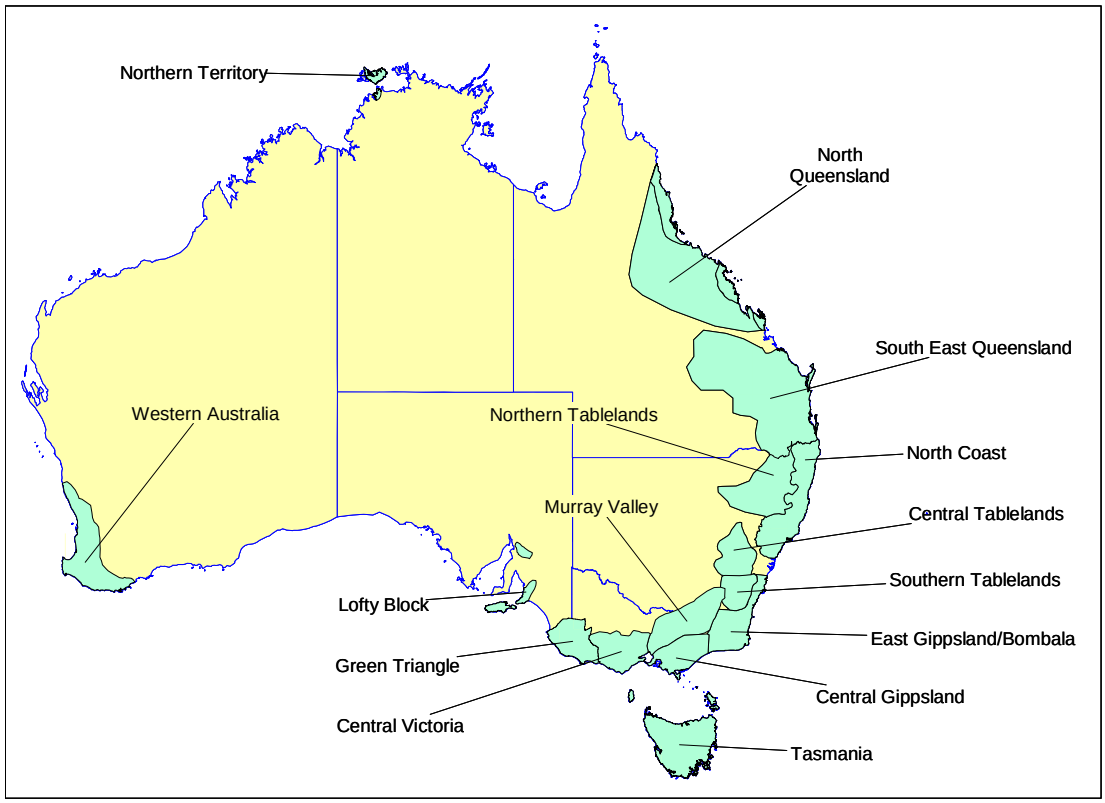
Australia's 1 million hectares of softwood plantations are producing sawlogs and pulp logs which are processed into a number of key products such as:

- Structural grade timbers
- Appearance grade timbers
- Industrial grade timbers
- Treated products
- Wood-based panels, such as plywood, particleboard, MDF and LVL
- Pulp and paper.

Australia's 0.5 million hectares of hardwood plantations are mainly planted for the production of pulpwood, however, higher grade logs are produced in a few locations and used in the solid wood industry. Many of the hardwood plantations are still relatively young and hence, significant volumes of fibre will not be available until the later part of this decade.

The plantation resource in Australia is spread out along the southern and eastern coasts, with additional resources in Tasmania and Western Australia.

Figure S1:
Map of NPI plantation regions

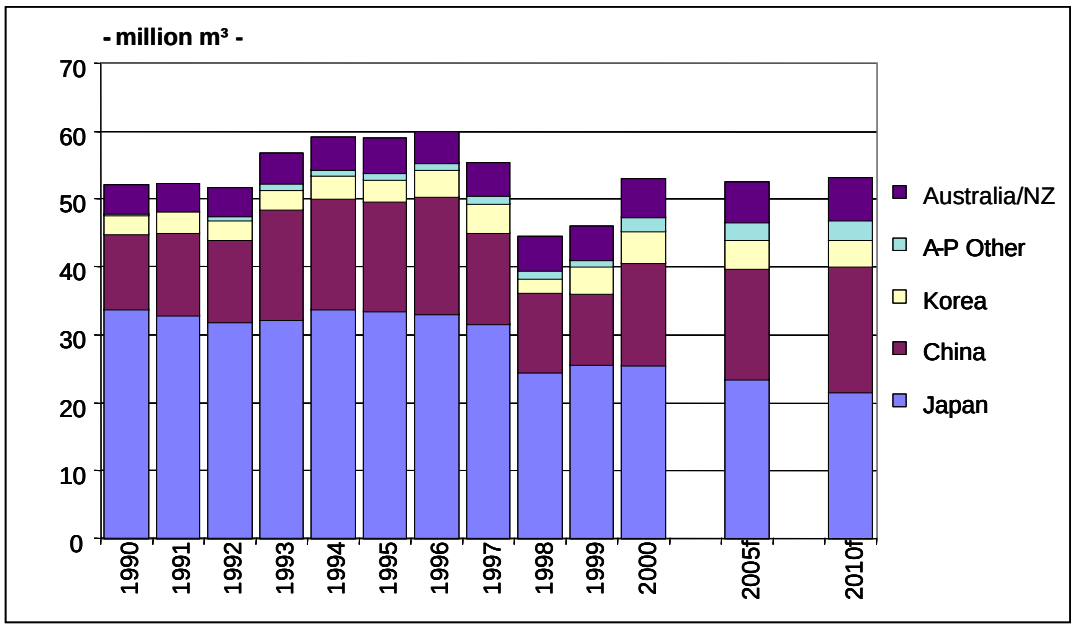


Markets

Sawnwood

Softwood consumption within the Asia-Pacific region is expected to remain relatively static through 2010 as the important Japanese market continues to decline, and China's growth remains limited by its building traditions (see Figure S2).

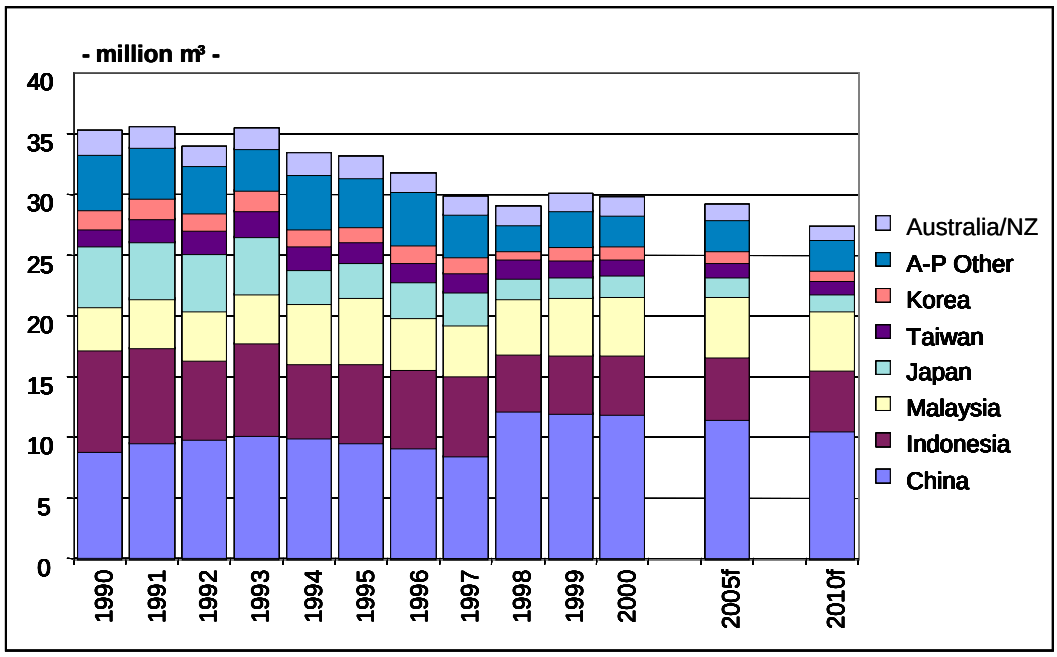
Figure S2:
Sawn Softwood Consumption in Asia Pacific, including Australia/New Zealand



However, the considerable changes occurring in both the domestic Australian market and the various export markets will provide real opportunities for future investments in this industry. Within the domestic market, substitution of imported material will continue to provide room for further growth. Opportunities also exist in supplying the Chinese market with a range of products even though Chinese per capita consumption is among the lowest in the world, with just 0.01 m³/capita in 2000, compared to 0.18 in Australia or 0.20 in Japan. The Japanese market is changing considerably and the use of engineered wood products in house construction is increasing rapidly. In addition, hardwood availability throughout Asia is declining and should present further opportunities for sawn softwood from Australia.

Hardwood consumption in the Asia Pacific region has been declining, primarily as a result of declining availability and rising costs of tropical sawn hardwood. This decline is expected to continue over time (see Figure S3).

Figure S3:
Sawn Hardwood Consumption in Asia-Pacific, including Australia/New Zealand

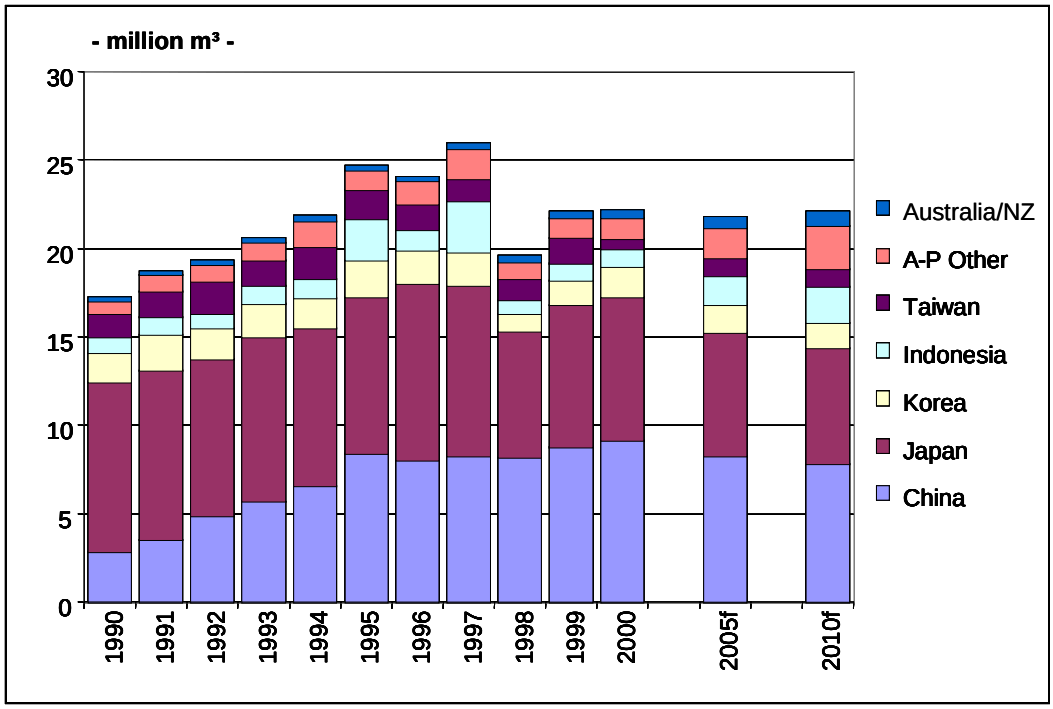


The decline in availability, particularly of high quality hardwood does present real opportunities for Australia. China is by far the biggest market for sawn hardwood followed by Malaysia and Indonesia. China has increased its imports dramatically over the past years and will continue to import large volumes. However, per capita consumption of hardwood is close to that observed in other countries, i.e. China at 0.01 m³/capita in 2000, compared to 0.08 m³/capita in Australia and 0.02 m³/capita in Japan. Initially, these opportunities will be available to the established native hardwood industry, however, sawlogs should become available from plantations as well.

Plywood

Plywood is the primary wood-based panel product within Asia-Pacific. Production facilities are found throughout the region and the industry supplies markets globally. However, production of plywood has traditionally been based on tropical hardwood and its availability has been in decline. Consumption of plywood is strongly concentrated in China and Japan who together account for more that 80% of the Asia-Pacific market. While consumption has declined since 1993, future consumption is not expected to increase dramatically as the supply of finished products is driven by the availability of resources.

Figure S4:
Plywood Consumption in Asia-Pacific, including Australia/New Zealand

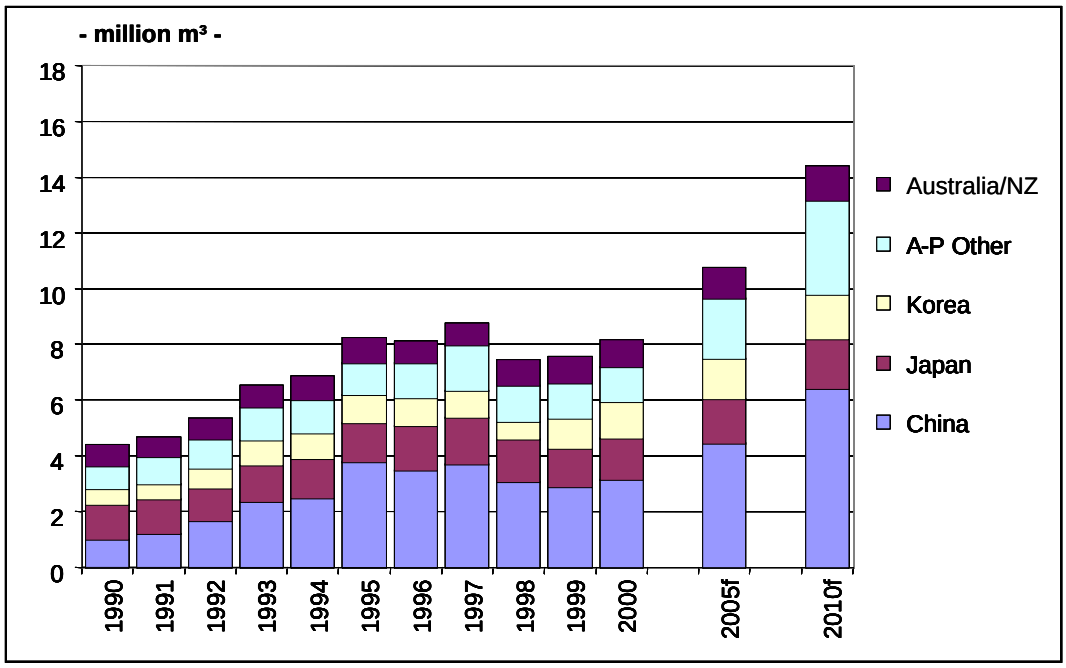


China has become the largest plywood market in Asia-Pacific. The majority of plywood is used is for decorative purposes but temporary construction uses, such as concrete formwork, are increasing. The Japanese market uses plywood more in construction and structural type end-uses and has become very used to combi and softwood based plywood. Raw material for plywood production will become increasingly scarce resulting in opportunities for the supply of plywood to the Asian market from Australia.

Particleboard

Particleboard is well established in the traditional markets of Europe and North America but is still relatively new throughout the Asia-Pacific region. The consumption of particleboard is expected to grow considerably, driven by the Chinese and other Asian markets (see Figure S5).

Figure S5:
Particleboard Consumption in Asia-Pacific, including Australia/New Zealand



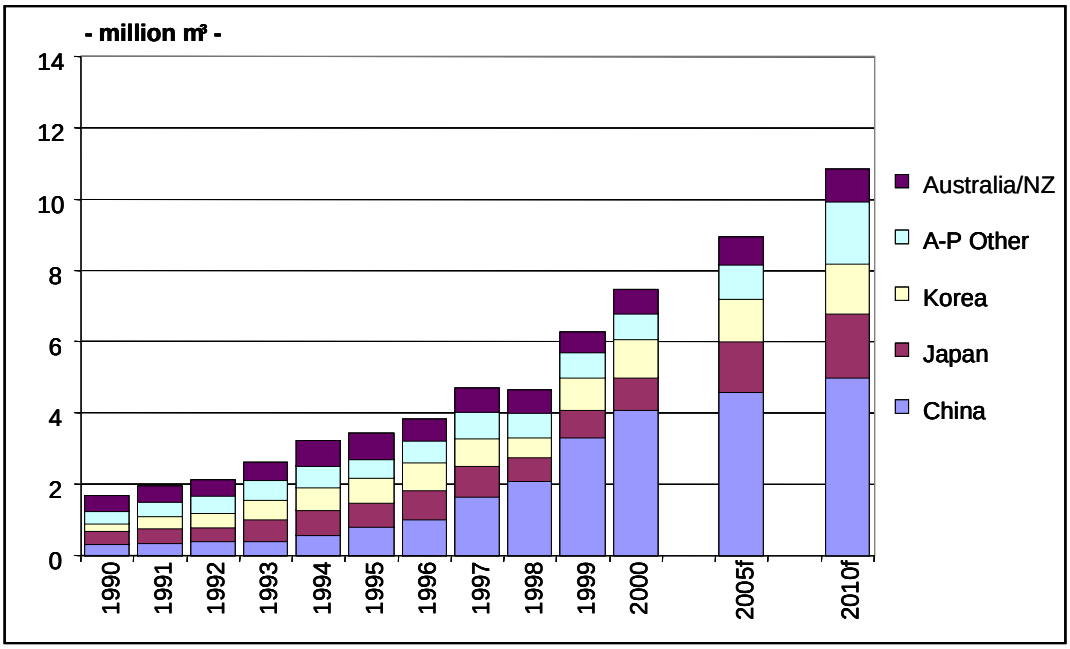
Particleboard is a relatively low cost panel and is not typically transported over great distances in raw form. However, value-added processes such as overlays or natural veneer, melamine or others allow particleboard to be cost effectively transported – these value-added particleboard products are the main opportunities for Australia.

Medium Density Fibreboard

Medium Density Fibreboard (MDF) has grown rapidly in Asia-Pacific. MDF is produced throughout the region, with significant capacity installed in Australia/New Zealand, Malaysia and China. Australia/New Zealand has been a major supplier of MDF to the Asian market and has developed a strong reputation for quality based on the utilisation of radiata pine fibre.

The strong consumption growth for MDF is forecast to continue as the panel will continue to find new end-uses and substitute for more traditional products (see Figure S6).

Figure S6:
MDF Consumption in Asia-Pacific, including Australia/New Zealand



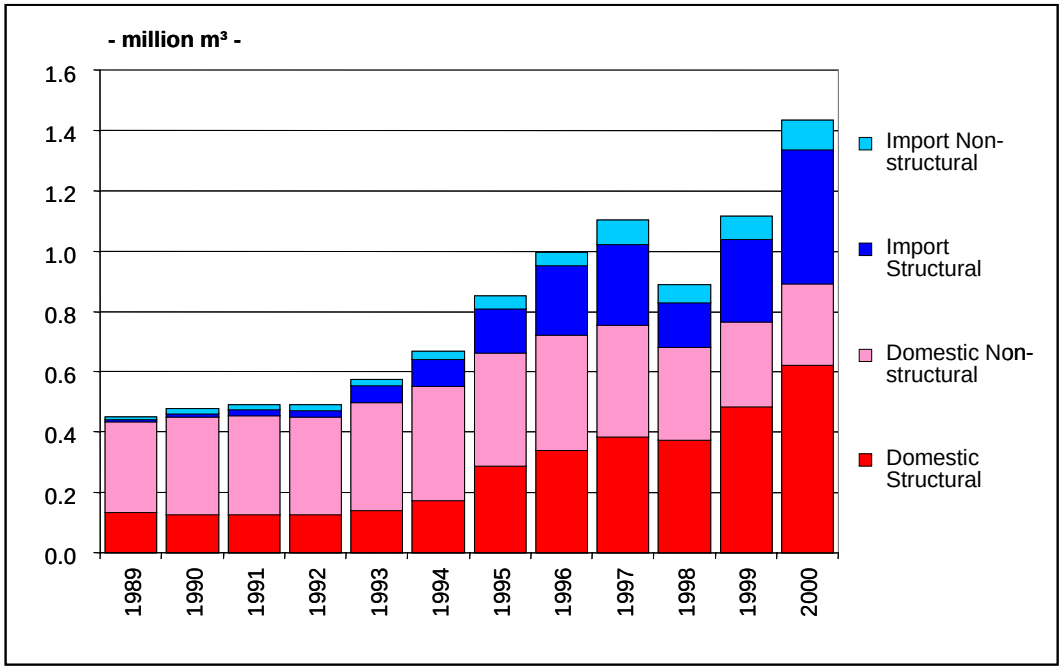
Major MDF markets within the region include China, Japan, Korea and Australia/New Zealand. All markets are expected to see continued growth in consumption and total consumption is forecast to reach some 11 million m³ by 2010.

The continued growth in demand will present future opportunities for Australia in the existing industry and for greenfield mills. It can be expected that softwood, hardwood as well as a mixture of fibres will be used in future MDF production, which will provide an increasing range of products for future markets.

Laminated Veneer Lumber

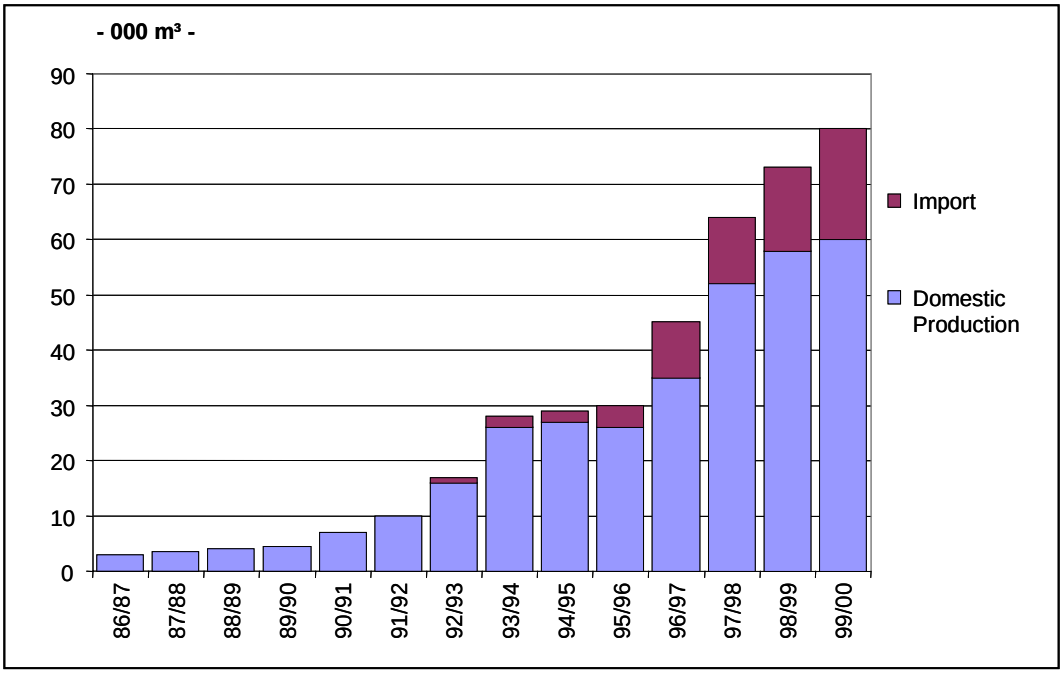
Within the Asia-Pacific region only two distinct markets for LVL exist to date. The main market is the Japanese market where both structural and non-structural LVL is used. Total consumption in Japan reached some 450,000 m³ in 2000 (see Figure S7).

Figure S7:
LVL Supply in Japan



The Australian market for LVL has developed strongly, and this market is primarily a structural LVL market. In addition to domestic supplies, LVL has been imported into this market from North America. Total consumption of LVL is estimated to have reached some 80,000 m³ in 1999/00 (see Figure S8).

Figure S8:
LVL Supply in Australia



No other significant markets have yet developed for LVL, however, it is expected that New Zealand's consumption of LVL will increase as LVL will be made available through domestic processing. In addition, various non-structural markets for LVL are expected to develop throughout Asia.

Opportunities exist for further expansion of the LVL industry in Australia. This would serve the increasing Australian market as well as exports markets.

Glue-Laminated Lumber

The only Asian market for glue-laminated lumber is in Japan where its use in house construction is growing rapidly. New Zealand has developed a small position in this market; facilities based in Australia could also present real opportunities.

The domestic and export market opportunities and Australia's cost competitiveness for solid wood products are illustrated in Table S1.

Table S1:
Solid Wood Opportunities

Summary	Supply Deficit in		Cost Competitiveness
	Asia	Australia	
Softwood sawn	●	●	●
Hardwood sawn	●	◖	●
Particleboard	●	◖	◖
MDF	●	○	●
LVL	◖	●	●
Glue-laminated lumber	●	◖	●

● Positive ◖ Neutral ○ Negative

Woodchips

Hardwood and softwood woodchips are traded within the Asia-Pacific region, and Australia is supplying both. The main market for woodchips is Japan (87%), but Korea and Taiwan are also importing significant volumes. Australia is in a strong position to increase its market share in the main woodchip markets as well as develop new markets for woodchips in Indonesia and other countries facing increasing resource scarcity.

The increasing supply of hardwood woodchips as a result of the rapid expansion of prospectus driven plantations provides opportunities for increased woodchip exports (and/or domestic processing). Most of the plantings are *Eucalyptus globulus*, regarded as one of the best fibres for BHKP production. Australia's

cost competitiveness will ensure markets can be found in Japan but some exports may be partly at the expense of native forest woodchips beyond 2010.

Opportunities for softwood woodchip export are not as strong due to competition from New Zealand and North America.

Table S2:
Woodchip Export Opportunities

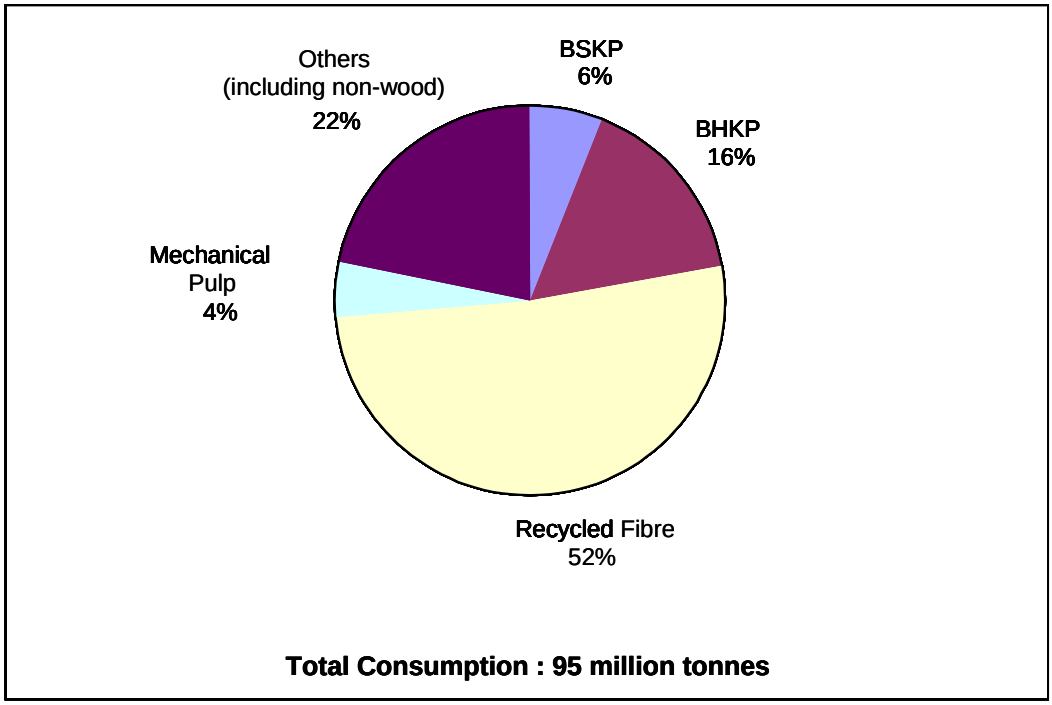
Summary	Supply Deficit in		Cost Competitiveness	Quality Advantage
	Asia	Australia		
Softwood	●	○	◖	◖
Native hardwood	●	○	●	◖
Plantation hardwood	●	○	●	●

● Positive ◖ Neutral ○ Negative

Papermaking Fibres

Papermaking fibre consumption within the Asia-Pacific region amounted to 95 million tonnes in 2000, including both market and integrated pulp. Recycled fibre accounts for 52% of all fibre used (Figure S9). Recycled fibre and bleached hardwood kraft pulp are increasingly replacing non-wood pulp, especially in China.

Figure S9:
Consumption of Papermaking Fibres in Asia-Pacific by Grades 2000



Consumption of market pulp in the region is summarised in Table S3.

Table S3:
Consumption of Market Pulp in Asia-Pacific 2000-2010 (million tonnes)

	Consumption 2000	Consumption 2010	Growth 2000-2010 (%/a)
BSKP	4.0	5.5	3.2
BHKP	5.9	11.0	6.4
Mechanical pulp	1.1	1.4	2.4

For market pulp, the total consumption of bleached softwood kraft pulp (BSKP) reached some 4 million tonnes in 2000 and is expected to increase to some 5.5 million tonnes by 2010. The Asia-Pacific region will remain a significant net importer of this grade.

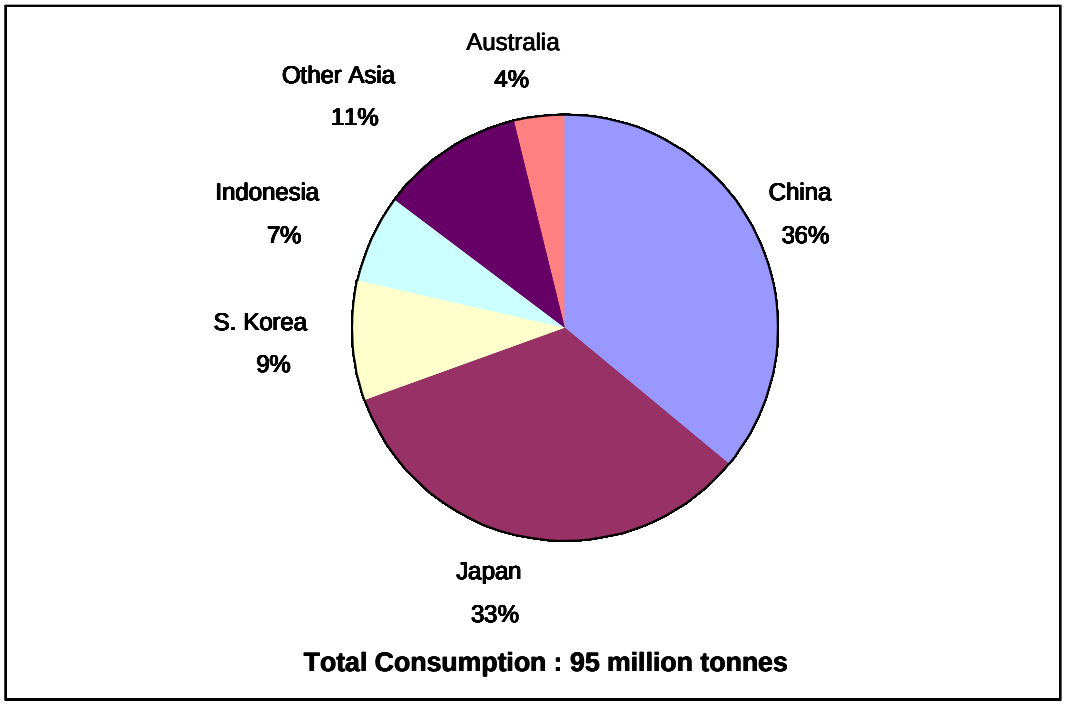
For bleached hardwood kraft pulp (BHKP), market pulp consumption reached some 6 million tonnes in 2000 and is expected to increase to some 11 million tonnes by 2010. The region has significant capacity expansion plans, and is expected to become a net exporter.

Mechanical pulp is a relatively small and specialised market pulp product; the total market for this pulp grade is only some 1.1 million tonnes in the region. Market demand for this pulp is expected to increase to some 1.4 million tonnes by 2010 but much of this will be supplied from mills presently planned in China.

Recycled fibre recovery in Australia could increase from the present 48% to some 50-60% typically achieved in other developed countries in the region. This would allow for an increase in use of this fibre within Australia and/or increases of exports of this fibre. Increasing use of recycled fibre may also result in an increase in pulpwood availability.

China and Japan account for one-third each of total papermaking fibre consumption (Figure S10). The Japanese fibre market is largely supplied by domestic recycled fibre and chemical pulp produced from imported woodchips.

Figure S10:
Consumption of Papermaking Fibres in Asia-Pacific by Country 2000



Opportunities exist for Australia to increase production of hardwood and softwood kraft pulp, mechanical pulp and the proportion of recycled fibre collected. This would present opportunities to supply domestic and export markets, particularly with BSKP, as the region will remain a significant net importer of this pulp grade.

An indication of how these opportunities fit with regional supply deficits and the potential cost competitiveness of Australian production is shown in Table S4.

Table S4:
Papermaking Fibre Opportunities

Summary	Supply Deficit in		Cost Competitiveness
	Asia	Australia	
BSKP	●	●	●
BHKP	◖	●	◖
Mechanical pulp	●	●	●
Recycled fibre	●	●	●

● Positive ◖ Neutral ○ Negative

Paper and Board

Table S5:
Consumption of Selected Paper and Paperboard in Asia-Pacific 2000-2010

	Consumption 2000 (metric tonnes)	Consumption 2010 (metric tonnes)	Growth 2000-2010 (%/a)
Newsprint	9.5	12.5	2.8
Printing and writing	27	38	3.5
Cartonboard	10	16	4.8
Corrugating material	28.6	40	3.4

Newsprint consumption in Asia-Pacific reached some 9.5 million tonnes in 2000 and is expected to increase to 12.5 million tonnes by 2010, with growth being concentrated in the developing countries such as China, Indonesia and Thailand. While Australia is a net importer of newsprint, the majority of the newsprint consumed (80%) is supplied by a single company.

Printing and writing paper consumption in the Asia-Pacific region reached some 27 million tonnes in 2000 and is expected to increase to 38 million tonnes by 2010. Australia is a major importer of various printing and writing grades (650,000 t/a) and opportunities exist to develop new production facilities for certain grades, integrated into a pulp production facility such as BHKP or mechanical pulp.

Cartonboard consumption within the Asia-Pacific region reached some 10 million tonnes in 2000 and is expected to increase to 16 million tonnes by 2010. The Asia-Pacific region as a whole is a small net importer. Australia imports volumes from New Zealand and the USA, but opportunities for expansion of cartonboard production within Australia are limited.

Corrugated materials consumption reached some 28.6 million tonnes in 2000 and is expected to increase to some 40 million tonnes by 2010. China and Japan are the key consumption centres accounting for 65% of the total market. Australia is a net exporter of corrugating materials and will remain a strong supplier of this product into the region.

An indication of the market opportunities and cost competitiveness of Australian production of the various grades is shown in Table S6.

Table S6:
Paper and Paperboard Opportunities

Summary	Supply Deficit in		Cost Competitiveness
	Asia	Australia	
Newsprint	◖	●	●
Wood-free	○	●	○
Wood containing	●	●	●
Cartonboard	●	●	●
Corrugating Materials	◖	○	●

● Positive ◖ Neutral ○ Negative

Investment Opportunities

Future opportunities to utilise the wood resources may be located in:

- Tasmania, with significant volumes of hardwood and native forest material potentially available, which would allow for investment in world scale chemical pulping operations.
- Green Triangle, with significant volumes of softwood pulpwood and softwood residues as well as hardwood plantation pulpwood available towards the end of this decade. As with the Tasmanian opportunity, volumes would be sufficient for world scale chemical pulping operations.
- Western Australia, with significant hardwood pulpwood availability, as well as smaller volumes of softwood sawlogs. Pulpwood availability would be suitable for chemical pulping options, while softwood sawlogs would be sufficient for additional capacity in sawmilling, or alternative processes such as LVL.
- Central Victoria, with volumes of softwood pulpwood available, suitable for various solid wood and reconstituted panels options.
- East Gippsland/Bombala, with good availability of softwood pulpwood and suitable for various reconstituted panel options as well as sawlog availability, which would support sawmilling or peeling operations and produce residues for panel manufacture.
- North Queensland sawlog availability suitable for supplying sawmilling operations.

There are a number of additional opportunities to expand the current industry capacity or develop more niche type activities throughout Australia. The significant increases in hardwood plantations are likely to result in developments of technology to allow utilisation of some of this resource by the solid wood industry.

The following graphs present 9 expansion and a minimum of 9 greenfield opportunities based on existing and developing regional wood resources.

Figure S11:
Pulpwood Roundwood and Residue Opportunities for Pulp and Paper Manufacture

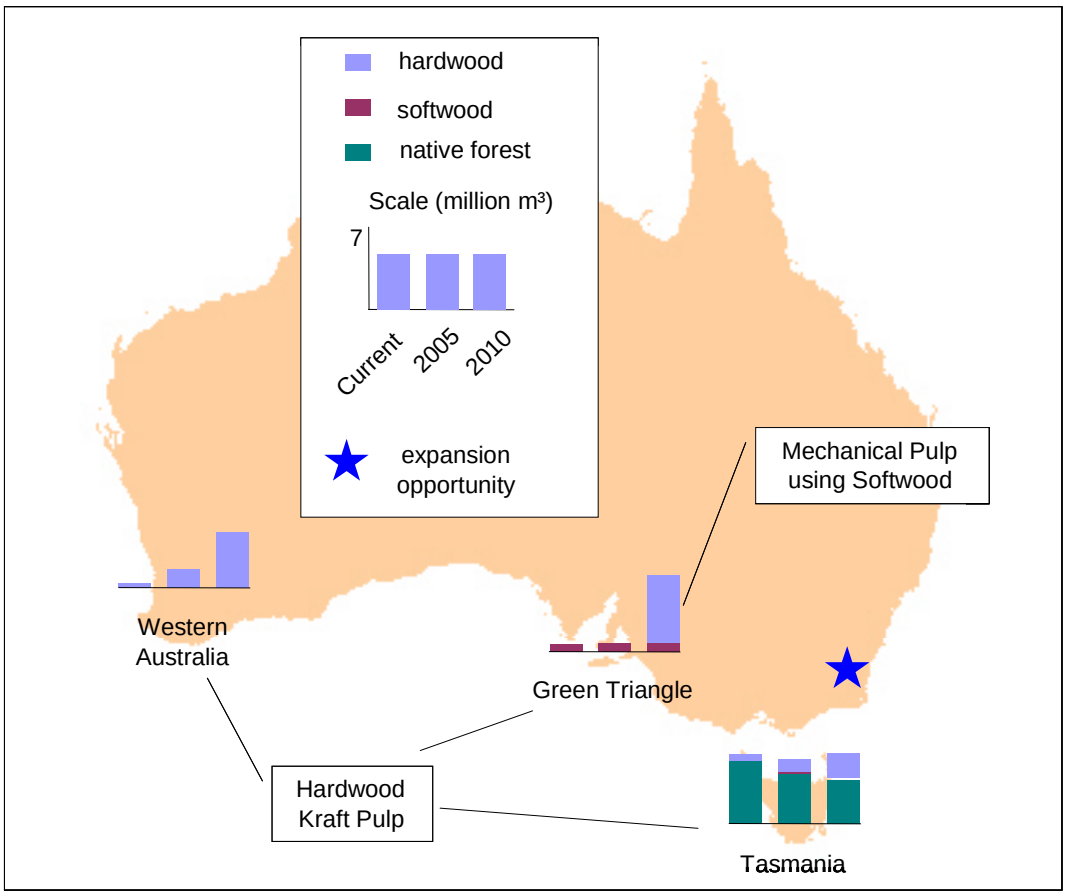


Figure S12:
Pulpwood Roundwood and Residue Opportunities for Panel Manufacture

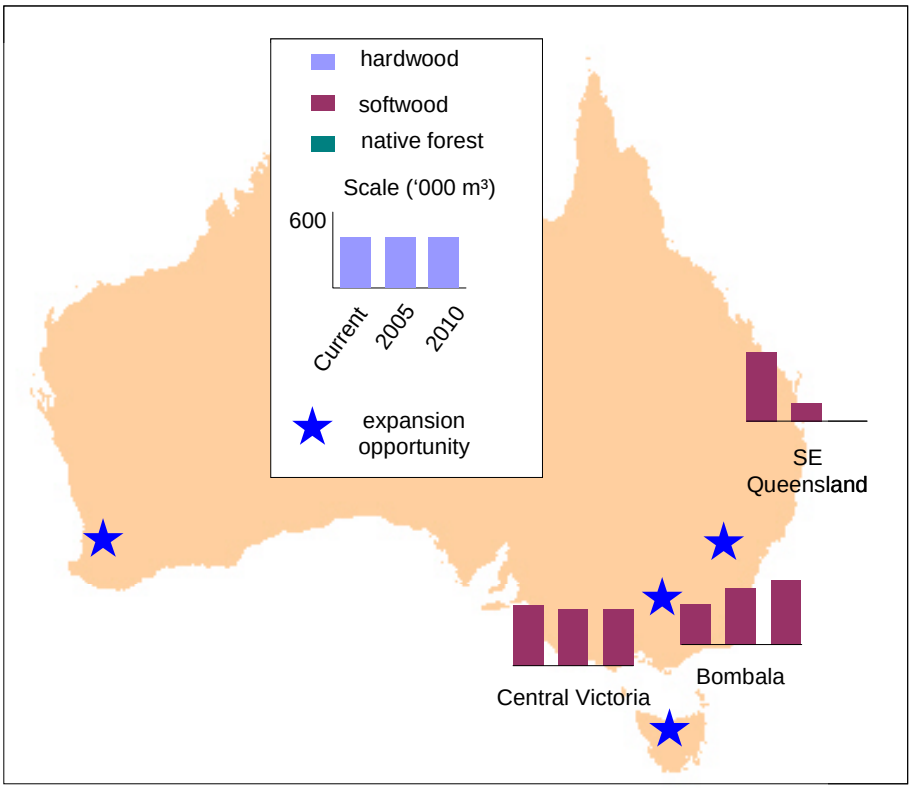
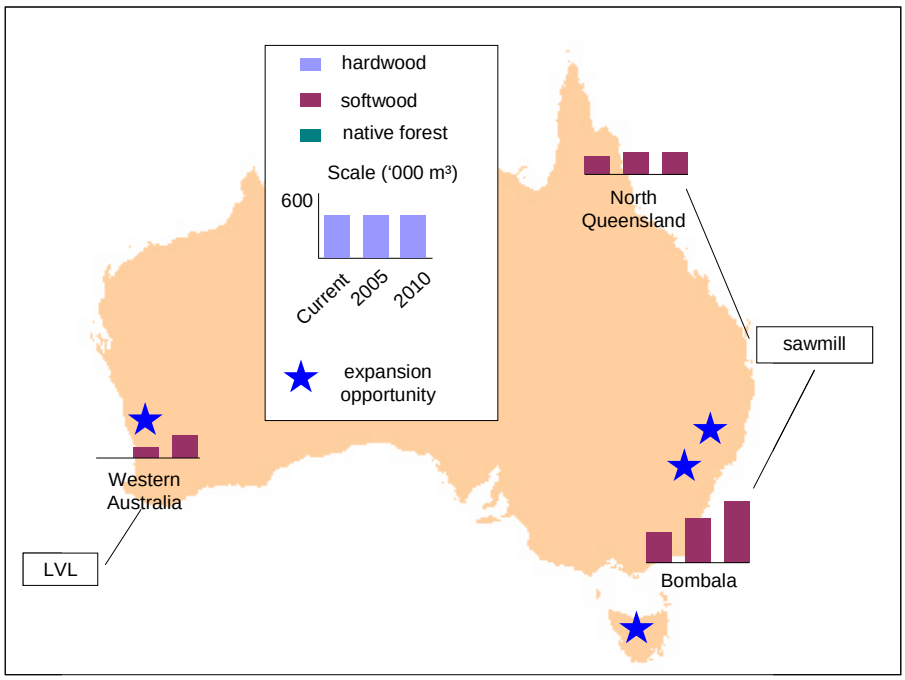


Figure S13:
Sawlog Opportunities for Sawntimber or LVL Manufacture



Investor Requirements

While Australia has the resource base to support a number of greenfield and brownfield investments in timber processing, there are three key elements that potential investors consider.

1. Sufficient high quality, cost competitive resources.

2. Infrastructure (transport, communication, energy, water) and a trained workforce.

3. Sovereign risk and political uncertainty, particularly the approval process and potential changes in legislation.