

# REPORT

## Australia's forest industry in the year 2020

*Prepared for*

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Project Manager:

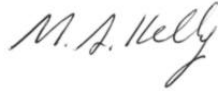


Jade Thomson  
Senior Consultant

URS Australia Pty Ltd

Level 6, 1 Southbank Boulevard  
Southbank  
VIC 3006  
Australia  
Tel: 61 3 8699 7500  
Fax: 61 3 8699 7550

Project Director:



Mark Kelly  
Principal Consultant

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## List of Terms

<b>APP</b>	Australian Paper Plantations
<b>BDMT</b>	Bone dry metric tonne
<b>CAR</b>	Comprehensive, adequate and representative
<b>CHH</b>	Carter Holt Harvey
<b>DSE</b>	Department of Sustainability and the Environment, Victoria
<b>ESL</b>	Engineered strand lumber
<b>FAO</b>	Food and Agriculture Organisation of the United Nations
<b>FIS</b>	Fee in store price
<b>FOB</b>	Free on board price
<b>FPC</b>	Forest Products Commission of WA
<b>FPQ</b>	Forest Plantations Queensland
<b>FSC</b>	Forest Stewardship Council
<b>GMT</b>	Green metric tonne
<b>ha</b>	Hectare
<b>HVP</b>	Hancock Victorian Plantations
<b>ITTO</b>	International Tropical Timber Organisation
<b>LSL</b>	Laminated strand lumber
<b>LVL</b>	Laminated veneer lumber
<b>m<sup>3</sup></b>	Cubic metres
<b>Mtoe</b>	Million tones of oil equivalent
<b>NFI</b>	National Forest Inventory
<b>NFPS</b>	National Forest Policy Statement
<b>NGAC</b>	NSW Greenhouse Abatement Certificate
<b>NPI</b>	National Plantations Inventory
<b>ODMT</b>	Oven dry metric tonne
<b>OSB</b>	Oriented strand board
<b>pa</b>	Per annum
<b>PFDC</b>	Plantation Forestry Development Committee
<b>RFA</b>	Regional Forest Agreement
<b>TCFA</b>	Tasmanian Community Forest Agreement
<b>TMS</b>	Timber market survey
<b>TIMO</b>	Timberland investment management organisation
<b>UNFF</b>	United Nations Forum on Forests
<b>USDA</b>	United State Department of Agriculture

## Executive Summary

### Key policy conclusions

- The NFPS warrants revision to reflect changes in the industry structure, outlook and the policy environment that have occurred since the 1990s. These changes include increasing private ownership of plantation resources, ongoing internationalisation of forestry and forest products industry investors, rationalisation of industry structures, and emerging product and market opportunities domestically as well as in the developing countries of Asia.
- Ongoing enhancement of Australia's international competitiveness in growing and processing forest resources is the key to maintaining a dynamic, flexible and growing forestry and forest products industry that continues to deliver economic benefits. Continued expansion of private sector investment driven by open and competitive markets is the most effective way of ensuring international competitiveness.
- The revised NFPS should provide an enhanced framework for an enabling policy environment that focuses on removing impediments to investment and addresses market failures where they occur.
- Encouraging the development of market based approaches to log pricing and allocation will enhance international competitiveness of the forestry and forest products industry by promoting the most efficient allocation of forest resources. While this will lead to short term structural adjustment, with consequent economic and social impacts, in the longer term it will provide a more robust forestry and forest products industry.
- In the plantation sector there is scope to expand private sector investment through further privatisation of publicly owned resources. This is expected to lead to more commercially driven, market based plantation investment and management decisions.
- The failure of markets to deal with the long time horizon between establishment and returns contributes to a lack of private sector investment in green field establishment of long rotation plantations in Australia. Recent tax changes to promote secondary markets for plantations are expected to assist, but there is scope to consider other direct government action to address this market failure.
- Further development of markets for environmental services would benefit the forestry and forest products industry and promote private investment in forest resources.
- Continuing Commonwealth support for research and development is critical to improving industry competitiveness. Areas of particular focus should include plantation growth rates and plant breeding, environmental impacts of forestry particularly in relation to water use and carbon sequestration, development of emerging technologies, and research into emerging product markets such as bioenergy and biofuels. As part of ensuring an industry focus in applied research and development the FWPRDC model for stakeholder involvement in priority setting should be implemented for other Commonwealth funded forest research and development programs, particularly funding provided to CSIRO/ENSIS.
- As part of an enabling policy environment there is a need for better social and economic information on the forestry and forest products industry in Australia. This can inform government policy makers as well as industry investors.
- Further promoting forest certification for sustainable forest management is the most efficient means of removing impediments to investment caused by uncertainty over frameworks for sustainable forest management, including the effects of illegal logging.
- Encouraging the sustainable management of private native forests provides an opportunity to balance some of the forecast decline in harvest volumes from public native forests. There is scope for government to assist in improving information and establishing a supportive environment to encourage investment by landowners in sustainable management of private native forests.

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The Australian forestry and forest products industry has changed substantially over the last 10-15 years. The changes have been driven by the rapid expansion in harvest volumes available from softwood plantations, increasing reservation of areas of native forests and the rapid development of hardwood pulpwood plantations. Changes in companies operating in the domestic forestry and forest products industry have reflected increasing globalisation of the industry.

Expansion of wood available from softwood plantations has facilitated an expansion in Australia's softwood processing industry with significant new capital investment by both domestic and international investors. This has included green field processing investments in panels, sawn timber, and pulp and paper manufacturing. There has also been continuing upgrades and expansion of existing manufacturing facilities. These changes saw the exit of a number of domestic conglomerates with long histories in the Australian forest sector. Privatisation of some publicly owned softwood plantation resources has also seen the entry of international specialist forest investment companies.

Declining access to native forests has seen hardwood sawn timber production decline. Remaining hardwood sawmills have pursued higher value appearance markets which has seen significant investment in kiln drying and further processing. Industry rationalisation in this sector has been supported by government structural adjustment programs. While sawlog production has declined woodchip exports from native forests have expanded.

Over the last decade a rapid expansion of private investment in hardwood pulpwood plantations has increased the area of land devoted to forest plantation production considerably. This investment was originally started by Japanese pulp and paper companies but Managed Investment Schemes (MIS) quickly expanded the level of investment based on a supportive taxation policy. The rapid expansion of private investment in hardwood pulpwood plantations has changed the nature of ownership of plantation resources in Australia.

Australia's forest product markets are open to international competition and new investment has seen the sector improve its competitiveness over time. In particular, as softwood sawn timber has expanded it has out-competed native hardwood sawn timber as well as hardwood and softwood imports.

While Australia's competitiveness in forest product manufacturing has improved, in general its domestic costs of production are still above global lowest cost benchmarks. Australia's relatively small market and remoteness contribute to this situation. Nevertheless, the constant threat of imports maintains competitive pressures on the domestic forestry and forest products industry. Australia's position as a net importer of forest products reflects this, the major exceptions being woodchips, paperboard and MDF.

Looking to the future, the forest sector will continue to change. The rapid expansion in availability of plantation softwood that drove industry development over the last 10-15 years has come to an end. There is little additional volume of either softwood pulplogs or sawlogs available over the next 20 years. On the other hand very large volumes of plantation hardwood pulpwood are becoming available most of which is expected to be exported to Japan. There are also prospects for the development of domestic pulpmills and other processors to utilise these resources.

Internationally, demand from the developing countries of Asia, particularly China, is driving forest product markets. China is importing increasing quantities of forest products and it is particularly driving international markets for logs and pulp. China is also exporting processed forest products, in particular furniture and paper. India offers similar growth prospects to China. Australia's proximity to Asia offers some advantages but these markets are also highly competitive and Australia's ability to supply will be subject to the resources available and the need for international cost competitiveness.

### A framework for forest policy

With a developed forestry and forest products industry in the context of an open market economy, government policy should focus on providing an enabling environment for future industry development and investment. Such an approach emphasises the role of markets in achieving the most efficient allocation of resources. Government policy frameworks should therefore focus on removing constraints to open and competitive markets and addressing instances of where markets fail to deliver the most efficient outcome (market failure).

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The NFPS has provided a useful framework for forest policy development and implementation in Australia. However, the industry has now changed considerably and faces different issues since the NFPS was developed e.g. the development of privately owned hardwood pulpwood plantations, ongoing structural adjustment in the native forests sector and reservation of forest areas beyond RFA commitments, the entry of new international forestry and forest product industry investors, and the development of markets for environmental services. Re-designing the policy to more effectively reflect these changes as well as emerging market opportunities would provide a more supportive framework for industry development. It would also help ensure the forestry and forest products industry receives due consideration in developing policies related to climate change, water, markets, renewable energy and environmental services. There is also a need to provide a clear framework for the ongoing application and development of RFAs. A revised NFPS would send a message to investors that there is a clear vision for the forestry and forest products industry that reaches beyond Plantations 2020 and deals with the changing circumstances of the industry.

The success of Plantations 2020 illustrates the benefits of framing policy to address market failure and impediments in order to achieve clear goals. It also illustrates the benefits of multi-faceted policies whereby impediments or market failures can be tackled on a number of fronts and allows policies to be refined in response to changing circumstances. For instance, the lack of investment in long rotation plantations needs to be addressed through a range of avenues. A revised NFPS will help government clarify its role in future development of the forestry and forest products industry.

A revised NFPS should focus on establishing a policy environment that promotes improved competitiveness in forest growing and processing. Ongoing improvements in competitiveness will be vital to addressing competition from imports as well as taking advantage of market opportunities in Asia. The policy also needs to recognise that private sector investment and open competitive markets will be vital to improving competitiveness. Consistent with such an approach the policy should emphasise potential to address market failures and remove impediments. The basis for actions and suggested approaches to achieve these outcomes across the different sectors of the forestry and forest products industry are summarised below.

### Resources

The development outlook, challenges and need for policy interventions in the forest resources sector in Australia varies across the different types of plantations and for native forests.

#### *Pulpwood plantations*

Hardwood pulpwood plantations developed in Australia over the last decade have been predicated on export to Japan. The Japanese preference for plantation pulpwood is expected to see plantation supplies from Australia take over markets currently supplied by domestic native pulpwood. This has particular implications for pulpwood produced from native forests in Tasmania which currently accounts for most of Australia's hardwood chip exports.

The need to address the threat to native forest woodchip export markets highlights the need for development of a pulpmill in Tasmania. One risk of a domestic pulpmill is that it will suffer cost and market disadvantages (being based on native forest supplies) compared to plantation mills thereby limiting the price it can pay for native forest pulpwood. This risk is balanced by the potential to replace hardwood kraft pulp imports into Australia and China's rapidly growing demand for pulp.

The potential for Australia to export hardwood chips to China, India and other Asian countries will be limited by the cost of wood that pulp and paper mills in those countries can pay and remain world competitive. It is expected that future sales of hardwood chips to these markets would likely be at prices significantly below those currently paid by the Japanese. The structure of pulp and paper markets in Japan puts it in a unique position in terms of its ability to pay for pulpwood.

It is expected that the Japanese pulp and paper industry will take up virtually all of the increasing volumes of plantation pulpwood becoming available in Australia over the next decade. However, beyond the next 10-15 years, declining population in Japan and ageing of their pulp and paper manufacturing facilities is expected to see continuing moves by the Japanese to establish pulp and paper production elsewhere.

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This may provide opportunities for Australia to develop plantation based domestic pulp and paper production.

As existing hardwood pulpwood plantations are harvested it is expected that MIS funds will increasingly be directed at re-planting rather than estate expansion. There is also expected to be some rationalisation of the existing hardwood estate after harvesting. There may be scope for softwood sawlog plantations to take up some of the land that does not prove suitable for second rotation hardwood pulpwood production. However, other regions offer scope for expansion of hardwood pulpwood plantations, most notably in Queensland, northern Australia and in Gippsland (for supply to the Australian Paper Maryvale mill).

Key challenges faced by the hardwood plantation sector include: the development of harvesting and processing infrastructure associated with the export of woodchips from the large volumes of plantation pulpwood becoming available over the next 5-10 years; marketing those woodchips, particularly in the Green Triangle where future sales volumes generally are not yet contracted; structural adjustment associated with rationalisation of the estate as part of second rotation investments; and concerns over the socio economic and environmental impacts of plantations, particularly water use. Similar to other forest resources, hardwood pulpwood plantation investments are likely to face increased risks associated with global warming, particularly bushfire threats.

Given that the hardwood pulpwood plantation sector is driven by private investment, the role for government is likely to be minimal. The Commonwealth government's support for forestry MIS as a means of facilitating investment in plantations should help promote second rotation investments as well as the potential for MIS to facilitate investments in long rotation plantations. There may also be a role for government in facilitating research into the socio economic impacts of plantation development.

### *Sawlog plantations*

The inability to attract new investment into long rotation plantations will limit expansion of Australia's softwood processing sector. As a largely publicly owned resource, the corporatisation of state plantation agencies has seen a reduction in investment in new plantation establishment. In addition, while Timber Investment Management Organisations (TIMOs) and other investors have demonstrated a strong interest in investment in existing plantation estates, they have not invested in green field plantation establishment. With a few exceptions, MIS have generally been less successful in attracting investment into long rotation plantations.

Recently introduced legislative arrangements to promote the development of secondary markets for MIS plantations are expected to help attract some additional investment into long rotation plantations. However, in general it appears that investment markets are not well disposed to the long wait for final returns associated with new sawlog plantation investments.

Investment in hardwood sawlog plantations suffers equally in commercial investment markets. However, the Commonwealth and State governments have invested in hardwood plantations, particularly in Tasmania, northern NSW and south east Queensland. These investments have mostly been linked to government actions that have reduced harvest volumes available from native forests.

The inability of commercial investment markets to deal with the long time between the initial investment and the major returns from sawlog harvesting suggests that there may be a case for government action to correct market failure. There is also market failure in relation to the non-market environmental benefits of plantations, particularly in relation to salinity and water quality more generally, and biodiversity values. The existing softwood plantations in Australia were virtually all created with government funding. Further, other countries provide significant direct financial assistance to support private sector investment in new plantation establishment. These issues suggest that there is a case for government to promote new private sector investment in long rotation plantations e.g. through the purchase of environmental services or direct financial support for plantation establishment.

The private sector generally manages plantations with a stronger commercial focus than government agencies as they are less encumbered by management goals that go beyond maximising returns to the grower/investor. State plantation agencies are commonly tasked with goals other than maximising

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commercial returns, in particular the protection of regional employment and the provision of social services. This has led to pricing and allocation of resources on a less commercial basis than a private investor would be expected to adopt. Governments should facilitate more market based pricing and allocation of resources to encourage the most efficient utilisation of resources.

The corporatisation of state forest agencies has increased the commercial focus of government plantation agencies. However, the degree of corporatisation has varied across the agencies and they still generally face a broader set of goals than purely commercial organisations. Where it has occurred the privatisation of state owned plantations has acted to remove these constraints generated by government ownership and management. While the structure of the forest industry in Australia means that it is not always possible to have open and competitive markets, a purely commercially focussed plantation owner will always aim to maximise returns to the resource. This is illustrated in the activities of Hancock Timber Resources Group, Global Forest Partners and GMO. In turn, maximising returns to the grower leads to a more efficient processing industry as well as attracting new investors to the plantation sector. Further privatisation of state owned plantation resources would lead to a greater focus on maximising commercial outcomes from plantation management.

Increasing concern over water availability and security is a critical issue to the agricultural and forestry industries in Australia, and presents a significant risk to plantation investments. Uncertainty over the allocation of water in the future, particularly given the potential drought impacts of climate change, will accentuate competition between users and threaten allocations for environmental flows and so future plantation investments. Similarly, the effects of climate change on plantation growth and potential for increased bushfire threat creates uncertainties for long rotation investments.

On the other hand water use by plantations can assist in addressing salinity issues so plantations provide benefits in catchments where salinity is a problem. Significant levels of funding have been committed to tree planting initiatives for salinity control through the National Action Plan for Salinity and Water Quality.

It is important that the relationships between water and forests, both native and plantations, is well understood. In particular, the broader role of how forests both use water, contribute to water quality and provide other environmental services at a landscape scale within and between catchments will be important to ensure that the full value of forests is understood. Research and development into these relationships should therefore be a priority for the forestry and forest products industry. Furthermore, it will be important that the industry be well represented in the water use debate to ensure it receives equitable treatment with other land uses. Uncertainties over growth rates and returns for hardwood sawlog plantations in Australia, particularly given the lack of existing plantation hardwood processing capacity, also suggest a role for governments in research and development of the potential for hardwood sawlog plantations.

### *Native forests*

The use of public native forests for production of commercial timber products will continue to decline in Australia. Queensland is committed to end harvesting of hardwood public native forests by 2025, WA has already reduced harvest volumes significantly, and some harvest volumes of sawlogs from public native forests in Tasmania will be reduced in lieu of supplies from sawlog plantations being established by Forestry Tasmania. In NSW and Victoria there is uncertainty over future sustainable harvest volumes from public native forests.

The potential loss of native hardwood pulpwood markets, as increasing volumes of plantation hardwood pulpwood become available, could make logging of sawlogs uncompetitive. In addition, similar to plantations the impact of climate change, particularly increasing incidence of bushfires, could adversely impact available harvest volumes.

Supplies from private native forests offer potential to balance, at least in part, declining harvest volumes from public native forests. Private native forests already provide significant harvest volumes in northern NSW, south east Queensland and Tasmania. However, a lack of knowledge of private native forests means that the sustainability of existing harvest volumes is unclear and the potential for expansion in these and other regions is also uncertain.

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Better information on the extent and use of private native forests would assist in promoting the development of sustainable private native forestry. However, efforts to regulate private native forest harvesting could discourage interest and investment in private native forests. There is a need to support landowners in developing approaches to sustainable management of private native forests. There are clear examples from other countries, particularly in Europe and USA, of extensive support systems for promoting sustainable private native forest management.

There is potential for the further development of more intensive management systems for both public and private native forests to also address the decline in supplies of sawlogs from public native forests. This would be assisted by research and development into appropriate systems, particularly in terms of their environmental impacts.

Increasing supplies from hardwood sawlog plantations will also supplement declining sawlog supplies from public native forests. Investments in hardwood sawlog plantations to date have been driven mostly by government funded programs in Tasmania, NSW and Queensland. A challenge facing the forestry and forest products industry in the future is the expansion of private investment in hardwood sawlog plantations.

A move to market based pricing and allocation of scarce native resources will help facilitate ongoing adjustment in the native forest sector and ensure efficient costs of production. In the past the pricing and allocation of native forests has suffered similarly to plantations whereby lack of clear market based approaches has resulted in less efficient industry outcomes. In particular, long term contracts based on providing resource security but for periods well in excess of the economic payback for the associated processing investments together with non-market based pricing, have tended to lock in industry structures rather than promote adjustment. In this regard Victoria is leading the way with the introduction of auctions for the pricing and allocation of native forests logs. While this will have short term adjustment costs, it will lead to a more competitive hardwood sawmilling industry in the longer term.

### The processing industry

#### *Sawn timber*

Australia's softwood sawn timber production is focussed on domestic markets. Overall, domestic demand for sawn timber in Australia is expected to grow at best only slowly. While most Australian sawn timber production is focussed on domestic markets, ongoing competition from imports means that Australian producers will need to maintain cost competitiveness.

The most significant trend in improving competitiveness in softwood sawn timber production is increased capacity to reduce unit costs. While Australia's domestic sawmills have been expanding capacities, they are generally still smaller than the lowest cost sawmills overseas. The need to maintain international competitiveness is expected to lead to ongoing rationalisation to deliver world scale costs of production in the softwood sawn timber sector. The most effective way to facilitate that rationalisation is the ongoing implementation of market based pricing and allocation of plantation resources. This is most effectively achieved through private resource owners.

While competitive scales for hardwood sawmills are generally lower than for softwood sawmills, Australian hardwood sawmills are typically smaller than internationally competitive world scale hardwood sawmills. It is likely that existing domestic trends in consolidation of hardwood sawmill capacities will continue. This can be most effectively facilitated by market based pricing and allocation of sawlogs. The experience of auctions for the sale of native forest logs in Victoria illustrates the potential for such an approach to generate structural change towards a more efficient industry as well as increase returns. However, it should be noted that such changes also come with significant short term social and economic costs.

The production of structural sawn timber from short rotation eucalypt plantations represents another potential development in the hardwood sector. The sawmill currently operated by Forestry Enterprises Australia (FEA) provides an example and such production could supplement tightening supplies from softwood plantations. However, the potential for large scale replication of this model is likely to be limited as the silvicultural practices applied to many pulpwood plantations will be unlikely to produce significant

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volumes of sawlogs. Nevertheless, with private ownership of large areas of hardwood plantations there is the ability to respond to market opportunities as they arise.

### *Panels and engineered wood products*

Unlike sawn timber, consumption of panel products, medium density fibreboard (MDF) and particleboard, has been growing steadily in Australia and per capita consumption has been increasing. The consumption of laminated veneer lumber (LVL) has been growing extremely fast over the last decade and this is expected to continue.

In other developed countries production and consumption of other engineered wood products has also been growing. Oriented strand board (OSB) markets have grown rapidly in the USA over the last decade where it is a replacement for structural plywood used in house construction, and production of laminated strand lumber (LSL) is beginning to expand. Because structural plywood is not used widely in house building in Australia, it is not expected that OSB provides opportunities in the domestic market. However, the production of an LSL type product made from eucalypt pulpwood (known as engineered strand lumber or ESL) is currently being developed and is expected to have significant market opportunities, particularly as a replacement for hardwood structural timber, LVL, steel and some appearance timber products.

It is expected that investment in softwood based panels and engineered wood products may be limited by resource constraints. However, with ongoing rationalisation of the softwood sawmilling sector there may be opportunities for less competitive softwood sawmills in some regions to be replaced with engineered wood product plants. In particular, there may be opportunities for production of plywood and LVL and also LSL.

The most effective way to facilitate these market driven changes is again through market based approaches to log pricing and allocation.

### *Pulp and paper*

The competitiveness of Australia's pulp and paper sector varies among the different market segments. The development of the Visy pulpmill in Tumut created a new standard in competitiveness of smaller scale unbleached chemical pulpmills and has driven an expansion of exports of paperboard from Australia. The planned expansion of the mill will increase exports.

On the other hand Australia has not been able to construct a world scale bleached hardwood kraft pulpmill despite having available native hardwood pulpwood resources. It remains to be seen whether or not the emerging hardwood plantation resource will provide sufficient impetus for development of new hardwood pulpmills in Australia. The two proposals currently being developed, the Gunns kraft pulpmill in Tasmania and a bleached thermo chemi-mechanical pulpmill (BCTMP) being developed by Protavia at Penola, SA are still uncertain.

Australia's existing production of communication papers (Australian Paper) has faced intense import competition in recent years from much larger world scale and lower cost producers. Australian Paper has addressed this issue through investing in its Maryvale pulp and paper mill including a current upgrade. The investment strategy by Australian Paper suggests that this mill will continue to produce for the domestic market. However, it will also face ongoing competition from imports. While Australian Paper has long term access to sufficient high quality native resources in Victoria, it has indicated its desire to source its wood resource from plantations. MIS are currently establishing hardwood pulpwood plantations in Gippsland in response to this demand.

Tissue production is largely a domestically focussed market in Australia, although there are imports of tissue for conversion. In recent years there has been considerable new investment in the industry and there is sufficient capacity to meet domestic demand growth. In the newsprint sector domestic production accounts for a little over half of apparent consumption with imports largely from New Zealand growing in recent years.

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### New and emerging markets and products

The development of markets for environmental services has the potential to provide significant benefits to the forestry sector. However, the assessment of these opportunities needs to be tempered by the still developing policy environment.

A carbon trading system will help attract investors to long rotation plantation investments by providing additional value for the trees being grown. Provided that the plantations meet the requirements set out in any such scheme there is potential to sell carbon created by new plantation estates. Under the Kyoto Protocol the requirements set out for plantations to qualify as carbon stores are strict, including the requirement for forests to remain in that land use for 100 years and the need for associated monitoring of carbon storage. The lack of recognition of carbon stored in wood products also acts to reduce the carbon store. However, there is scope that the requirements for forest sinks may be updated in negotiations for ongoing international arrangements. Further, in any trading system forests will need to compete with other alternatives such as geo-sequestration and investments via the clean development mechanism.

Bioenergy utilising wood waste provides opportunity for renewable energy production. There is already active investor interest around Australia in bioenergy production utilising wood. It also appears that wood based bioenergy is competitive with other forms of renewable energy. However, the cost of wood to the mill door is a major determinant of competitiveness and bioenergy producers could not pay export parity for woodchip exports and it is not clear that bioenergy will drive new plantation investment. Rather, it appears that there is an opportunity for bioenergy producers to utilise wood waste generated by harvesting or processing operations not suitable for woodchip exports. Another limitation on bioenergy from wood waste is the restriction by some governments on the use of native forest wood for bioenergy production. Future development is also likely to depend on government regulatory requirements relating to renewable energy.

Production of ethanol from wood provides a similar opportunity to bioenergy. While there is greater uncertainty over the competitiveness of technologies to produce ethanol from wood compared to other raw materials, most notably grains, technologies are developing rapidly including the development of pilot plant current underway in NSW. Ethanol production will also need to compete with a range of emerging fuel technologies e.g. direct injection gas, hydrogen, and electricity.

Water provides both an opportunity and constraint on plantation development. There is potential that restrictions on water use based on current allocations could strongly constrain plantation development e.g. as in South Australia. On the other hand tree planting can play an important role in improving water quality and the development of market based approaches to control of salinity. It will be important to establish a sound scientific understanding of the relationship between trees and water at various scales to ensure that forestry is not disadvantaged relative to other commodities.

Newly developing technologies for utilising wood fibre to produce engineered wood products that will compete with solid timber in high strength applications provide opportunities for new investment. These are likely to include engineered wood products such as LVL, LSL and ESL, arising from both hardwood and softwood plantations. In particular, the development of the Lignor project offers a potential new use for plantation hardwood pulpwood. Lignor is an engineered strand lumber (ESL) product which utilises eucalypt hardwoods that has been developed in Australia with assistance from the Commonwealth government. There are also opportunities for utilising softwood in similar laminated strand lumber (LSL) products.

### Research and development

High quality research and development (R&D) is vital to future development and competitiveness of the forestry and forest products industry in Australia. R&D is another area in which it is accepted that private markets often do not provide efficient solutions.

Forestry and forest product R&D expenditure has both declined in real terms, and shifted significantly away from corporate generated expenditure to Commonwealth and State government sources. Expenditure on forest products research has reduced more significantly than forest and plantations related research.

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A number of public agencies provide R&D services to the forestry and forest products industry. The establishment of the Forest and Wood Products Research and Development Corporation (FWPRDC) has resulted in the consultative development of a strategic R&D plan for its expenditure. The newly formed Forest and Wood Products Australia (FWPA) is structured along similar lines to the FWPRDC and is likely to have similar management processes.

While the FWPA will increase funds available for R&D, expenditures by other forestry R&D organisations particularly CSIRO/ENSIS are significantly larger. However, other providers do not have consultative processes for identifying R&D strategies as adopted by the FWPRDC. Industry understanding and support for their services may increase if similar processes were adopted. The FWPA may act as a coordination point for all industry R&D but such a role would require the cooperation of all providers. Communicating and engaging with stakeholders in the development and implementation of these programmes would assist in identifying and meeting sectoral R&D needs.

### Industry engagement and promotion

The forestry and forest products industry has suffered from negative community attitudes and a lack of understanding and acknowledgement of the economic, social and environmental benefits of the industry. As such, the industry's social license to operate is continually challenged. For example, community objection to further plantation expansion in many regions poses a threat to the ongoing growth of the sector.

There is a role for the Commonwealth government in ensuring the forestry industry is fairly represented and promoted in relevant forums. In particular, the forestry and forest products industry needs to be well represented in policy debates over carbon trading schemes, water use and trading, renewable energy and infrastructure development. The formation of FWPA as an industry owned and operated company with expanded funding and a focus on industry development may help develop more coordinated approaches to such issues. Revision of the NFPS would also provide a base for raising the profile of the forestry and forest products industry across the Commonwealth government and for the industry to develop more singular approaches to government.

Another particular role that the Commonwealth government could fulfil is in ensuring the collection and dissemination of data on the sector. It has successfully done this with the National Plantation Inventory and there is a need for improved economic and social data and analysis of industry performance which the Commonwealth could take a lead role in. Collection of such data, analysis and dissemination is vital for ongoing policy development.

## Section 1

## Introduction

The Department of Agriculture Fisheries and Forestry (DAFF) has appointed URS Forestry to prepare this report outlining the major influences on development of the forestry and forest products industry in Australia since 1990 through to 2020. Accordingly, this report provides an analysis of industry development since the National Forest Policy Statement (NFPS) was established in the early 1990s, outlines the current situation and outlook for industry sectors, and identifies key factors that will influence future development of the forestry and forest products industry in Australia.

As part of developing the views expressed in this report URS Forestry has consulted with a wide range of people and organisations involved in the forestry and forest products industry. The project also involves workshops with DAFF staff to explore relevant issues. The purpose of the report is to inform policy considerations of DAFF.

The report is structured to provide an overview of the development of the forestry and forest products industry in Australia since the early 1990s (Section 2). It then examines the resource situation faced by the industry including forecasts of available wood volume (Section 3). Section 4 provides analysis of market trends, situation and outlook including analysis of the competitive situation for forest product sectors. Sections 5 to 8 examine major issues that are likely to impact on future development of the forestry and forest products industry. Key issues and findings are presented in a brief summary at the start of each section.

Finally, policy implications of the analysis are outlined in Section 9.

**Section 2****Industry development 1992-2006****Key issues and findings**

- There has been substantial change and structural adjustment in the Australian forestry and forest products industry since the development of the NFPS since 1992.
- RFAs led to significant increases in reserves and to reductions in sustainable sawlog harvest volumes from public native forests but also enhanced certainty for some segments of the industry and provided funding for structural adjustment.
- At the same time expanding harvest volumes from softwood plantations facilitated a rapid expansion in softwood sawn timber production as well as in other softwood products. This led to significant investment across all sectors of the softwood industry.
- Structural change in the hardwood sawn timber sector has been driven by declining resources and competition from softwood while investment in value adding and industry consolidation has been supported by government programs.
- Concern over sustainable natural resource management increased significantly over this period, particularly in relation to salinity. While the potential for forestry to assist in sustainable natural resource management has been identified, this has not always been reflected in appropriate resource investments. Western Australia has provided a lead in the role forestry can play in addressing natural resource management problems, but there is room for more explicit consideration of this role in other parts of Australia.

This section outlines the main components of forest policy and major changes in the Australian forestry and forest products industry over the last 10-15 years. It commences with an overview of the forest policy framework and how these policies have affected industry development. It then examines investment and structural change in the industry.

**2.1 National and state policies and programs**

The Commonwealth government provides an overarching framework for forest policy through the NFPS. It also supports plantation development through Plantations for Australia: The 2020 Vision (2020 Vision) and the Farm Forestry National Action Statement. The framework for supporting development of Australia's wood processing industry is supported through 'Forest and Wood Futures: An Action Agenda to Pursue the Vision for Australia's Forest and Wood Products Industry'.

The Commonwealth government is a strong supporter of research and development for the forest sector through matching industry funding provided to the Forest and Wood Products Research and Development Corporation (FWPRDC), direct budget support for CSIRO and funding of Cooperative Research Centres (CRCs). In 2005 the Commonwealth government also launched the National Indigenous Forestry Strategy (NIFS). The strategy which was developed in conjunction with Indigenous communities encourages Indigenous participation in the forestry and forest products industry.

The Commonwealth government is also responsible for Australia's involvement in international forest policy issues. These include managing Australia's contribution to and involvement in the United Nations Forum on Forests (UNFF), the Food and Agriculture Organisation of the United Nations (FAO), the Montreal Process and the International Tropical Timber Organisation (ITTO) as well as a range of other international treaties and initiatives that have relevance to the forestry and forest products sector.

**2.1.1 Regional Forest Agreements**

Under the NFPS, the Commonwealth and State governments undertook Regional Forest Agreements (RFAs) to establish agreed approaches to sustainable management of native forests. The RFAs included the development of nationally agreed criteria to protect forest biodiversity, old-growth forests and wilderness areas through the creation of world class Comprehensive, Adequate and Representative (CAR) reserve systems. Comprehensive Regional Assessments (CRAs) were undertaken for each

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**Industry development 1992-2006**

region to assess the environment, heritage, social and economic uses and values of the forests and to identify public forest areas that needed protection, and those that would be available for commercial wood production.

Ten RFAs have been signed between the Commonwealth and State governments in Victoria, New South Wales, Tasmania and Western Australia. The agreements are for 20 years with provision for review every five years.

All of the the RFAs decreased the area of native forests available for commercial production. According to the national State of the Forests Report (DAFF 2003) the RFAs increased the area of forests in reserves by 39% across Australia. NSW had the largest increase with forest reserve areas increasing by 74%. In Victoria the increase was 36% which was substantially more than Tasmania (19%) and WA (12%). However, State government actions in NSW, WA and Victoria post RFAs increased reserved areas further. No RFAs were finalised for Queensland where the state government decided to end native forest logging in the South East region (the major region with productive native forests) by 2025, and to reduce logging in the Western forests region by 2012. Table 2-1 outlines increases in forest reserve area in the pre- to post-RFA periods.

**Table 2-1: Forest reserve areas pre and post RFA**

State	Pre-RFA reserve area ('000ha)	Post-RFA reserve area ('000ha)	% increase
New South Wales	2,154	3,739	74
Tasmania	2,305	2,747	19
Victoria	2,114	2,876	36
Western Australia	933	1,047	12
<b>Total</b>	<b>7,506</b>	<b>10,409</b>	<b>39</b>

Source: DAFF (2003)

***Production from public native forests***

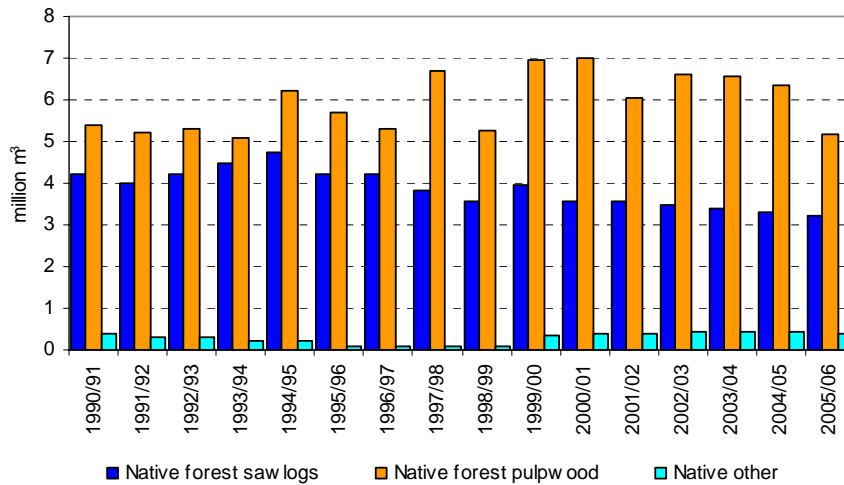
Implementation of the RFAs and other State agreements has resulted in a reduction in the sustainable yields from Australia's native forests. Figure 2-1 shows the change in harvest volumes of native forest sawlogs and pulpwood from 1990/91 to 2005/06. Over this time the volume of native sawlogs harvested has decreased by an average 1.8% pa. While RFAs contributed to the decline in native forest sawlog harvests from more than 4 million m<sup>3</sup> pa to around 3 million m<sup>3</sup> pa, the decline was also influenced by increasing competition from plantation softwood over this period. In addition to the reductions in sustainable yields, the quality of native forest logs harvested has declined as production has moved to re-growth forests.

Following development of the RFAs, all forest products from forestry operations conducted in accordance with RFAs can be fully utilised and either processed domestically or exported. This has led to an increase in harvest volumes of native forest pulpwood from 5 million m<sup>3</sup> pa up to 7 million m<sup>3</sup> pa in 1999/00 and 2000/01. The decline in native forest pulpwood production since 2000/01 largely reflects changes in market demand rather than reduced capacity to supply.

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Figure 2-1: Australia's native forest harvest



Source: ABARE (2006)

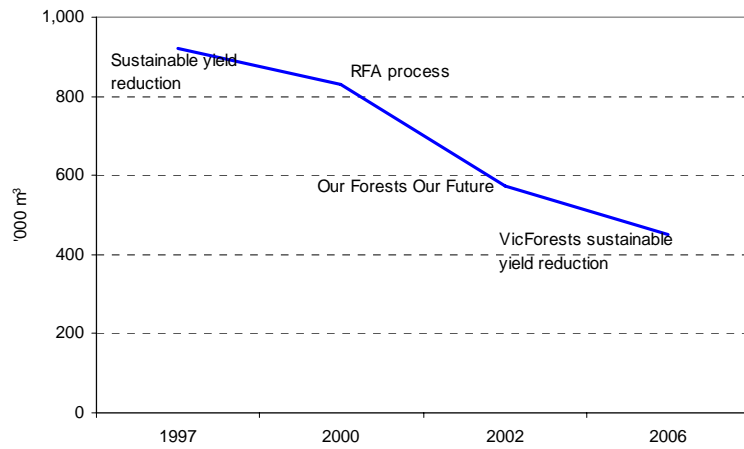
Details of the various RFAs and other forest agreements are described below:

- New South Wales* has three signed RFAs with the Federal Government covering Eden, the North East and Southern New South Wales. It is currently working on an additional state based forest agreement for the Western region. Most of the reductions in harvest levels of native forests in New South Wales were initiated prior to the completion of the RFAs. A 30% reduction in supplies of quota quality hardwood sawlogs was introduced in June 1995 and in 1996/97 the government established 'term agreements' for sawmills which were set at 50% of 1995 quota allocations. In 2005/06 Forests NSW harvested 665,000 m<sup>3</sup> of native hardwood sawlogs.
- Victoria* has five RFAs in East Gippsland, Gippsland, Central Highlands, North East and Western Victoria. The RFAs resulted in reductions to sustainable yields although the impacts differed amongst the regions. These agreements have been superseded by a State government review in 2002 that reduced the total sawlog harvest from native forests across the state by a further 30% to around 550,000 m<sup>3</sup> of native hardwood sawlogs per year. In 2006 VicForests announced a further reduction in sustainable yield to 450,000 m<sup>3</sup> based on its own review of timber resource availability after the 2003 Alpine fires. The latest bushfires will lead to more reductions in available volume. Figure 2-2 shows reductions to sustainable yield in Victoria over the past decade.

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Figure 2-2: Victorian reduction in sustainable sawlog volume estimates



Source: URS Forestry (2006)

- The RFA for *Tasmania* was signed in November 1997 and encompassed the entire state. In May 2005, the Tasmanian Community Forest Agreement (TCFA) was signed under the RFA. The TCFA transferred a further 180,000 ha of private and publicly owned native forest into reserves and included the establishment of a new Forest Conservation Fund to protect old growth and other forest areas. This agreement also asserts that by 2010, no more than 20% of the area of old growth harvested each year will be clearfelled. Tasmania currently harvests around 650,000 m<sup>3</sup> of native hardwood sawlogs per year. This volume is based on the current agreement and is not expected to alter significantly up to 2020 at which time supplies from hardwood sawlog plantations will become available. Tasmania also has a legislated minimum harvest volume of 300,000 m<sup>3</sup> pa of high quality sawlogs from native forests.
- In *Western Australia*, an RFA for the South West forests was signed in 1999. The RFA planned to reduce the annual cut of jarrah sawlog from 482,000 m<sup>3</sup> pa in 1999 to 286,000 m<sup>3</sup> pa in 2004 and the annual cut of karri sawlog from 203,000 m<sup>3</sup> pa to 178,000 m<sup>3</sup> pa in 2004. Since these measures were announced, a change in government led to the implementation of the "Protecting our old-growth forest" policy, creating several new conservation reserves in the South West of the state. The Western Australia government subsequently announced a new sustainable yield of sawlog of 131,000 m<sup>3</sup> pa from jarrah forest and 54,000 m<sup>3</sup> pa from karri forest from the end of 2003.
- In *Queensland*, under the South East Queensland Forests Agreement (SEQFA) sawlog supply levels in the south east will be maintained at around 50-55,000m<sup>3</sup> pa of compulsory sawlogs<sup>1</sup> until 2025 and will then cease. To date there have been no formal outcomes from the Western Hardwoods Plan, which is part of a Statewide Forests Process, however a draft plan states that harvesting from Crown Land in the Western Hardwood Region will cease in 2012. Production of hardwood sawlogs from native forests in Queensland, from both public and private lands, has declined steadily over the last three decades from around 700,000 m<sup>3</sup> pa in the 1970s to about 4-500,000 m<sup>3</sup> in recent years.

The RFAs provide for annual reporting against commitments and obligations for the first five years of the agreements. Where annual reviews have been completed they are available on the RFA website (<http://www.daff.gov.au/rfa>). The Commonwealth and relevant State governments also undertook to

<sup>1</sup> 'Compulsory' sawlogs are standard quality sawlogs that sawmills must take under supply arrangements. Public forests also supply additional volumes of 'optional' logs which are lower quality logs that sawmills have the option to purchase.

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review their performances against their respective RFAs every five years and to include community consultation as part of the review process. However, only Tasmania has completed a five yearly review.

The importance of maintaining a stable basis for future forest sector development suggests that there is a need to improve the framework for reporting on progress against RFA commitments, particularly the five yearly reports. Further, the first RFA (East Gippsland) is half way through its term and will be due for renewal in 2017 with others to follow. This suggests there is also a need to develop a framework for renewing RFAs as they reach the end of their terms.

### 2.1.2 The 2020 Vision

The Commonwealth government has provided strong support for plantation development through the 2020 Vision. Established in 1997 as a partnership between the Commonwealth government, the State/Territory governments and the plantation timber growing and processing industries, the 2020 Vision seeks to enhance international competitiveness of Australia's forest industries through a range of policy initiatives, including a target of trebling the plantation area by 2020. This target requires annual planting of new plantations of 75,000 ha.

Part of the policy initiatives in the 2020 Vision include having governments remove impediments to forestry development compared with other agricultural land uses. The Commonwealth government's tax treatment for MIS based investments has been a key driver of increased investment in plantations and the government's recent decision to clarify rules for plantations reflects the commitment to the 2020 Vision. Since the establishment of the 2020 Vision around 100,000 ha of new softwood plantations and 638,000 ha of new hardwood plantations have been established in Australia. The increase in the level of new plantation development in Australia over the last decade (mostly hardwood pulpwood plantations (see Section 3) has been aided by the supportive policy environment of the 2020 Vision.

## 2.2 Industry development

The Australian forestry and forest products industry has changed substantially over the last 10-15 years. The changes have been driven by the rapid expansion in harvest volumes available from softwood plantations and increasing conservation of native forests.

While the consumption and production of hardwood sawn timber declined, the hardwood sawmilling sector increased investment in production of higher value products. This involved targeting products that utilised the superior strength and appearance characteristics of native wood and required significant investment in drying and further processing. These changes were supported by the Commonwealth and State government policies and programmes.

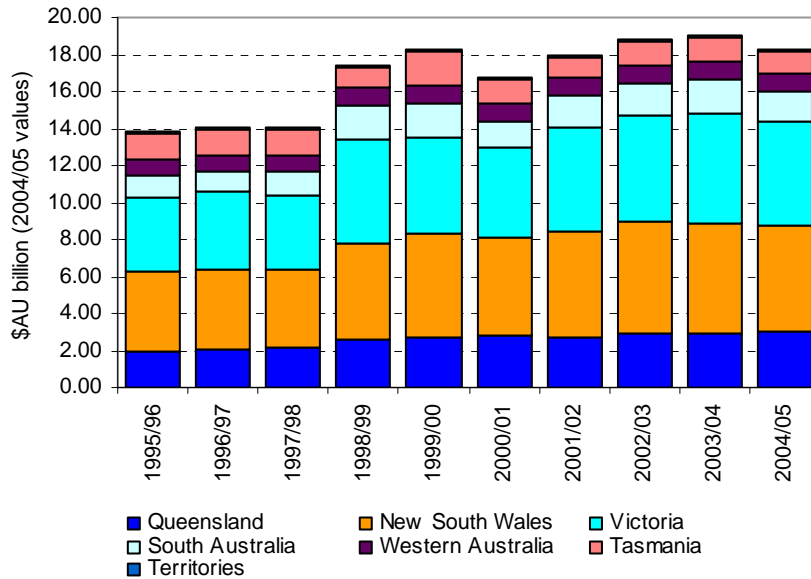
Increases in available softwood harvest volumes have seen significant new capital investment in softwood processing by both domestic and international investors.

These changes also saw the exit of a number of domestic conglomerates with long histories in the Australian forest sector. These combined effects have seen the value of turnover for the forestry and forest products industry increase at an average 2.7% pa since the mid 1990s (Figure 2-3) and in 2003/04 (the latest year for which data are available) the industry generated around \$18 billion in turnover. This corresponds to around 5% of the value of Australia's total manufacturing output.

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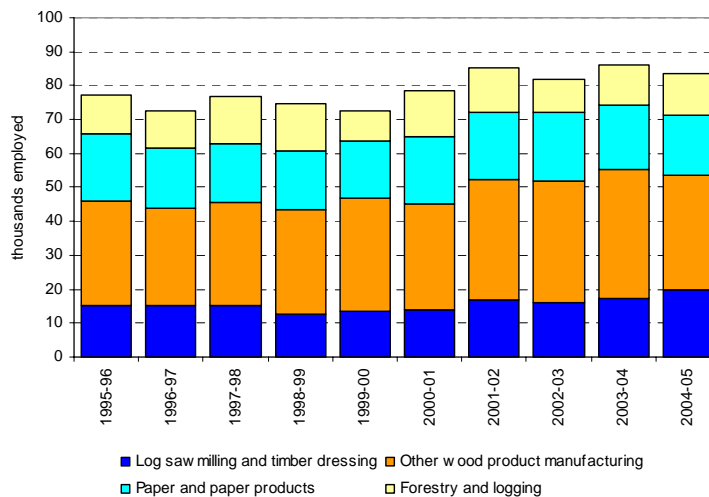
Figure 2-3: Value of turnover of Australia's forestry and forest products industry



Source: ABARE (2006)

Total employment in the forestry and forest products industry has been growing only slowly at an average rate of 0.9% pa over the last decade. Employment has been growing fastest in log sawmilling and timber dressing (2.8% pa) while employment in the paper and paper products industry has declined at an average of 1.4% pa since the mid 1990s. Forestry and logging employment grew at an average annual rate of 0.8% pa. The increase in employment in log sawmilling and timber dressing reflects the expansion of the softwood industry over this period. The decline of employment in the paper industry is a reflection of new technology, capital investment and industry restructuring.

Figure 2-4: Employment in Australia's forestry and forest products industry



Source: ABARE (2006)

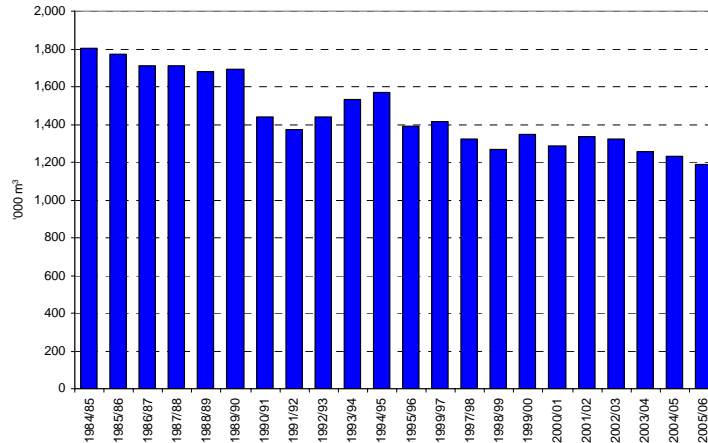
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2.2.1 Restructure of native sawmilling industry

Production of native hardwood sawn timber in Australia declined at an average of around 2% pa since the mid 1980s (Figure 2-5). This reflected increased competition from plantation softwood sawn timber as well as reductions in the areas of native forests that are available for commercial wood production.

Figure 2-5: Production of hardwood sawn timber in Australia



Source: ABARE (2006)

The change in the native hardwood sawmilling sector has seen a number of hardwood sawmills close, particularly smaller sawmills that in the past may have been operated by individuals or families. It has also seen considerable restructuring in the sector as sawmills have sought increased scale required to meet the investment costs associated with kiln drying and other value adding.

The restructuring in the native sawn timber industry has been supported by a range of industry assistance programs funded by the Commonwealth and State governments. The adjustment process has included assistance for sawmill closures, buyouts and investment in value adding technology. The following illustrate the types of approaches adopted across the states:

- In *Victoria*, reduction of sawlog volumes under RFAs and the *Our Forests Our Future* policy were also accompanied by industry grants totalling up to \$80 million to support the exit of companies from the industry and the buy-back of licences to facilitate the move to lower sustainable volumes. Grants totalling \$33 million to companies exiting the industry were made through the Forest Industries Structural Adjustment Package (FISAP), funded jointly by the Australian and Victorian governments. Between 1995 and 2004 Department of Sustainability and Environment (DSE) bought back timber licences totalling an annual volume of 268,000m<sup>3</sup>.

Currently there is less than 40 native hardwood sawmills in Victoria processing D+ sawlogs. This compares to an estimated 100 sawmills in Victoria identified in 1997 in the RFA process. However, many of these mills would have been smaller mills operated by individuals or families often on a part time basis. ITC Timber, part of the Futuris Group of companies, is the largest hardwood sawmiller in Victoria. ITC merged with Melbourne based Neville Smith Timbers (the then largest hardwood sawmilling business in Victoria) in 2004. ITC also recently acquired J L Gould Sawmills.

- Under the *Tasmanian* Community Forest Agreement, the government has provided support for the Tasmanian hardwood industry, including \$42 million for the development and revitalisation of mills and other businesses in the industry and \$4 million for country sawmills, \$4 million to build skills and training for the Tasmanian forest industry, and \$10 million in assistance for the Tasmanian softwood industry. Prior to this the Tasmanian native hardwood industry had received assistance under the Helsham Agreement (\$12 million) and the Tasmanian RFA (\$13 million).

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- In *NSW*, the FISAP provided \$120 million to assist the industry to value add, expand market opportunities and assist businesses and workers to exit the industry. This has seen considerable new investment in the NSW industry. In particular the state's largest hardwood sawmilling company Boral bought out a number of sawmills across the state and has invested (with FISAP support) in extensive value adding operations.
- *Queensland* has seen a number of sawmill buyouts and allocation buybacks since the inception of the South East Queensland Forests Agreement. The first major industry transition was the purchase of Boral's sawmills by the Queensland Government. In 2006 the Queensland government also purchased Hyne's four hardwood sawmills, which it intends to sell (some without allocations) and reallocate some of its log supply. The Queensland government has also bought back a number of allocations. There have been some mill buyouts by the larger operators including Dale and Meyers and Parkside Timber.

### 2.2.2 Processing of plantation hardwood pulpwood

The increasing availability of hardwood plantation pulpwood has led to investment in processing operations in Australia. To date this has included the development of a woodchip mill at the Mirambeena industrial park near Albany in WA and the development of woodchip export facilities at the port of Albany. There has also been significant investment in systems for in-field chipping of plantation pulpwood.

The development of domestic pulp production facilities could provide new markets for both plantation and native forest hardwood pulpwood. The bleached kraft pulp mill proposed by Gunns in Tasmania is currently subject to government approval processes and could utilise up to 3 million tonnes of pulpwood annually. The proposed development of a BCTMP mill in the Green Triangle region would utilise around 0.8 million tonnes of pulpwood annually.

The development of the Lignor project offers a potential new use for plantation hardwood pulpwood. Lignor is an engineered strand lumber (ESL) product which utilises eucalypt hardwoods that has been developed in Australia with assistance from the Commonwealth government. Lignor has been researching and developing ESL and is currently developing plans to build an operational plant in WA. If successful, Lignor could create significant competition in domestic forest product markets particularly for higher strength products including hardwood sawn timber and laminated veneer lumber (LVL). ESL is also expected to have considerable export potential. The proposed Lignor plant in WA would require around 0.4 million tonnes of pulpwood annually.

The development of bioenergy production facilities also provides opportunities for utilising pulpwood, although it is unclear whether bioenergy facilities could afford to pay prices for resources sufficient to support plantation development in its own right. For instance, the development of wood pellet exports currently being planned in WA will utilise residue material rather than purpose grown pulpwood.

### 2.2.3 Investment in the expanding softwood sector

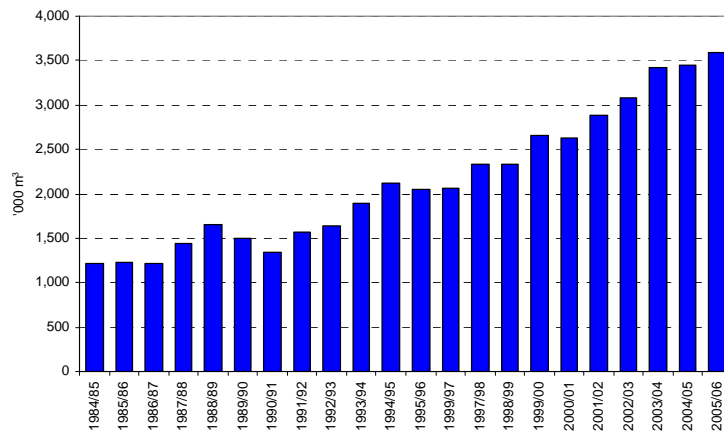
As the availability of plantation softwood increased over the last 10-15 years, Australia's softwood processing industry has expanded with new green field processing investments in panels, sawn timber, and pulp and paper manufacturing. Softwood sawn timber production has been growing at an average rate of 5.3% pa since the mid 1980s (Figure 2-6) representing a trebling of the industry's output.

There has also been continuing upgrades and expansion of existing manufacturing facilities and significant activity in buyouts and takeovers.

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Figure 2-6: Production of softwood sawn timber in Australia



Source: ABARE (2006)

**Investment in processing capacity**

Over the last 10-15 years there has been more than \$2 billion in new softwood processing investment in Australia. This has included establishment of green field processing operations as well as expansions and upgrades of existing processing operations. Table 2-2 highlights those investments with a value exceeding \$100 million.

Table 2-2: Major softwood based investments in Australia

Company	Investment	Approx value (\$ million)	Year	Location
Australian Paper	Pulp mill upgrade (softwood and hardwood)	200	2007	Maryvale, Vic
Wesbeam	LVL	100	2005	Perth, WA
Kimberley Clark	Tissue mill expansion	200	2002	Millicent, SA
Visy Industries	Pulp mill - kraft linerboard	400	2000	Tumut, NSW
Amcor	New corrugators	150	2000	Brooklyn Vic, Roclea Qld, Revesby NSW
Starwood	New MDF mill (now decommissioned)	130	1997	Bell Bay, Tas
CSR (now Highland Pine - CHH/Boral)	Sawmill and MDF mills	200	1995	Oberon, NSW
Dominance	MDF mill	100	1995	Wangaratta, Vic
Visy Industries	Recycled and packaging board	100	1995	Brisbane, Qld

Source: URS Forestry

Most softwood sawmilling investments are less than \$50 million and therefore do not feature in the major softwood investments listed above. Significant sawmilling investments over the last decade are listed in Table 2-3.

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Table 2-3: Significant sawmilling investments

Company	Investment	Approx value (\$ million)	Year	Location
Hyne and Son	New sawmill	50	2005	Tumbarumba, NSW
Highland Pine (CHH/Boral)	Sawmill upgrade	15	2004	Oberon NSW
Hyne and Son	New sawmill	60	2003	Tuan, Queensland
Weyerhaeuser	Sawmill upgrade	40	2003	Tumut, NSW
Allied Timber Products	New sawmill	30	2003	Bathurst, NSW
GTFP	Sawmill upgrade	30	2003	Mt Gambier, SA
McVicar Timber	New sawmill	30	2003	Quirindi NSW
GTFP	Sawmill improvement	25	2003	Dartmoor, Vic
Auspine	Sawmill improvement	15	2003	Tarpeena, SA
Highland Pine (CHH/Boral)	Sawmill	30	2001	Oberon NSW
Hyne and Son	New sawmill	30	2001	Tuan, Queensland
Auspine	Sawmill	30	2000	Tarpeena, SA
Weyerhaeuser	Sawmill upgrade	15	2000	Tumut, NSW
D & R Hendersen*	Sawmill	10	2000	Benalla, Vic
Weyerhaeuser	Sawmill	10	2000	Dartmoor, Vic
CHH	Sawmill	20	1999	Morwell, Vic
Hyne and Son	Sawmill	15	1999	Imbil, Qld
AKD	Sawmill	30	1997	Colac, Vic
Austral (now owned Hyne and Son)	Sawmill	15	1996	Holbrook, NSW
Tasco	Sawmills	20	1995	Lara, Vic

\* new sawmill constructed in 2005/06 following fire in old mill

Source: URS Forestry

In addition to the major investment of the Visy Tumut pulpmill and Kimberley Clark Australia's (KCA's) new tissue line at Millicent, SA there have been many other smaller but still significant investments in the pulp and paper sector. Examples include:

- Amcor's construction of a de-inking plant at Fairfield, Victoria (\$70 million) and upgrade of its Petrie containerboard mill (\$55 million);
- Encore Tissue's new mill at Laverton, Victoria - \$30 million; and
- Visy packaging board mill rebuild at Coolaroo, Victoria - \$15 million.

Investments in new panel production facilities generally involve greater levels of expenditure than that required for sawmills. A number of new panel mills in Australia have been constructed at a cost greater than \$100 million. In addition to those shown in Table 2-2, other major investments over the last decade have included:

- Monsbent's new particleboard line constructed at Benalla in 2001 at a cost of around \$70 million; and
- CHH Nangwarry LVL plant constructed in 1995 at a cost of around \$55 million.

The Starwood MDF mill, which is now de-commissioned, provides some valuable lessons. This mill was constructed by Hokushin in 1997 to process mostly hardwood pulpwood available in Tasmania. However, problems were encountered with technology and also in market acceptance of the product. This led the mill to move to softwood pulpwood but supply problems were encountered. The mill was then sold to CHH who recently sold it to FEA who plan to build a new sawmill on the site. Perhaps the greatest lesson from this situation is to ensure that technology and resources are matched and can meet market demands before committing to mill development.

### Buyouts and takeovers

There has also been a large number of company acquisitions in the softwood sector over the last 10-15 years. These have facilitated entry of new international players, consolidation of some domestic players and exit of others. A number of assets have changed hands several times over the decade. Acquisition

## Section 2

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activity has occurred in all sectors of the industry including pulp and paper, sawmills, wood based panels and plantations. These have included:

- Fletcher Building's acquisition of Amatek/Laminex which included assets in NSW, Queensland and WA, for \$645 million in 2002;
- Hancock Victorian Plantation's acquisition of the Victorian Plantations Corporation (VPC) resources for \$550 million in 1998, and subsequent further acquisition of the Australian Paper plantation estate for \$152 million in 2001;
- Gunns' acquisition of North Forest Products plantation estate and woodchip export operations in Tasmania for \$330 million in 2001;
- Norske Skog's acquisition of Fletcher Challenge Paper which included ANM assets at Boyer, Albury and in New Zealand, for \$830 million in 2000;
- Marubeni's acquisition of Bunnings Forest Products including plantations and woodchip export operations at Bunbury in WA for \$58 million in 2000;
- CHH's acquisition of CSR panels and a 50% shareholding in the Oberon sawmill for \$330 million in 2000; and
- CHH's acquisition of the SA government's Forwood processing assets at Mt Gambier for \$130 million in 1996.

Other notable acquisitions have been Sumitomo Forestry Corporation's purchase of Alpine MDF, the ITC acquisition of Neville Smith Timber Industries, and the GMO purchase of 50% of the Forestry Tasmania Taswood joint venture.

### 2.3 Natural resource management agenda

The National Action Plan for Salinity and Water Quality (NAP) and the Natural Heritage Trust (NHT) represent substantive investment programs by the Commonwealth government to improve the management of Australia's natural resources. The \$3 billion NHT program was set up in 1997 to deliver on the objectives of biodiversity conservation, sustainable use of natural resources and community capacity building and institutional change. The \$1.4 billion NAP program was endorsed by government in 2000 to build on the achievements of the NHT and promote further actions to address water and salinity issues by communities at the landscape level.

The two programs are delivered jointly at the regional level. Underpinning the program are regional natural resource management (NRM) plans covering each of the 56 NRM regions in Australia. NRM plans are developed by local communities and endorsed by government. Funding for the program due to conclude in 2008 has been extended to 2013.

Since the inception of NHT there has been significant investment in a large range of activities. Investments are developed primarily at a regional level in response to the regional NRM plans, aimed at addressing long term resource condition targets identified in the plans. NRM plans focus on issues such as land, water, biodiversity, coastal/marine, atmosphere, cultural heritage and community assets. Whilst investment was originally focussed on planning and resource assessment activities, it is now shifting to on-ground activities, such as revegetation and rehabilitation activities, protection of native species and establishment of perennial pastures.

The recognition and application of forestry as an NRM solution varies significantly between regions, but in general, targets concerning farm forestry or the establishment of new plantations are to date peripheral to the main NRM activities. There is also significant variation between regions. At one end of the spectrum, some NRM plans promote plantation development, whilst on the other hand there are NRM groups that do not support forestry due to the perceived impacts on water availability and land use change.

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Western Australia provides some notable examples of using forestry activities to deliver NRM solutions, particularly to combat salinity problems. In the 1990s significant investment was made in planting trees and native vegetation to ameliorate and prevent dryland salinity. Whilst most of these plantings did not have a commercial focus, a current program, the Strategic Tree Farming Project, is focussed on the establishment of tree crops for both NRM and commercial forest product outcomes. The Strategic Tree Farming Project is delivering large scale on-ground tree planting programs on private land, delivered by the WA Forest Products Commission (FPC) and funded entirely through the National Action Plan for Salinity (NAP) and the WA government. The FPC estimates that by 2020 around 800,000 ha of tree crops will be established on locally owned farms.

The support of the Western Australian government has been fundamental to the success and scale of tree crop establishment programs in the state. There are several examples in other regions where NRM plans promote forestry as a land management system and which have funding available to assist with plantation development. However, despite this, uptake of plantation development has been limited. The main contributing factors to this trend are most likely the cost of establishment to landowners, uncertain product markets and concerns over land use change. There appears to be scope for greater integration between NRM and forestry activities to take advantage of available NRM funding to deliver commercial forest product outcomes, in particular linking in the carbon benefits of woody perennial species.

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**Key issues and findings**

- Availability of public native forest resources will continue to decline in most states. There is uncertainty regarding ongoing access to public native forest resources for commercial harvesting.
- There will be further declines in sustainable sawlog yields from native forests in Victoria and Tasmania and uncertainty surrounds the ability of the government to meet existing licence commitments in NSW. The harvest of public native forests in Queensland will end by 2025.
- Increasing occurrence of bushfires represent a further threat to sustainable yields, particularly in a global warming context.
- Increasing supplies from hardwood plantations will supplement some of the volume reduction from native forests.
- Private native forests are an important source of native forest sawlogs in northern NSW, south east Queensland and Tasmania. There is a need to develop a better understanding of the extent and nature of private native forests with a view to establishing a basis for encouraging sustainable forest management, including appropriate silvicultural management practices, by private forest owners. There is scope to develop or extend programs that provide assistance to private forest growers, particularly under the current trend of increasing regulation.
- A decline in investment in new long rotation plantations means that there will be only small increases in the availability of wood from softwood plantations over the next 10-20 years and this will constrain expansion of the softwood processing sector.
- Investment in long rotation plantations is constrained by the failure of markets to deal with the long time between plantation investment and significant returns from sawlogs. Government incentives or subsidies may be required to increase the size of the softwood plantation estate. This is common practice in other countries.
- Expansion of short rotation plantation areas is likely to decline significantly in the next few years as establishment shifts to second rotation, particularly in regions where plantations have been established. Any ongoing expansion is likely to be in new regions e.g. central Queensland and northern Australia.

This section provides an overview of the outlook for forest resources in Australia and implications for future development of the forestry and forest products industry.

**3.1 Native forest resources**

Forecasting future harvest volumes from public native forests is subject to uncertainty. While government policies suggest that sustainable yield is now more soundly based and forest reserves reflect world class levels of protection, uncertainty remains over future harvest levels.

Tasmania provides the most security and it intends to replace the decline in native forest sawlog harvest volumes with resources from hardwood plantations which are being established with assistance from the Commonwealth government. The Queensland government has also been investing in hardwood sawlog plantations to replace volumes harvested from native forests which will end in 2025. NSW sawmillers have expressed concern that future native forest harvest levels in NSW may struggle to meet existing long term contractual commitments. While the NSW government has also invested in hardwood sawlog plantations it has not been at a scale sufficient to provide confidence to processors over the availability of future volumes. In Victoria uncertainty is driven by concern over a range of issues including potential losses from bushfires and the potential halting of logging in Melbourne water catchments. Table 3-1 provides a summary of current public native forest sawlog supply and future issues expected to affect supply. There is potential for more intensive management of regrowth native forests to produce greater yields from native forests. These options are being pursued in Victoria, Tasmania and NSW.

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Table 3-1: Summary of public native forest sawlog supply

State	Harvest volumes	Future
NSW	<ul style="list-style-type: none"> <li>560,000 m<sup>3</sup> pa sawlogs committed under Wood Supply Agreements</li> <li>340,000 m<sup>3</sup> pa low quality logs potentially available</li> <li>665,000 m<sup>3</sup> harvested in 2005/06</li> </ul>	<ul style="list-style-type: none"> <li>Some concern that commitments can't be met. Expect some decline in harvest over next 10-20 years. Plantation resources may compensate but unlikely to be sufficient</li> </ul>
Vic	<ul style="list-style-type: none"> <li>450,000 m<sup>3</sup> pa of D+ sawlogs</li> <li>130,000 m<sup>3</sup> pa of E grade logs</li> </ul>	<ul style="list-style-type: none"> <li>Volumes recently reduced due to impact of the 2003 Alpine fires. Extent of further volume reductions from 2006/07 fires currently unknown</li> </ul>
Tas	<ul style="list-style-type: none"> <li>650,000 m<sup>3</sup> pa RFA sustainable sawlog harvest (including veneer logs)</li> <li>Legislative requirement for production of at least 300,000 m<sup>3</sup> pa of high quality eucalypt sawlogs</li> </ul>	<ul style="list-style-type: none"> <li>Relatively stable native forest supply with future decline to be met by increasing plantation resources</li> </ul>
WA	<ul style="list-style-type: none"> <li>131,000 m<sup>3</sup> pa of jarrah sawlogs</li> <li>54,000 m<sup>3</sup> pa of karri sawlogs</li> </ul>	<ul style="list-style-type: none"> <li>Volumes were reduced to these levels at the end of 2003. These volumes appear sustainable and risk of future change is minimised by the inclusion in existing contracts of provisions for compensation should resources not be provided</li> </ul>
Qld	<ul style="list-style-type: none"> <li>250,000 m<sup>3</sup> pa from public forests currently harvested (about half hardwood, half cypress)</li> </ul>	<ul style="list-style-type: none"> <li>Most native hardwood forest harvesting on Crown Land will cease by 2025, to be replaced by plantation resources</li> </ul>

3.1.1 Private native forests

Of Australia's 165 million ha of forest, 70% is privately managed with 38 million ha under freehold tenure and approximately 75 million ha under leasehold tenure. However, this included many forests that may be considered of little commercial value, and in most parts of Australia there is very little information on the commercial timber value of private native forests. A summary of the available information on private native forest resources in each state is provided below:

- New South Wales* has a substantial private native forest resource estimated at 8.5 million ha. Several studies have been made quantifying regional areas that are available for harvest but to date no comprehensive state total has been published. According to a study published through the Northern Rivers Private Forestry Development Committee, the total area available for harvest is 512,000 ha in Upper North Coast NSW. Smaller surveys have been completed in the Central and Northern Tablelands (aerial surveys of forest cover and species type). A survey of NSW processors completed by the Northern Rivers Private Forestry Development Committee (2006) estimated a private native forest harvest volume of around 600,000 m<sup>3</sup> pa across NSW. Despite this, relatively little is known about the management of private forests in NSW.
- Victoria* has a private native forest area of around 1.3 million ha, of which around 350,000 ha is available for commercial timber production (DSE 2005). There is very little known about the harvest volume of logs from private native forests but it is generally thought to be low. Victorian government departments do not monitor harvesting of logs from private native forests. The Northern Inland Forestry Investment Group (2006) reported a private native forest harvest of 77,000 m<sup>3</sup>.
- Tasmania* appears to be in the best position of the states with regard to understanding private forests. Private native forest harvest data is collected by Private Forests Tasmania. In 2004/05

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97,000 tonnes of sawlogs and 1.6 million tonnes of pulpwood were harvested from private forests in Tasmania. In 2005/06 harvest levels dropped significantly to 70,000 tonnes of sawlog and 0.9 million tonnes of pulpwood due to a downturn in demand for export woodchips. Future supplies from private native forests in Tasmania are expected to decline due to reductions in available resources.

- In *Western Australia* there is an estimated 1.6 million ha of private native forests. Very little is known about these forests and there is only a small amount of timber harvesting. The Northern Inland Forestry Investment Group (2006) reported a harvest of about 15,000 m<sup>3</sup> of sawlogs and 23,000 tonnes of pulpwood.
- *Queensland* is estimated to have a private native forest estate of around 10.3 million ha. Private native forests make a significant contribution to the overall sawlog harvest in Queensland, particularly in the south east of the state, and in central Queensland to a lesser extent. It is estimated that around 200-250,000 m<sup>3</sup> pa of sawlogs is harvested from private native forests in Queensland.

The ability of private native forests to provide an ongoing sustainable supply of hardwood sawlogs to industry is generally poorly understood around Australia. Silvicultural practices are generally unknown with the expectation that they are poorly developed. In addition, management of private native forests for timber production is becoming more regulated in some states and this may threaten future harvest volumes. Key components of the regulatory regime for private native forests in the states are outlined in Table 3-2.

**Table 3-2: Summary of regulatory approaches to private native forests**

State	Regulation of private native forestry
Victoria	<ul style="list-style-type: none"> <li>• Code of Forest Practice for Timber Production administered by local government provides an overarching purpose for native timber harvesting operations on public and private land. Compliance with the Code is required under the <i>Sustainable Forests (Timber) Act 2004</i>.</li> <li>• Harvesting can also be regulated under native vegetation controls administered by the DSE.</li> </ul>
Queensland	<ul style="list-style-type: none"> <li>• Code applying to native forest practice on freehold land introduced in December 2005. All private landowners must comply with the code and must notify the state government prior to conducting a native forest practice.</li> </ul>
Tasmania	<ul style="list-style-type: none"> <li>• Harvesting native forests on private land requires a Forest Practices Plan in accordance with the Forest Practices Code. The Forest Practices Authority administers this certification to protect the natural and cultural values of Tasmania's forest.</li> <li>• The <i>Forest Practices Act 1985</i> enables land owners to apply to have their forest classified as a private timber reserve. This entitles the land owner to dedicate their resource to long term forest management under sustainable forestry criteria. Establishing forest as a private timber reserve exempts land owners from meeting local government planning regulations.</li> <li>• Where a private timber reserve is not declared, land owners must apply for planning approval via their local council meeting the widely variable requirements of the <i>Land Use Planning and Approvals Act 1993</i>.</li> </ul>
WA	<ul style="list-style-type: none"> <li>• The CALM Act 1984 requires that harvesting of native forest is conducted on a sustained yield basis via licensing.</li> <li>• The clearing of native vegetation is directly controlled under the 2003 amendments to the Environmental Protection Act 1985. Permission for clearing is required and conservation values are independently assessed. There is sometimes local interpretation of these values.</li> <li>• Land clearing is also included in the definition of development and generally requires permission under the Planning and Development Act 2005.</li> </ul>

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State	Regulation of private native forestry
NSW	<ul style="list-style-type: none"> <li>Under the <i>Native Vegetation Act 2003</i> harvesting native forestry on private land requires approval through the preparation of a Property Vegetation Plan or through an application for development consent.</li> <li>New legislation will be brought into effect during the next two years. A Code of Practice for private native forestry (regulation) was introduced in August 2007 which will provide a minimum forestry operating standard. This code will operate under the above Native Vegetation Act until replaced by stand alone, Private Native Forestry Management legislation. Under these arrangements while PNF remains under the jurisdiction of the Native Vegetation Act it is defined as clearing, so that PNF activities are covered within the regulation.</li> </ul>

3.1.2 Management of conservation reserves

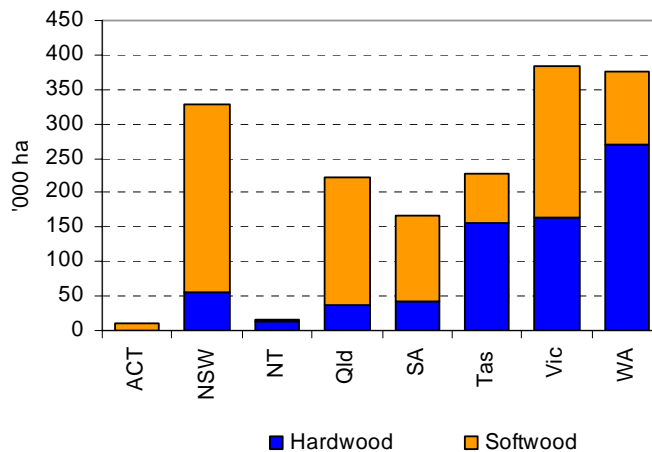
Implementation of the RFA process has resulted in large increases in Australia’s forest reserve areas, as discussed in Section 2.1.1. The sustainable management of more reserve areas for conservation values presents new challenges for public authorities, such as fire management issues, management of invasive species and public access.

There is concern amongst industry stakeholders about the adequacy of the management of conservation reserves, particularly with regard to bushfire management. However there is very little data readily available about the extent of increased funding or resources available for reserve management.

3.2 Plantations

Australia’s plantation estate is comprised of around 990,000 ha of softwood plantation and 740,000 ha of hardwood plantation. Figure 3-1 shows that Victoria, WA and NSW have the largest plantation estates.

Figure 3-1: Australia's plantation area by state



Source: NPI (2006)

3.2.1 Long rotation plantation investment

Softwood plantations are primarily grown for sawlog production, although pulpwood is a significant by-product of the forestry regime used to grow sawlogs. With financial support from the Commonwealth, state governments were largely responsible for development of the softwood plantation estate in Australia between the 1970s and 1980s and remain the main owners of the resource.

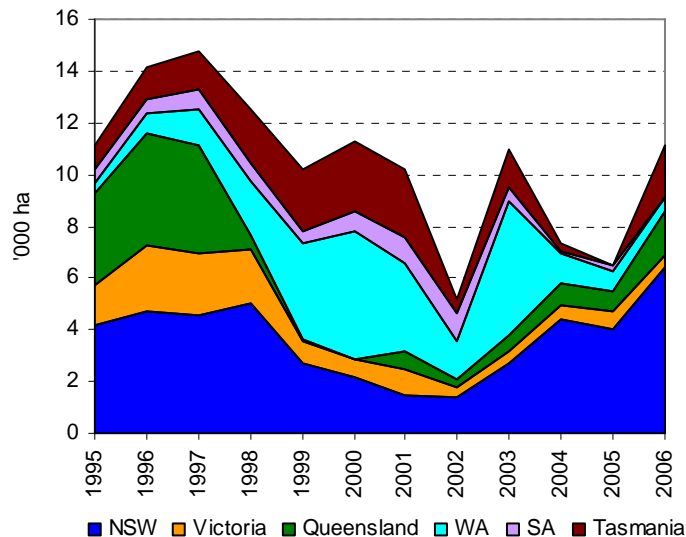
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The most significant exception to public ownership is in Victoria and Tasmania. In Victoria the State government sold its softwood plantation estate to Hancock Victorian Plantations (HVP) in 1998 for \$550 million. HVP is owned by the Hancock Natural Resources Group (HNRG), a timber investment management organisation (TIMO) from the USA, and a number of Australian investors including superannuation funds. In Tasmania, Forestry Tasmania and GMO Renewable Resources LLC, another TIMO, jointly own the pine plantation estate under a joint venture called Taswood established in 1999. Other smaller private owners of softwood plantations include Auspine, Global Forest Partners, AKD and Green Triangle Forest Products.

Figure 3-2 shows that the annual area of green field plantation softwood established over the last decade has declined. This slow down in conjunction with the conversion of some poorly located softwood areas to hardwood, the loss of the most of the ACT Forests estate to bushfires in 2003 (>10,000 ha), the loss of some existing plantation areas to meet more stringent environmental standards (such as those required by FSC and AFS), and the conversion of some plantation areas close to urban centres to non-forestry uses (e.g. the Sunshine coast hinterland in Queensland and the Gngangara estate north of Perth in WA) have led to a slow down in growth in the domestic softwood estate.

Figure 3-2: New softwood plantation establishment in Australia



Source: NPI (2007)

In 2005 about 6,500 ha of new softwood plantations were established, the majority (4,000 ha) in NSW. Willmott Forests, an MIS company, has the largest softwood plantation expansion program, based primarily in southern NSW. Willmott Forests has recently negotiated with HVP to re-establish harvested HVP softwood plantations. While at the current time this is a relatively small program and by focussing on re-establishment does not expand the estate, it may provide a model for expanding the role of MIS in further developing funding of long rotation plantation establishment in the future, including investment in green field plantation establishment.

Gunns is developing new softwood plantations in southern NSW through its MIS and is expected to establish between 2,000 and 3,000 ha in 2007. The company's annual establishment beyond 2007 will depend on future investment levels. Some state agencies, including in Queensland, WA and Tasmania, have small plantation establishment programs.

Development of long rotation hardwood sawlog plantations in Australia has been driven mostly by governments. The NSW, Queensland and Tasmanian governments have programs for the development of hardwood plantations for sawlog production. These programs are essentially to compensate for reductions in sustainable volumes arising from reservation of native forest areas. Some MIS companies

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are also offering longer rotation hardwood products, mainly tropical timbers, but these have attracted only a relatively small amount of funding compared to short rotation plantations.

The most fundamental determinant of private investment in plantations is the risk-return profile compared to other potential investments. The risk-return profile of plantation investments suffers compared to alternatives due to the long term nature of plantation investments. Plantations are seen as relatively illiquid assets, which generally increases the relative risk to investors.

Returns from green field long rotation plantation investments generally find it difficult to meet the investment hurdle of commercial investors. Factors constraining returns include declining real log prices, and high land prices. Added to this it appears that financial markets cannot deal with the long time between plantation investment and significant returns from sawlogs.

An examination of drivers of new forest investment in a range of countries suggests that government involvement and/or support commonly has been associated with building new plantation estates. In Australia and New Zealand direct government investment drove the establishment of softwood plantation estates. In South American countries direct government subsidies have been used to promote rapid expansion of both short and long rotation plantations. In the USA taxation treatment has been used to attract institutional investment into forests as well as to encourage expansion of the resource. Similarly while forests in Western Europe tend to have less distinction between native forests and plantations, it is common to provide either direct financial incentives or specific taxation treatment to attract new investment.

The experience of MIS and evidence from overseas suggests that significant expansion of the sawlog estate in Australia is unlikely to occur if left to existing financial markets. This suggests that governments may need to intervene to address market failure.

One factor that has discouraged investment in long rotation plantations is the relative lack of secondary markets for plantations in Australia. Domestic sales of existing plantation assets over the last decade have mostly taken the form of purchases by TIMOs. These included the sale of Victoria's softwood plantations and Australian Paper Plantations (APP) to HVP, the purchase of half of Forestry Tasmania's plantation softwood assets by GMO, and the acquisition by Hume Forests and Murray Forests (Global Forest Partners) of Norske Skog's plantations and smallholder plantations in southern NSW. Apart from institutional investors, the remainder of secondary sales have been largely short rotation hardwood plantations that are being on-sold between industrials such as the sale of Bunnings Tree Farms to Marubeni Corporation and the sale of North Forest Products to Gunns Limited.

In the 2007/08 budget the Commonwealth government announced that it was implementing changes designed to promote secondary markets for MIS investors. The development of secondary markets is expected to provide greater liquidity for forestry investors and be a positive influence on investment in long rotation plantations. The changes introduced by the government will allow investors in MIS plantations to sell their interests after a period of four years. Previously investors who entered an MIS with the intention of selling their interest prior to final harvest ran the risk of losing tax deductibility of the initial investment. This acted to discourage investors in long rotation plantations who were seeking more liquidity from their investment.

Governments could also address market failure through direct payments for plantation investors e.g. by purchasing environmental benefits supplied by long term plantations.

### 3.2.2 Short rotation plantation investment

Interest in hardwood pulpwood plantation development arose from investments by Japanese pulp and paper companies. The rate of establishment increased dramatically from the early 1990s driven by government support through taxation arrangements which encouraged investment via Managed Investment Schemes (MIS).

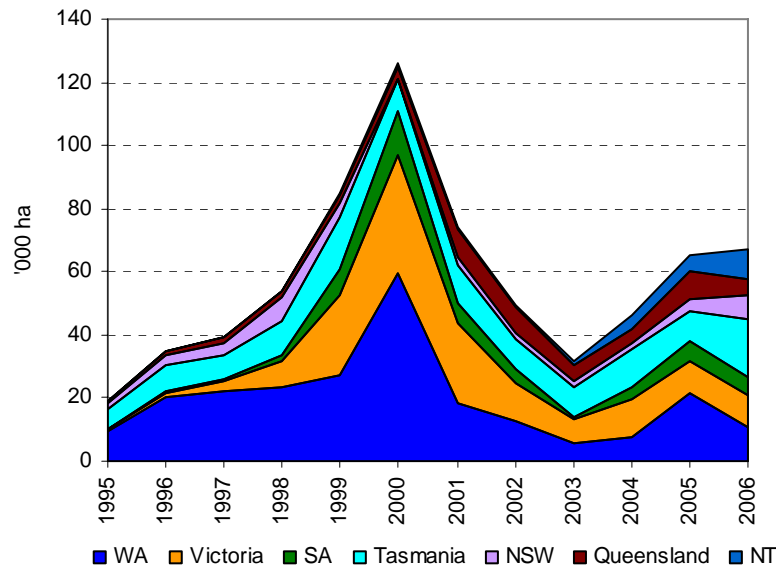
Australia's hardwood plantation estate is still expanding and annual establishment rates fluctuate according to the level of funds raised by MIS companies. New plantation development peaked in 2000, with about 126,000 ha established in that year. That peak was a result of changes to administration of

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the 13 month rule that allows for the time lag between investment and plantation establishment. About 65,000 ha were established in 2005 (Figure 3-3).

Figure 3-3: Areas of hardwood plantations established in Australia



Source: NPI (2007)

As a result of the expansion in plantations, hardwood pulpwood production is expected to increase from the current level of around 3 million m<sup>3</sup> pa to around 10 million m<sup>3</sup> pa by 2010 with further significant increases beyond that. As these eucalypt plantation resources mature over the next four years, establishment will shift rapidly from the development of new land to re-establishment of harvested sites. It is likely that there will be rationalisation of the existing hardwood estate as low productivity sites or areas with higher use values are not replanted after harvest.

Increasing competition for land driven by hardwood plantation expansion has contributed to increases in the price of land in some regions although other factors have also been important in increasing land values. As investment is directed towards re-establishment it is expected that plantation expansion in these regions will slow. To the extent that MIS are able to attract funds to continue expanding the estate (i.e. beyond re-planting harvested areas), it is likely that the expansion may be in newly developing regions with lower land costs. In this regard in recent years there has been new development of hardwood pulpwood plantations in Central Queensland and northern Australia. Plans by Australian Paper to furnish its Maryvale pulpmill from plantations have also led MIS to establish hardwood pulpwood plantations in Gippsland.

MIS have been the main vehicle driving progress towards the 2020 Vision. However, the shift to investment in second rotation plantations is expected to contribute to a slow down in expansion of plantation areas. In addition, growing community concern over the rate of plantation expansion in some regions has led to more complex local government controls that provide a disincentive to plantation expansion. Added to this some long term uncertainty arises from the fact that the operation of MIS relies on continued government support for the maintenance of existing taxation arrangements, although the Commonwealth government has legislated to support these arrangements.

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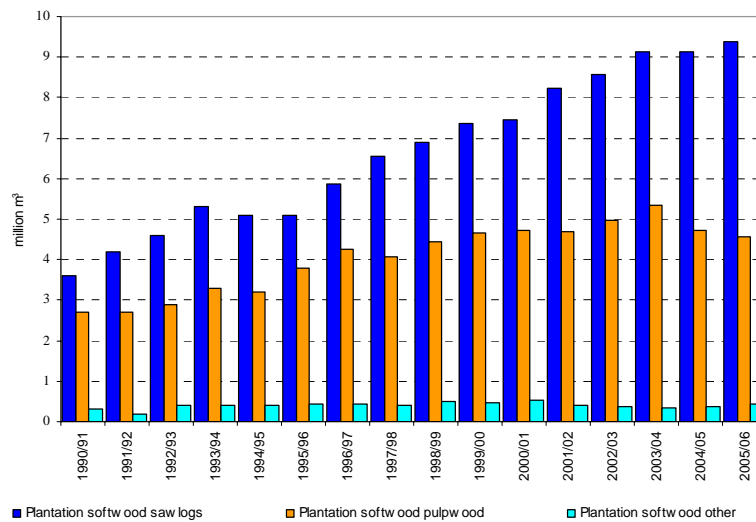
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3.2.3 Plantation wood flows

**Softwood**

The volume of softwood sawlogs available for harvest has increased rapidly over a long period (Figure 3-4). The increasing volume of sawlogs harvested has added to the available volume of softwood pulpwood. These increases have led to the significant investment in softwood processing already mentioned.

**Figure 3-4: Softwood plantation harvest volumes**



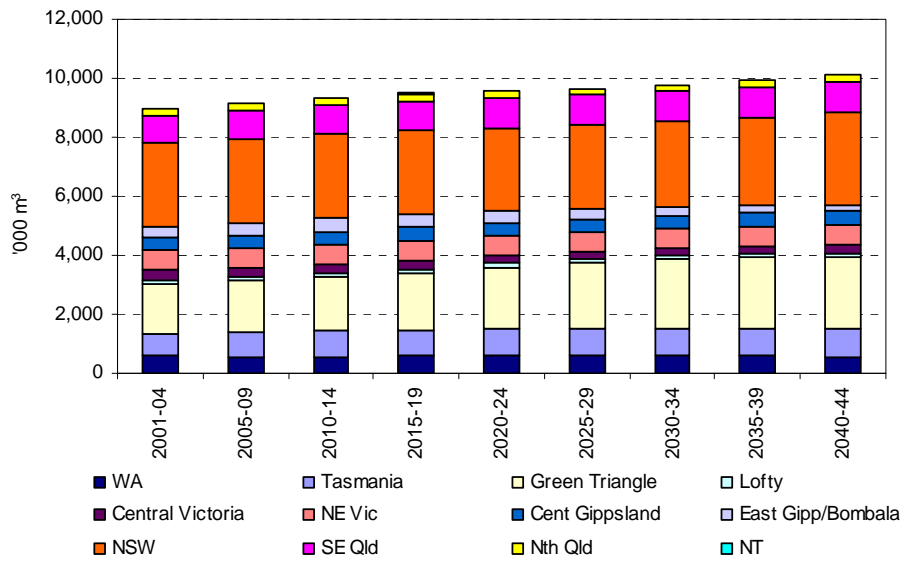
Source: ABARE (2006)

However, this long and sustained increase in harvest volume has largely come to an end, reflecting the decline in new plantation establishment since the 1980s. The National Plantation Inventory (NPI) forecasts, on the basis of no new additional softwood plantations but replanting of existing areas, that the available harvest of softwood sawlogs will increase to around 10.3 million m<sup>3</sup> pa in 2040, from a current harvest volume of 9.4 million m<sup>3</sup> in 2005/06 (Figure 3-5).

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Figure 3-5: Forecasts softwood sawlog woodflows by plantation region



Source: NPI (2002)

In most regions of Australia there is normally a small number of softwood sawlog processors and usually one dominant supplier of sawlogs. In most regions a large proportion of the available volume is committed under existing long term contracts of up to twenty years duration. Capacity to process total softwood sawlog volume is largely in place, with the exception of the East Gippsland/Bombala region where there is potential for construction of a new mill with the capacity to process around 400,000 m<sup>3</sup> pa of sawlogs. There is also a significant volume of pulpwood available in this region.

There may be opportunities to utilise existing log exports in domestic processing. Australia currently exports between 0.6 to 1 million m<sup>3</sup> pa of softwood logs, mostly from Victoria, South Australia and North Queensland.

There are also some regions that appear to have insufficient resources to support world scale competitive softwood sawmills focussed on framing production (competitiveness issues are discussed in detail in Section 4). This may provide opportunities in regions with smaller volumes of resource to attract specialist processing mills. This could include investment in plywood, LVL or sawmills focussed on higher value appearance products.

In general, the future supply situation is expected to reduce the historical level of investment in softwood manufacturing assets.

The availability of pulpwood harvested from softwood plantations is expected to stabilise at a little below current levels of availability. While some regions still suffer from a lack of markets for softwood pulpwood e.g. Bombala, other regions have fully allocated supplies. For instance, the recently announced expansion of the Visy Tumut pulp and paper mill is expected to lead to pulpwood supplies being sourced from regions beyond existing supply zones and has created high levels of competition for softwood pulpwood in the Murray Valley region. Similarly, those regions with access to ports and export woodchip operations such as the Green Triangle have strong markets for pulpwood.

**Hardwood**

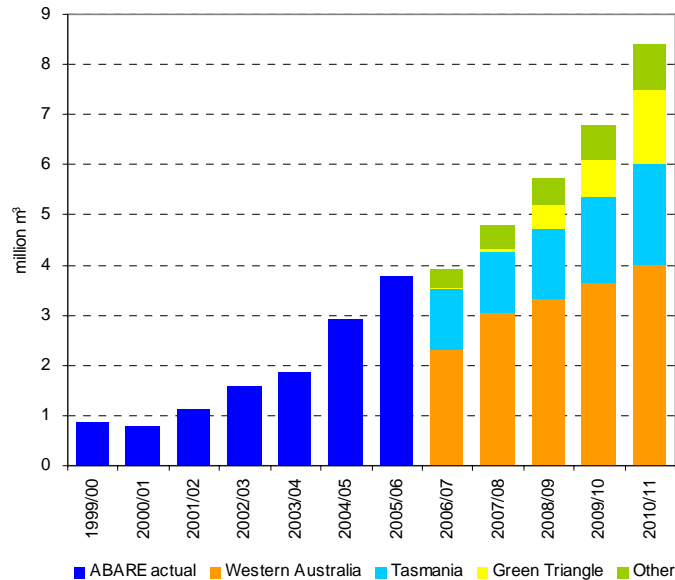
The supply situation for hardwood plantation resources is very different to that of softwood, with large increases in volumes of hardwood pulpwood available over the next five years which have been building since the early 2000s (Figure 3-6). These volumes will increase further to well beyond 10 million m<sup>3</sup> pa after 2010. Most of the eucalypt pulpwood plantations have been established with the plan of exporting

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woodchips. There are also opportunities for the development of domestic pulpmills or other processing facilities that could utilise this resource.

Figure 3-6: Actual and estimated hardwood plantation pulpwood harvest volumes



Source: URS Forestry estimates

3.3 Farm forestry

Accurate data on farm forestry plantations are scarce. Data is best where governments have been directly involved and PFDCs in some regions have conducted surveys that have assisted in identifying farm tree plantations. Table 3-3 provides estimates of farm forestry plantations across Australia.

Farm forestry in Australia has been supported through a range of initiatives and organisations. The more significant development of farm forestry appears to have occurred where landowners have been able to receive external direct investment in plantation establishment and management. For example, joint venture hardwood plantation programs between the government and landowners in Queensland and NSW have seen expansion of farm forestry in those states over the last decade. Similarly, plantations established by MIS on land leased from farmers have facilitated farm forestry where not all of the farm area is planted.

The data in Table 3-3 include estimates of MIS plantations that are considered farm forestry i.e. where MIS plantations are leased from landowners and the leased areas form part of a working farm with other active agricultural enterprises. Estimates of the area of MIS plantations that met these criteria were derived from consultations with MIS companies. The data illustrate the important contribution that MIS have made to the expansion of farm forestry in Australia.

The availability of NRM funding through NRM regional bodies, such as Catchment Management Authorities, has also resulted in some private plantation development, particularly in southern NSW and Victoria. Programs such as the Private Forestry Development Committee (PFDC) program, Landcare, Greening Australia and one off government incentive programs (e.g. the Queensland Community Rainforest Reforestation Program) have also encouraged farm forestry developments.

WA has the largest area of farm forestry plantations, where direct government involvement and MIS companies have played an important role. Government joint venture programs in NSW have been the basis of a large proportion of farm forestry plantations in that state.

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Table 3-3: Estimated areas of farm forestry plantations in Australia

Region	Farm forestry plantations (ha)
Central and North Queensland	1,375
South East Queensland	3,384 <sup>a</sup>
<b>QUEENSLAND</b>	<b>4,759</b>
North Coast	7,632 <sup>a</sup>
Northern and Central Tablelands	2,760
Murray Valley	9,011
Southern Tablelands	7,641
South East New South Wales	906
<b>NEW SOUTH WALES</b>	<b>27,950</b>
North West Victoria	4,500
Central and Western Victoria	1,330
+ MIS plantations	20,200
Gippsland	5,607
<b>VICTORIA</b>	<b>31,637</b>
South East South Australia	671
+ MIS plantations	6,700
Mt Lofty Ranges and Kangaroo Island	1,845
<b>SOUTH AUSTRALIA</b>	<b>9,216</b>
South West Western Australia	38,680
+ MIS plantations	22,000
<b>WESTERN AUSTRALIA</b>	<b>60,680</b>
Tasmania	14,805
+ MIS plantations	6,200
<b>TASMANIA</b>	<b>21,005</b>
<b>NORTHERN TERRITORY</b>	<b>44</b>
<b>TOTAL</b>	<b>155,291</b>

<sup>a</sup>includes Victoria and SA  
Source: BRS, URS Forestry estimates

Development of farm forestry plantations of any considerable scale generally relies on sources of funding external to the landowner. The long timeframes involved in plantation forestry, together with risk associated with the lack of proven economic returns, has limited green field plantation investment by private landowners to very small scales. A lack of established forest product markets in some regional areas also increases investment risk.

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3.4 Log pricing and allocation

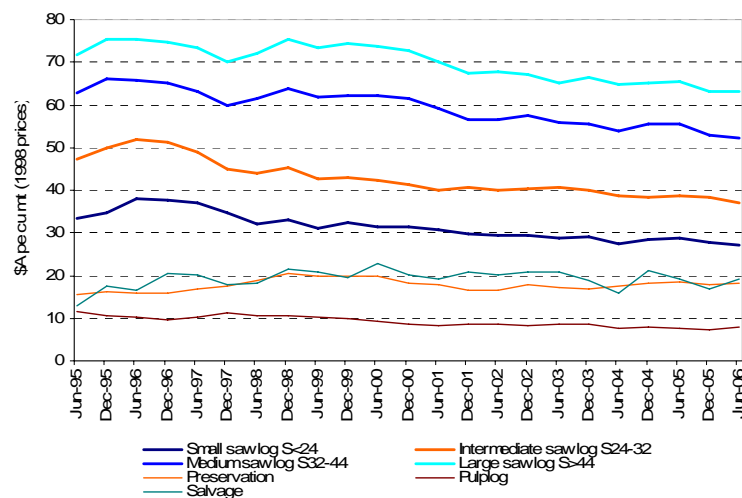
Traditionally in Australia plantation and native forest resources log prices have been mostly determined through administrative processes. The structure of the industry with relatively few processors within particular regions has also led governments to provide long term contracts to provide resource security for processing investments. The government agencies responsible for forests were also commonly charged with multiple objectives including generating regional employment and providing non market based services to local communities.

The desirability to move to more market based mechanisms was recognised in the NFPS which committed governments to introducing more market based approaches to log pricing and allocation. Since the introduction of the NFPS State governments have introduced some open market sales of logs, the operations of plantations and native forests have been split into separate business in a number of states, state forest agencies have been corporatised to varying degrees. The privatisation of plantations in Victoria and Tasmania has also introduced more commercial approaches to log pricing and allocation decisions in those states.

Despite these changes administered prices are still the major means by which plantation log prices are determined across Australia. URS Forestry estimates that more than 70% of available plantation softwood resources are committed through contracts with greater than 10 years duration, which generally do not allow for open market price discovery.

Real softwood sawlog prices have declined over the last decade (Figure 3-7). This reflects the overall supply/demand situation for softwood logs whereby the domestic market has absorbed increasing volumes of softwood sawlogs, industry structures and prevailing pricing mechanisms.

Figure 3-7: APLPI prices for softwood sawlogs sawlog



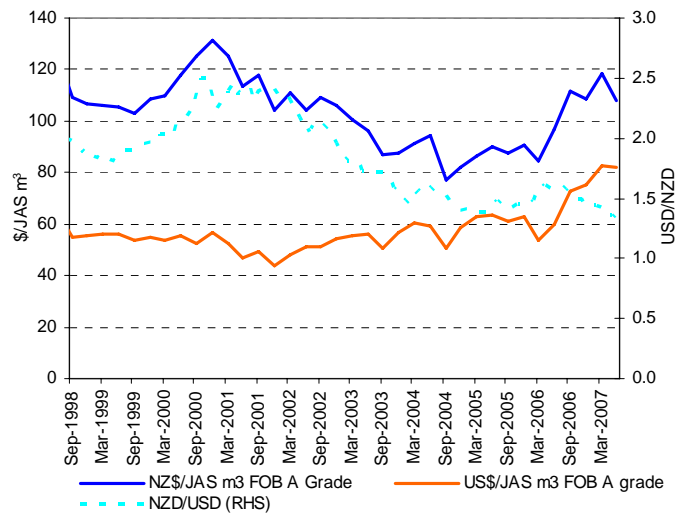
Source: APLPI (2006)

International prices for softwood log exports are considerably more volatile than domestic prices. Figure 3-8 illustrates price movements in radiata log exports from New Zealand over the last decade. Prices are set in \$US at the export port (free-on-board prices – FOB) and are therefore influenced by movements in currency exchange rates and costs of shipping. The figure illustrates that \$US prices showed little trend for most of the decade, although the appreciation of the \$NZ against the \$US saw \$NZ prices fall. Over the last year log export prices increased substantially, partly as a result of concern over Russia’s intentions to impose log export taxes.

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Figure 3-8: International prices for softwood export logs



Source: MAF (2007)

Administered approaches to log pricing and allocation constrain commercial outcomes from plantations. This can be expected to provide lower returns to plantation investments than would occur in open and competitive markets which in turn is likely to discourage plantation investment. Where logs have been offered for sale through tenders in Australia it has almost invariably resulted in higher log prices than prevailing administered prices. While this is likely to reflect the marginal nature of volumes tendered, it also suggests that market based sales have the ability to align log prices more closely with willingness to pay by processors.

The structure of most of Australia's forestry and forest products industry with few buyers and sellers means that long term supply contracts are vital to providing resource security for processing investments. However, it is common practice for state agencies to provide long term contracts that run beyond the depreciation life or the payback period for processing investments. For instance, the payback period for a new sawmill investment typically would be around 6-10 years but it is common for state forest agencies to provide long term sawlog supply contracts for 15-20 years. While this may have been less of an issue when there were large volumes of softwood logs becoming available, in the future it may constrain new investors from entering the industry.

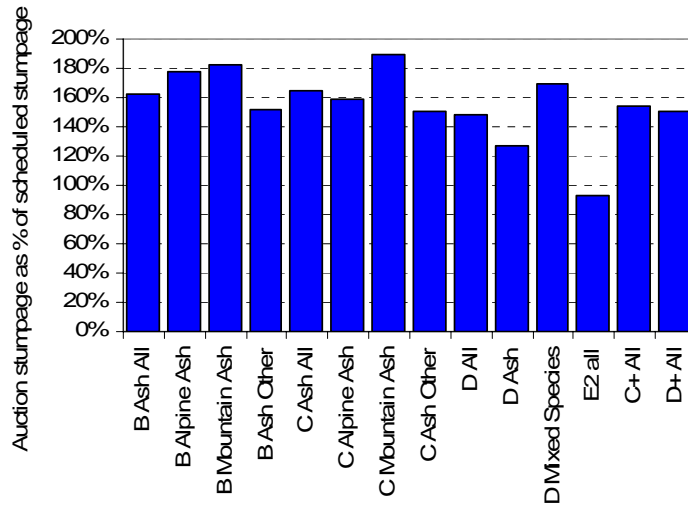
The situation is similar in the native forest sector but decreasing harvest volumes means that the effects of non-market based log pricing and allocation in terms of constraining new entrants and in producing less than optimal log prices may be worse.

However, in last few years the Victorian government has taken the unique step of introducing an auction system as the means of pricing and allocating native forest logs. There have only been two auctions held to date and both auctions resulted in log prices much higher than the prevailing administered log stumpages (Figure 3-9). Generally, the auction prices achieved for B and C grade logs were around 60% higher than scheduled prices for equivalent logs. D grade log auction prices were about 50% higher than existing scheduled prices. Similar price outcomes were achieved for the higher grade logs in the second online auction.

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Figure 3-9: VicForests auction stumpage prices as percentage of scheduled prices



Source: VicForests

The resulting high prices could be caused by a range of factors including marginal pricing, perceived shortages arising from the reductions in sustainable harvest volumes in Victoria, and the significant forward period over which log volumes were sold. They may also reflect buyers' lack of familiarity with the auction system and with their own business costs structures. It is expected that subsequent auctions will see average log prices move to a level consistent with long term viability of the processing industry. Nevertheless, it is expected that a combination of lower sustainable yields together with the auction system will lead to average prices higher than existing administered log prices.

The auction system is also expected to drive ongoing structural adjustment in the native hardwood sawmilling sector in Victoria. In particular, the increase in log costs is expected to see some smaller and medium size sawmills exit the industry with consequent social and economic costs for regional towns (URS Forestry 2006). The size of the adjustment may also reflect the situation that long term licences have led to less structural adjustment than might otherwise have occurred.

No other state has adopted market based approaches to log pricing and allocation for sale of publicly owned forest resources in Australia to the extent that Victoria has. This could represent a threat to the Victorian industry whereby it is forced to pay higher prices while sawmills in other states benefit from lower, administratively determined prices, making it difficult for the Victorian industry to attract investment into processing. On the other hand it could be expected that a more efficient industry created by structural adjustment in Victoria will be better equipped to manage in the highly competitive sawn timber market in the longer term.

### 3.5 Certification for sustainable forest management

Certification of forests for sustainable forest management in Australia is currently mainly being driven by pressure from international customers of forest and wood products (most notably Japanese woodchip buyers) and forest growers, such as governments and TIMOs (e.g. HVP's major investor, the USA based Hancock Natural Resources Group, requires certification of its Victorian plantations). Pressure for certified products in the Australian market is less than in international markets, but is expected to become increasingly important in the future.

There are a number of assessments of progress towards certification for sustainable forest management available. The Confederation of European Paper Industries (CEPI) reports that there is currently around 295 million ha of forests certified under various schemes of which 94% are either FSC or recognised by the Program for Endorsement of Forest Certification Schemes (PEFC). The FSC drove initial steps towards forest certification and concern over the approach embodied by the FSC led forest industries and

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governments around the world to develop their own systems. The Sustainable Forest Initiative (SFI) developed by the American Forest and Paper Association in the USA is one such example. The Australian Forestry Standard (AFS) is another such system.

A number of major private plantation owners in Australia have or are pursuing FSC certification for their plantations. On the other hand a number of government forest agencies and private companies are pursuing AFS certification for their operations.

While there appears to be a plethora of different initiatives and associated approaches and standards there is evidence of increasing commonality between certification schemes. For instance, Cabbage and Newman (2005) note that competition between the Sustainable Forest Initiative (SFI) and FSC in the USA has led to increasing convergence between the two schemes. They state: *"The SFI has become greener over time, as environmental groups who serve on its advisory board aggressively pursue more strict environmental guidelines and standards.... At the same time, FSC has become more pragmatic in their operations, especially in implementation, if not on paper."* There is also evidence of possible convergence between FSC and AFS in Australia with the potential for a single assessment process to provide certification for both schemes being considered. However, it is still not clear that in practice FSC will certify public native forests in Australia.

It is expected that certification of forest management practices in Australia will be an important component of demonstrating sustainability credentials in the future. With increasing convergence between schemes choosing a certification scheme should become less difficult. However, it appears that progress towards convergence in Australia will be difficult while some supporters of the FSC are opposed to any native forest logging. This will most likely see the native forest industry focus on AFS certification in the short term.

### 3.6 The future for forest resources in Australia

In summary key issues for the future development of forest resources are:

- The commitment to stop logging of public native forests in South East Queensland by 2025 and the planned reduction in some harvest volumes from native forests in Tasmania in lieu of supplies from sawlog plantations will see national production from native forests continue to decline. Added to this, the impacts of bushfires in Victoria, the potential for increased bushfires in the context of global warming, and potential future changes to land uses create uncertainty over future sustainable harvest volumes from public native forests.
- Harvest volumes from private native forests have already provided a balance to some of the decline in supplies from public native forests. However, a dearth of information on private native forests creates uncertainty over the sustainability of existing supplies and the potential for harvesting private native forests in the future. There is a strong need to create a more supportive framework for private native forestry across Australia including the collection of information on the extent, nature and management of private native forests. There is also a need for assistance to encourage landowners to adopt sustainable silvicultural management practices.
- There is potential for more intensive management of both public and private native forests to provide a balance to declining native forest harvest volumes. This could be supported through appropriate research and development particularly in regard to the environmental effects of more intensive management practices.
- Despite strong interest in plantation investments from a range of investors, particularly TIMOs and superannuation funds, there is a lack of investment in green field development of long rotation plantations. MIS are capable of attracting investment for long rotation plantations but are unlikely to attract the same level of investment as for short rotation plantations. There is potential that tax changes to facilitate secondary markets for MIS plantations will lead to more long term plantation investments through MIS. But on the other hand this potential may be watered down by MIS investing in re-establishment of existing long rotation plantations. An ongoing lack of new investment in

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sawlog plantations runs the risk of constraining further development of the forest product processing industry;

- Market failure arising from the short term focus of capital markets contributes to the lack of new investment in green field long rotation plantation establishment in Australia. Ongoing new investment in green field plantations could be assisted by direct government intervention e.g. through payment for environmental services;
- Development of green field short rotation plantations is likely to decline significantly in the next few years as establishment shifts to second rotation, particularly in regions where land costs are high. Depending on the ability of MIS to raise funds in excess of that required for re-establishment, it is expected that new hardwood pulpwood plantation expansion will focus on newly emerging regions with more available land or specific market opportunities i.e. Central Queensland, northern Australia and Gippsland;
- The main challenge facing the hardwood pulpwood plantation sector will be the ongoing development of markets to absorb increasing volumes of pulpwood available for harvest and facilitating investment in harvesting and associated infrastructure. In particular, it will require significant investment in roads and in skills/training for workers. There is also likely to be some rationalisation of the area of hardwood plantations as the sector strives to provide returns adequate to attract re-investment in second rotation; and
- Market based approaches to allocation and pricing of wood will help attract plantation investors and lead to a more efficient processing industry.

### 3.7 Harvesting and haulage

The harvesting and haulage sector is crucial to the forestry and forest products industry and generates significant income and employment. In 2002/03 the Forest & Forest Products Employment Skills Company estimated that around 11,000 people were employed in the harvest and haulage sectors (FAFPESC 2003). Harvesting and haulage costs represents a significant proportion of delivered log value, typically ranging between 30-50% of delivered log costs.

The harvesting and haulage sector has undergone considerable adjustment over the last decade, driven by reductions in native forest harvesting. Harvesting and haulage operations in the native forest industry are generally carried out by relatively small family owned businesses. As part of the native forest rationalisation process, contractors affected by these changes have received government assistance to exit the industry. Despite the rationalisation in contractor numbers, harvesting contractors have continued to operate without any major consolidation of the remaining contractor workforce, with the exception being WA where contractors have consolidated into a few larger operators. Native forest operations in NSW, Victoria and Tasmania continue to be carried out by a large number of small contractors. Annual quotas in the vicinity of 30,000 tonnes pa are common. In Queensland, native forest contractors are even smaller.

The nature of forest contracting requires large investments in machinery so that fixed costs associated with interest repayments and the relative level of equity are key influences on contractor profitability. For smaller operators with high gearing, a reduction in quota volumes means less revenue with relative small changes in costs thereby reducing profitability significantly. This means that returns to investment are more uncertain for smaller operators. As such, it is not uncommon for contractors to exit when markets down turn. On the other hand a larger operator with lower gearing could be expected to have greater flexibility to park machinery and reorganise crews so that there is more chance of maintaining profitability.

The native forest harvesting and haulage sector will continue to face the challenges associated with its small business structure and it is likely that there will be some further restructuring of the sector. Adjustment is likely to be most significant in Victoria, where a competitive tender system will be introduced by VicForests for harvesting and haulage contracts by 2008. Tenders for the allocation of harvesting and haulage contracts have also been implemented in other states although to varying degrees.

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The introduction of more market based approaches to letting of native forest harvesting contracts through open competitive tendering in other states would also be beneficial to the industry by allowing the more efficient operators to secure additional resource, which in turn would allow them to better manage the peaks and troughs of the markets. This would also facilitate opportunities for existing native contractors to move to plantations. Furthermore, consolidation of the number of contractors would improve the ability of the remaining contractors to manage normal market movements. Government could assist small contractors to cope with these changes through supporting the development of business management and planning skills.

In contrast to the native forest sector, the vast majority of harvesting operations in hardwood and softwood plantations are highly mechanised and harvesting contractors in the plantation sector generally require much larger annual contract volumes to be viable.

Another significant change facing the harvesting and haulage sector is the expansion of harvesting of hardwood pulpwood plantations. The development of the skills base required to harvest the very large increases in the availability of plantation grown hardwood from maturing plantations occurring over the next 5-10 years is a challenge to the plantation companies, the contractors who service the industry and the providers of technical education and skills training. Capital investment and the entry of new players will be required to service the sector.

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### Key issues and findings

- Economic growth provides market opportunities for forest products in Asia, particularly China and India.
- Australia will remain a net exporter of MDF, paperboard and woodchips but is likely to remain a net importer of most other forest products. The development of domestic pulp production capacity could generate exports which would assist in reducing the trade deficit in forest products.
- Australia has some market protection as a result of its geographical isolation, however the country is open to import competition and imports drive competitiveness of domestic processors.
- More market based approaches to log pricing and allocation will help drive efficiencies in the forestry and forest products industry.
- Efforts to reduce imports of illegally imported wood if successful may provide opportunities for domestic sawn timber producers by increasing demand for domestically produced higher value hardwood sawn timber. However, the ability for Australian producers to respond will be limited by resource constraints.
- There will be further consolidation of the hardwood sawmilling industry driven by reductions in resource availability and the need for mills to remain competitive. There will also be market pressure on the native hardwood sawn timber sector to continue to move to higher value added and/or specialist products.
- Opportunities exist for new engineered wood products to utilise the hardwood short rotation plantation estate.
- There are opportunities to produce hardwood sawn timber from plantations, particularly in higher value appearance products.
- The competitiveness of domestic market pulpmills in Australia will be limited by export parity prices for hardwood chips. However, declining export markets for native forest woodchips may make them more attractive to domestic pulpmills.

This section examines the key market impacts likely to influence development of the forestry and forest products industry in Australia. It commences with a brief overview of the global context for forestry highlighting key developments likely to impact on Australia. It then examines the situation and outlook for major forest products relevant to Australia.

### 4.1 Global markets for forest products

While Australia's forestry and forest products industries are very small on a global scale, the competitiveness of international forest product markets and Australia's exposure to international trade means that market trends can directly impact on the domestic industry as well as influence export opportunities.

### 4.2 Global production

Global production of industrial roundwood has increased steadily over a long period, averaging an annual increase of 1.2% pa since the 1960s (Figure 4-1). The major disruption to that growth occurred in the early 1990s with the break up of the USSR. However, since that time production has steadily rebuilt at the same rate as the longer term increase.

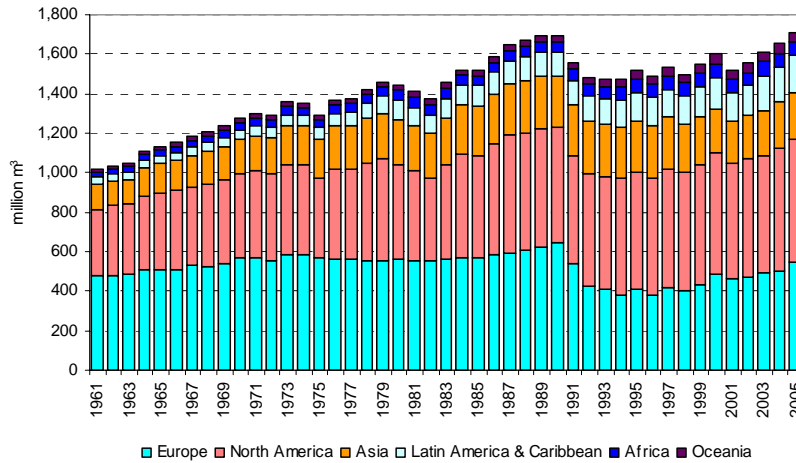
Latin America and the Caribbean has been the fastest growing region, averaging an annual increase of 3.7%. Asian production has also increased over the period but reached a peak in the late 1980s and early 1990s. Figure 4-1 also shows that North America (Canada and the USA) and Europe account for

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around two-thirds of global production. Oceania which includes Australia accounts for less than 3% of global industrial wood production.

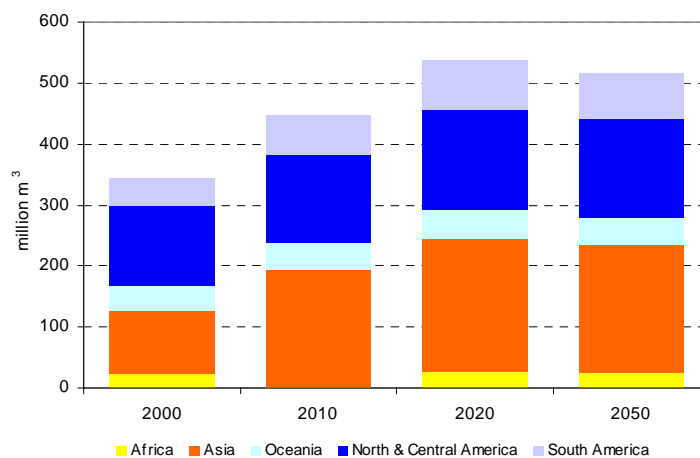
Figure 4-1: Global industrial roundwood production



Source: FAOSTAT (2007)

Wood from plantations is accounting for an increasing proportion of forest products but still only accounts for around 20% of industrial wood production. FAO has estimated that the area of plantations in tropical and sub tropical regions was expanding at more than 4 million ha pa (Brown 2000 – aggregated global statistics for temperate and boreal countries are not available). Asia and South America accounted for the strongest growth. Tropical plantations account for around 45% of the total area of forest plantations around the world. Most of these plantations are tropical hardwoods based on short rotation crops to produce pulpwood. The so-called “southern plantation countries” (New Zealand, Australia, Chile and South Africa) have all developed significant plantation estates that have been increasingly replacing wood from the natural forests of traditional south east Asian producers (Philippines, Indonesia and Malaysia). In these countries the share of wood production from plantations has risen from 40% in the mid 1980s to currently more than 60% (Enters and Durst 2004). The volume of wood produced from plantations is expected to continue to grow over the next decade, particularly in Asia where plantations have a pulpwood focus (Figure 4-2), but in total will still account for less than one-quarter of global industrial wood production.

Figure 4-2: Forecast global plantation harvest



Source: Brown (2000)

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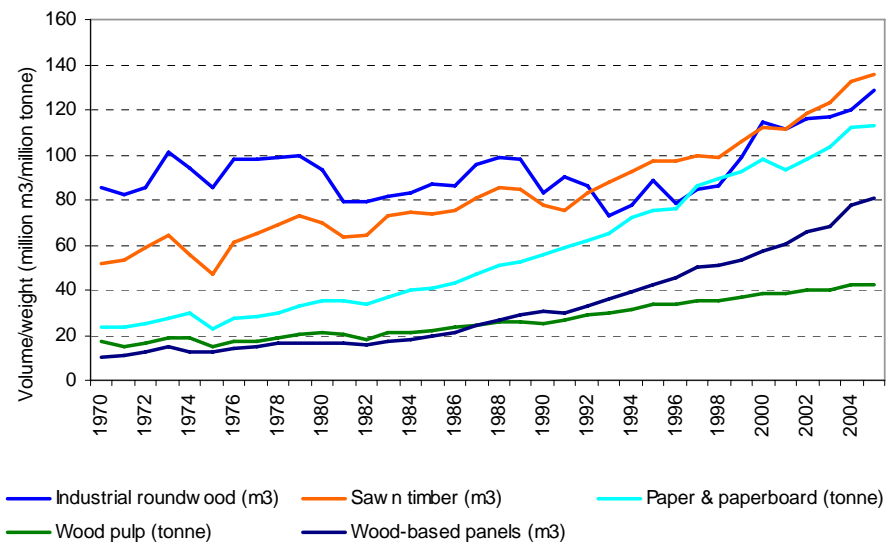
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Increasing supplies of logs from natural forests in Russia and Africa have been important to rising industrial roundwood production and have balanced declining supplies from tropical forests in Asia. Russian log exports have increased from around 20 million m<sup>3</sup> pa in the late 1990s to almost 40 million m<sup>3</sup> in 2005. Russia accounts for the largest proportion of imports into China (65% in 2005), and softwood accounted for 62% in 2005, increasing from 47% in 2000. Because of its significance in supplying global log export markets, moves by Russia to increase log export taxes have the potential to significantly increase log export prices. Russia has proposed increasing its log export tax from the current 6.5% of FOB values progressively up to 80% of FOB values by 2009. The first stage of this increase was implemented recently. However, it is not yet clear that these plans will be implemented to their full extent.

4.2.1 International trade

The global trade of timber products has expanded substantially over the past three decades. Initially the trade was dominated by logs (industrial roundwood), which were imported to support a domestic manufacturing base. The trend in global trade is now shifting towards processed product, with processing occurring close to the resource (Figure 4-3). The largest growth in trade has been in wood based panels, which include engineered wood products.

Figure 4-3: Global trade of forest products



Source: FAO (2007)

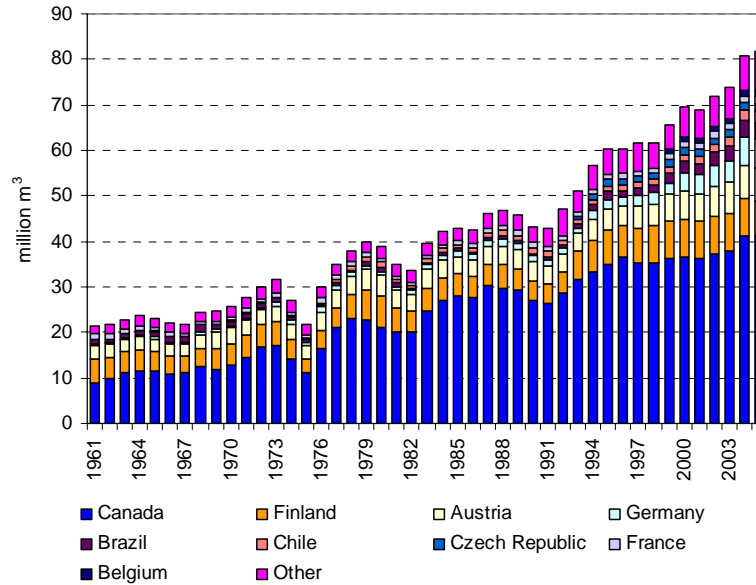
Figure 4-4 and Figure 4-5 illustrate the growing world trade in sawn timber and pulp. This growth in trade reflects an increasing globalisation of the forestry and forest products industry.

The growth in trade reflects growing demand from the countries of Asia who generally do not have sufficient resources to meet their own demand. For sawn timber, key factors influencing the growth of trade are the increasing reliance of the USA on sawn timber produced in Canada, the growth of timber production from European countries, particularly post the break up of the USSR, and the emergence of South American countries as sawn timber producers.

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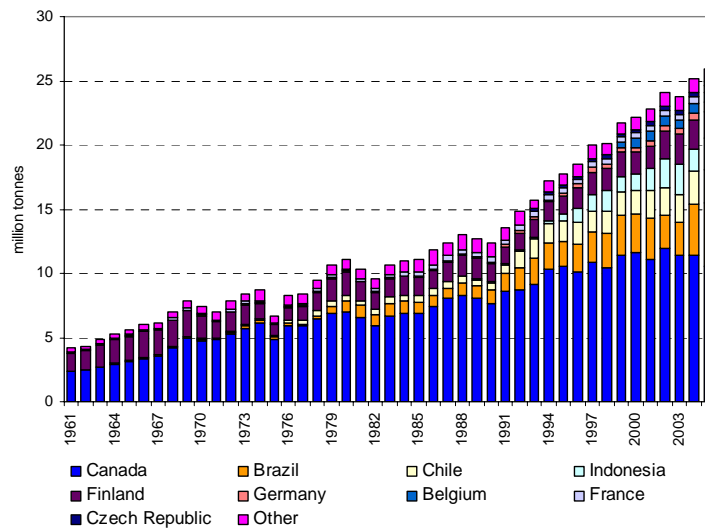
Figure 4-4: Global trade (exports) in sawn timber



Source: FAOSTAT (2007)

The increasing trade in pulp reflects similar trends in terms of North America. It also illustrates the emergence of Brazil, Chile and Indonesia as major suppliers of pulp to world markets. The major consumers of pulp exports are the USA and China.

Figure 4-5: Global trade (exports) of virgin fibre pulp



Source: FAOSTAT (2007)

4.2.2 China

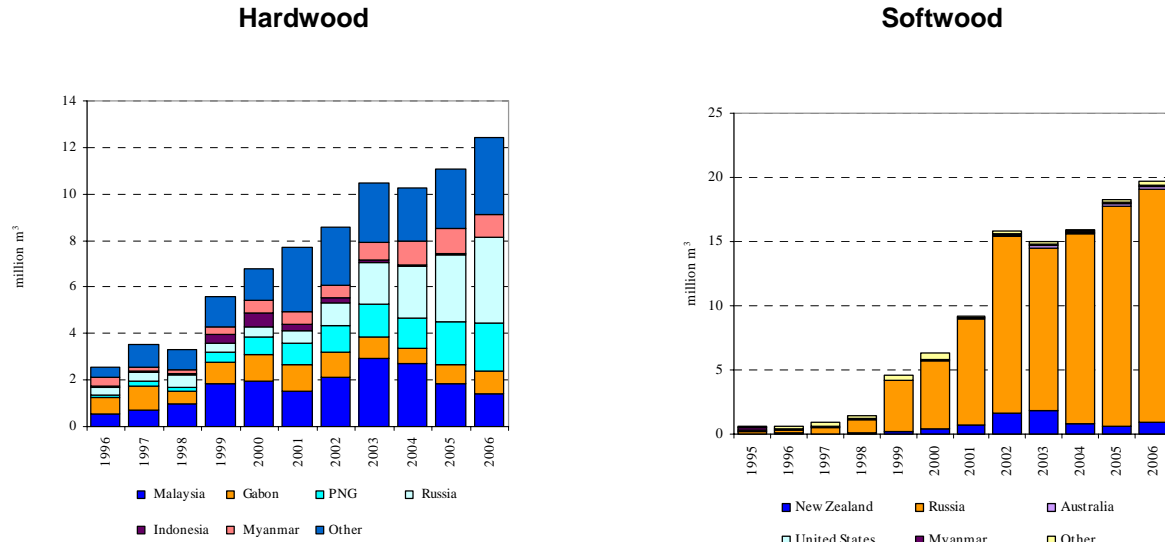
The most significant component of world forest product markets over the last decade has been the emergence of China as major importer of forest products. China has become the dominant buyer of

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softwood and hardwood logs globally (Figure 4-6). China has expanded its imports of hardwood logs as Japan has reduced its imports.

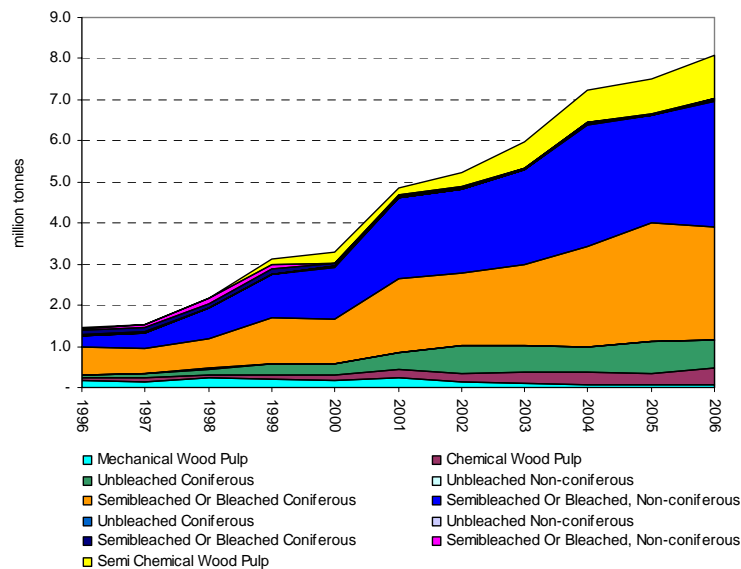
Figure 4-6: China's imports of hardwood and softwood logs



Source: GTIS

China is the world's largest importer of pulp and the volume of its pulp imports have been climbing rapidly over the last decade (Figure 4-7).

Figure 4-7: China's imports of pulp



Source: GTIS

China's increasing demand for forest products is to support its growing production of processed wood products not just for satisfying domestic demand but also for export. In particular, China's export of furniture has had a large impact on world markets, particularly in the USA.

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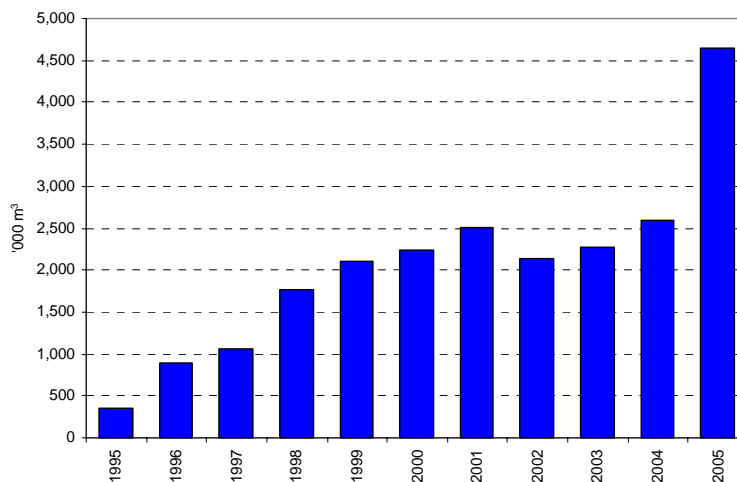
### 4.2.3 India

India's real GDP growth has averaged over 6% since 1997 and in 2006 was reported to be 9.2%. This rate of growth has led to increasing imports of forest products.

India has a well-established forestry industry. However, it is dominated by state ownership and is tightly regulated. Government policy since the introduction of a 1988 National Forest Policy has been to concentrate on plantation development for fuel wood and fodder production on state land. This means that other wood product markets have to be supplied by remaining private and community forest areas, which only account for a small 10% of forest area.

As a result, production in the Indian wood products industry has been limited by domestic supply shortages. This has led to an increasing reliance on imported logs, wood chips and pulp from other countries. India's imports of forest products expanded by 82% between 2000-2005. The volume of imported industrial roundwood rose by 108% over this period (Figure 4-8). Roundwood represented 88% of imports overall, being sourced primarily from Malaysia and Myanmar. However, this is still less than 15% of China's log imports.

**Figure 4-8: Imports of industrial roundwood into India**



Source: FAOSTAT (2007)

India generally does not use structural timber in housing construction. If structural timber was to become considered as a construction material, however, there would be a major supply opportunity. It is Indian government policy to have all India's 50 million households living under shelter by 2012.

At present, Australia exports only 75,000 m<sup>3</sup> of roundwood to India, representing 7% of Australia's total export volume. A vast supply opportunity, however, could open if higher value wood products tariffs were eased by India.

### 4.2.4 Modelling international forest product markets

Modelling the implications of trends in international forest product markets has been the subject of a number of global modelling exercises. The first international forest products models appeared in the 1980s and projected future market conditions in the forest sector globally and for particular geographic regions. Ongoing development of the models incorporated trade, substitution and simultaneous solutions for different products which allowed predictions of supply, demand and prices on regional basis and for more specific products e.g. for pulpwood and sawlogs. These changes also saw modelling techniques develop from static simulation models which estimate demand and supply to determine equilibrium prices for a single period to models which allow optimisation over time. Over the last five years or so these

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models have been developed further to assess the impacts of policy options on a country, regional or global basis e.g. to assess the impact of trade barriers, illegal logging and most recently carbon trading.

The major forest product models developed internationally have included:

- The **Global Trade Model (GTM)** developed by the Centre for International Trade in Forest Products (CINTRAFOR) at the University of Washington. This model was essentially an extension of a global model developed by the International Institute for Applied Systems Analysis (IIASA).
- The **Timber Assessment Market Model (TAMM)** of the US Forest Service is used to predict forest product demand in the US as part of ongoing planning. More recently the model has also been used in combination with the North American Pulp and Paper Model (NAPAPM) of the US Forest Service's Forest Products Laboratory. The TAMM model focuses on softwood log and timber markets while the NAPAPM models focused on pulpwood (USAD 2003).
- The **Global Forest Products Model (GFPM)** developed by the University of Wisconsin and utilised by FAO and ITTO in preparing global forest sector outlook studies (Zhang, Boungiorno and Zhu 1997).
- **Timber Supply Model** of the Resources for the Future (RFF) – RFF has used this model to assess the impact of policy options including assessing the impacts of tax reform, the effects of forest conservation and the impact of climate change (Sedjo and Lyon 1996).

The early models generally projected forest product and log price increases which resulted from forecast increases in demand and limited supply. The international log price spike of the early 1990s appeared consistent with these predictions. However, as log prices fell and the models became more sophisticated, in particular by taking account of product substitution and supply responses, log price predictions reduced to movements of around same real or real decline. These changes helped explain the return of log prices to more 'usual' levels following the price spike in the early 1990s.

The use of the models to examine different scenarios has also illustrated that supply or demand shocks can lead to significant price changes. Supply and demand shocks are most commonly driven by changes in domestic government policies.

One of the more recent predictions of log prices came from the FAO Asia-Pacific outlook study (FAO 1998). One of the working papers for that study (FAO 1997) used the GFPM (with support from ITTO) to project log supply, consumption of forest products, and prices. It predicted a 16% decline in real log prices between 1995 and 2010 under its base case scenario. Under this scenario log supplies in the region increased largely from softwood plantations and substitution between plantation and traditional log products. Under a constrained supply situation which assumed a 25% fall in natural forest logging in the region (largely tropical native forests), the price of logs remained steady in real terms over the same period. Under a situation of additional demand growth and supply scarcity, log prices increased in real terms. The Asia-Pacific outlook is currently being updated.

The TAMM (USDA 2003) forecast real hardwood sawlog stumpage price movements of 0.2% and 1.6% pa for the north and south USA up to 2050, respectively. The high forecast increase in the US south reflected constrained supply in that region.

The use of the models to assess policy options also illustrates that supply and demand side shocks can have significant impacts on log prices. CINTRAFOR used its GTM model in the early 1990s as part of a project conducted by the International Institute for Environment and Development (IIED) for the International Tropical Timber Organisation (ITTO) to assess the impact of trade barriers on tropical log forest products. The key outcome of this project was to illustrate that, by depressing prices, trade barriers on tropical forest products would adversely impact tropical producers and not help protect forests.

In 2004 the American Forest and Paper Association (AFPA 2004) used the GFPM to estimate the impact of illegal logging on global and US forest product prices. The base case for the GFPM which, compared to other projections forecasts demand on the high side, estimates a real price increase of 1.2% pa between 2002 and 2012. Under a scenario by which illegal logging is phased out over a 5-year period, the rate of increase in log prices rises by an additional 1.8% pa over the same period. This suggests that

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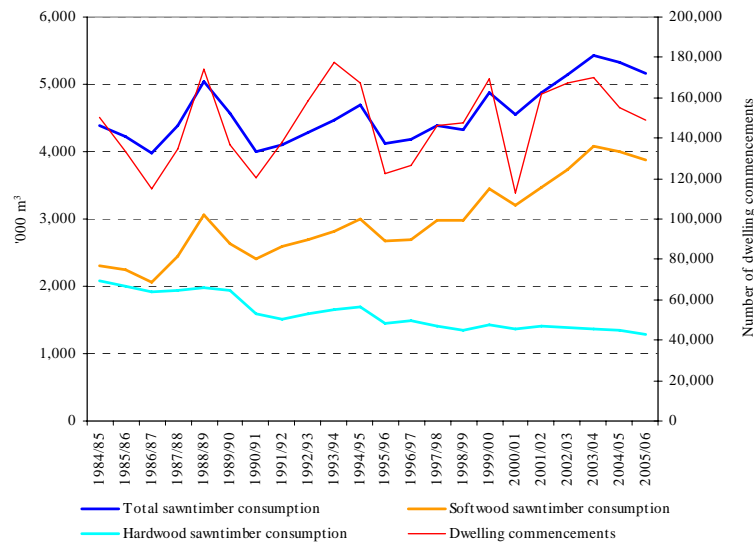
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while illegal logging is significant in terms of its market impact, efforts to reduce illegal logging should be able to be absorbed by international hardwood processors.

4.3 Sawn timber in Australia

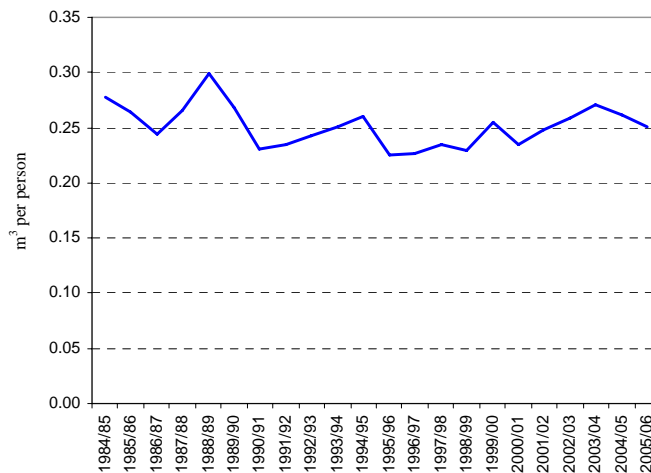
For a long period sawn timber consumption in Australia has fluctuated between 4-5 million m<sup>3</sup> pa in line with housing market conditions (Figure 4-9). Based on these data sawn timber consumption in Australia has been growing slowly at an average 0.7% pa. Over the period shown population has grown by an average 1.3% pa so that per capita consumption of sawn timber has declined (Figure 4-10).

Figure 4-9: Apparent consumption of sawn timber in Australia



Source: ABARE (2006)

Figure 4-10: Per capita consumption of sawn timber



Source: ABARE (2006) ABS (2006)

The significant increase in sawn timber consumption since the 1990s reflects a change in the basis on which apparent consumption data is estimated rather than a fundamental shift in the level of sawn timber

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consumption. It is likely therefore that these data overestimate the rate of increase in sawn timber consumption and also per capita timber consumption in recent years.

The factors contributing to declining per capita consumption of sawn timber are complex and data limitations make it difficult to be precise about the causes of the decline. However, contributing factors would include:

- construction techniques such as use of concrete slabs have acted to reduce timber used in houses;
- increasing numbers of multi unit dwellings construction that use less timber framing per unit of floor area than free standing houses; and
- increasing use of wood panel products instead of solid timber in many applications e.g. use of MDF in furniture manufacture and particleboard flooring.

Figure 4-9 also illustrates that over the same period, softwood sawn timber consumption has been growing steadily while hardwood sawn timber consumption has declined.

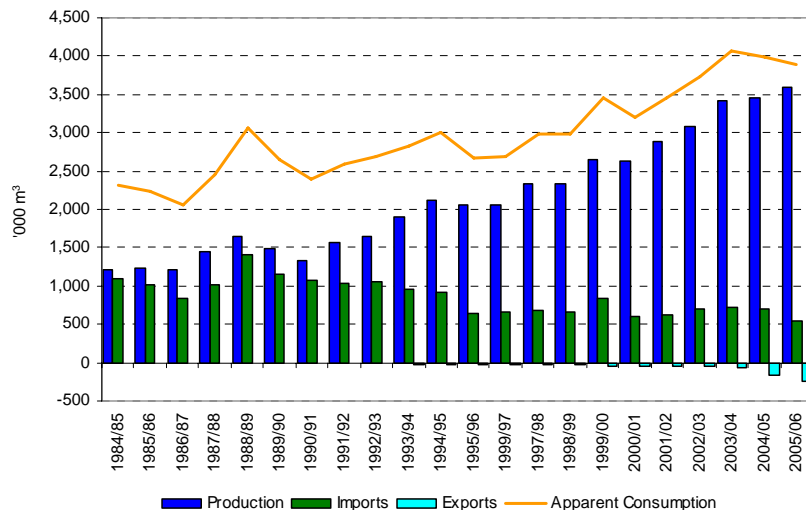
The volume of hardwood sawn timber imports into Australia declined from around 170,000 m<sup>3</sup> pa in the early 1990s to less than 105,000 m<sup>3</sup> in 2001/02, but has begun to increase again in recent years to around 140,000 m<sup>3</sup> pa.

It is expected that over the next 10-15 years sawn timber consumption will continue to grow only slowly at best.

4.3.1 Softwood sawn timber

Apparent consumption of softwood sawn timber has increased steadily, with an average increase in production and consumption volume of 5.3% pa and 2.5% pa since 1984/85, respectively. This has seen softwood sawn timber out-compete domestic hardwood and both hardwood and softwood imports.

Figure 4-11: Apparent consumption of softwood sawn timber



Source: ABARE (2006)

The rate of increase in softwood sawn timber consumption is expected to slow over the next 10-15 years. It is expected that opportunities for softwood sawn timber to continue replacing hardwood in solid timber uses will become increasingly limited. Softwood has already captured most framing markets.

Treated softwood is also increasingly being used for outdoor structural and appearance applications e.g. it is estimated that softwood now accounts for around 65% of house decking markets. The growth in use

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of treated softwood sawn timber in outdoor applications is subject to government regulations relating to treatment chemicals, in particular, increasing limits on the use of CCA treatment. However, replacement treatment technologies continue to develop with increasing levels of adoption domestically. Technologies are also developing to allow colouring of softwood timber for external use which will improve its competitiveness against hardwood.

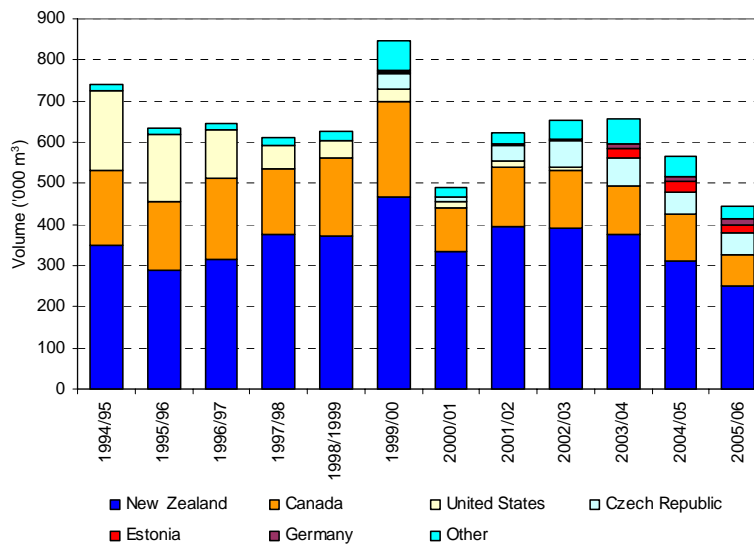
Softwood engineered wood products such as LVL and laminated beams, are capturing market share from hardwoods in high strength applications e.g. in flooring bearers and joists and lintels.

Australia's relative isolation and corresponding high transport costs for imports have allowed domestic softwood producers to out-compete imports, both by direct substitution for imported softwood but also by replacing imported hardwoods. The share of imports in softwood apparent consumption in Australia has fallen from almost half in 1984/85 to 14% in 2005/06.

New Zealand is the major source of imports into Australia and tends to supply products less readily available in Australia (Figure 4-12). These include large end section timber, clear timber and treated structural sawn timber. With the focus on softwood production expansion in Australia being on large volume structural framing markets, domestic producers have tended to regard treated timber markets as secondary markets. There is scope for smaller specialist mills in Australia to focus on treated timber markets which generally provide good prices.

Imports from Canada have generally declined over the period reflecting the overall market trend. The exception to this in recent years has been imports from the Czech Republic and Estonia. Imports from these sources were a response to buoyant domestic timber market conditions from new low cost producers. However, as the domestic market tightened, they have tended to decline. Nevertheless, the experience illustrates the competitiveness of international sawn timber markets.

Figure 4-12: Australian softwood sawn timber imports by major sources



Source: GTIS (2007)  
 Note: excludes wood in strips, friezes for parquet flooring

Competition from imports acts as a constraint on domestic timber markets, by ensuring that domestic timber prices do not move largely out of concert with international timber prices. It also acts to ensure that domestic sawn timber producers remain cost competitive.

While export volumes of softwood sawn timber from Australia have grown over the last decade, only relatively small quantities are exported. The increases in the last two years reflect some increase in

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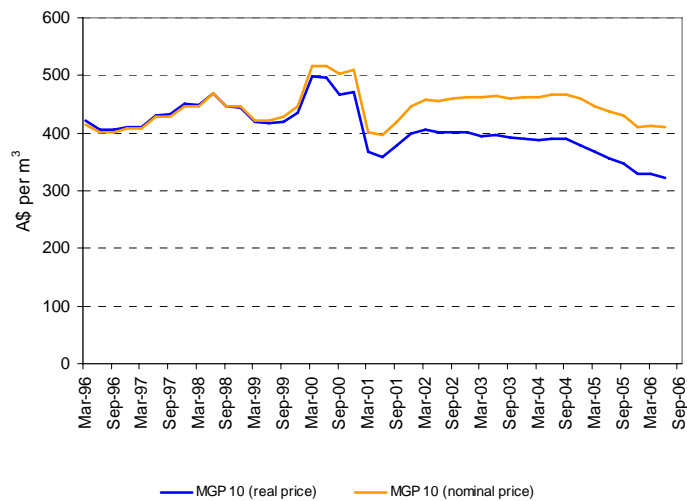
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export volumes to China as well as timber exported as part of Asian tsunami reconstruction efforts. It is expected that resource constraints, relative competitiveness of domestic producers and limited surplus supply will mean that exports will remain relatively unimportant to the Australian softwood sector.

**Softwood timber prices**

Softwood sawn timber prices have declined in real terms most notably in recent years. This reflects the substantial increase in production capacity, increasing price competition from lower cost producers and soft domestic market conditions throughout 2005/06.

Figure 4-13: Timber prices



Source: TMS (2006)

**Competitiveness**

As Australia has expanded its production of softwood sawn timber it has also improved its competitiveness. Table 4-1 which compares typical softwood sawmilling costs in Australia with a number of regions illustrates that in general Australia’s costs of softwood sawn timber production are above lowest cost benchmarks. However, it should be stressed that these are indicative only and that actual cost figures can vary widely from one mill to another. In particular, log costs are highly dependent on log size and quality which varies enormously from one region to another as well as between mills e.g. the higher delivered log costs for Australia generally reflect the typically larger size and high grade outturn of Australian softwood plantation logs.

Nevertheless, the data suggest that operational costs in Australia are typically higher than other major softwood processing regions. Processing costs for the best New Zealand mills are approaching best practice, though care should be taken in interpreting these figures – typically a New Zealand mill produces a high proportion of green rough sawn timber due to the resource quality, which means the average overall processing cost is lower as there is no drying or dressing costs for that portion of the production. Nevertheless, the data suggest that Australian softwood sawmills could be vulnerable to competition from New Zealand imports as well as other lower cost producers.

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Table 4-1: Relative cost competitiveness of Australian softwood sawmills

	Australia		New Zealand		BC Interior		Canada Prairies		Chile	
	Avg		Avg	Top qtr	Avg	Top qtr	Avg	Top qtr	Avg	Top qtr
	\$US per m <sup>3</sup>									
Delivered log cost	53		53	58	45	40	37	35	36	38
Net wood fibre cost	100		93	90	75	66	75	66	64	66
Operational costs	115		90	61	55	64	64	61	35	32

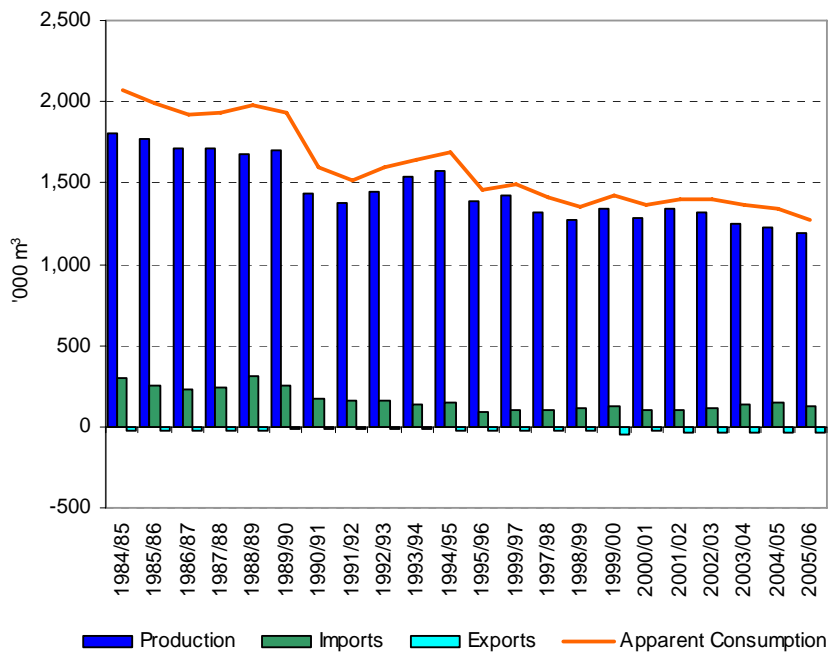
Source: URS Forestry estimates, IWM et al (2005)

4.3.2 Hardwood sawn timber

Apparent consumption of hardwood sawn timber has declined by an average of 2.2% pa since 1984/85 (Figure 4-14). This has been associated with the increase in softwood sawn timber as well as the impact of restrictions on harvesting of public native forests.

As softwood has captured the house framing market hardwood sawn timber production in Australia has generally switched to higher value strength (large beams, lintels and stair treads) and appearance uses (particularly flooring). Production of kiln dried hardwood and flooring have expanded rapidly in the hardwood sector. It is estimated that around 65% of total sawn output from Victorian and NSW mills is now value added dried products. Queensland sawmills still produce a higher proportion of green sawn timber.

Figure 4-14: Apparent consumption of hardwood sawn timber in Australia



Source: ABARE (2006)

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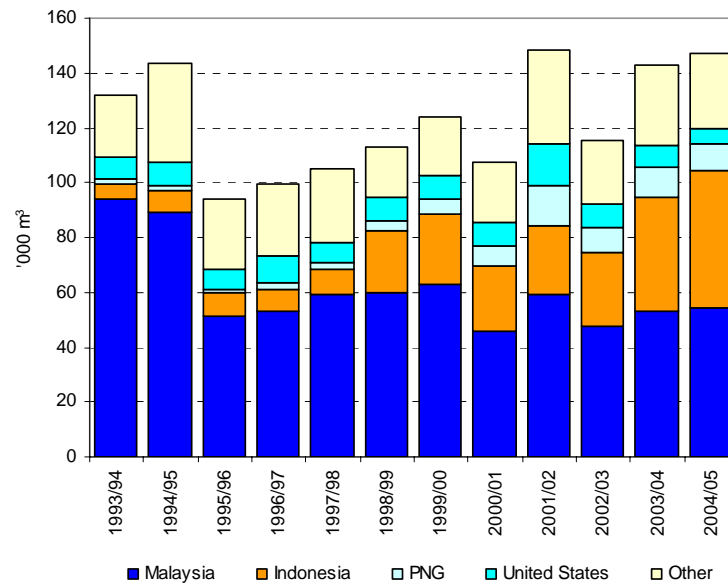
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The initial competition from softwood was in the traditional framing products. However, it is expected that structural hardwood products will now face increasing competition from engineered wood products. The latter have the advantage of not being limited by length and can be used in pre-fabricated housing. While engineered wood products currently only form a small percentage of the market, their market share is growing quickly. Consequently, it is expected that hardwood products will continue to move to higher value, appearance based markets such as flooring and furniture.

The volume of hardwood sawn timber imported into Australia is relatively small compared to softwood and fell though the 1990s but has also fluctuated with the state of domestic timber markets (Figure 4-15).

In recent years there is some evidence of increasing imports of hardwood sawn timber which appear to reflect the increasing scarcity of domestic native hardwood sawn timber. Malaysia and Indonesia are the largest sources of tropical hardwood sawn timber imports into Australia and imports from Indonesia have been growing in recent years. It is expected that constraints imposed on access to resources in these countries will limit the ability of hardwood imports to capture an increasing share of the Australian market.

Figure 4-15: Australia's imports of hardwood sawn timber by source



Source: ABARE (2006)

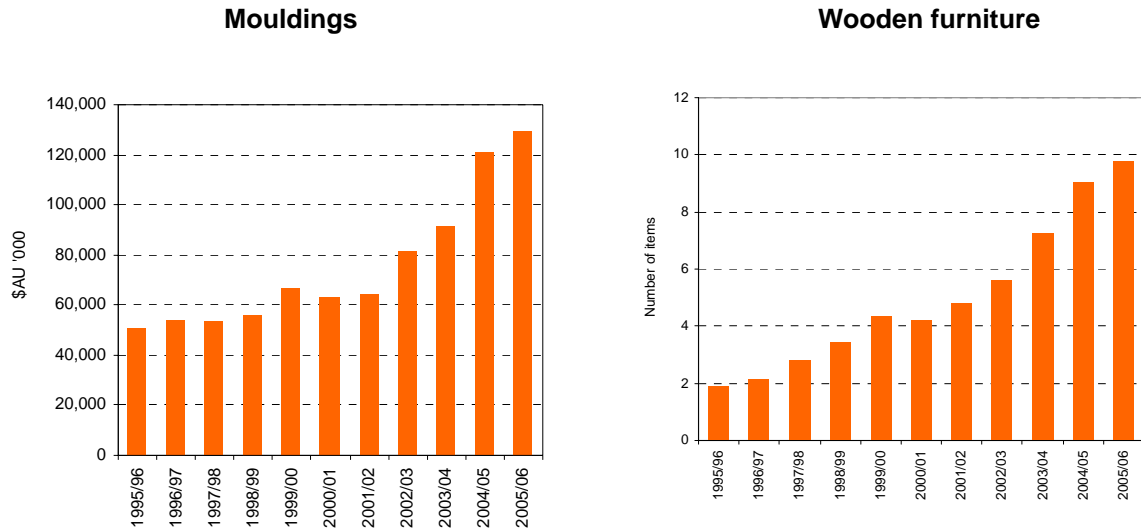
There is further opportunity for hardwood sawn timber import replacement. These opportunities are likely to lie with products other than domestic hardwood sawn timber because of domestic resource constraints. These other products are likely to include engineered wood products such as LVL, LSL and ESL, arising from both hardwood and softwood plantations.

The furniture market and appearance mouldings market are often cited as opportunities for further value adding of domestic sawn timber. Local hardwood sawmills report strong demand for furniture timber. While it appears that there will always be a good market for higher value solid timber hardwood furniture and mouldings, in general these markets in Australia are subject to intense competition from imports. Imports of both of these products have been increasing in recent years (Figure 4-16) and will make it difficult to expand domestic markets.

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Figure 4-16: Australian imports of mouldings and wooden furniture

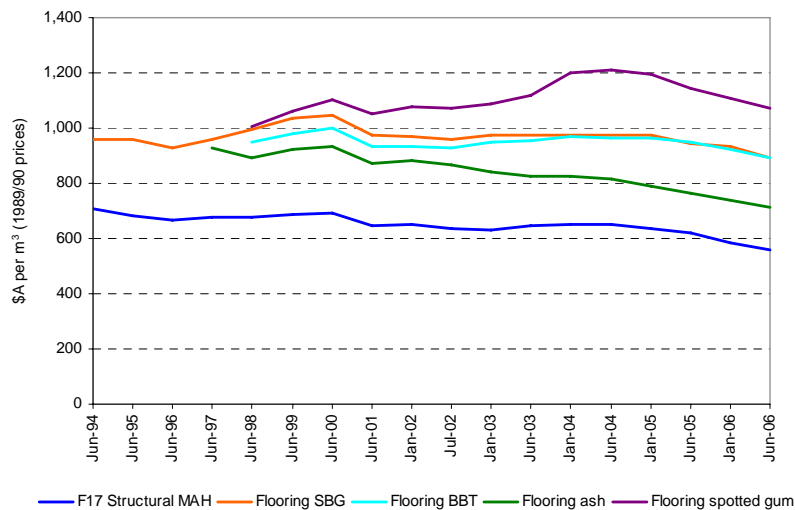


Source: ABARE (2006)

Hardwood timber prices

Reflecting the move to higher value uses and increasing scarcity of supply hardwood sawn timber prices in Australia have held stronger in real terms than softwood timber prices. However, recent weakness in domestic timber markets has seen prices decline in real terms.

Figure 4-17: Real movement in selected hardwood sawn timber products



Source: TMS (2006)

Competitiveness

The competitiveness of hardwood sawmills varies considerably from mill to mill. It is therefore difficult to strictly define industry competitiveness as a whole. Hardwood sawmills tend to focus on particular product markets and design their processing operations to meet the needs of those markets as well as the nature (size and quality) of the log resources they have access to. This means that costs of production and returns can vary considerably amongst mills. In general because of their focus on higher

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value production hardwood sawmills do not require the same scale as softwood sawmills to be competitive.

Notwithstanding these qualifications the average size of hardwood sawmills in Australia would generally be considered to be below the scale required to meet international competitiveness benchmarks. While the larger sawmills with input capacity in excess of 100,000 m<sup>3</sup> pa would be consistent with these benchmarks, the large number of sawmills across the country with inputs of less than 30,000 m<sup>3</sup> pa suggest there is considerable scope to improve competitiveness. While resource distribution can constrain mill sizes and some smaller sawmills with niche markets are expected to continue competitive operations, in general it is expected that most hardwood regions will see fewer, larger hardwood sawmills. The moves to hardwood plantation resources in some regions will increase the pressure for larger capacity sawmills as new plantation based hardwood sawmills are likely to require larger scale than existing hardwood sawmills to reach competitive costs and return structures.

Given the resource constraints faced by the industry in most states, together with increasing competition in structural hardwood markets from engineered wood products, it is expected that there will be continued pressure on the native hardwood sawn timber sector to move to higher value added products. At the same time, increasing competition from imports of furniture and mouldings suggests that pressures to remain internationally competitive will continue.

It is likely that ongoing consolidation of processors in Victoria, NSW and Queensland will be necessary to meet the pressures of growing competitiveness and from further decline in the availability of resources. This does not mean that all small mills will disappear as some of these mills have specific niches that will continue to provide profitable businesses.

### 4.4 Wood based panels

#### *Medium density fibreboard*

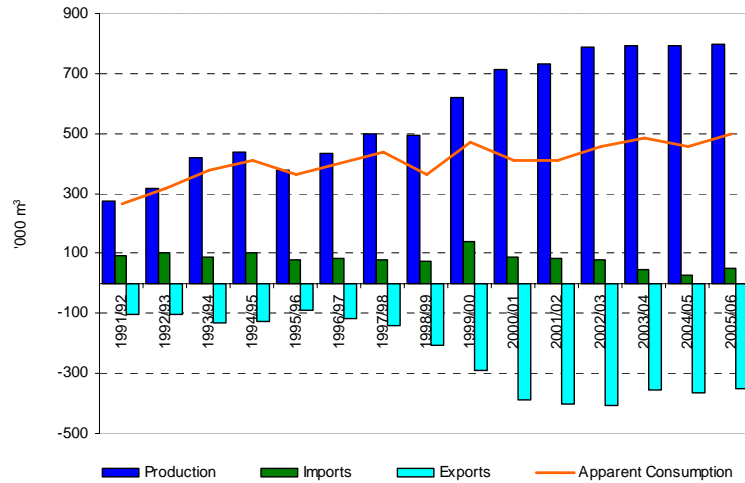
Australia's MDF industry has expanded rapidly over the last 10-15 years as increasing volumes of softwood pulpwood from forest thinning and softwood sawmill residues have become available. A number green field MDF mills have been constructed in Australia over this time. Only the Starwood mill in Tasmania has not been successful. This mill was originally predicated on producing MDF utilising hardwood resources but the mill eventually mostly relied on softwood. After purchasing the mill from its overseas owners CHH has now decommissioned the plant and recently sold the site to FEA who are constructing a sawmill there.

Figure 4-18 illustrates that MDF production and consumption in Australia have been increasing at average rates of 7.9% and 4.7% since 1990/91, respectively. It also illustrates that domestic production significantly exceeds consumption and therefore exports are significant for MDF, accounting for an equivalent of 44% of domestic production.

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Figure 4-18: Apparent consumption of MDF in Australia



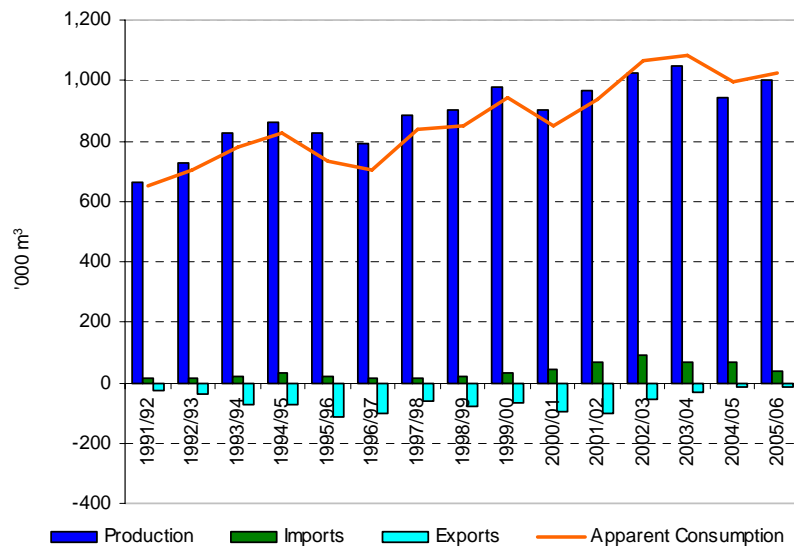
Source: ABARE (2006)

The MDF mills constructed in Australia over the last decade or so are modern mills of international scale and generally have access to good quality resources. Given their proven ability to export MDF, most of which goes to Asia, the sector in Australia is considered cost competitive. However, it is understood that MDF exports have varied in profitability and that producers have found this market difficult as the \$A has strengthened against the \$US in recent years. This, combined with limited uncommitted pulpwood supplies, suggests there is limited opportunity for further investment in MDF in Australia.

Particleboard

Manufacture of particleboard has grown similarly in Australia with apparent consumption and production increasing at an average of around 3% pa since 1990/91. Exports and imports of particleboard are minimal (Figure 4-19).

Figure 4-19: Apparent consumption of particleboard



Source: ABARE (2006)

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Most particleboard mills in Australia are relatively old and are generally considered high cost compared to international benchmarks. While domestic production capacity has matched consumption closely, ongoing growth in the market could provide opportunity for more competitive facilities. Increasing competition for residual wood from MDF, wood chip export and other potential uses is likely to constrain investment in new particleboard production. One potential option in this regard might be the opportunity for a new particleboard production facility based on wood not currently utilised e.g. residues from logging operations and/or recycled wood.

**Plywood**

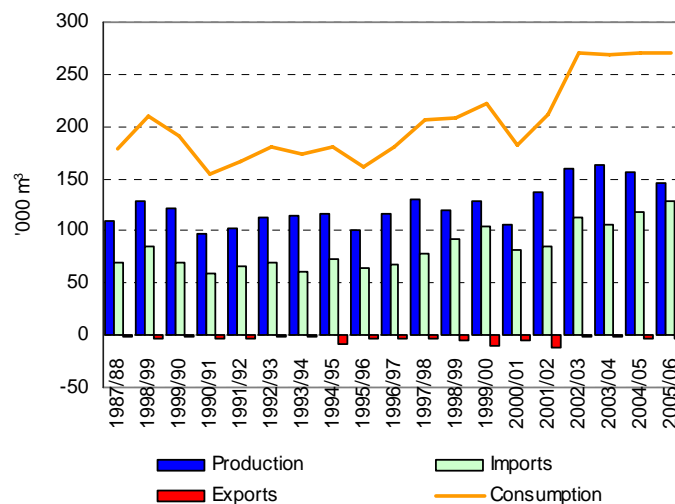
The consumption of plywood in Australia was relatively stable throughout the early 1990s but over the last decade has grown more rapidly at an average rate of around 4% pa (Figure 4-20). Only small quantities of appearance plywood are consumed in Australia and most is structural plywood used predominantly in the residential sector.

Imports of plywood are significant, generally accounting for more than 40% of consumption. New Zealand accounts for around half of plywood imports, and its share of import has grown as tropical plywood supplies have declined.

The plywood industry in Australia is small scale and high cost compared to international benchmarks. This suggests that there is an opportunity for a new world cost competitive plywood mill in Australia that could take advantage of a growing market as well as capture market share from imports and higher cost domestic producers. The alternative is that imports capture an increasing share of the market which has already been occurring.

The potential for a new plywood mill in Australia is likely to be limited by the ability to capture suitable resources in sufficient quantity for a world scale mill. Such a mill would likely require a minimum input of around 200,000 m<sup>3</sup> pa.

**Figure 4-20: Apparent consumption of plywood in Australia**



Source: ABARE, Plywood Association of Australia, URS Forestry estimates

Two new hardwood veneer mills are currently being developed in Tasmania. These mills will be based on native hardwood logs that were previously exported and the veneer produced will be exported for plywood manufacture overseas. The development of these mills illustrates the potential for further investment in this sector.

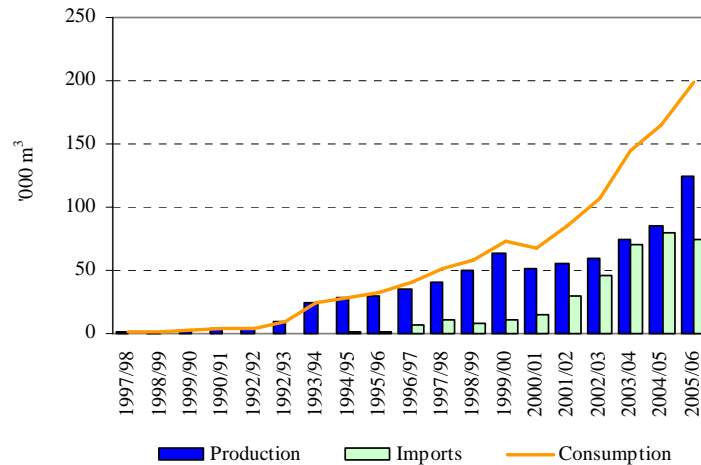
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**Laminated veneer lumber**

Production and consumption of LVL have been growing faster than any other forest product, respectively averaging 16% and 21% annual growth over the last decade, albeit from a low base (Figure 4-21). Imports, largely from New Zealand, make a significant contribution to consumption of plywood and LVL in Australia and have been increasing.

**Figure 4-21: Apparent consumption of LVL in Australia**



Source: ABARE, Plywood Association of Australia, URS Forestry estimates

LVL is gaining market share in many residential building structural applications that have previously used hardwood sawn timber, including floor bearers, beams and joists. LVL use has also expanded with the use of I-joists in which it is used in flanges. I-joists have steadily penetrated the flooring market in Australia.

There are currently two producers of LVL in Australia: the CHH mill at Nangwarry in the Green Triangle and the newly constructed Wesbeam mill in WA. Given the growth in LVL consumption and the high level of imports there appears to be potential for construction of further LVL capacity in Australia. However, available resources are likely to provide a significant constraint on such a development unless an investor could capture some currently unallocated resource of suitable quality or perhaps capture resources from an existing sawmill operation. An LVL mill would require around 2-300,000 m<sup>3</sup> of log input to be of competitive scale. Any LVL mill in Australia is likely to be subject to considerable competition from New Zealand producers and there is potential for this competition to increase in the future.

**4.5 Export woodchips**

The global market for woodchips is principally driven by pulp, paper and paperboard production for which woodchips provide feedstock. Hardwood woodchips have a short fibre length suited to the production of high quality printing and writing papers. Softwood species such as radiata pine have a longer fibre length and are commonly used in lower value newsprint and packaging products.

Japan drives international woodchip markets. It is estimated that annual trade in woodchips in the Pacific Rim is around 16 million bdmt of which Japan imports 85% (DANA 2006).

**4.5.1 Hardwood chip exports**

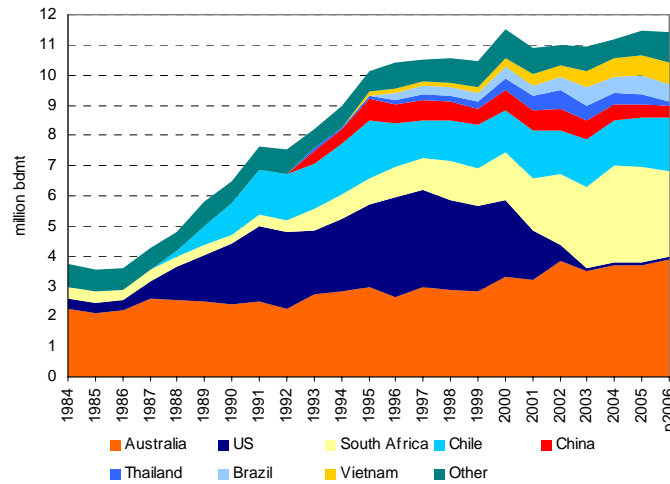
Australia's hardwood chip exports have historically been based on native forests, with Tasmania being the major source. Exports are currently around 4.5 million bdmt annually and have been around this level over the past 3-4 years. While Australia's volume of hardwood chip exports to Japan has grown since 1985, its share of the Japanese market has declined as the Japanese have sought volumes from other

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suppliers (Figure 4-22). Japan's increasing imports of woodchips represented a shift from domestic supplies to imported supplies whilst total consumption has only grown marginally in the same period. In the future total consumption is expected to decline as Japanese pulp and paper production declines. Factors contributing to the expected decline in Japan's pulp and paper production include the aging of its pulp and paper facilities, increasing competition from imported paper products and falling domestic demand for pulp and paper as Japan's population begins to decline.

Figure 4-22: Japanese import of hardwood chips by source

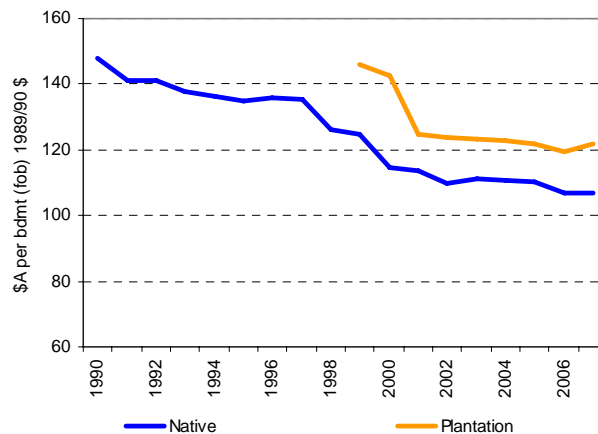


Source: Global Trade Atlas (2007)

Hardwood chip export prices to Japan are denominated in Australian dollars and so relative movements in the value of the Australian dollar, the US dollar and the Yen can have a significant impact on the preparedness of Japanese mills to source chips from Australian suppliers. Shipping costs also influence relative competitiveness.

Prices for hardwood chip exports from Australia have been declining in real terms over the last 15 years. Reflecting the preference of Japanese pulp and paper companies for plantation woodchips and the higher pulp yields they provide, plantation hardwood chips receive a premium over native hardwood chips. The latest price negotiations resulted in a small real increase in plantation woodchips while the price for native forest woodchips was maintained in real terms (Figure 4-23).

Figure 4-23: Real prices for Australian hardwood chip exports



Source: URS Forestry estimates

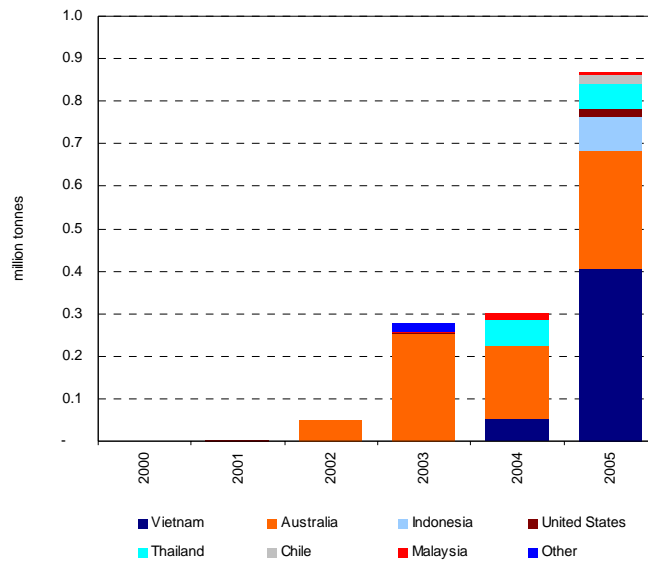
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The large increases in plantation hardwood pulpwood coming on stream in Australia will have a major impact on woodchip export markets. The volume available from plantations in Australia over the next decade is equivalent to around the current total volume of hardwood exports.

While China's demand for hardwood chip imports has been growing (Figure 4-24), its ability to import a large proportion of its fibre supplies in the form of woodchips will be limited by the openness of its pulp and paper markets as well as its desire to export paper products. This is evidenced in China seeking imports of hardwood chips from lower cost suppliers and from integrated operations between China and range of exporters (i.e. Indonesia). It is likely that China will continue to import some woodchips but the bulk of its paper industry fibre requirements are expected to continue to be in the form of pulp.

Figure 4-24: China's imports of hardwood chips



Source: Global Trade Atlas (2007)

South East Asian countries most notably Vietnam are also expanding their plantation resources. While the productivity of these resources is unclear it is expected that they will be relatively low cost suppliers.

In summary, given the expected supply/demand environment it appears unlikely that increasing volumes of hardwood pulpwood in Australia will be absorbed by existing export markets without ongoing real price declines. Given the market preferences for plantation woodchips, it is expected that the greatest price pressure will be felt by native hardwood chip exporters. This suggests that exports of native hardwood chips from Australia may find it difficult to compete and it is likely that native woodchip exports will be replaced by plantation grown chips. It also suggests that pulpmill developments in Australia that utilise native forest woodchips and/or plantation grown chips would benefit native woodchip exporters.

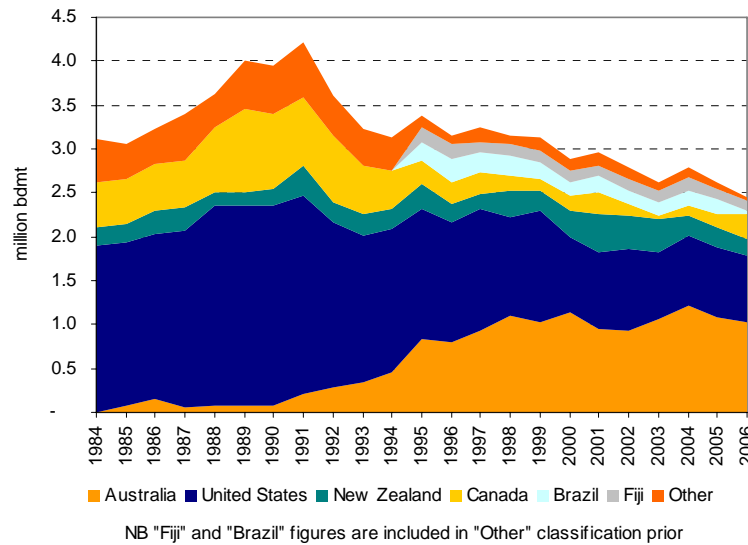
4.5.2 Softwood chip exports

Australia's exports of softwood chips are around 1 million bdmt pa. Similar to hardwood chips Japan dominates the market and is the major destination for Australian exports. While Japan's total volume of imports has declined over the last decade, Australia's share of the Japanese market has increased (Figure 4-25). The decline in Japanese demand reflects its increasing use of recycled paper.

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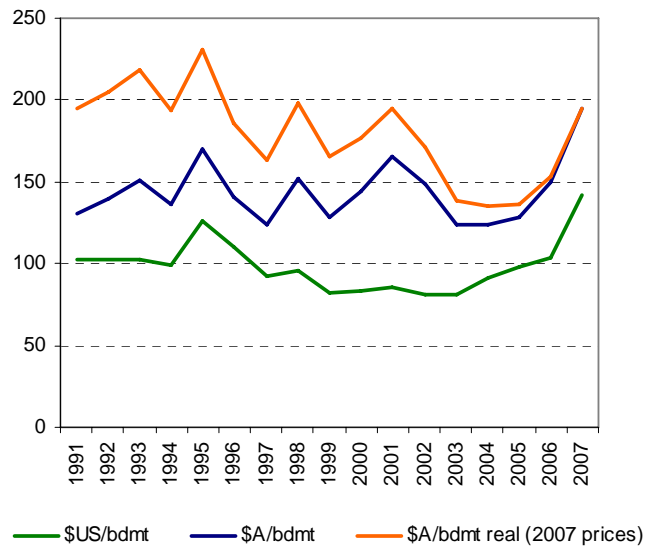
Figure 4-25: Japanese imports of softwood chips by source



Source: Global Trade Atlas

Softwood chips are traded in US dollars. Over the last fifteen years softwood chip prices have fluctuated considerably (Figure 4-26). Softwood chip prices have strengthened in recent years and the latest prices negotiated resulted in large increases. This reflects a shortage of supply on international markets being driven largely by short term factors such as the current down turn in the US housing market, pest problems in forests in Canada, and the effect of storms in Europe. While prices are currently high and profitable for exporters, there are periods when softwood chip export is a marginal business.

Figure 4-26: Australian softwood chip export prices



Source: DANA (2006), URS Forestry estimates, UBC

In Australia growing demand by domestic processors of softwood chips and declining volumes of pulpwood available from plantation thinnings could be expected to cause a tightening of supply of softwood chips. It is difficult to discern long term trends in softwood chip export prices as prices fluctuate depending on supplies from other sources as well as pulp and paper market conditions.

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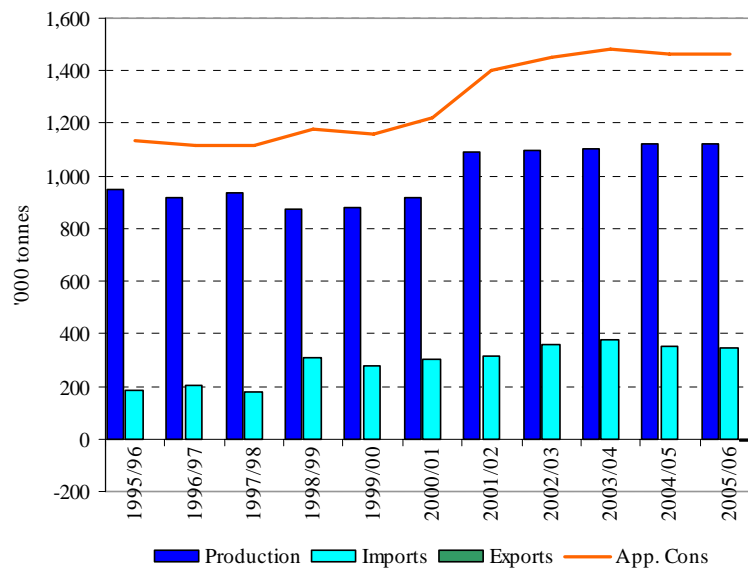
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4.6 Pulp and paper

The pulp and paper sector makes a significant contribution to employment and income generated by the forestry and forest products industry in Australia. In general the domestic industry can be divided into those products that utilise primarily softwood pulpwood, being packaging, newsprint and tissue, and communication papers that utilise primarily hardwood (i.e. printing and writing paper excluding newsprint).

Consumption of paper and paperboard in Australia has been growing at an average rate of 1.7% pa over the last decade. Consumption of communications papers has been growing the fastest at an average of 4.6% pa over the last decade, tissue consumption has been growing at an average 2.6% pa while consumption of packaging paper and paperboard, and newsprint have been relatively stable.

Figure 4-27: Apparent consumption of paper and paperboard in Australia



Source: Industryedge (2006)

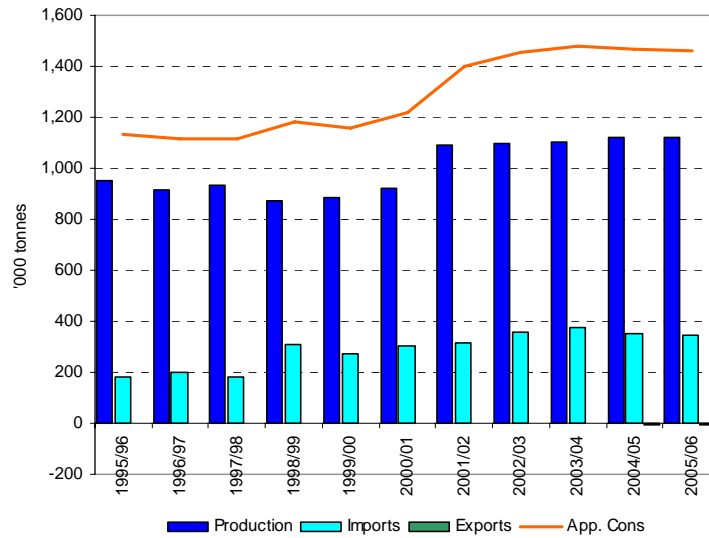
4.6.1 Pulp

All pulp production in Australia is integrated with paper mills but paper producers also import significant quantities of pulp. Apparent consumption of pulp in Australia has been growing at an average 2.6% pa (Figure 4-28). The major contribution to this growth has been the construction of the Visy pulpmill at Tumut in NSW which is illustrated in the increase in production in 2001/02. Imports of pulp account for around one-quarter of domestic pulp consumption.

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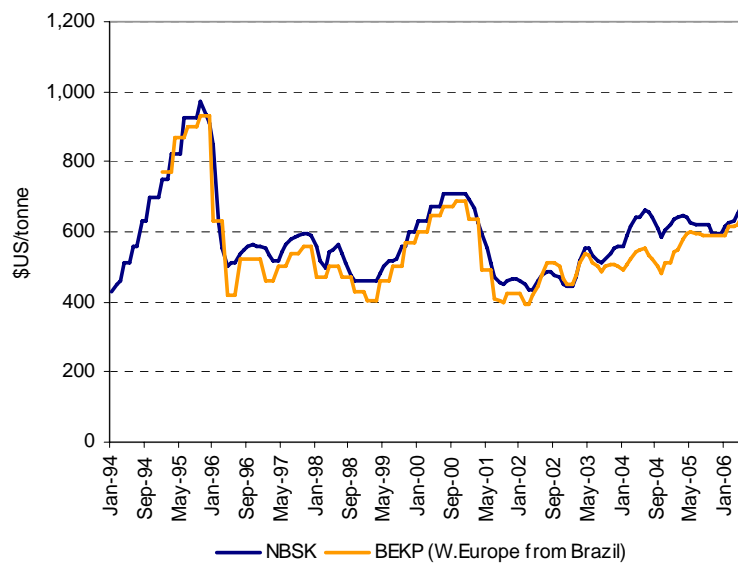
Figure 4-28: Apparent consumption of pulp in Australia



Source: Industryedge (2006)

As discussed in Section 3.2.3, large volumes of hardwood pulpwood will come on line over the next 5-10 years. There may be opportunities for the development of pulpmills or other processing facilities that could utilise this resource to value add domestically, rather than exporting woodchips. However, pulp is more exposed to international markets than other forest products and any new mill would need to ensure it matches world competitive cost benchmarks for production of either kraft pulp or chemi-thermo mechanical pulp (CTMP). Prices for pulp traded on international markets are also notoriously volatile. While prices have been high in recent years they tend to fluctuate with relative movements in demand growth and increases in supply capacity.

Figure 4-29: International pulp prices



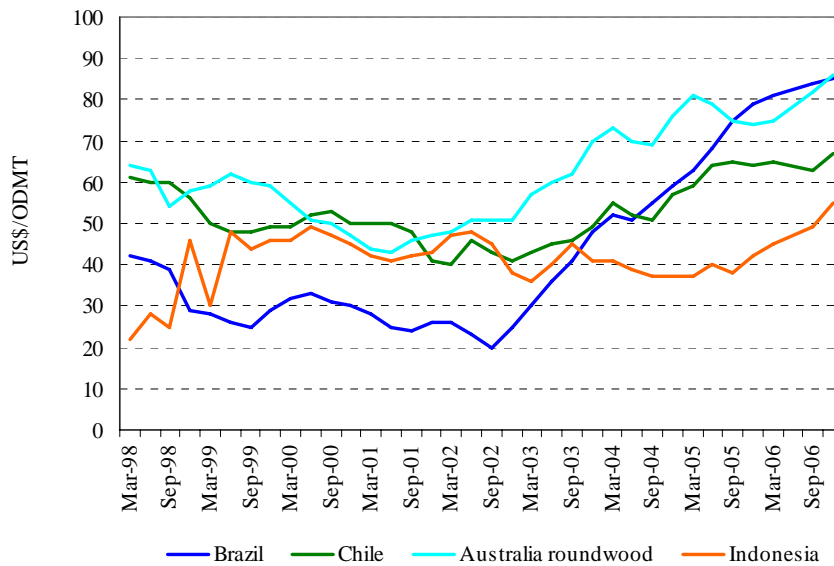
Source: Pulpwatch (2006)

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Cost competitiveness represents a major challenge to pulpmill development in Australia. The cost competitiveness of individual mills can vary substantially with a wide range of factors and exchange rate movements in particular can have a strong influence. In the 1990s the development of pulpmills in Indonesia set the cost benchmark for pulp production. However, Indonesian costs increased as native forest resources have been depleted and plantation resources have not yet matured. This led to the rapidly expanding pulp industry in Brazil, based largely on eucalypt plantation resources, becoming the world's lowest cost producer by some margin in more recent years. However, since 2003 the cost of pulpwood delivered to Brazilian mills has increased dramatically. This is function of an appreciating Brazilian Real as well as integrated producers recognising more realistic returns to the forests. Figure 4-30 shows the significant increases in pulpwood prices in Brazil and other countries. The figure also illustrates that in recent years Australia's relative pulpwood prices have also increased significantly, again reflecting currency appreciation.

Figure 4-30: Delivered hardwood pulplog prices



Source: WRI (2007)

Current prices for plantation hardwood chip exports in Australia provide an equivalent for logs delivered to the mill of around \$A65/m<sup>3</sup> or around \$US105/odmt. The prices paid by domestic pulpmills are commonly lower than the price received for hardwood chip exports to Japan. Japan can afford to pay higher prices due to the structure of its paper market which is relatively protected from import competition through non-tariff barriers. Export parity prices for Australian hardwood chip export suggest that a new domestic hardwood pulpmill would face delivered wood costs higher than other international pulp producers.

The difficulty in achieving international competitiveness in Australia is evidenced through two recent decisions to not proceed with proposed pulpmill developments based on plantation hardwood resource. In May 2006 a proposed investment for a BCTMP mill at Collie in WA was abandoned with the mill proponents citing inability to achieve international competitiveness as a major reason for not proceeding (ARC International). In April 2007 a proposed investment for a BCTMP mill at Heywood in Victoria was dropped in favour of developing a single larger mill at Penola in SA. There is still considerable doubt over whether the Penola mill will proceed.

The cost competitiveness of the proposed Gunns pulpmill in Tasmania could be expected also to suffer disadvantages if it has to pay export parity prices for its pulpwood. However, the availability of cheaper native pulpwood, particularly if it becomes difficult to export in light of increasing plantation supplies, may provide some balance. The recently implemented revised pulpmill process is expected to facilitate a decision by governments over environmental approvals for the mill by the end of 2007.

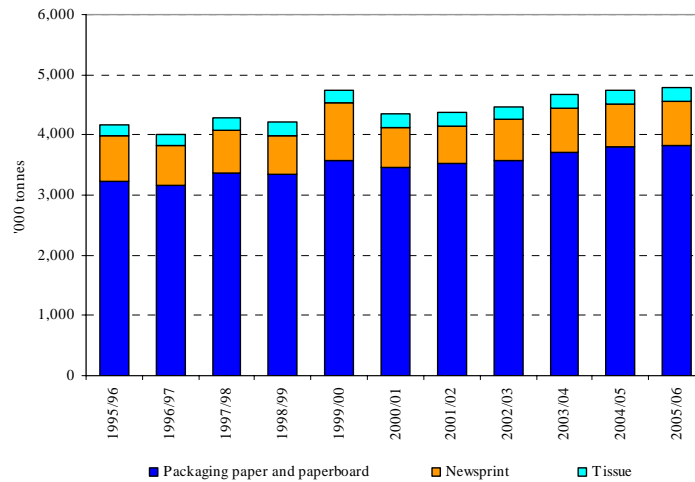
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4.6.2 Packaging, newsprint and tissue

Total consumption of packaging and paperboard, newsprint and tissue has been increasing only slowly in Australia (Figure 4-31). Tissue consumption has been increasing the fastest but represents only a relatively small volume of production.

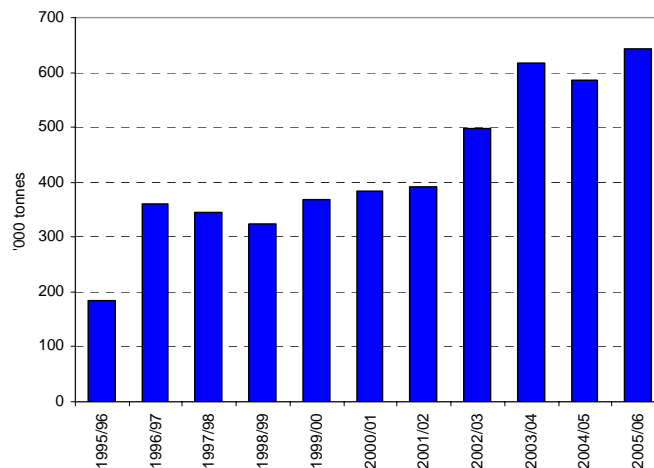
Figure 4-31: Apparent consumption of packaging, newsprint and tissue in Australia



Source: ABARE (2006)

Packaging production currently exceeds domestic consumption and exports have been growing steadily. The planned expansion of the Visy pulpmill at Tumut will therefore need to rely on export markets to absorb its increased production. Exports of packaging and paperboard have increased by an average of 13% pa since 1996 (Figure 4-32). The plans for further production capacity at the Visy mill will rely on growth of packaging exports. Increasing export volumes of kraft linerboard produced by Visy suggest that it is relatively cost competitive in its production.

Figure 4-32: Australian exports of packaging and paperboard



Source: Industryedge (2006)

Australia imports significant quantities of newsprint, generally between around 30-40% of domestic apparent consumption, mostly from New Zealand. The newsprint market is dominated by Norske Skog

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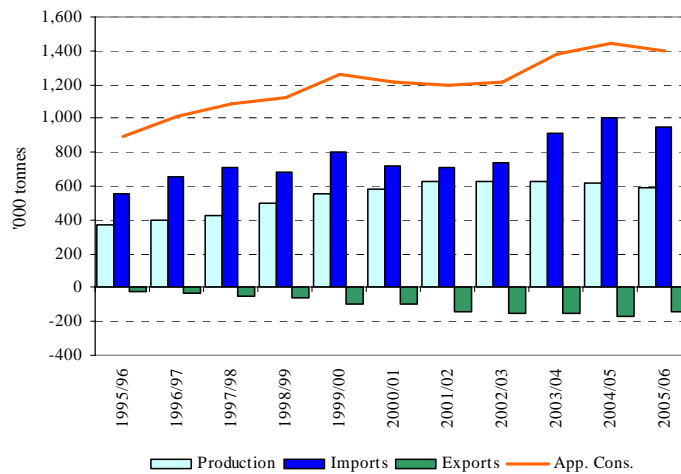
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who has production facilities in Australia and New Zealand and any opportunities for greater domestic production would require Norske Skog participation.

4.6.3 Communication papers

While apparent consumption of communication papers in Australia has been growing relatively quickly, in recent years most of this increase has come from imports, in particular imports of photocopy paper from Indonesia and more recently China. This illustrates the highly competitive nature of international paper markets and the openness of Australian markets to that competition.

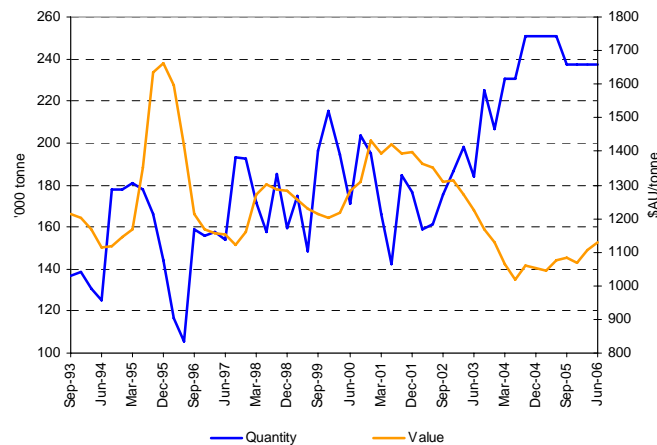
Figure 4-33: Apparent consumption of communication papers in Australia



Source: Industryedge (2006)

The increasing level of imports suggests that Australian Paper has struggled to maintain international competitiveness in communication paper production. Figure 4-34 illustrates how highly competitive pricing has been associated with increasing imports. While export volumes have increased, this reflects imports forcing Australian Paper to sell some of its output on export markets at low prices. Australian Paper is currently undertaking an upgrade of its pulpmill at Maryvale which it expects to improve competitiveness. It has also regained some domestic market share through marketing the higher quality characteristics of its paper, including superior environmental credentials compared to some imports.

Figure 4-34: Quantity and price of imported printing and communication papers



Source: ABS and Industryedge (2006)

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It is expected that some proportion of imported communication papers will have used illegally sourced wood but it is very difficult to identify how much this may account for.

### 4.7 Impact of illegal logging

A report prepared for DAFF in 2005 (Jaakko Poyry 2005) estimated that illegal logging affects around 9% of Australia's forest product imports in value terms, equating to around AU\$400 million pa (based on 2003/04 data). Wooden furniture, miscellaneous forest products, paper and paperboard and sawn timber were identified as the products with the highest risk of using illegally sourced wood. Imports of wood and paper products utilising tropical forests in Asian countries has the highest geographic risk for illegally sourced wood.

The Commonwealth government is committed to reducing the amount of illegally harvested forest products imported into Australia. In pursuit of this goal the government has outlined a series of actions in a discussion paper titled 'Bringing down the axe on illegal logging – a practical approach' (DAFF 2006). These cover a range of domestic and international actions. The domestic actions include raising awareness, introducing voluntary measures, developing certification for sustainable forest management and chain of custody certification and developing purchasing guidelines. Internationally focussed actions include working with exporting countries to improve forest management practices and promoting international collaboration to address the issue.

Reducing illegal logging could have positive implications for Australian domestic hardwood producers through reducing import competition. However, there are a number of practical difficulties associated with identifying and regulating illegally sourced timber and wood products. In particular, frameworks for determining legality differ between countries and the availability and standards of documentation differ. In this environment independent certification for sustainable forest management and chain of custody certification provide the highest level of protection against illegally sourced wood. This suggests that there would be benefits in the Australian government promoting further development of certification systems and developing a timber procurement policy to provide a framework for the government's own purchases of wood and paper products.

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### Key issues and findings

- Engineered wood products will continue to provide new investment opportunities in timber markets. Engineered Strand Lumber (ESL) and Laminated Strand Lumber (LSL) are examples of recently developed technologies that provide opportunities for development in Australia. These products generally compete with other existing wood products but offer advantages.
- Bioenergy and biofuels provide potential opportunities that could develop new markets for wood and improve returns to forestry by providing markets for material that is commonly not utilised at present. However, while there is substantial interest in the potential of these markets, technologies are still developing and their market progress is likely to depend on government regulatory action.
- Research and development into relevant technologies and market issues will assist their development.

This section examines a number of emerging technologies that may influence future development of the forestry and forest products industry in Australia. Changing technologies can have significant impacts on the nature and development of an industry e.g. the development and rapid adoption of MDF had significant implications for the solid wood sector which are still continuing. While it is difficult to predict such changes with accuracy, the technologies discussed in this section can at least be identified as being of potential significance.

### 5.1 Engineered wood products

As discussed in Section 4 the development of engineered wood products (EWP) has already impacted on forest product markets in Australia. In particular, the development of particleboard and MDF production has seen it used in many applications that were once filled by solid wood. In more recent years LVL has become increasingly accepted as a potential replacement for hardwood timber in high strength uses and this trend is expected to continue.

LSL is an engineered wood product that is manufactured from lower grade wood to produce beam products with high physical and mechanical properties. LSL is made in a similar manner to oriented strand board (OSB) whereby timber is flaked into strands, oriented in a longitudinal direction and pressed/glued into billets that can be cut into any size required.

Small quantities are currently being imported into Australia e.g. as part of flooring systems, but LSL has the opportunity to compete with structural softwood and hardwood sawn timber as well as higher strength timber applications and steel. The current cost of production appears to make it most suited to competing at the higher value end of structural timber applications.

Trus Joist (Weyerhaeuser) is the major LSL producer in the USA and markets a proprietary product called Timber Strand. This product is currently made from low cost hardwoods because these woods have few alternatives uses. Timber Strand is used in timber studs in the USA where it competes with solid timber, and it is also being used in I-Joist flanges where it competes with LVL.

Tim Tek is another LSL product in the USA. It has been developed from a product called Scrimber which was originally developed in Australia utilising plantation softwood but did not succeed to commercial production. However, the Scrimber process has been further developed in conjunction with Mississippi State University. Tim Tek technology is considered to be suitable for both softwood and hardwood.

An engineered strand lumber (ESL) product has been developed by the Australian company Lignor that utilises eucalypt hardwoods. With assistance from the Commonwealth government Lignor has been researching and developing ESL and is currently developing plans to build an operational plant in Western Australia. If successful Lignor could create significant competition in domestic forest product markets particularly for higher strength products including hardwood sawn timber and LVL. It would also provide an additional market for hardwood pulpwood. ESL will also have considerable export potential. If

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these markets can be developed there may be potential for ESL mills in other regions with available plantation hardwood pulpwood resources.

Wood-plastic composites are another group of products that could generate competition in solid wood markets. These products are not new and the automobile and door industries have used composites of wood and plastic for decades. They typically use sawdust as their wood input. However, markets for extruded wood-plastic composites have been growing rapidly, particularly in the USA.

Composite flooring is an engineered product that is already widely produced overseas and is imported into Australia. Composite flooring is also manufactured domestically but not on the scale commonly applied in other countries. Composite flooring typically consists of substrate of plywood or MDF with a veneer on top for appearance and is usually installed on top of a concrete slab or on particleboard where timber floors are used. Some composite products use paper which photographically provides an image of wood. These types of flooring products provide highly competitive markets for solid wood floors and are likely to continue to do so.

It is difficult to predict the exact nature of emerging wood products and their impact on forest product markets. However, it is clear that ongoing technological change will continue to keep forest product markets highly competitive. In this regard it is in the interests of future industry development to allow open and competitive markets to facilitate development of these products. It also suggests that ongoing support for research and development associated with new products will provide benefits for industry development.

### 5.2 Bioenergy and biofuels

#### 5.2.1 Bioenergy

Government policy is a major driver of demand for renewable energy. In 2001 the Commonwealth government introduced the Mandatory Renewable Energy Target (MRET) scheme. This mandated that 2% of Australian electricity output will be from renewable sources by 2010 and this target was later extended to 2020. A 2% target is equivalent to 9,500GWh of electricity. Under the scheme renewable electricity generators are issued with Renewable Energy Certificates (RECs) which are tradeable (1 REC = 1 MWh of renewable energy). Electricity wholesalers are required to provide RECs for specified targets each year, moving up to 2% by 2010 and remaining at that level till 2020. RECs can also be used as NSW Greenhouse Abatement Certificates (NGACs).

Internationally, wood based bioenergy production is developing rapidly. The European Union (EU) has created strong incentives for the production of renewable energy. It has established a carbon emissions trading scheme aimed at reducing commercial carbon emissions and has also set a renewable energy target for member countries of 20% by 2020. Other countries are following this lead, for instance Japan has recently established a 3% renewable energy target, to be fulfilled by 2010.

The strong incentive created in the EU for wood based bioenergy has increased demand for wood, particularly wood pellets (small, easily transportable pellets of dried, compressed wood waste that burn extremely efficiently), and international trade and prices for wood pellets in Europe have increased as a result. EU countries with strong markets for wood fuel include Sweden, Finland, Denmark and Austria. In Finland, the largest producer of wood based bioenergy, 20.4% of total primary energy is produced through wood fuel. In Sweden wood produces 15.5% of total energy production, in Denmark 5.5% of production, and in Austria 10.7% of production (EuroObserv'ER 2005). In these countries, wood is used for heat production in District or Combined Heat and Power plants (DHPs and CHPs) close to cities and towns. Wood is extensively used as a heat source due to strong government financial support which assists in achieving cost competitiveness against other heating sources.

Despite the MRET scheme, levels of demand for wood bioenergy production seen in the EU have not been experienced in Australia thus far. The recent growth in the EU wood bioenergy market can be attributed to ongoing financial support by some national governments, combined with strong overarching targets and support from the EU (EuroObserv'ER 2005). Government funding for wood bioenergy projects

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in Australia has been more limited, and has been made available to a range of renewable energy producers including already established hydro and wind energy producers.

A range of technologies exist for generating electricity from wood including direct combustion, co-firing, gasification, pyrolysis and fermentation. Co-firing of wood waste in coal power generators does not require significant investment in technology and has been investigated and trialled by a number of generators including CS Energy and Tarong in Qld, Lidell in NSW, and Verve Energy in WA. However, currently there are also three proposals for direct combustion bioenergy plants in WA, ranging in size from 20 MW to 45 MW. The plants will require much more technological investment and will be fuelled primarily by local forest plantation residues.

Western Power (now Verve Energy) established a pilot Integrated Wood Processing (IWP) plant in WA to test joint production of eucalyptus oil, activated carbon and electricity in an integrated manufacturing process. The demonstration plant reportedly proved the viability of the IWP process and the company is now seeking investment in a commercial scale facility.

The relative cost competitiveness of wood based bioenergy plants compared to existing coal fired plants has been the major limitation on investments to date. While schemes like MRET and carbon trading will improve the attractiveness of bioenergy investments, it appears that without such interventions, investments will not proceed in the immediate future. The cost competitiveness of wood bioenergy in Australia is subject to substantial uncertainty and the competitiveness of biomass electricity generation is reported as significantly below that of coal (Table 5-1). More recent estimates from Verve Energy suggest bioenergy production costs of \$120/MWh compared to \$90/MWh for wind and \$50-60/MWh for coal. Other limitations such as policy uncertainty and the high cost of technology make potential returns on investment uncertain, particularly in Australia. The current value of a REC is around \$12-13/MWh which helps to balance the cost disadvantages of biomass generation.

**Table 5-1: Average cost of electricity for different forms of generation**

Form of electricity generation	Average cost of generation (\$/MWh)
Coal	24-43
Co-firing biomass	42-61
Co-firing bagasse	45-70
Biomass	54-103
Wind	66-107
Solar	182-271

Source: NAFI (2005)

As a result of the growing international bioenergy market there is a developing interest in Australia to export wood biomass for bioenergy production, particularly to the EU market which is currently the largest and fastest growing in the world. Canada is currently a major exporter of wood pellets to the EU, shipping pelletised wood waste from the west coast of the country to the large markets in Northern Europe. Anecdotal information suggests that Canadian companies earn good returns, as increasing demand in Europe has recently pushed prices to record levels (Daugbjerg-Jensen 2007).

At present there are reported to be investors in WA and NSW pursuing wood pellet production for export to the EU. Production is reported to be based on forestry and agricultural residues but there is interest in other feedstock such as mallee eucalypts (John Bartle *pers. comm.*). Resource and capital costs are reported to be low for pellet production although finding a reliable and readily accessible supply of resource may affect the feasibility of these investments.

Production of wood pellets for export also raises potential environmental issues which may need to be addressed by Australian exporters in the longer term. The use of wood pellets is driven by the demand

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for a carbon neutral and sustainable/renewable fuel source. When the full costs of Australian exports to the EU are considered, carbon emissions created to transport the pellets may compromise the environmental benefit of the fuel use in the first place. Furthermore, the impact of harvesting forest and crop residues, which would normally form part of the soil nutrient cycle, may also have adverse implications for plantation productivity.

The emerging nature of bioenergy policy and the bioenergy market make it difficult to predict its future development and the implications for the forestry sector. Most countries are still in the early stages of government incentive schemes to encourage the use of renewable fuels. As a result, policy volatility is high, potentially opening and closing market opportunities depending on domestic and international developments. While EU markets appear strong and have been established for some time, the size of potential demand may not justify up front investment costs. In addition, energy technology investment is high at present and markets for new innovative energy sources may open in future. In summary while bioenergy presents a potential opportunity for the forestry and forest products industry it is also subject to high levels of uncertainty and risk.

### 5.2.2 Biofuels

Biofuel production also presents an emerging market opportunity for forest products as concern grows about the negative impacts of fossil fuels on the world's climate and the limitations to global oil supplies are realised. The major prospect that biofuels hold is as a substitute for petroleum products in the transport sector.

Biofuel production world wide currently stands at over 18 million tonnes of oil equivalent (Mtoe) pa most of which is produced in Brazil (ethanol from sugarcane) and the US (ethanol from corn), with 2.5 Mtoe produced in the EU (biodiesel, mostly from rapeseed oil) (O'Connell *et al.* 2007). Biofuel production in Australia is currently relatively small (75ML of ethanol, 50ML of biodiesel) and is based on a range of feedstocks including coarse grains and wheat, molasses and sugar cane (O'Connell *et al.* 2007).

World production of biofuels is growing fast as many developed countries invest heavily in supporting research and development into production processes and biofuel crops. In Australia, the Commonwealth government introduced a policy that increases the economic incentives of biofuel investment and set a biofuel production target of 350 ML by 2010 (CIE 2005). The ongoing development of sustainable energy policies is likely to see continued support for next generation biofuels.

The liquid biofuels of most significance to the forest industry in Australia are ethanol, methanol, and synthetic diesel (Cummine 2007). Of these, ethanol is attracting by far the most attention.

Ethanol is produced by fermenting the sugars contained in plant biomass. All current world production of ethanol is based on the fermentation of 'first generation' feedstocks (direct sources of starch or sugar such as corn and sugar cane). While these feedstocks are readily accessible, there is uncertainty regarding their viability for long term supply. This is due to the strong ongoing competition for these feedstocks from other large consumers including the food and agricultural feed markets.

'Second generation' (lignocellulosic) feedstocks include sugarcane bagasse, wheat straw, cotton gin trash, algae and wood. Because second generation feedstocks can include crop and forestry waste, the resource cost is estimated to be much lower than that of first generation feedstocks. However, lignocellulosic production technology is more complex, having initially to break down the woody material into sugars, and is yet to be commercialised anywhere in the world.

Although development of efficient and viable lignocellulosic breakdown technologies has been the subject of research for decades, it has only recently become a very high priority, and is now the target of large scale public and private R&D funding around the world. For instance, the US, China, and Canada all have large scale research facilities dedicated to developing the efficiency of the lignocellulosic process ([www.biofuelreview.com](http://www.biofuelreview.com)). Hydrolysis using enzymes remains the most popular method being trialled, but increasing attention is being paid to concentrated acid hydrolysis.

The latter technology is being used in the Australian designed pilot plant at the Harwood sugar mill in northern NSW. That pilot plant, reported to have strong commercial potential (Cummine 2007), is being

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constructed by Ethanol Technologies Ltd, which is 51% owned by Willmott Forests (a domestic plantation and wood processing company), and many individual sugar cane growers. The plant will also demonstrate the extraction technology developed by Apace Research Ltd that produces ethanol without using conventional steam distillation, thereby avoiding large volumes of noxious effluent to be treated and disposed of.

## Section 6

## Land management and climate change

### Key issues and findings

- The effects of global warming are expected to result in annual average warming of temperatures in Australia and changes in average annual rainfall, most likely reduction. When rainfall changes are combined with increases in potential evaporation, a general decrease in available soil moisture is projected across Australia, with droughts likely to become more severe.
- Reductions in productivity of forests and plantations, increased competition for water resources and increased frequency and severity of fires present significant risks to the forestry industry.
- Growing concern over water availability has led to an increasing focus on how forests, both plantations and native, use water. It is important that the relationship between water and forests is well understood at a landscape level to ensure the forestry industry receives fair and equitable treatment in the water debate.
- Fire management in Australia needs to evolve to meet the new challenges that are resulting from climate change, a growing urban/rural interface and an increase in the area of conservation reserves. A greater shift in thinking from fire suppression to prevention (fuel management) is a critical step.
- The introduction of carbon trading represents opportunities for the forestry industry to generate additional value from plantations and hence encourage greater investment in plantation development. In order to maximise the potential benefits of a carbon trading scheme it will be necessary to address challenges regarding the complexity and costs of carbon accounting systems.

In the section key issues relating to the physical environment in which the forestry industry operates are considered. In particular, the need to deal with changes arising from global warming and land management issues are expected to impact on the forestry sector.

### 6.1 Overview of climate change impacts

There is general consensus amongst the scientific community that global warming is occurring and will continue into the future. The Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC TAR 2001) concludes that global warming has taken place over the last century and that most of the global warming that has occurred over the past 50 years is attributable to human activity. Projections of global warming in the 21<sup>st</sup> century are dependent on scenarios of future emissions of greenhouse gases. Average projections of temperature increase range from 1.4 °C to 5.8°C by 2100 relative to 1990 (AGO 2003).

Climate change is evident in both a change in average temperature and rainfall, as well as changes in the frequency and severity of extreme weather events, such as droughts and floods. Australian average temperatures have risen by 0.7°C over the last century and rainfall has increased over the last 50 years over north western Australia, but decreased in the south west of Western Australia and in much of south eastern Australia (AGO 2003).

CSIRO projects an annual average warming of 0.4 °C to 2°C over most of Australia by 2030, and of 1 °C to 6°C by 2070 (relative to 1990), with slightly less warming in some coastal areas and Tasmania, and the potential for slightly more warming in north western Australia. Projections for changes in average annual rainfall are most severe in the south west of the country, ranging from -20% to +5% by 2030 and -60% to +10% by 2070. In parts of south eastern Australia projections range from -10% to +5% by 2030 and -35% to +10% by 2070. In other parts of northern and eastern Australia there could be an increase or decrease in rainfall at a given locality (AGO 2003). When rainfall changes are combined with increases in potential evaporation, a general decrease in available soil moisture is projected across Australia, with droughts likely to become more severe.

Climate change presents some significant risks to the forestry and forest products industry, particularly reductions in productivity from reduced rainfall and increasing pressure on forestry to reduce water

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interception, as well as the impacts of increased fire risk. However it also presents opportunities to capture economic value through carbon sequestration activities. Adaptation to climate change, through means such as species development, silvicultural management and plantation placement, can potentially offset some of the adverse impacts, but this will come at a cost.

Future forest productivity will depend in part on the balance between the benefits of increased carbon dioxide and the patterns of change in rainfall and temperature (CSIRO 2001). Where carbon dioxide levels rise and there is no change to rainfall, tree growth rates may increase, whilst the opposite will be true under reduced rainfall scenarios. Research on the relationship between forests and climate change in the United States, summarised in AGO (2003), found that species will generally migrate towards the poles or to higher altitudes in response to increased temperatures, but that species mix may change and the rate of migration will depend on seed dispersal, the spread of insects and disease, the role of wildfire and human intervention. Warming is expected to accelerate insect development and facilitate expansions in the ranges of pests. Drought will reduce forest productivity, and drought induced reductions in decomposition rates may cause a build up of organic material on the forest floor, which has implications for fire regimes.

The viability of future plantations will depend in part on adequate planning for climate change and variability, control of fire and interactions with soil moisture and water supply. The following sections address the land management issues associated with water management and fire mitigation, and opportunities and challenges in carbon sequestration markets.

### 6.1.1 Carbon sequestration

The forest and wood products industry is one of the few industries that is carbon positive. The combination of carbon sequestration in growing trees and the long term carbon storage in wood products represents a significant net store of carbon. In 2004, a net 14.9 million tonnes of carbon were removed from the atmosphere through sustainable forestry and the increase in carbon stored in wood products (FWPRDC and CRC 2006). Furthermore, the use of wood products is consistently more greenhouse friendly than alternative building materials.

Increasing concern and building consensus over the role of human activity in global warming suggests it is likely that a price will be imposed on carbon in the future and that trading systems will be applied to carbon. Thus it seems that forests will have a role in strategies for reducing net carbon emissions. This presents a significant opportunity for the forestry sector as the introduction of carbon trading will provide additional value for plantation investors and therefore could be expected to encourage increased investment in plantation development. However, a number of issues and challenges need to be overcome to take best advantage of the opportunities presented to the forestry industry.

Carbon trading mechanisms are already in place in various countries and regions around the world and in Australia. Under the Kyoto Protocol which provides an existing global framework for development of approaches to reducing carbon dioxide emissions, limits on carbon emissions can be met through direct reductions of emitters (inside the gate technology or production changes that reduce carbon dioxide emissions); investment via the Clean Development Mechanism (CDM) or Joint Implementation (JI) processes (which involves investments in third countries to reduce emissions), or through buying offsets via an emissions trading scheme.

Internationally the European Union Emissions Trading Scheme (ETS) is the most advanced compulsory scheme operating around the world. Voluntary schemes have also been developed in Japan, the UK, Switzerland, the USA and Canada (proposed). The world trade in carbon allowances has been growing strongly, reportedly showing a 2,500% increase in value of carbon trades and an 850% increase in volume of CO<sub>2-e</sub> between 2004 and 2005, and is continuing to grow in 2006 (Point Carbon 2006).

Domestically, the NSW and ACT governments have developed a Greenhouse Gas Abatement Scheme (GGAS) which aims to limit carbon dioxide emissions by the electricity sector and other major emitters. Under these schemes forest sinks are required to be:

- On Kyoto eligible land;

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- Able to demonstrate appropriate risk management procedures;
- Able to maintain sequestration activities for 100 years;
- Consistent with the Australian Standard for Carbon Accounting;
- Conservative in estimating abatement claims through allowances for uncertainty; and
- Subject to financial assurances as part of investments.

The NSW/ACT GGAS is structured around mandatory requirements on electricity retailers, major electricity users and selected major projects (known as benchmark participants) to reduce greenhouse gas emissions. Targets are set for individual benchmark participants proportionally based on state wide reduction goals. Participants can meet their targets by purchasing NSW Greenhouse Abatement Certificates (NGACs) and surrendering them to the Independent Pricing and Regulatory Tribunal of NSW (IPART).

Under the NSW/ACT scheme an NGAC is equivalent to 1 tCO<sub>2-e</sub> reduction. Large users can claim credit for reducing greenhouse gas emissions from non-electricity related processes at sites they control and can also claim credit for surrender of Renewable Energy Certificates (RECs) under the Mandatory Renewable Energy Target (MRET) scheme. There is a financial penalty of \$11.00 per tonne of CO<sub>2-e</sub> for not meeting targets. The price of NGACs is currently around \$12-13/NGAC.

There appears to be a preference amongst carbon emitters towards emission reduction strategies rather than carbon sequestration. In 2005 the number of abatement certificates in NSW increased to more than 9 million tonnes of CO<sub>2-e</sub>. However of a total of 146 NGAC providers, only 4 were for carbon sequestration, an equivalent of 0.5 million tonnes of CO<sub>2-e</sub>.

The State governments have developed plans for a national emissions trading scheme and a public discussion paper was released in 2006.

In December 2006 the Prime Minister appointed a joint Commonwealth-business Task Group to advise on the nature and design of a workable global emissions trading system in which Australia would be able to participate. The Task Group provided its report to the government on 31 May 2007 (Australian Government 2007). It concluded that there would be benefit in the Commonwealth government setting a post-2012 constraint on carbon emissions and that an emissions trading system would help achieve reductions in carbon emissions at least cost. It also recommends that the introduction of an emissions trading system be progressed with careful planning and implementation, and proposes a cap and trade model as the preferred means.

The Task Group report recognises the potentially important role that the forest sector can play in achieving carbon offsets. In particular, it identified that forests can play a potentially important role as carbon sinks and especially in building familiarity with offset credit mechanisms and assisting in achieving least cost abatement should an emissions trading system be introduced. It is observed in the report that current methodologies in international emissions accounting assume that all carbon within a tree is emitted upon harvest and suggests that Australia could play a role in leading the way in the development of approaches that maximise the potential of carbon sinks, including developing methodologies that recognise carbon remains locked in the timber until it decays.

The Commonwealth government's 2007/08 budget also included taxation provision to support the development of carbon sink forests. Under the arrangements provided for in the budget, carbon sink forest operators will be allowed to depreciate the costs of establishing a qualifying carbon sink forest under the horticultural plant provisions over a period of 14 years, with effect from 1 July 2007. This compares to the current arrangements under the horticultural plant provisions which would only allow depreciation over the effective life of such a forest, a considerably longer period. In addition, the government will introduce immediate deductibility for costs incurred in establishing a qualifying carbon sink forest during a 5 year period commencing 1 July 2007. The immediate deduction will take precedence over the general horticultural provisions during this period. To be eligible for carbon sink forest tax concessions, businesses will need to participate in the Government's Greenhouse Challenge

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Plus program. Carbon sink forest projects must also demonstrate that they comply with environmental and natural resource management guidelines for their geographic location.

Another significant challenge facing the development of forest sinks is the complexity and cost of carbon accounting systems. Specialist skills and resources are required to develop and manage highly technical carbon accounting systems and processes. Competition for these skills is likely to be very high amongst the industry and retention of skills may therefore be challenging. It also appears that the complexity of rules for forestry and especially the need to maintain carbon sequestration activities over 100 years may act to discourage investment in forestry relative to other options.

Development of carbon abatement policy in Australia is still in relative infancy. It is critical that the interests of the forestry industry are well represented in policy forums to maximise the value the industry can achieve from carbon markets and overcome some of the issues of carbon accounting.

## 6.2 Water

Water availability and security is a critical issue to the agricultural and forestry industries in Australia, and presents a significant risk to future expansion of the plantation estate. Decreasing security of water supplies in the future, particularly given the likely drought impacts of climate change, will accentuate competition between users and threaten allocations for environmental flows and future economic growth. In this environment it is likely that users will pay increasing prices for water.

Increasing concern over water availability has led to significant government initiatives over the last decade or so. The National Water Initiative is committed to identifying over allocated water systems and restoring those to sustainable levels, expansion of the trade in water, creating more secure water access entitlements and better water planning. Given that plantations use more water than pasture it is likely that these changes will impact on plantation investors. As part of this there is an identified need to better understand the impacts of plantations on stream flow in the context of sub-catchments and larger areas. There is also a need to ensure that the relative economic value of forests versus pasture/grazing is recognised in efforts to regulate use of water.

Most recently, the Commonwealth government released a National Plan for Water Security. Under this plan the government proposes to revise water sharing plans for each valley in the Murray Darling Basin to include revised water use caps and provisions for flow interception activities, including plantation development. This initiative demonstrates the increasing focus on how plantations use water.

State governments have responded to the issue of plantations and water use in different ways. For instance, in the Green Triangle region of South Australia water use issues were the subject of widely based consultation between governments and regional agencies, the forestry and forest products industries and irrigation based primary industries. The outcome of these consultations was that plantations were categorised as a water affecting activity and up to 60,000 hectares of additional plantations were allowed without the need to offset plantation water use against water holding licences. However, this right is tempered by water use entitlements being based on 'hundreds'<sup>1</sup> that could significantly limit plantation expansion on a local basis as well as more generally in the future. .

In Victoria DSE is developing land use strategies to deal with the impact of plantations on water availability and use. This may involve the targeting of plantation development to areas which meet various environmental criteria and the limitation or charging of a financial levy on future plantation development. The Victorian government is also currently assessing options for reduced logging in Melbourne water catchments as a way of increasing water yield.

On the other hand water use by plantations can assist in addressing salinity issues so plantations can be seen as providing strong benefits in catchments where salinity is a problem. Significant levels of funding

<sup>1</sup> A 'hundred' is a measure of land area used in South Australia that is based on an area of 100 square miles.

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have been committed to tree planting initiatives for salinity control through the National Action Plan for Salinity and Water Quality.

It is important that the relationships between water and forests both native and plantations is well understood. In particular, the broader role of how forests both use water, contribute to water quality and provide other environmental services at a landscape scale within and between catchments will be important to ensure that the full value of forests is understood. Research and development into these relationships should therefore be a priority for the forestry and forest products industry. Furthermore, it will be important that the industry be well represented in the water use debate to ensure it receives equitable treatment with other land uses.

### 6.3 Fire

Fire has occurred naturally in Australia for millions of years and most ecosystems have developed a specialised relationship with fire. The south eastern regions of Australia are some of the most fire prone regions in the world and bushfires have resulted in significant loss of life and property in Australia since European settlement.

There has been substantial government investment in bushfire prevention, control and recovery over the last 50 years. However the occurrence of major bushfire events in recent years, particularly in Victoria, NSW and the ACT, has led to increasing concern about the impact of bushfires on communities, the forest industry and the environment, and has placed fire management practices under increasing scrutiny.

A number of changing circumstances over the last two decades have acted to heighten bushfire risk and are likely to continue to do so in the future. The changes include:

- Climate change will result in parts of Australia becoming hotter and drier. Many recent studies have confirmed the relationship between global warming and increased fire frequency and intensity in parts of Australia. A study by the CSIRO found that climate change will lead to an increase in fire weather risk in many areas, with the combined frequencies of days with very high and extreme Forest Fire Danger Index (FFDI) ratings likely to increase by 4%-25% by 2020 and 15%-70% by 2050 (Hennessey et al 2005). The study found that the increase in fire weather risk is generally largest inland, with Tasmania likely to be relatively unaffected. In addition to increased fire weather risk, fire intensity and severity will also be affected by increased fuel loads resulting from drought conditions;
- Manipulation of fuel type, load and arrangement is necessary to help protect local areas of high value, particularly in light of the increased risks posed by climate change. Government agencies are finding it increasingly difficult to meet fuel management targets due to several influences including increased risk of property damage as the urban/rural interface grows, fewer days with suitable conditions for fuel reduction burning and community concerns regarding smoke pollution. Furthermore, an increase in the area of forests in conservation reserves, rather than productive forestry, decreases the incentive to manage fuel loads. Fuel reduction burning needs to be given a higher priority to reduce the risk of bushfires causing damage to life, property and ecological values. This requires ongoing research into fire behaviour, ecological effects and the development of prescribed burning guides for all forest types. It also requires commitment and resources to ensure annual prescribed burning targets are met, and community education on the value of prescribed burning;
- The creation of new conservation reserve areas has also led the closure, or lack of maintenance, of many roads and fire trails, which has implications for fire suppression activities. There is a need to review the adequacy and maintenance of access roads, bridges and fire trails to ensure good access for fire fighters and a suitable network of roads from which prescribed burning can be carried out. The decline of the native forestry and forest products industry in many regional areas associated with increasing reservation of native forests has also led to a loss of many experienced bush workers and the heavy earthmoving equipment owned by the timber industry available for fire fighting in forests; and

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- The urban/rural interface is expanding in many areas of Australia as areas with bush land become more populated with the urban sprawl. Fire management is currently largely divided between urban and rural sectors and the interaction between fire management agencies is not keeping up with the growth of the urban/rural interface. There needs to be greater interaction between fire agencies to ensure the development of clear approaches for responsible fire management in areas of rural/urban interface.

## Section 7

## Research and development

## Key issues and findings

- Research and development (R&D) expenditure plays an important role in developing new technologies, improving efficiency in the forestry and forest products industry and informing government policy and programs.
- Forestry and forest product R&D expenditure has both declined in real terms, and shifted significantly away from corporate generated expenditure to Commonwealth and State government sources. In 2001/02, government sourced expenditure accounted for 46% of R&D expenditure, whilst companies contributed 15%, down from 24% in 1981/82.
- Expenditure on forest products research has reduced more significantly than forest and plantations related research, highlighting the decline in corporate generated expenditure in research relevant to forest products.
- The trend in company based expenditure appears to reflect a range of changes in the sector, including greater involvement of international companies in the Australian wood products manufacturing sector. This may have led to some company based R&D being completed offshore.
- A major change in the program development and delivery of forestry related R&D was established through the Forest and Wood Products Research and Development Corporation (FWPRDC). The FWPRDC developed a strategic R&D plan, involving public and private industry participants along the forest and wood products supply chain. Forest and Wood Products Australia (FWPA), which has now replaced the FWPRDC, is likely to have similar consultative processes for its R&D investment planning.
- Commonwealth government funding is of increasing importance and continuing this funding commitment is a key to the further development of the forestry and forest products industry. As part of this, Commonwealth government support of ENSIS and other potential forest sector R&D vehicles is critical. Communicating and engaging with stakeholders in the development and implementation of these programs would assist in identifying and meeting sectoral R&D needs.

This section examines issues related to research and development expenditure in the Australian forestry and forest products industry.

## 7.1 The case for government funding of research and development

The Productivity Commission (Productivity Commission 2006) has identified that public support for R&D provides an important input into innovation. It also identified two important rationales for public funding of R&D: the enhancement of government activities e.g. in developing approaches to environmental protection; and the existence of spillovers from R&D activities whereby it is not possible for private investors to capture all of the benefit from investing in research and development. The Productivity Commission also concluded that on the basis of multiple strands of evidence public R&D expenditures provide net returns.

Government support for R&D in the forestry sector appears consistent with these observations. In particular it can play an important role in developing new technologies ranging from growers through to end product processors. Particular areas that would benefit from R&D expenditure identified throughout this review of the forestry and forest products industry over the next 10-15 years include:

- Further investigation of the environmental impacts of plantations particularly in relation to water use and developing workable approaches to determining in monitoring carbon storage;
- Approaches to and the effects of more intensive management of native forests;
- The social and economic impacts of the forestry and forest products industry;
- Development of new production technologies and emerging products and markets;

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- Species and optimal silvicultural management practices for hardwood sawlog plantations; and
- Fire management.

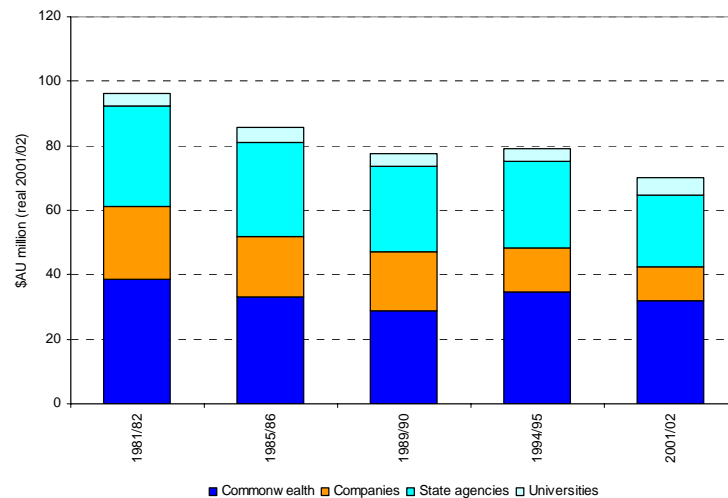
7.2 Research and development funding trends

In 1980, R&D expenditure had three main sources: Australian and State governments and corporate funding. A survey completed by Turner & Lambert (2004) showed that real expenditure in 2002 dollars on total forestry and forest products R&D declined from \$96 million in 1980/81 to \$70 million in 2001/02, with the most significant decline occurring in forest products research (Figure 7-1). Company based funding of R&D more than halved in this period. The corporate contribution in 2001/02 was down to 15% of total expenditure, with the Commonwealth and State Governments contributing 46% and 32% respectively of overall funding.

The trend of expenditure is partly reflective of the changing focus in the forest sector through this period, and also of the industry structure. Funding in forest research shifted significantly towards native plantation species and away from native forest management, reflecting the increasing importance of hardwood pulpwood plantation development as well as interest in hardwood sawlog plantations.

Through this period, the entry of a number of international wood manufacturing companies into Australia has likely contributed to R&D programs becoming more international whereby R&D is completed in a range of countries.

Figure 7-1: Real expenditure on forest and forest products research



Source: Turner and Lambert (2004)

Three other major trends have occurred in the forest sector R&D programs during the past 15 years:

- The Commonwealth government has supported the development of Co-operative Research Centres (CRCs), where a CRC is established to focus on a particular area of research. Forest sector research has been spread through a range of CRC programs such as the CRC for Sustainable Ecosystems, Bushfire, Catchment Hydrology, Greenhouse Accounting, Temperate Hardwood Forestry and Sustainable Production Forestry. This model involves the linking of industry and universities for defined periods to focus on a particular area of research. Expenditure through the CRCs, and the involvement of industry both public and private, has resulted in the building of a body of knowledge relevant to particular sectors;
- The development of the Forest and Wood Products Research and Development Corporation (FWPRDC) has resulted in a structure which allows government agencies and industry corporations to jointly plan and oversee an agreed R&D program. The joint funding structure, linking agreed

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levies with matching Commonwealth government funding and voluntary State Government funding, has created a pool for R&D programs. The FWPRDC management has developed an interactive process of developing and prioritising an industry wide R&D plan; and

- The development of ENSIS, a joint venture between the CSIRO Forest and Forests Products Division and the New Zealand Scion research agency. ENSIS is seeking to capitalise on the complementary skills of the two organisations as well as securing efficiencies in R&D programs in the sector.

Whilst the key funding sources are Government supplied, real Australian and State government expenditure declined in the period 1981/82 to 2001/02. During this period, the forest sector may have been considered of a lower priority area of research for receiving government budgetary support, and particularly where other sectors (i.e. the resources sector) have developed higher profiles. However in recent times, the profile of the forest sector has risen as interest in the role of forests as carbon sinks has risen in association with concern over global warming. In the short term the forest sector has an opportunity to capture additional funding due to its critical role in both minimising and adapting to global warming.

### 7.3 R&D issues and policy implications

The key trends in the forestry and forest product related R&D are:

- The rising importance of Commonwealth government support for forest sector research;
- Establishment of an effective vehicle for coordination of part of the forest sector research program through FWPA;
- Continuing contribution of State government funds; and
- Declining expenditure from Australian based corporations.

These trends highlight major policy implications:

- With increasing reliance on Australian and state government funding, maintaining Commonwealth and State government support for R&D expenditure is critical to ongoing industry development;
- Climate change is now a high profile and key platform in Australian and State government policy settings. Climate change could manifest itself in water and fire issues in native forest and plantation management, but also through the potential benefits in carbon sequestration through forest and wood products. This raised profile provides R&D programs with the opportunity to capture additional support from the government research budgets;
- The FWPA which will be established in the near future will generate additional R&D funding and has been designed to improve the consistency between industry priorities and R&D expenditure. However, the level R&D funding to be managed by FWPA remains considerably less than R&D funds provided through other government agencies, in particular CSIRO/ENSIS;
- With the reliance on government funding, efficient R&D programs would ideally include a development and priority setting process that includes the range of stakeholders, including governments and industry. Therefore the development of a communication and consultation program in both Australian and state government expenditure priorities would assist in ensuring industry needs are identified and met through the R&D providers. The model developed by the FWPRDC for cooperatively identifying R&D priorities should be adopted by these other R&D providers.

**Section 8****Social and economic impacts****Key issues and findings**

- The forestry and forest products industry contributes significantly to the economic and social well being of Australia and particularly the regional communities in which it operates.
- Despite the contributions made by the plantation sector, some communities are concerned at the speed at which plantation expansion has occurred.
- The forestry and forest products industry has demonstrated that it can provide significant opportunities for Indigenous communities and there is potential for this to be expanded, particularly given the need for plantation land.
- Skills shortages are a threat to the forestry and forest products. Regions with large volumes of hardwood pulpwood coming on stream will require significant additional skilled workers.
- A decline in forestry students at tertiary level could make it harder to find professionals for the industry in the future.

This section provides an overview of the nature of the substantial economic and social benefits that the forestry and forest products industry generates for the Australian economy, especially in regional Australia. It also highlights the importance of ongoing development of skills and education in the sector. Opportunities for forestry activities to generate economic and social benefits for Indigenous Australians are also discussed.

**8.1 Social and economic impacts**

There is no single source of information on the economic and social contribution of the forestry and forest products industry to the Australian economy. Data on industry production and employment are provided primarily through the Australian Bureau of Statistics (ABS) and the Australian Bureau of Agricultural and Resource Economics (ABARE 2006). Other organisations undertake analysis of the forestry and forest products industry from time to time. This has included a range of studies conducted around regional Australia by organisations including Private Forestry Development Committees (PFDCs), regional development organisations, and industry associations. URS Forestry (2003) provides a summary of available information.

**8.1.1 Income and employment generation**

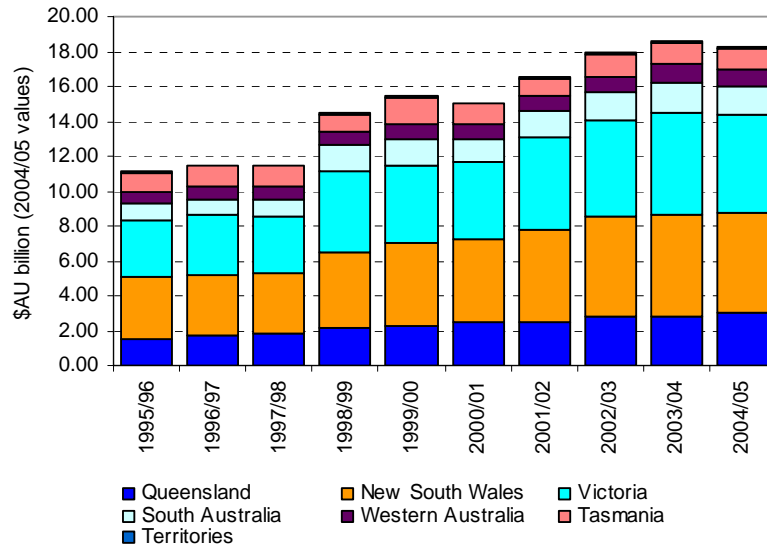
As noted in Section 2.2 Australia's forestry and forest product industries generates around \$18 billion in annual turnover and employs around 83,000 people. The value of turnover and numbers employed have been growing at an average 2.7% pa since the mid 1990s.

Victoria and NSW each account for around 30% of income generated by the national forestry and forest products industry (Figure 8-1).

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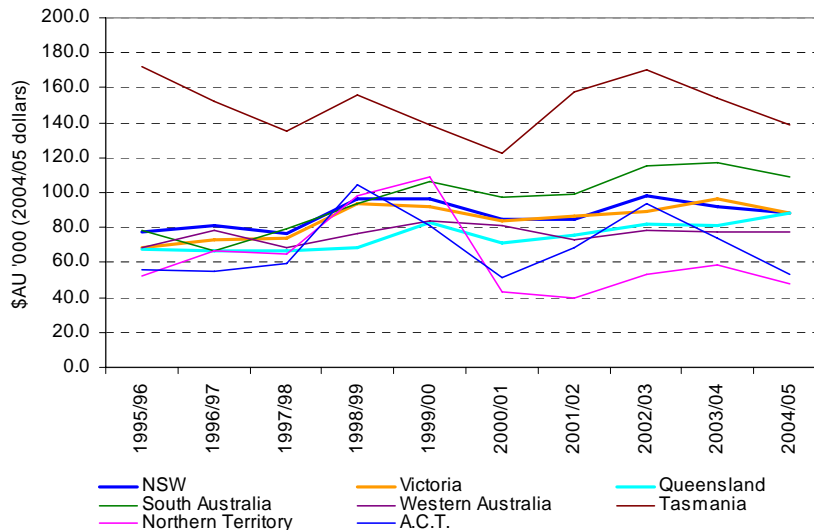
Figure 8-1: Forest product industry turnover by state



Source: ABS (2007)

While income and employment have been growing in the forestry and forest products industry, the value added per person has been growing only slowly at an average 1.1% pa in real terms. This suggests that there could be gains from increasing productivity in Australia's forest products industry.

Figure 8-2: Value added per person in the forestry and forest products industry (2004/05 dollars)



Regional impacts

The forestry and forest products industry provides significant social and economic benefits in the regions in which it operates. In many towns, forestry provides the major basis for the local economy and the community is strongly dependent on its existence. Typically the introduction or expansion of the forestry industry in an area will provide:

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- Increased employment and average income;
- Increased secondary businesses and flow-on economic effects;
- Increased investment by business and government (e.g. health and infrastructure); and
- Diversification of economies to provide longer term stability to the community.

These impacts are most readily identified through regional socio economic impacts studies.

One study of the socio economic impacts of changing land use in South West Victoria in 2000 (ILFR, 2000) highlighted the variability of impacts between different communities and that changes in agricultural land use as well as expansion of plantations were evident in the region. The study observed that in general there were significant negative perceptions of the impact of plantation expansion on rural populations in the region, particularly where adjacent farms were purchased by plantation companies. The study did however point out that plantation development generated significant income for the region.

Research into the community effects of forestry has in the past, mainly focussed around the changes to local economic and employment conditions. Information on social and demographic changes particularly at a local level is scarce. Social assessments were conducted as part of the Comprehensive Regional Assessment (CRA) processes undertaken as part of the RFAs. The assessments generally included development of a social profile of communities and investigation of their direct and indirect reliance on forests. While the RFA social impact studies represented a valuable baseline of information, they are now dated and mostly have not been re-visited to evaluate the impacts of the RFAs.

In recent years there have been a number of studies that have responded to increasing community concerns over the rapid expansion of hardwood plantations in some parts of Australia. The most comprehensive study examined the impact of plantations in the South West Slopes of NSW and the Great Southern region in WA (FWPRDC, 2005). The findings of this study were largely favourable towards the industry and some industry participants in these regions have noted the usefulness of this information in promoting the benefits of plantation forestry.

The need for a more comprehensive understanding of the community impacts of forestry and the forest products industry is being addressed in a number of projects being undertaken by the CRC for Forestry as part of its Trees in the Landscape program. This includes a Communities project which is conducting time series research from 2006-2012 focused on Tasmania, South West Western Australia and the Green Triangle region.

The current trends of growing plantation production and shrinking native forestry mean that there will be community impacts throughout Australia over coming years. These effects will vary amongst forestry regions. For the government to have a clear understanding of the impacts of forestry policy decisions and industry growth, further research into community impacts is needed.

### 8.2 Human resources

If not managed effectively skills shortages have the potential to seriously limit the growth of an industry, or an economy. By definition, a skills shortage exists 'when employers are unable to fill, or have difficulty filling vacancies for an occupation at current levels of remuneration, employment conditions and reasonable location' (NAFI, 2006).

The forestry and forest products industry is currently widely recognised as being faced with skills shortages, both professional and contracting/labour skills. NAFI (2006) reported that the most common shortage was for electricians and fitters. There were also reported shortages of engineers, truck drivers, machinists, saw doctors (particularly in NSW) and harvesting machine operators.

A lack of professional employees in the industry is also of considerable concern, and is likely to become worse as university enrolments in forestry degrees are at historically low levels. This issue is currently being addressed though joint initiatives of Melbourne University, the Australian National University and Southern Cross University.

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Skills shortages can arise through a complex array of factors including industry specific factors and broader social and economic variables. NAFI (2006) identified the following key factors contributing to skills shortages in the forestry and forest products industry:

- **Industry perception** – some parts of the forestry and forest products industry suffer from negative public perceptions of its sustainability, its safety record, and it can be regarded as a less sophisticated industry;
- **Wage competitiveness** – the forestry and forest products industry competes with the mining industry for many positions including tradespeople, labourers and engineers. The high wages often found in the mining industry often out-compete the wages available in forestry. The current mining boom is making this situation worse;
- **Job location** – forestry employment is often found in rural areas which are less desirable to many people;
- **Resource and job security** – reductions in native resources available for harvesting over the last decade have eroded job security prospects for potential employees;
- **Increasing mechanisation** – increases in production efficiency via advances in production technology have acted to reduce the number of jobs and meant that employees need a higher skill level; and
- **Strong labour market** – labour availability is an issue as there is currently low unemployment and fewer young people are looking for work in rural areas.

The severity of skills shortages in the forestry and forest products industry is not uniform and varies across job types and localities. The industry has addressed the problem through partnerships at various levels between government, industry and the training and education sector. The Commonwealth government implemented the National Skills Shortage Strategy in 2004 targeting funding and training initiatives both nationally and regionally for technical skills and trade qualifications. Since being introduced a number of initiatives have been established including a recent Work Skills voucher package to help young people access training for workplace skills. This package builds on top of an earlier Apprenticeships Incentive Program. It will take some years to judge the success of these programs in alleviating skills shortages.

One specific issue facing the forestry industry is the development of skills required to facilitate the harvesting of large volumes of hardwood pulpwood plantations maturing in south west WA and the Green Triangle region over the next 5-10 years. Technologies for harvesting these resources are also being developed and will require training on new machinery and processes.

### 8.3 Indigenous forestry

Historically, Indigenous Australians have had a very low participation rate in the commercial forestry and forest products industry. In recent years, Indigenous Australians have increasingly resumed ownership and management over their former territorial lands. A large socio economic gap continues to persist between Indigenous and non-Indigenous Australians where suitable means for helping local communities alleviate their situation is needed. The engagement of Indigenous Australians with natural resource industries is seen as one way of helping communities better themselves economically by utilising their own resources.

Forestry, in particular holds good potential for Indigenous Australians. Indigenous land accounts for 13% of all forested area in Australia. In addition, plantation companies have expressed interest in developing business partnerships with Indigenous communities to access underutilised forest and land for their operations. Pursuing forestry development would mean that communities could manage a valuable ongoing industry within their own traditional systems whilst allowing other commercial or non-commercial activities to co-exist, including alternative and non-wood harvesting of flora and fauna (e.g. eco-tourism, bush tucker, bush medicines, cultural heritage).

In response to the potential for forestry development, and the willingness of industry to contribute, in 2005 the Commonwealth government developed a National Indigenous Forestry Strategy (NIFS). The strategy

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was based on a 2003 consultation program with the forestry and Indigenous communities throughout Australia. The strategy aimed to “encourage Indigenous participation in the forestry and forest products industry by forming business partnerships with the forestry industry to provide long term benefits to Indigenous communities, as well as to the forest and wood products industry”. DAFF reports that there have been in excess of 18 projects throughout Australia that have occurred as a result of NIFS. This has included the funding of a community nursery in North West Tasmania, and a joint project with Private Forests North Queensland and Australian Forest Growers to employ three Indigenous forestry teams in Northern Queensland to salvage timber following the damage to forests caused by Cyclone Larry in 2006.

Through NIFS, the Commonwealth government has also provided funding to NAFI to employ a full time liaison officer “to boost educational and training options for Indigenous Australians in the forest and timber industry” and to help improve staff management practices for better employment outcomes for Indigenous Australians. Since commencing in the role the liaison officer has worked with forestry businesses in South West Victoria, the Gippsland/Southern NSW area and in Tasmania.

One success story that existed prior to NIFS is commercial forestry development on the Tiwi Islands. The Tiwi Islands is now home to a strong business partnership between the Tiwi Land Council and Great Southern Plantations, a plantation MIS company. Great Southern have engaged with the Tiwi Land Council, who represent native title holders, to develop Acacia plantations for woodchip export. Land lease fees and a share in profits are paid to the Tiwi Land Council, which thus far have been reinvested into the project. Plans for the project mean that by 2013 the Tiwi Islands project will be a large scale woodchip producer with an export volume of over 1 million tonnes. The partnership has now been in progress for seven years and has brought investment to the Tiwi Islands including substantial funding for an upgrade to roads and a commitment from the partnership to employ and train Indigenous locals to contribute and eventually take senior roles in managing the operations.

Another success is demonstrated in the partnership between Comalco, a mining company, and the Napranum Aboriginal Corporation who represent the local Aboriginal community in Cape York, far north Queensland. Land was relinquished by Comalco in the 1960s to the local people to engage in sustainable land management. Comalco donated its sawmill to the Napranum people, some of which had been working for them processing wood. The Napranum have used the mill to produce timber for local construction needs and have maintained a steady supply of timber to the local town of Weipa. Comalco have continued their partnership with the local Indigenous community through an agreement related to land being cleared for mining. The operations involve the local Napranum people, harvesting and processing forests that need to be cleared for mining – the results of which would otherwise be wasted – and re-establishing plantations on land where Comalco has ceased mining. This has facilitated a long term sustainable enterprise for the local Indigenous community with further opportunities to expand the forestry business and train more Indigenous staff.

Future success in Indigenous forestry will result from constructive engagement between industry and Indigenous communities with the facilitation and support of government. The NIFS will provide a framework for this engagement, and prospects at this stage appear to be positive.

## Section 9

## The future policy framework

### Key issues and findings

- The NFPS warrants revision to reflect changes in the industry structure, outlook and policy environment.
- Encouraging the development of market based approaches to log pricing and allocation will enhance competitiveness of the forestry and forest products industry.
- Privatisation of government owned plantation resources would promote more efficient management of those resources and facilitate market based pricing and allocation.
- Government involvement is required to address market failure that limits investment in new long rotation plantations.
- Facilitating the development of markets for environmental services would benefit the forestry and forest products industry.
- Economic information on the forestry and forest products industry needs improvement.
- Continuing Commonwealth support for research and development is critical, and the FWPRDC (now FWPA) model for stakeholder involvement in priority setting should be implemented for other Commonwealth funded programs.

This section provides a summary of key implications for policy framework relevant to the future of the forestry and forest products industry.

### 9.1 A revised National Forest Policy Statement

The National Forest Policy Statement (NFPS) has provided a useful framework for forest policy development and implementation in Australia. However, the industry has now changed considerably and faces different issues since the NFPS was developed e.g. the development of privately owned hardwood pulpwood plantations, ongoing structural adjustment in the native forests sector and reservation of forest areas beyond RFA commitments, the entry of new international forestry and forest product industry investors, and the development of markets for environmental services. Re-designing the policy to more effectively reflect these changes as well as emerging market opportunities would provide a more supportive framework for industry development. It would also help ensure the forestry and forest products industry receives due consideration in developing policies related to climate change, water, markets, renewable energy and environmental services. A revised NFPS would send a message to investors that there is a clear vision for the forestry and forest products industry that reaches beyond Plantations 2020 and deals with the changing circumstances of the industry.

The success of Plantations 2020 illustrates the benefits of framing policy to address market failure and impediments in order to achieve clear goals. It also illustrates the benefits of multi-faceted policies whereby impediments or market failures can be tackled on a number of fronts and allows policies to be refined in response to changing circumstances. For instance, the lack of investment in long rotation plantations needs to be addressed through a range of avenues. A revised NFPS will help government clarify its role in future development of the forestry and forest products industry.

A revised NFPS should focus on establishing a policy environment that promotes improved competitiveness in forest growing and processing. Ongoing improvements in competitiveness will be vital to addressing competition from imports as well as taking advantage of market opportunities in Asia. The policy also needs to recognise that private sector investment encouraged through open and competitive markets will be vital to improving competitiveness. Consistent with such an approach the policy should emphasise the need to address market failures and remove impediments to investment.

## Section 9

# The future policy framework

## 9.2 Open and competitive markets

In an open market based economy such as Australia, the role for government in industry development is to create an enabling environment for private investment to allow markets to allocate resources to their most valuable use. This includes ensuring that impediments to the operation of markets are removed. There is also a role for government in overcoming distortions caused by market failure.

If the forestry and forest products industry in Australia is to continue to provide economic and social benefits to regional communities it will need to ensure competitiveness with imports. This requires a flexible and responsive industry, which can be most effectively achieved through open and competitive markets.

Ongoing development of open and competitive markets can be achieved by expanding private sector ownership of existing plantation resources. Further privatisation of state owned plantation resources would achieve this. This will also lead to more market based approaches to log pricing and allocation which will help maintain and improve competitiveness of the processing sector.

In publicly owned native forests the adoption of more market based pricing and allocation of resources will encourage the most efficient utilisation of resources and improve the competitiveness of the processing sector. More market based prices will also provide an incentive for investment in private native forestry.

Key market failures that governments need to address include supporting the development of private investment in green field long rotation plantations, the development of markets for environmental services, ongoing provision of research and development expenditures, and provision of social and economic information on the forest sector.

Major impediments to achieving open and competitive markets that governments can remove include the collection and dissemination of information on private native forests, the development of clear and unambiguous frameworks for sustainable management of plantations and native forests, encouraging certification for sustainable forest management, and the development of a timber procurement policy to provide a framework for government purchases of wood and paper products.

## 9.3 Sustainable development

Concerns over environmental issues, which provide both opportunities and threats to the forestry and forest products industry, demand that sustainable development should be at the core of forest policy. This is the case with the existing National Forest Policy Statement (NFPS). However, the emerging issues of global warming, carbon trading, water use and investment in renewable energy extend the existing policy framework.

Initiatives to recognise and develop the role of forests in these areas can provide positive outcomes in terms of economic growth, social development and environmental protection. For instance, developing markets for environmental services would help increase investment in long rotation plantations. Similarly, research and development into these areas is required to ensure that the forestry and forest products industry maximises its opportunities and that it is not disadvantaged relative to other industries.

The NFPS has provided a useful framework for forest policy development and implementation in Australia. However, the industry has now changed considerably and faces different issues to when the NFPS was developed. Re-designing the policy to more effectively reflect these changes would help ensure the forestry and forest products industry receives due consideration in developing policies related to climate change, water, markets, renewable energy and environmental services. A revised NFPS would also send a message to investors that there is a clear vision for the forestry and forest products industry that reaches beyond Plantations 2020 and deals with the changing circumstances of the industry.

The success of Plantations 2020 illustrates the benefits of framing policy to address impediments in order to achieve clear goals. It also illustrates the benefits of multi-faceted policies whereby impediments or market failures can be tackled on a number of fronts and allows policies to be refined in response to changing circumstances. For instance, the lack of investment in long rotation plantations needs to be

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addressed through a range of avenues. A revised NFPS will help government clarify its role in future development of the forestry and forest products industry.

### 9.4 Research and development

Research and development is another area in which it is accepted that private markets often do not provide efficient solutions. Forestry and forest product R&D expenditure has both declined in real terms, and shifted significantly away from corporate generated expenditure to Commonwealth and State government sources. Expenditure on forest products research has reduced more significantly than forest and plantations related research.

High quality R&D is vital to future development and competitiveness of the forestry and forest products industry in Australia. A number of public agencies provide R&D services to the forestry and forest products industry. The establishment of the Forest and Wood Products Research and Development Corporation (FWPRDC) resulted in the consultative development of a strategic R&D plan for its expenditure. Forest and Wood Products Australia (FWPA), which has now replaced the FWPRDC, is likely to have similar consultative processes for its R&D investment planning.

Other R&D providers do not have such consultative processes for identifying R&D strategies. Industry understanding and support for their services may increase if similar processes were adopted. FWPA may assist in this but it would require the cooperation of all providers. Similarly, continuing Commonwealth support for ENSIS and other potential R&D vehicles is critical. Communicating and engaging with stakeholders in the development and implementation of these programmes would assist in identifying and meeting sectoral R&D needs.

### 9.5 Engagement and promotion

The forestry and forest products industry has suffered from negative community attitudes and a lack of understanding and acknowledgement of the economic, social and environmental benefits of the industry. As such, the industry's social license to operate is subject to challenge. For example, community objection to further plantation expansion in many regions poses a threat to the ongoing growth of the sector.

There is a role for the Commonwealth government in ensuring the forestry industry is fairly represented and promoted in relevant forums. In particular, the forestry and forest products industry needs to be well represented in policy debates over carbon trading schemes, water use and trading, renewable energy and infrastructure development. The formation of FWPA will go some way to achieving this. Revision of the NFPS would also provide a base for raising the profile of the forestry and forest products industry across the Commonwealth government and for the industry to develop more singular approaches to government.

Another particular role that the Commonwealth government could fulfil is in ensuring the collection and dissemination of data on the sector. It has successfully done this with the National Plantation Inventory and there is a need for improved economic and social data and analysis of industry performance which the Commonwealth could take a lead role in. Collection of such data, analysis and dissemination is vital for ongoing policy development.

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