Comparison of Pooled Eucalypt Timber Investment Growth Rates

Prepared by IndustryEdge P/L for Forest Enterprises Australia Ltd December 2007



Introduction

Forest Enterprises Australia Ltd (FEA) is a significant ASX-listed forestry and an increasingly emerging forest products company.

FEA has vigorously pursued its long-term stated strategic goal of vertical integration through innovation and technology. It has developed, and continues to increase, a substantial volume of independent private plantation forest resource to process through its innovative, advanced processing facilities and market through both its well-established and developing brands.

Headquartered in Launceston Tasmania, FEA currently manages over 50,000 hectares of hardwood Eucalyptus plantations in Tasmania, New South Wales and Queensland. It will be processing and adding value to both its hardwood and softwood resource through its new state-of-the-art facility at Bell Bay in northern Tasmania producing an output next year of approximately 400,000 tonnes of logs branded as EcoAsh[®] and BassPine[™] products. This volume, which is expected to grow to over 650,000 tonnes within a five year timeframe, makes FEA the largest plantation-based saw miller in Tasmania.

Additionally, during 2008 FEA will be exporting around 500,000 tonnes of woodchips through SmartFibre Pty Ltd, a joint venture plantation based woodchip export operation also located in Bell Bay Tasmania.

FEA was established in 1985 and planted its first plantations on behalf of private clients in 1987. Tasmanian Forests Trust No 1, its inaugural public forestry investment, was launched in 1993, and was one the first public hardwood forestry investment schemes in Australia. Since then FEA has offered 15 consecutive MIS projects, concentrating on eucalypt plantations. The plantations established under the 1993 Project were planted during the spring of 1993, thinned in 2004 and are now scheduled to be clearfall harvested during the autumn of 2008.

FEA has commissioned *IndustryEdge* to prepare a report that would allow the growers of its inaugural project to compare the growth rate of their pooled investment with growth rates of comparable pooled investments established elsewhere in Australia during the same period. The brief also required *IndustryEdge* to report on any available growth data on eucalyptus plantations established by other forestry investment managers during the following five years.

IndustryEdge is a leading provider of market intelligence on the pulp and paper industry throughout Australasia. Its market analysis is communicated to subscribers through a wide range of monthly and annual publications, including its flagship monthly market intelligence report, *Pulp & Paper Edge*, as well as through client-focused consulting services.

The sources of the data used by *IndustryEdge* to prepare this report are all publicly available. They include reports produced by the three major research companies assessing plantation MIS schemes, namely Australian Agribusiness Group (AAG), Adviser Edge Investment Research and Lonsec. *IndustryEdge* has also referred to relevant offer documents (prospectuses and product disclosure statements), websites, ASX releases, and information provided to growers.

Background

The ultimate indicator of the growth rate for a timber plantation is the volume of logs or woodchips delivered to the point of sale after the plantation has been harvested. The volume of logs in a stack is difficult to accurately determine, Logs and woodchips are usually sold by weight (as measured by a weighbridge), and can be converted to volume by a conversion factor. The volume that is sold is grown in the plantation over a period of time that is usually called the rotation period. Because some Managed Investment Scheme plantations are established up to 12 months after the majority of growers make their investment, the rotation period for a proportion of the pooled investment may be less than the period of the totalled pooled investment, but usually the final harvesting may occur over a period of time that reflects different planting times as well as variations in growth rates in any particular pool or age class.

To facilitate growth rate comparisons between different plantations grown over different rotation periods, the most common method of expressing a growth rate is by a **Mean Annual Increment** (**MAI**), which is the average volume of timber grown per hectare divided by the rotation period. MAI is expressed as m³/ha/yr.

It is also important to realise that growth rates vary between species on any given area or site. Managers usually grow a particular species to maximise volume growth and value.

If a plantation has not yet been harvested, it is possible to assess the *standing timber volume* through a rigorous sampling procedure known as a plantation *inventory* where the height and diameter of individual trees are measured in a systematic series of plots used to calculate the overall standing timber volume. This method can be used to assess plantations of any age, but the estimate for young plantations is likely to have a significant statistical extrapolation error. However, by age 8, the potential of a location and the silvicultural history of a site are reflected in the trees and the standing timber volume can usually give a clear indication of the likely volume of timber available to harvest at the end of the rotation.

In looking at the standing timber volume and what is sold from a site, there are inevitably some volume losses incurred during harvesting (from stumps, breakages, short logs) or losses in fines and debarking from in-forest chipping, and the recoverable timber volume will be less than the standing timber volume by an amount equal to the harvesting losses commonly between 5% and 10% of the standing timber volume.

Plantation growth rates vary with age. Although they are subject to variations caused by climatic factors (such as rainfall and temperature), geographic factors (such as soil type and depth), and silvicultural factors (such as quality of land preparation, planting and tending), the standing timber volume in a plantation over time will track along fairly predictable growth curves of the type displayed in Figure 1.

Similarly, when the standing timber volume is divided by the age in years at measurement, the MAI at each point during its growth can be derived. MAIs will usually track along fairly predictable growth curves of the type displayed in Figure 2.

The development of growth curves is a highly technical area of expertise, and developed by managers over a long period of time as plantations are continually measured and reconciled with final harvest volumes.

Although some sampling error is present with young plantations, this decreases with age when a plantation is assessed at age 8 or later. When the standing timber volume of a plantation (or MAI at that age) is compared with a suitable set of growth curves for the species, there is a good indication of the likely standing volume at harvest. After allowing for normal harvesting losses, the approximate recoverable timber volume likely to be available for sale at the end of the rotation becomes evident.

Figure 2



Performance to Date of Hardwood Plantations

Figure 1

Some of the early timber plantations established during the target period (1992 - 2000) have been harvested and some general public information is available on actual volume recovered during harvest. Additionally, various timber plantation managers have made inventory data available on their websites or provided them to research houses which, in turn, have published them with the approval of the respective managers.

It is not always clear if the data presented is total assessed volume or estimated recoverable volume or, for that matter, if the actual intensity of the forest inventory is consistent between managers.

Over is a summary of growth rate data known to *IndustryEdge* relative to the target period.

Timbercorp Limited

Timbercorp Limited (Timbercorp) promoted its first public hardwood timber project in 1992. Until the early 2000s, Timbercorp indicated in its investment documents that it expected timber growth rates between 27-30 m³/ha/yr over a 10 year rotation, which would generate yields at harvest of between 270 - 300 m³/ha.

Timbercorp has completed harvesting its 1992, 1993, 1994 and 1995 projects, but minimal details have been published.

In respect to the 1992 project, a Press Release¹ made in 2003 implied a yield of 200 m³/ha, which is 26% less than the lowest end of its forecast range. Timbercorp provided its estimated yield details to AAG² which has stated that "Results to date show yields averaging approximately 20 m³/ha/yr which is well below company expectations of 27 - 30 m³/ha/yr".

Timbercorp has also provided AAG with yield estimates for its 1996 to 1999 projects of 20m³/ha/yr, which are also well below the lowest end the forecast range stated in the relevant investment documents. In discussing these disappointing yields, Timbercorp has pointed to: "*issues surrounding what by today's standards appear to be inferior land selection, unimproved genetics and below average rainfall as some of the contributing factors.*"

Project	Age at Inventory (Years)	Expected MAI Yield (m³/ha/yr)
1996	10	20
1997	9	20
1998	8	20
1999	7	20
2000	6	21
2001	5	22

Overview of Timbercorp's Yield Estimates for Past Projects 1996-2001

In its more recent projects, Timbercorp has lowered its offer document yield expectation to a growth rate of 27.5 m³/ha/yr and adopted a more flexible rotation length of between 8 and 12 years. Timbercorp has indicated that, with industry improvements in silviculture (eg genetics and nutrition) and more rigorous land selection criteria, it believes that it will be possible to achieve closer to its targeted yields for its newer hardwood timber projects.

Great Southern Limited

Great Southern Limited (Great Southern) released its first hardwood timber project in 1994. Until the early 2000s, it indicated in its investment disclosure documents that it expected growth rates of between 25 - 30 m³/ha/yr over a 10 year rotation³, which would generate volumes at harvest between 250 and 300 m³/ha.

Great Southern has completed harvesting its 1994 and 1995 projects and has reported harvest volumes of 123 m³/ha and 166 m³/ha⁴ respectively, which equate to MAIs of 12.3 m³/ha/yr and 16.6 m³/ha/yr – assuming a ten year rotation period. Great Southern, being aware of a potential shortfall of timber volume at harvest, acquired additional areas of plantation in recent years and has added timber harvested from these plantations into its 1994 and 1995 project pools to enhance the returns to its growers⁵.

Great Southern has also completed harvest on its 1996 project and has reported an average yield of 197 tonnes/ha, which is equivalent to approximately 197 m³/ha⁶ and an MAI of 19.7 m³/ha/yr. It used 'reserve plantations' to again enhance grower's return to the equivalent of 250 m³/ha⁷ which was the lower end of the yield forecast in the investment documents.

Although its later projects have not yet been harvested, Great Southern has conducted detailed inventory on these plantations and AAG has published the results⁸. Plantations in Great Southern's 1997 project had an estimated MAI growth rate at age 9 of between 14-18 m³/ha/yr. Plantations in its 1998 project had an estimated MAI growth rate at age 8 also between 14-18 m³/ha/yr. With only one and two years to grow, it is reasonable to expect that these projects are unlikely to obtain their original targeted timber volumes. Additionally, based on these estimates, these projects are also unlikely to exceed the harvested yield of the 1996 project which is 21% less than the lowest end of the forecasted range.

Overview of Great Southern's Yield Estimates for Past Projects 1996 - 2001

Project	Age at Inventory (Years)	Expected MAI Yield (m³/ha/yr)
1996	10	18-21
1997	9	14-18
1998	8	14-18
1999	7	15-20
2000	6	16-21
2001	5	17-22

Overall, the timber growth rates achieved on the early Great Southern Plantations have been below those anticipated at the time of investment and AAG point out that they *"are likely to be approximately 20% down on forecasts."*

Great Southern has pointed out that the plantation growth rates for these plantations have been impacted by some specific site issues and the recent below average rainfall conditions⁹. It also notes, as do the research houses¹⁰, that since at least the year 2000, it has been using more rigorous site selection processes and, combined with the general industry improvements in establishment techniques and fertilizer regimes, Great Southern expects that the growth rates for its later projects may be closer to those indicated in the respective PDSs.

Integrated Tree Cropping Limited

Integrated Tree Cropping Limited (ITC) first offered a hardwood timber project in 1998. Although it has not commenced harvesting plantations in its first project, it has been harvesting plantations established through early projects by other managers and companies that have since come under ITC's control.

ITC has, however, conducted detailed inventory of their early projects and these are reported on the ITC website¹¹. For the 1998 project the document posted on the website reports a weighted average standing volume of 112 m³/ha at age 8, equivalent to an MAI growth rate of 14m³/ha/year. However, because ITC use a "Plantation Unit" for their investment unit instead of a hectare, the unit size for each project varies. In the AAG report¹³, an MAI growth rate of 16 m³/unit/yr is indicated which would give a standing volume of 128 m³/unit. All reports from ITC and the research houses acknowledge that this project and subsequent ITC projects (until at least 2001) will fail to reach the MAI growth rates indicated ITC's original investment documents.

Project	Age at Inventory (Years)	Weighted Average Standing Volume (m ³)	Subsequent Estimated MAI (m³/ha/yr)
1998	8	112	14
1999 – WA	7	51-65	7-9
1999 – Green Triangle	7	69-97	10-14
1999 – Esperance	7	37-50	5-7
2000 – Esperance	6	48	8
2000 – Green Triangle	6	71	12
2000 – WA	6	67	11
2000 – Queensland	6	23	4

ITC Yield Estimates for Past Projects 1998-2000

ITC has also pointed to the significant improvements in their management regimes and site selection processes, and it has lowered its the growth rate expectations for the more recent ITC projects to be more in line with achieved results and stated expectations, especially now that ITC offers sufficient land (known as a Plantation Unit) to achieve the required volume during the term of the project.

Gunns Plantation Limited

Gunns Limited (Gunns) commenced its growth into Managed Investment forestry plantations in 2000. Gunns also acquired the significant plantation assets and experience of North Forest Products Ltd and, to a lesser extent, Boral Ltd and has extensive freehold plantations to base the modelling in their projects.

Hardwood plantation trees in Gunns projects are grown on a 13 - 18 year basis to produce pulpwood and veneer logs.

Currently there is no published data to draw observations on the early projects of Gunns, as the plantations would be generally considered too young to assess for accurate estimates, although some thinning has already occurred.

Generally, it is not unreasonable to expect Gunns' projects to perform in a similar capacity to those of FEA.

Forest Enterprises Australia Limited

Forest Enterprises Australia Limited (FEA) are establishing eucalyptus plantations on a 13 - 16 year rotation to produce sawlogs and pulp logs, unlike Great Southern, Timbercorp and ITC (and Gunns with its Option 1) that establish eucalypt plantations grow timber targeted solely at the woodchip market.

Because of FEA's slightly longer rotation term, its inaugural project 1993 is only now approaching harvest. FEA investment documents to 1998¹² projected an MAI target for recoverable timber of 25 m³/ha/yr, resulting in a target harvest volume of 375 m³/ha. FEA has announced¹³ that the pre-harvest inventory for the plantations in the 1993 project indicates that the growth rate of recoverable timber is estimated to be 29 m³/ha/yr, which results in a yield of more than 400 m³/ha. The estimated results are around 16% higher than the targeted volume of timber indicated in the investment document. In addition to this, approximately 60% of the logs are expected to be classified as sawlogs which will attract a higher return to the investor than pulp logs.

FEA has also reported the standing volumes and MAIs for their other early projects, based on an inventory conducted in 2006¹⁴. The timber harvest volume for the early FEA projects should meet or significantly exceed the respective targets, in all except the 1995 project which is comparable with the best yields being reported by other companies.

Project Year	Age at Inventory (years)	Target MAI (m³/ha/yr)	Expected MAI (m³/ha/yr)
1993	13	25	32
1994	12	25	36
1995	11	25	20
1996	10	25	29
1997	9	25	24
1998	8	25	26
1999-2001	5-7	25 - 28	n/a

Overview of FEA's Yield Estimated for Past Projects 1993 - 1998

As pointed out by all eucalypt MIS managers, the industry has made significant advances in silvicultural management since the late 1990s due to new genetic material being deployed, a better understanding of nutrient management, and tighter operational controls coupled with tighter land selection protocols. Although the growth performance of FEA's plantations established between 1993-1998 has been exceptional when compared with its industry peers, FEA has also taken advantage of these industry-wide advances.

Conclusion

The early eucalypt projects with plantations managed for pulpwood generally forecast growth rates in the MAI range between 25 and 30 m3/ha/yr, with the estimate made by FEA being at the conservative end of this range.

In general, the published and reported growth rates of these early projects which have been harvested have been disappointing with actual yields for most companies being around 20% below the lowest end of their forecast range. The exception to date has been FEA – the anticipated return for its inaugural project should not only exceed the growth rate forecast by 16%, but exceed the actual harvested plantation yield of its peers by between 45% and 75%.

Some inventory information has been reported for the younger plantations of these managers and the trend seems likely to continue. The expected yields from these plantations are also likely to be around 20% below the forecast volumes, until at least the 1999 plantings. Again the exception appears to be FEA - its younger plantations (except 1995) are likely to meet and exceed the respective investment forecast.

Since 2000, an industry wide improvement in silvicultural practices has occurred based on early experiences, research conducted by forestry companies and bodies (such as CSIRO), and an increase in the involvement of forestry professionals. A better understanding of site parameters has led to tighter site selection procedures, research has led to better nutrient management and improved genetics, and more rigorous control of operations has led to better deployment of these improved silvicultural regimes.

All companies have benefited from these industry- wide improvements, and will continue to do so into the future providing that there is ongoing research and development. In addition the emergence of the potential of solid wood products as a plantation objective will change the way forests will be managed.

This being said, site characteristics such as land quality and climatic factors will remain relatively constant and the key factors that determine growth rate potential of the species currently being used. The routine of reserve plantations and the use of variably sized "plantation units" does provide a pragmatic and logical solution to site constraints in some growing areas.

Footnotes

- ¹ Timbercorp Press Release 10 April 2003
- ² AAG Report on Timbercorp 2007 (Single Payment) Timberlot Project page B5, March 2007
- ³ Great Southern Plantation's 1994 to 2000 PDSs, AAG Great Southern Plantations 2007 page B6, May 2007
- ⁴ AAG report of Great Southern Plantations 2007 page B6, Lonsec report Great Southern 2008 High Value Timber Project page 10, February 2008
- ⁵ Lonsec Great Southern 2008 High Value Timber Project page 10, February 2008, Great Southern Plantations 1994 Project Grower Returns, Great Southern Plantations 1995 Project Grower Returns
- ⁶ Great Southern Plantations 1996 Project, Harvest Update, August 2007
- ⁷ Great Southern Plantations 1996 Project, Investment Update, December 2007
- ⁸ AAG Great Southern Plantations 2007 page B6, May 2007
- ⁹ Great Southern Plantations 1994 Project Grower Returns, Great Southern Plantations 1995 Project Grower Returns
- ¹⁰ Great Southern Plantations Project 2007 PDS, AGG Great Southern Plantations 2007 Project, May 2007
- ¹¹ http://www.itclimited.com.au/defult.asp?V_DOC_ID=834
- ¹² Disclosure documents for FEA's Projects from 1993 1998
- ¹³ FEA Fact Sheet No 1, December 2007
- ¹⁴AAG Report on FEA Plantations Project 2007, page B6, May 2007

Disclaimer

Robert Eastment, Director, *IndustryEdge* Pty Ltd, has prepared this independent report for Forest Enterprises Australia Limited. In preparing this report, *IndustryEdge* has relied on information given to it by the referenced documents. Industry Edge has not independently verified this information. *IndustryEdge* has also collected independent information about hardwood plantations. This independent report contains the opinion of *IndustryEdge* on the potential growth rates of the major managed investment schemes for the production of hardwood pulplogs. Nothing in this report is, or should be relied upon, as a promise by *IndustryEdge* the growth rates are accurate as published. No person may reply on this independent report for any other purpose or in any other context. *IndustryEdge* has not been involved in the preparation of any other aspect of growth rate reviews and is not liable for any other aspect of analysis of growth rate reviews.



UPDATE TO 2007 MARKET INFORMATION REPORT ON THE AUSTRALIAN FOREST INDUSTRY

PREPARED BY INDUSTRYEDGE FOR FEA PLANTATIONS LTD

OCTOBER 2008



UPDATE TO 2007 MARKET INFORMATION REPORT ON THE AUSTRALIAN FOREST INDUSTRY

IndustryEdge was commissioned to write the Market Information Report on the Australian Forest Industry for FEA Ltd in 2007.

In undertaking the update of the report for end of financial year 2008, the analysis, charts, tables and conclusions have been documented with current available information. Forest products data with reference to global trade and apparent consumption by countries other than Australia, has been updated to 2006, since 2007 international data will not be available until mid-2009. Domestic data has been updated to June 2008 where practical, or December 2007 where current data is not available at the time of writing.

The analysis and commentary has been provided in context of changes that have occurred, or have been estimated to change based on derived market and economic trends.

The document is intended as an addendum to the 2007 market report, rather than a replacement.

AUSTRALIAN FOREST INDUSTRY OVERVIEW

GLOBAL TIMBER SUPPLY GAP



Source http://faostat.fao.org and IndustryEdge estimates



Source: http://faostat.fao.org

Annual deficit in sawn softwood timber is predicted to be 35 million tonnes by 2010 and for sawn hardwood timber to be 10 million tonnes.

Between 2004 and 2007, the Centre for International Forestry Research (CIFOR) has reported, exports of plywood from Indonesia have decreased by nearly 75% and exports of sawnwood are down by nearly 50%. CIFOR documents the decline has been caused by illegal logging and unsustainable harvesting of forestry concessions in the 1990's and post-2000. As a result of now seriously diminished forestry resources, CIFOR has also documented that in 2006 the cross border trade from Kalimantan into Malaysia has decreased by as much as 70%. The Indonesian government has requested the Malaysian government to "set harsh sentences" on Malaysian companies dealing in illegally shipped timber from Indonesia.

GLOBAL PAPER CONSUMPTION TREND



Source: http://faostat.fao.org

From 1996 to 2006, world production of paper and paperboard has been increasing at an average annual rate of 2.5%, increasing output by 80.8 million tonnes, or from 284.3 million tonnes in 1996 to 365.1 million tonnes in 2006.



http://faostat.fao.org



http://faostat.fao.org

Between 1996 and 2006, the apparent consumption of paper and paperboard in Asia increased at an average annual rate of 3.4%. This growth is a third faster than the rate of increase in global supply over the same period. For Asia the sharp rise in demand is being driven by China's growth in population, literacy and income levels.

China's apparent consumption per capita of paper and paperboard rose at an average annual rate of 6.8% between 2000 and 2006. Over the same period, China's GDP increased at an average rate of 9.6% pa.

In 2006, the average consumption of paper and paperboard in China was 41.7 kg per capita, while the average for the world was 54.1 kg per capita. In comparison the average per capita consumption for South Korea was 179.3 kg and for Malaysia was 119.2 kg.



THE ASIA-PACIFIC MARKET

Source: http://faostat/fao.org

Log consumption in the Asia region has been growing at an average annual rate of 2.3% for the five years between 2001 and 2006.

Australia's major Asian trading partners (Japan, China, Indonesia, Taiwan, Korea and India) will be responsible for an estimated additional 214 million people between 2007 and 2015.

Between 2005 and 2025, the prediction is the proportion of Chinese living in urban areas will increase from 44% (560 million) to 66% (926 million), then passing the 1 billion level by 2030.



JAPANESE WOODCHIP MARKETS

Source: Japan Customs http://www.customs.go.jp/toukei/download/index_d012_e.htm



Source: Japan Customs http://www.customs.go.jp/toukei/download/index_d012_e.htm

From 2007, Japan accounts for 77% of the major woodchip trade in the Asia Pacific region, down from 79% the previous year. Even though Japan's imports of hardwood woodchips increased by 500 thousand tonnes in 2007, China's and Taiwan's imports of hardwood chips combined increased by 710 thousand tonnes.

Australia continues to be the major supplier of hardwood and softwood woodchips to Japan, accounting for 37.3% and 44.0% of shipments respectively in 2007.

In 2007, Japan imported 11.8 million tonnes of hardwood woodchips and 2.5 million tonnes of softwood woodchips.

In 2000, shipments from Australia accounted for 37.9% of softwood woodchips and 28.7% of hardwood woodchips imports.

For hardwood woodchip shipments to Japan in 2007, Australia's major competitor is South Africa, with 2.5 million tonnes, or 21.2% of the market.

CHINA

Between 2000 and 2007, China's economy grew at an average rate of 9.6% pa, based on growth in GDP. In 2007 China's economy was the third largest in the world, behind the USA and Japan.



Source: http://faostat.fao.org

China's production of paper and paperboard has increased from 28.5 million tonnes in 1995 to reach 58.0 million tonnes in 2006, with an average annual increase of 6.7%, or a total rise in annual production of 30 million tonnes.



Source: http://faostat.fao.org

In 2006, with 58 million tonnes China was the second largest producer in the world after the USA with 84.3 million tonnes. Production levels in the USA are not rising, in fact they are expected to slide in the short-term, while Chinas production levels have been increasing at an average annual rate of 6.7%.

In 2006, the average consumption of paper and paperboard in China was 41.7 kg per capita, and is expect to increase through the economic cycles with rising wealth and literacy. Continued growth in Chinese consumption will drive the expansion of the Chinese domestic paper and paperboard manufacturing base, and as a result greater demand for woodchips from the Pacific Rim countries such as Australia.

FEA is well positioned to continue previous shipments of both woodchips and sawnwood from its Tasmanian operations to the expanding Chinese market. In addition FEA is in a position to take advantage of the Chinese demand for peeler (veneer) logs, since shipments have already been made by FEA and will continue to expand as harvesting increases from FEA plantations.

AUSTRALIA'S COST COMPETITIVENESS

Australia's exchange rate has also been an advantage for domestic exporters over recent years, however, similar to the currencies of many of Australia's major trading partners, the AUD has slipped against the USD as a result of the global financial restructuring. Over the long-term Australia's major resource and shorter freight routes are expected to provide natural advantages as the Australian currency moves through exchange rate cycles against the USD.

SAWN TIMBER MARKETS



Source: Australian Forest & Wood Product Statistics, ABARE







The major driver for changes in demand for the sawn timber market is the cycles in the dwelling construction market, as well as renovations and additions. This naturally occurring cycle in turn is influenced by population growth and economic cycles that include moves in interest rates, changes to GDP and wealth, demand for Australia's natural resources and the impact of the weather on primary production.

In the chart titled Sawnwood Consumption vs Dwellings Approved, while the Dwellings Approval line fluctuates, over the decade between 1996 and 2007 it can be seen the growth trend between Dwellings Approved and Sawnwood Consumption is very close.

Over the longer-term, Australia has maintained a trade deficit for sawn timber, with domestic demand being greater than local supplies.

The demand for sawn hardwood, which historically has been sourced almost entirely from native forests, has been declining at an average annual rate of 1.7% between 1996 and 2007. There are a number of factors influencing this decline, with the major ones being the diminishing supply of sawlogs from multiple use native forests as more forests are placed in reserves, and a strong substitution for native hardwood by plantation grown softwood and hardwood.

Demand for sawn softwood has been increasing at an average rate of 3.8% pa since 1996, which is approximately equal to the average rate of increase in Australia's GDP over the long-term. The strong growth rate has been achieved through the domestic building cycles that have occurred in the intervening years since 1995. However, in the future FEA anticipates demand for softwood will be tempered slightly with the increasing supply of plantation grown hardwood such as EcoAsh.

VENEER & SELECT GRADE SAWN TIMBER

High value timber products, such as decorative veneers, select grade flooring and mouldings, have historically been sourced from native forests. However, with the investment and research in producing solid wood products from expanding pruned hardwood plantations, products such as EcoAshClear® are increasingly supplying the market for select grade timbers. Management of hardwood plantations is also resulting in the production of structural veneers, especially ply and laminated veneer lumber (LVL).



Source: ABARE and Plywood Association of Austrasia P/L

Domestic growth in demand for ply and LVL has been increasing at an average rate of 9.6% during the twelve years between 1996 and 2007.



AUSTRALIA'S ECONOMY AND ITS FOREST PRODUCTS SECTOR

Source: ABARE

INDUSTRY CONTRIBUTION TO AUSTRALIA

Industry Contributions	Unit	1999	2000	2001	2002	2003	2004	2005	2006	2007
Turnover										
Log sawmilling and timber dressing	AUDM	2355	2685	2569	3538	4054	4234	3894	3856	4530
Other wood processing manufacturing	AUDM	4245	5161	4557	5217	5813	6355	6520	6529	7254
Paper and paper products	AUDM	5602	5780	7951	7808	8059	8123	8085	8575	7205
Total		12202	13626	15077	16563	17926	18712	18499	18960	18989
Employment										
Forestry & Logging	'000'	14.0	8.7	13.5	13.2	9.7	12.1	12.2	11.3	11.3
Log sawmilling and timber dressing	'000'	13.5	13.5	13.9	16.6	15.7	16.8	15.5	16.0	16.0
Other wood processing manufacturing	'000	30.9	33.3	31.4	32.3	32.8	34.0	34.8	36.1	35.9
Paper and paper products	'000'	17.3	16.9	19.7	19.5	19.8	18.7	19.7	19.3	17.8
Total		75.7	72.4	78.5	81.6	78.0	81.6	82.2	82.6	81.0
Imports										
Sawnwood	AUDM	416.7	548.1	427.7	442.5	589.3	583.5	586.1	527.6	567.1
Wood based panels	AUDM	142.4	189.4	151.6	164.8	206.2	193.1	216.1	228.2	274.6
Paper & paperboard	AUDM	1756.2	1997.8	2088.0	1991.3	2111.2	2102.1	2184.1	2187.0	2270.5
Total		2315.3	2735.3	2667.3	2598.6	2906.7	2878.7	2986.3	2942.8	3112.2
Exports										
Sawnwood	AUDM	42.8	51.2	58.9	65.9	68.7	72.1	101.6	121.0	145.3
Wood based panels	AUDM	100.9	143.2	205.4	214.9	185.3	148.5	153.4	153.0	125.6
Woodchips	AUDM	585.9	646.8	743.8	712.0	808.0	794.4	858.2	839.0	950.3
Paper & Paperboard	AUDM	355.4	489.6	528.8	698.7	625.0	629.6	626.9	601.1	650.5
Total		1085.0	1330.8	1536.9	1691.5	1687.0	1644.6	1740.1	1714.1	1871.7

Source: ABARE, ABS & IndustryEdge estimates

Even though Australia is a net importer of forest products, forestry has historically been a major industry, and will remain a significant one with turnover in 2007 reaching almost \$19 billion.

The sector employs approximately 81 000 people, which is 6.9% of the manufacturing sector.

In 2007, Australia's balance of trade for wood and wood products was a deficit of \$1.8 billion.

Australia's Forest Products Trade Deficit - Calendar Year 2007

	Imports	Exports		
	-		BOT	
Sawnwood	\$444	\$134	(\$310)	
Paper products	\$2,285	\$636	(\$1,649)	
Pulp	\$276	\$14	(\$262)	
Woodchips	\$1	\$997	\$996	
Roundwood	\$0.70	\$119	\$118	
Wood-based panels	\$284	\$118	(\$166)	
Wastepaper	\$2	\$211	\$209	
Paper Manufactures	\$498	\$107	(\$391)	
Misc. Forest	\$585	\$57		
Products			(\$528)	
Total	\$3,876	\$2,076	(\$1,800)	

The only forestry products for which Australia is a net exporter are woodchips (almost \$1 billion in the value of shipments) and roundwood (logs) that has a value of \$118 million. While \$134 million of sawnwood are exported each year, more than three times this value is imported, with shipments reaching \$444 million in 2007.

For the last calendar year Australia had net imports of \$1.649 billion of paper and paperboard products, which equated to approximately 1.6 million tonnes. The imported volume of paper and paperboard has been rising at an average rate of 2.5% per year over the past decade.



AUSTRALIA'S FOREST RESOURCE PRODUCTION & CONSUMPTION

Source: ABARE

For 2007, Australia's roundwood (log) removals were more than 27 million cubic metres (m³). The volume being removed from native forests has been diminishing at an average annual rate of 3.7% between 2000 and 2007. However, the volume from softwood plantations has been increasing at an average rate of 2.2% pa over the same period, and for hardwood plantations, starting from a very small base the average rate of increase has been 28.7% pa.

In 2002, when harvesting of hardwood plantations first produced more 1 million m^3 of logs, plantations only accounted for 10.2% of the domestic hardwood supply, however, by 2007, the proportional supply from plantations has increased to 32.2%.

AUSTRALIA'S PLANTATION ESTATE



Source: Australia's Plantations 2008, Department of Agriculture, Fisheries and Forestry, Bureau of Rural Sciences. Commonwealth of Australia 2008.

With Australia's trade deficit in forest products remaining close to \$2 billion every year, the Commonwealth government has been supporting a policy of expanding the domestic plantation resource. The goal of the policy is to increase Australia's plantation estate from 1 million hectares in 1997 to 3 million hectares by 2020.

In 2007, which is approximately half way through the period, Australia's plantation estate has reached 1.873 million hectares, comprising of 883,493 hectares of hardwood, 1,010,155 hectares of softwood and 9,254 hectares of 'other species'.

The graph below titled 'Total Hardwood and Softwood Plantations 2007' shows the split between hardwood and softwood resource by state for 2007.

REDUCING ACCESS TO AUSTRALIA'S NATIVE FORESTS



Source: ABARE

Access to the harvesting of native forests is gradually being restricted, with greater areas of forests being placed in reserves.

While on a national basis supplies of both sawlogs and pulpwood from native forests have been trending down, with the volume of saw and veneer logs declining at an average annual rate of 2.7% over the twelve years from 1996 to 2007, while for pulpwood the reduction in supply has been falling at the slower rate of 0.5% pa over the same period.

The species selected for growing in hardwood plantations have a greater proportion of available fibre for the manufacturing of paper and paperboard. As a consequence there is an increasing preference for woodchip buyers, especially in Japan, to source woodchips from plantations.

In 1995 only a quarter of Japans hardwood woodchip imports were sourced from plantations, however, by 2007 the proportion had increased to more than three quarters.

The trend for the major Japanese woodchip market towards plantation grown hardwood woodchips is predicted to continue due to the higher usable fibre from plantations and for environmental preferences.

EMERGING ALTERNATIVE FOREST PRODUCT MARKETS

Native forests and plantations are increasingly being recognised as producers of more products than the traditional sawnwood and woodchips. With a greater global focus on climate change and what steps can be taken to slow or reduce the consequences of climate change, forests and plantations have the potential to make significant contributions.

FEA plantations have the potential for generating five products that will have a positive impact in assisting steps being taken to mitigate climate change. These are:

<u>Bioenergy</u> – the combustion of renewable resources such as timber and other vegetable matter in the generation of energy, usually in the form of steam. Since Australia has ratified the Kyoto Protocol, the Commonwealth government, as the signatory, is considering joining a number of other parties in seeking the

inclusion of bioenergy, when it replaces the burning of fossil fuels, as a legitimate form of reducing emissions.

<u>Ethanol production</u> – the manufacturing of ethanol from plantations, especially residues, as a replacement for the use of petrochemicals in powering transport.

<u>Wood pellets</u> – there is a strong market for wood pellets in Europe, and increasingly in North America and Asia. The burning of wood pellets for heating is recognised, especially in Europe, as a green form of energy since one is using a renewable resource and not fossil fuels. Wood pellets are already being produced in Australia for shipment to Europe, with plantation species being mixed in the manufacturing process to achieve the best calorific potential.

<u>Power generation from biomass</u> – similar to bioenergy, whereby timber residues and other renewable vegetative matter is combusted to produce electricity, with the added benefit being the reduction in the use of fossil fuels such as coal and oil.

<u>Carbon trading</u> – the use of forests and plantations to sequester carbon from the atmosphere, usually taking it in the form of carbon dioxide.

CARBON CREDIT TRADING

Interest in carbon trading has been well documented in various forms of the media, however, there is currently no international market or other mechanism for the trading of carbon credits between emitters and forest growers. There are a number of agreements that have been reached between two parties, however, these are more specific arrangements and not open market trades.

Australia is considering what form policy should take in developing a carbon trading market, with a goal to have transactions occurring by 2010, however, any domestic policy will need to be in line with international agreements. Growers should be aware there is no definitive time scale or policy yet for the trading of carbon, however, there is clear motivation from the Commonwealth government to establish such a market and to have it operating within a couple of years.

WHY INVEST IN FORESTRY

MARKET OPPORTUNITIES

Growing World Demand

Global demand for solid wood, manufactured wood products such as ply wood or particle board, and other products derived from wood such as paper, paperboard and energy, is increasing with a growing population in most regions of the world and improved standards of living with rising wealth, especially in emerging countries such as China and India.

There is a clear relationship between the wealth of a nation and the quantity of wood and wood products consumed per capita. Plantations are valuable resources, both from the perspective as a resource for supplying wood products for value adding into products including paper and paperboard, and on environmental grounds for locking up carbon in wood products.

As the population in urban areas, especially in China where the movement of citizens from rural areas to urban communities is evident, there will be increasing demand for building materials, as well as wood products such as furniture and flooring.

Declining Access to Native Forests

There is a declining trend in the availability of native forests in Australia for the supply of sawlogs and pulpwood. Australia is not unique in this situation, most developed and developing countries are restricting access to native forests for timber supply, and in those countries that are still harvesting significant volumes, there is growing international pressure to reduce harvest levels, and in countries were it is prevalent, to stamp out illegal logging.

However, while demand grows for wood and wood products, and log supplies from native forests are diminishing, there must be a concerted drive to expand plantation resources globally. Plantations are a solution in protecting native forests and increasing log supplies for processing industries.

Diversified Forest Product End-Markets

The development of plantations focused on only a single market is the equivalent of 'placing all ones' eggs in a single basket'. It is prudent to manage plantation investments for the production of the three major products that have been produced by forests for centuries. These are:

<u>Sawn timber</u> – To derive sawn timber from young eucalypt plantations is an innovation that has progressed well through recent research and development. Solid wood from hardwood plantations can be used as a substitute in the softwood market for framing and building, but with smaller sizes due to the greater density and strength, and in the flooring and appearance grade timber markets.

<u>Wood based panels</u> – Timber panels incorporate a wide range of engineered wood products made from sliced, peeled or chipped logs. The manufactured products are designed to have better strength and

machining capabilities than the original logs. Examples of these products include medium density fibreboard, particleboard, plywood, glulam, oriented strand board (OSB), laminated veneer lumber (LVL) and veneers for covering plywood or other types of panels.

<u>Woodchips</u> – The two major uses of woodchips are in the manufacturing of some of the boards mentioned above, but with the greater proportion being utilised in the manufacturing of paper and paperboard. Woodchips from plantations are particularly better for paper and paperboard production than woodchips sourced from older native forests, since the plantation resource is likely to be more standard in its characteristics, need less bleaching and provide more usable fibre. As a consequence plantation resourced woodchips attract a market premium when traded.

Global markets for all three forest products are strong and will continue to grow for the long-term driven by increasing population numbers and rising wealth, especially in developing countries.

High Value Versatile Species

The plantation species, as well as the sawmilling and drying techniques developed by FEA at its modern mill facility, have been carefully selected and enhanced to produce the best quality products in either sawntimber for building or appearance grade applications, or for the manufacturing of paper and paperboard.

The plantation species are selected for their fibre properties and the ability to grow well in FEA preferred and selected regions. The better performing species are Eucalyptus nitens for hardwood and Pinus radiata for softwood.

The focus on high value versatile species is to ensure better secure markets and the generation of higher returns for the growers. Plantation grown woodchips have a higher yield for paper and paperboard manufacturing than resources supplied from native forests, and as a result are able to attract a price premium of as much as 10%.

Sawlogs, because of the growing regime and better value adding potential, attract a market price much higher than a pulplog, from which woodchips are derived. The growing of quality saw and veneer logs increases the returns for plantation investors, and assists the country to reduce is growing trade deficit in forest products.

While softwood is the most significant timber species used for construction, renovating and home extensions, there is a growing potential to utilise plantation grown EcoAsh and EcoAshClear for their greater strength to weight ratio.

Australia's Competitive Position

Australia is conveniently located with shorter shipping times to the major roundwood, solid wood and woodchip markets of Asia. Japan is the most significant importer of woodchips in the world, and China is rapidly expanding its timber processing and furniture manufacturing industries.

In addition China has a growing demand for construction timbers, both panels for formwork and solid wood for framing.

Even though Russia is the major supplier of wood into China and has a closer proximity, its intention to introduce significant tariffs, at a minimum of Eur50 per cubic metre from the 1st January 2009, will create market opportunities for alternative imports, especially from Australia.



GOVERNMENT POLICY & AUSTRALIA'S PLANTATIONS

Source: Australia's Plantations 2008, Department of Agriculture, Fisheries and Forestry, Bureau of Rural Sciences. Commonwealth of Australia 2008.

In recognition of the emerging opportunities for renewable timber production, the policy statement 'Plantations for Australia: The 2020 Vision' was released in 1997 and relaunched in 2002 as a combined strategy of federal and state governments, and the commercial plantation growing and timber processing industries.

This government policy and strategy confirms the establishing of plantations as the preferred option to ensure future domestic timber supplies. The '2020 Vision' seeks a trebling of the nation's1997 resource base from 1 million to 3 million hectares by the year 2020. The '2020 Vision' has enjoyed support at all levels of government and in the investment community since its release.

Australia's total plantation area reached 1.87 million hectares in 2007, being 980.2 thousand hectares of softwood plantations (52.3%) and 883.5 thousand hectares of hardwood plantations (47.2%). Of this total, investors who have purchased woodlots in Managed Investment Schemes (MIS), including those managed by FEA Plantations; own over 583 thousand hectares (31%) of Australia's plantations (2007). Current plantation figures show a further increase of the 2007 MIS total to 680.4 thousand hectares. In conjunction with this, tropical plantation timbers in the MIS sector, which include African mahogany, have increased 40% above that for the 2007 total of 17,451 hectares.

References 2008

- 1. Plywood Association of Australia P/L
- 2. Australian Bureau of Statistics:
- International Trade Cat # 5439.0
- Producer Price Index Cat # 6427.0
- Building Approvals Cat # 8731.0
- 3. Australian Bureau of Agriculture and Resource Economics, Australian Forest and Wood Products Statistics, March and June Quarters 2007
- 4. Australia's Plantations 2007, Department of Agriculture, Fisheries and Forestry, Bureau of Rural Sciences. Commonwealth of Australia 2008.
- 5. Food and Agriculture Organization of the United Nations http://www.fao.org/waicent/portal/statistics_en.asp
- 6. GeoHive: Global Statistics, http://www.geohive.com/default1.aspx
- 7. IndustryEdge estimates & research
- 8. Japan Customs: http://www.customs.go.jp/toukei/info/tsdl_e.htm
- 9. World Fact Book CIA
- 10. Swivel.com National GDP's
- 11. Global Forest Resources Assessment 2005, FAO 2006
- 12 Database of Changes in Wood Pulp and Paper Capacity, NLK Associates, August 2007
- 13. fx.sauder.ubc.ca/data Exchange rates
- 14. Chinability.com/gdp
- 15. Taiwan Customs: http://web.customs,gov.tw/statistics
- 16. Korean Customs: http://english.customs.go.kr/kcsweb

"Robert Eastment, Director, IndustryEdge Pty Ltd, has prepared this independent report for FEA Plantations Limited for inclusion in its PDS relating to the FEA Plantations Project 2009. In addition, this independent report will be used by FEA Plantations Limited in a range of company marketing reports, including newsletters, and as supporting documentation for research undertaken by industry analysts and commentators.

In preparing this report, IndustryEdge has relied on information given to it by FEA Plantations Limited about its business and practices. IndustryEdge has not independently verified this information. IndustryEdge has also collected independent information about the hardwood sawn timber industry.

Nothing in this report is, or should be relied upon, as a promise by IndustryEdge that the Project will perform as indicated nor the markets for hardwood sawn timber will be as predicted.

No person may rely on this independent report for any other purpose or in any other context. IndustryEdge has not been involved in the preparation of any other aspect of the PDS and is not liable for any other aspect of the PDS.

IndustryEdge will receive a professional fee of \$6,000 (+GST) for the preparation of this independent report. Apart from this fee, IndustryEdge does not have any pecuniary or other interest in the Project or FEA Plantations Limited which could be reasonably regarded as influencing the provision and content of this report.

This report does not constitute advice or an opinion on the financial product offered under the PDS. IndustryEdge does not hold an Australian financial services licence."